

The Financial and Non-Financial Outcomes of Rural to Urban Migration in Australia

A thesis submitted in partial fulfilment of the requirements for
the award of the degree:

Bachelor of Commerce (Hons)

University of Wollongong

School of Economics

By Nathan Kettlewell

2009

Certificate of Originality

The work contained in this thesis has not been previously submitted for a degree or other qualification at any other higher education institution. To the best of my knowledge, this thesis contains no material previously published or written by another person, except where due reference is made.

Signed:

Date:

Dedication

I am grateful to my family for their love and support throughout this year and indeed my entire time at university. I am particularly thankful to my grandad for his continual interest in my work which has helped to keep me motivated.

Table of Contents

LIST OF TABLES.....	5
LIST OF FIGURES.....	6
LIST OF ABBREVIATIONS.....	7
ABSTRACT.....	8
1. INTRODUCTION.....	9
1.1 OBJECTIVES AND MOTIVATION.....	9
1.2 DATA AND METHODOLOGY.....	10
1.3 THESIS STRUCTURE.....	11
2. SOCIAL AND FINANCIAL ISSUES FOR AUSTRALIA’S RURAL POPULATION IN RECENT YEARS.....	14
2.1 RURAL LIVING.....	16
2.2 DROUGHT.....	18
2.2.1 <i>Economic Consequences of Drought</i>	19
2.2.2 <i>Social Consequences of Drought</i>	20
2.3 RURAL HEALTH.....	23
2.3.1 <i>Physical and Mental Health – Provision and Prevalence</i>	23
2.3.2 <i>Rural suicide</i>	25
2.4 <i>Youth Exodus</i>	25
2.5 SUMMARY.....	26
2.6 CONCLUSION.....	27
3. LITERATURE REVIEW.....	29
3.1 THEORETICAL MODELS OF MIGRATION.....	29
3.1.1 <i>Uncertainty: Migration in Response to Expected Income - Todaro (1969) and Harris and Todaro (1970)</i>	30
3.1.2 <i>Regional Amenities and Hedonic Pricing</i>	34
3.2 WAGE RETURNS TO INTERNAL MIGRANTS.....	40
3.2.1 <i>Wage returns to Internal Migrants in General</i>	41
3.2.2 <i>Wage Returns to Rural to Urban Migrants</i>	51
3.2.3 <i>Summary</i>	53
3.3 THE WELL-BEING OF INTERNAL MIGRANTS.....	54
3.3.1 <i>Empirical Studies</i>	55
3.3.2 <i>Summary</i>	58
4. THEORETICAL FRAMEWORK.....	59
4.1 THEORETICAL PERSPECTIVE.....	59
4.1.1 <i>Income Motive</i>	65
4.1.2 <i>Migrant Utility</i>	66
5. MEASURING THE FINANCIAL RETURNS FOR RURAL TO URBAN MIGRANTS....	68
5.1 DATA.....	68
5.2 DEFINING RURAL AUSTRALIA.....	69
5.3 MOVERS.....	72
5.4 THE FINANCIAL RETURNS.....	74
5.4.1 <i>Descriptive Analysis</i>	74
5.4.2 <i>Formal Analysis and Results</i>	86
5.4.3 <i>Discussion</i>	104
5.6 SUMMARY AND CONCLUSIONS.....	110
6. MEASURING THE NON-FINANCIAL RETURNS FOR RURAL TO URBAN MIGRANTS.....	112
6.1 NEIGHBOURHOOD, COMMUNITY AND HOME SATISFACTION.....	114
6.2 FINANCIAL AND EMPLOYMENT SATISFACTION.....	117

6.3 OVERALL LIFE SATISFACTION	126
6.4 DISCUSSION	133
6.4.1 Culture Shock	134
6.4.2 Utility Maximising Framework	135
6.4.3 Explanations for Unchanged Life Satisfaction	139
6.4.4 Policy	146
6.4.5 Results from our Full Regression	147
6.5 SUMMARY AND CONCLUSIONS	148
7. SUMMARY AND CONCLUSIONS	150
7.1 RESULTS	150
7.2 CONCLUSIONS AND IMPLICATIONS	152
7.3 FUTURE RESEARCH	154
REFERENCES	157
APPENDIX 1	167
APPENDIX 2	171
APPENDIX 3	173
APPENDIX 4	174
APPENDIX 5	177

List of Tables

TABLE 5.1 SOS STRUCTURE.....	71
TABLE 5.2 NUMBER AND DISTANCE OF MOVES (WAVES 1-7 OF HILDA).....	72
TABLE 5.3 CHARACTERISTICS OF MALE MOVERS AND STAYERS (YEAR BEFORE MOVE).....	78
TABLE 5.4 CHARACTERISTICS OF FEMALE MOVERS AND STAYERS (YEAR BEFORE MOVE).....	79
TABLE 5.5 MALES WEEKLY WAGE MEAN COMPARISONS.....	84
TABLE 5.6 FEMALES WEEKLY WAGE MEAN COMPARISONS.....	84
TABLE 5.7 MALES HOURLY WAGE MEAN COMPARISONS.....	84
TABLE 5.8 FEMALES HOURLY WAGE MEAN COMPARISONS.....	84
TABLE 5.9 ONE YEAR WEEKLY WAGE RETURN.....	91
TABLE 5.10 ONE YEAR HOURLY WAGE RETURN.....	92
TABLE 5.11 WEEKLY WAGE RETURNS TO MALE RURAL TO URBAN MOVERS.....	96
TABLE 5.12 WEEKLY WAGE RETURNS TO FEMALE RURAL TO URBAN MOVERS.....	96
TABLE 5.13 HOURLY WAGE RETURNS TO MALE RURAL TO URBAN MOVERS.....	97
TABLE 5.14 HOURLY WAGE RETURNS TO FEMALE RURAL TO URBAN MOVERS.....	97
TABLE 5.15 FIXED EFFECTS FULL SPECIFICATION.....	98
TABLE 6.1 NEIGHBOURHOOD, COMMUNITY AND HOME SATISFACTION OF MALE MOVERS.....	117
TABLE 6.2 NEIGHBOURHOOD, COMMUNITY AND HOME SATISFACTION OF FEMALE MOVERS.....	117
TABLE 6.3 FINANCIAL AND EMPLOYMENT SATISFACTION OF MALE MOVERS.....	123
TABLE 6.4 FINANCIAL AND EMPLOYMENT SATISFACTION OF FEMALE MOVERS.....	124
TABLE 6.5 OVERALL LIFE SATISFACTION OF MALE MOVERS.....	129
TABLE 6.6 OVERALL LIFE SATISFACTION OF FEMALE MOVERS.....	130
TABLE 6.7 CHANGES IN AREA SOCIO-ECONOMIC STATUS OF MALE MOVERS.....	146
TABLE 6.8 CHANGES IN AREA SOCIO-ECONOMIC STATUS OF FEMALE MOVERS.....	146
TABLE A2.1 FIRST STAGE EQUATION FOR ONE YEAR WEEKLY WAGE RETURN.....	171
TABLE A2.2 FIXED EFFECTS RESULTS FOR HOURLY WAGE WITH DIFFERENT RESTRICTIONS.....	172
TABLE A2.3 LAMBDA COEFFICIENTS FROM IV MODELS (WEEKLY WAGE).....	172
TABLE A2.4 LAMBDA COEFFICIENTS FROM IV MODELS (HOURLY WAGE).....	172
TABLE A3.1 NUMBER OF MOVERS FOR DIFFERENT DURATIONS SINCE THE MOVE (MALES).....	173
TABLE A3.2 NUMBER OF MOVERS FOR DIFFERENT DURATIONS SINCE THE MOVE (FEMALES).....	173
TABLE A5.1 LIFE SATISFACTION FULL REGRESSION (INDIVIDUAL FIXED EFFECTS).....	177

List of Figures

FIGURE 3.1 WAGE/RENT TRADE-OFF FOR INDIVIDUALS AND FIRMS.....	37
FIGURE 3.2 IMPACT OF AMENITY LEVEL INCREASE	39
FIGURE 4.1 THE DECISION TO MIGRATE.....	62
FIGURE 4.2 A CHANGE IN AREA PREFERENCES.....	64
FIGURE 4.3 BOREDOM OR DETACHMENT OVER TIME	65
FIGURE 5.1 CONSUMPTION/LEISURE TRADE-OFF.....	106
FIGURE 6.1 TIME PATH OF LIFE SATISFACTION (MALE LABOUR FORCE PARTICIPANTS)	131
FIGURE 6.2 TIME PATH OF LIFE SATISFACTION (MALE GENERAL POPULATION)	131
FIGURE 6.3 TIME PATH OF LIFE SATISFACTION (FEMALE LABOUR FORCE PARTICIPANTS).....	131
FIGURE 6.4 TIME PATH OF LIFE SATISFACTION (FEMALE GENERAL POPULATION).....	132

List of Abbreviations

ABARE – Australian Bureau of Agricultural and Resource Economics

ABS – Australian Bureau of Statistics

AGDHA – Australian Government Department of Health and Ageing

AIHW – Australian Institute of Health and Welfare

ARIA – Accessibility/Remoteness Index of Australia

BOM – Bureau of Meteorology

CRMH – Centre for Rural Mental Health

HILDA – Household, Income and Labour Dynamics in Australia

IV – Instrumental variables

LSAY – Longitudinal Survey of Australian Youth

MSR – Major Statistical Region

PSID – Panel Study of Income Dynamics

SOS – Section of State

Abstract

The aims of this thesis are to measure the financial (wages) and non-financial (subjective indicators of well-being) outcomes of rural to urban migrants in Australia. This is done using regression techniques to control for both observable and unobservable factors that may influence outcomes. Data from the Households, Income and Labour Dynamics in Australia survey is used. We examine males and females separately as well as the outcomes of inter-rural movers. It is found that males experience higher weekly but not hourly compensation while the opposite is true for females. Inter-rural movers do not experience any wage returns. Overall life satisfaction is unchanged for most groups examined (we separate the general population and labour force participants only). Only female rural to urban movers experience an increase in satisfaction (after three years). Inter-rural male labour force participants go from a disadvantageous position to one of equivalence with non-movers which may be because they are less satisfied with their employment opportunities than non-movers before leaving. Implications of both economic and psychological theories are discussed that could explain the fact that we do not consistently observe an increase in life satisfaction from moving. Policy implications are also discussed in relation to both our financial and non-financial results.

1. Introduction

1.1 Objectives and Motivation

A current population trend in Australia is that people are leaving rural areas to move to more urbanised regions (Garnett & Lewis 2007). Economic and social disparities (such a lower access to services) between rural and urban areas appear to have driven much of this trend. This has economic and social implications for the rural sector with stunted (in some areas negative) labour market and population growth. Furthermore, with the young overrepresented in the migration figures (particularly females), rural areas are becoming relatively ‘aged’ as well as struggling with gender mismatch issues (Argent & Walmsley 2008).

The main aim of this thesis is not to analyse the impact of outmigration upon those who are left behind. This is left for future research. Rather the wage returns and returns to subjective well-being of those who move will be estimated. We will estimate not only the contemporaneous returns to moving, but also examine the time path of returns to both wages and life satisfaction. There are a number of motivating factors for this work.

(1) The information may be useful for policy makers. It may identify motivations for migrating and possible inequalities between rural and urban Australia.

(2) It will be one of the first studies to link the literature on subjective well-being and rural to urban migration in a developed country. Indeed, even at a broader level of

general internal migration, few studies have examined returns to subjective indicators of well-being, despite the act of migration typically being considered as a utility maximising choice. Furthermore, the well-being returns for different durations since the move have received little attention.

(3) It will be the first study (to the best of my knowledge) to explore the wage returns to rural-urban movers in Australia using a representative sample of the general population and using formal techniques to control both for observable and unobservable personal characteristics (i.e. selectivity bias).

(4) The information is likely to be important for prospective movers. Particularly in the case of overall life satisfaction, movers are likely to be subject to uncertainty in their decision making, with vast differences in the social and environmental functioning of rural and urban living.

1.2 Data and Methodology

This study uses panel data from the Household, Income and Labour Dynamics in Australia (HILDA) survey.¹ The survey re-interviews respondents annually and seven waves (or years) of data are currently available (2001-2007). By exploiting the panel aspect of this data we are able to control for individual characteristics that would remain unaccounted for in cross-sectional studies. As HILDA is a nationally representative sample and Australia is a highly urbanised nation, an unbalanced panel

¹ The HILDA Project was initiated and is funded by the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) and is managed by the Melbourne Institute of Applied Economic and Social Research (MIAESR). The findings and views reported in this paper, however, are those of the author and should not be attributed to either FaHCSIA or the MIAESR.

of all available years of data is used to deal with the fact that we observe only a relatively small number of rural to urban moves.

The fact that the decision to migrate may be endogenous (due to movers having unobserved traits that distinguish them from non-movers which are correlated with earnings causing self-selection bias) is strongly understood by modern researchers (Greenwood 1997). To account for this we use a fixed effects specification which should account for self-selection bias if the unobserved traits are time invariant. In case unobserved traits are not time invariant and occur because of changes in personal circumstances for example, we also estimate wage growth equations using instrumental variable (IV) methods.

Fixed effects specifications are also used when we estimate the returns to factors of subjective well-being (these factors are satisfaction with employment opportunities, financial situation and overall life satisfaction) to make interpersonal comparisons more plausible. If we did not use fixed effects we would not be accounting for the fact that having a higher subjective life satisfaction score than another person does not necessarily imply a superior level of life satisfaction if each person evaluates the reporting scale differently.

1.3 Thesis Structure

This thesis is structured as follows. In Chapter 2, current economic and social circumstances for rural Australia are discussed. This chapter is intended to provide a brief insight into the context of rural living in Australia. With this information we are

able to make some predictive judgments and have a source of reference to perhaps offer insight into some of our results. In Chapter 3 the literature on general internal migration, and more specifically rural to urban migration, in developed countries is reviewed. Two main strands of literature are reviewed; namely the theoretical literature on the migration decision and its macroeconomic consequences and the empirical literature on both the wage and well-being outcomes of movers. A simple mathematical and diagrammatical model to analyse the theory behind the decision to migrate is developed in Chapter 4. This gives clarity to the theoretical predictions discussed in Chapter 3. The empirical work begins in Chapter 5 where the data and sample used is described before estimating the weekly and hourly wage returns to both female and male movers. As previously stated, techniques are used to account for possible unobserved characteristics and self-selection bias and the wage returns to different durations since the move are estimated. In Chapter 6 the returns to various domains of subjective well-being are estimated. These domains are satisfaction with one's neighbourhood, community, home, employment opportunities, financial situation and overall life. For the last three measures of well-being a fixed effects specification to control for personality and response scaling factors is used. For all domains satisfaction for different durations since the move are estimated, a notable omission from the current literature. Currently there exists very few papers which estimate the subjective well-being (life satisfaction/happiness) returns to internal migration at any level. Those that have attempted to do this have often used recall measures of well-being (which may be biased due to memory constraints as well as changing aspirations – see Shiffman and DeVries (1999) and Easterlin (2001)) or have not accounted for unobserved personality and response scaling factors. The last

chapter of this thesis thus contributes a novel contribution to the literature of the psychological effects of migration.

2. Social and financial issues for Australia's rural population in recent years

Introduction

Population growth for Australia's rural areas has been well below the rate for the general population in recent years. Between 2003 and 2008, average annual population growth in remote Australia was 0.3% compared the national average of 1.5% and major city average of 1.6% (ABS 2009). In New South Wales and Victoria, growth was in fact negative, with the states recording growth rates of -1.7% and -1.2% respectively.² Garnett and Lewis (2007) use a different classification of rural and remote than ABS (2009), however the story is the same. Between 2000 and 2005, the total population increase was 4%, whereas the increase for remote areas was only 0.6% (Garnett & Lewis, 2007). This compares to 3.2% for 1996 to 2001 (the national rate was 6% for this period).

Driving this low, and in some areas negative, level of population change is the prevalence of high levels of outmigration from rural areas. This trend has been apparent for many years with the level of net migration to remote areas equal to -6.2% between 1991 and 1996 and -7.6% between 1996 and 2001 (Garnett & Lewis 2007). If we include inland areas in our classification of 'rural,' the trend is still apparent although less severe with net migration figures of -1.9% and -2.4% for the periods 1991 to 1996 and 1996 to 2001 respectively. More than half of the migrants from

² These results were derived using the Accessibility/Remoteness index of Australia (ARIA) which identifies five categories of remoteness based on distance to access service centres. The empirical work undertaken in this thesis does not use this classification due to sample constraints. Details are provided in Chapter 4.

inland and remote Australia have migrated to capital cities and other metropolitan areas with populations of more than 100 000 people. Young people are overrepresented in the outmigration figures (particularly young females) which has resulted in an older rural population and a mismatch between the amount of males and females, which carries with it both economic and social consequences (Argent & Walmsley 2008).

To explain this migration phenomenon, research has focused on both the economic disadvantages faced by rural populations, as well as the structural constraints (such as limitations on the access of services and education) of rural townships. In this chapter an overview of rural issues and comparisons between rural and urban circumstances will be presented. This exercise builds the contextual framework used to predict and analyse the financial and non-financial outcomes of rural to urban movers in Australia.

Determining the relative social and economic circumstances of Australia's rural communities is a complex task. The degree and nature of financial hardships and social pressures is by no means universal. Each town is uniquely characterised in terms of population, industry structure and economic risks (such as risk of drought). As stated by Larson (2006 pg. 2) "It is axiomatic in discussing rural and remote Australia that diversity rules. If you have seen one country town, you have seen only one country town." Furthermore, with no clear outline over what characteristics of a region constitute the classification of 'rural,' broad conclusions are even more difficult to apply. Nevertheless, examination of current research into rural economic

and social circumstances does reveal some common issues facing rural communities, which are of course of differing significance across different regions.

2.1 Rural Living

Economic and social inequality between rural and urban areas has been persistent in Australia. Rural areas have been overrepresented in the distribution of Australian socioeconomic disadvantage (Ciurej, Tanton & Sutcliff 2006). The ‘rural crisis’ of pervasive out migration (particularly of young people) has been partially attributed to these inequalities (Gibson & Argent 2008).³

Rural communities have faced issues of lower incomes, lower services and lower political influence compared to urban Australia (Pritchard & McManus 2000). Less than 10% of rural residents feel they have adequate access to services and transport whereas 40% and 42.4% of urban residents indicate adequate access to services and transport respectively (Hogan et. al. 2008). It is important to note that inequalities have varied in extent (and are not always relevant) across different communities. In fact, some rural towns have been the subject of relative economic advantage. Service based towns, towns garnering significant levels of tourism and towns with strong employment in the booming mining sector have been subject to relative economic advantage, while sea change and agricultural based communities have suffered (Baum, O’Conner & Stimson 2005).⁴

³ Note that the term ‘rural crisis’ is used by some authors (for example Pritchard and McManus (2000)) in respect to the adverse socioeconomic and spatial factors facing rural communities. In reference to Gibson and Argent (2008) I am referring to the ‘rural crisis’ as identifying the chronic outmigration of residents (particularly young) from rural Australia.

⁴ In 2001 over 11% of rural Australia was employed in mining compared to about 1% for non-rural Australia (Garnett & Lewis 2007).

The socio-economic disparities between the rural and urban parts of Australia have been attributed to restructuring of the pastoral and agricultural industry in response to globalisation, outmigration from rural areas and recentralisation of government services (Pritchard & McManus 2000). Microeconomic reform has placed competitive pressure on the agricultural sector, although it has been argued such policy has been consistent with both efficiency and equity goals (Freebairn 2003). Reduced government service provision has been a concern for rural communities and is reinforced by the depopulation trend, with services being reduced in line with declining populations (Pritchard & McManus 2000). Furthermore, rural populations have been subject to inadequate financial facilities (Jones 2002) and, particularly in recent years, instances of severe drought (Bureau of Meteorology (BOM) 2007).

There are differences in the pressures on mental health for rural Australians, with unique issues such as isolation, low access to or availability of services, low levels of awareness and a higher reluctance to seek help, reinforced by living in a 'close-knit' community (Beyond Blue 2008 pg.98). Despite this, actual levels of mental health have been relatively similar between rural and urban populations (Australian Institute of Health and Welfare (AIHW) 2008A). Rural Australians have lower access to health care (AIHW 2008B) while instance of injury is higher and many other health outcomes are worse (AIHW 2005). Relatively high instances of male suicide have been a major issue in rural communities for many years.

AIHW (2005) attempted to quantify happiness differentials between different areas of Australia, finding that people in regional areas were as likely (although people in

outer regional areas were less likely) to report feeling ‘delighted’ and people in regional areas and inner regional areas were more likely to report feeling ‘terrible’ than people living in the city (for all other levels of happiness results were about the same). With the amount of people reporting ‘terrible’ equalling about 1% and the amount of people reporting ‘delighted’ 12%, the results do not indicate any overwhelming happiness disparity. Hogan et. al. (2008) found that rural residents were more likely to report a ‘high score’ for life satisfaction (8/10 and above) than urban respondents.

2.2 Drought

Direct employment in the agricultural sector is most represented in rural communities (Garnett & Lewis 2007). As a result, the impact of drought is going to be particularly severe for rural communities.⁵ In addition, it is important to realise that drought also impacts upon those who are dependent on those employed in the agricultural industry. For instance, drought that affects the profits of a farm in a small community will have significant flow on effects to those employed in other sectors, such as services, as a result of decreased spending by both the farmer and those employed by the farmer who are all part of the rural community.

Southern Victoria, northern and eastern Tasmania, south east Queensland, south east South Australia, the south west of Western Australia as well as much of New South Wales has been affected by well below average rainfall throughout the new

⁵ The Bureau of Meteorology defines a drought as, “a prolonged, abnormally dry period when there is not enough water for users' normal needs.” This does not give any specific parameters for what constitutes a drought. Consequently, the exact definition of ‘drought’ remains unresolved. The declaration of a drought is the responsibility of the State government.

millennium (BOM 2007). Severe droughts have been recorded in 2002 and 2006 as well as 2001 for Southwest Victoria (BOM 2007). This climatic situation has resulted in significant economic and social consequences. Some attention is given here to the impact of drought as the period examined in the empirical section of this thesis (2001-2007) seems to coincide with severe drought for much of Australia.

2.2.1 Economic Consequences of Drought

Using general equilibrium economic modelling, Horridge, Madden and Wittwer (2005) simulated a 30% reduction in output in the agricultural sector in response to the 2002-03 drought. This accounted for a 1% drop in gross domestic product (GDP) had the drought not occurred. The multiplier effects were estimated to cause a further 0.6% reduction in GDP for a total reduction of 1.6%. Similarly, the ABS (2004) estimated that the 2002-03 drought, through the direct impact on agriculture, decreased GDP by 1% between 2001-02 and 2002-03. The impact of the 2006 drought on average broadacre farm incomes was extremely obvious, with average farm incomes dropping from \$70 182 in 2005-06 (ABARE 2008) to only \$29 800 in 2006-07 (ABARE 2009). Obviously, the economic impact to rural communities from severe drought can be substantial.

Alston and Kent (2004a), along with findings on the social implications of drought, found that drought was associated with severe economic consequences in effected communities. A case study of three NSW drought effected communities found that drought resulted in lower incomes, increased debt and longer working hours through both drought specific tasks and staff reductions. Reduced income varied among

communities but was generally estimated to be within the range of \$60000 and \$100 000. Businesses generally recorded downturns with businesses directly related to farming experiencing the greatest losses.

Further study to analyse the financial and social impact of drought has been undertaken by Edwards, Gray and Hunter (2008).⁶ With a sample of 8000 people living in rural and regional Australia the economic impact on farmers, farm-workers and those not directly employed in agriculture was analysed. The magnitude of the results varied upon two definitions of drought (although the general conclusions were usually the same). A rainfall deficiency classification and a social classification based on whether residents perceived they were in drought were used. Using the rainfall classification farmers in drought were likely to be \$4267 worse off than those with simply below average rainfall. With the social definition farmers in drought were likely to be \$20 483 worse off than farmers who had not been in drought for the last three years. Those in the community not directly employed in the agricultural sector were also worse off (to a lesser extent) although farm workers were no worse off in terms of income. Rural residents in drought effected areas were more likely to face financial hardships (such as missing mortgage repayments) and, with the rainfall definition, were subject to lower levels of employment.

2.2.2 Social Consequences of Drought

With communities facing reduced incomes, higher levels of debt, lower employment and longer working hours, drought is likely to be accompanied by social

⁶ An extended paper (Edwards, Grey & Hunter 2009) found evidence of financial hardship (particularly for farmers) as a result of drought.

consequences. Alston and Kent (2004a) found that drought caused people to become less active in the community. This is not fully supported, with Edwards, Gray and Hunter (2008 pg. 8) finding that drought affected areas were more likely to be subject to higher levels of membership in community groups, which may be interpreted as “pulling together in the face of adversity,” and the Centre for Rural Mental Health (CRMH) (2005) finding that some farmers in drought reported increased community closeness with increased willingness to share feelings towards the common difficulties they were collectively facing. In the former study however, it was also found that drought affected communities were more likely to report a low level of social cohesion, which represented reduced trust and fellowship in the community. Stehlik, Lawrence and Gray (2000) also report a loss of community networks as a result of severe drought.

Drought has been linked to reduced mental and physical health (Edwards, Gray & Hunter 2008 and Alston & Kent 2004a). An inadequate provision of services during drought has been identified by Alston and Kent (2004b). With the added mental and financial pressures faced by drought affected residents, demand for services such as financial counselling and support has stretched supply to capacity. Access to medical treatment has also been an issue with many families struggling to afford the journey to town or the consultant fee from seeing the doctor (Alston & Kent 2004b). Carroll, Frijters and Shields (2009) used data on individual life satisfaction and found that drought in spring (in rural but not urban areas) had a significant negative effect on self-reported well-being with an income equivalence of \$18 000.

It is well documented that youth outmigration has been pervasive in rural communities, with particular concern applied to the large proportion of young female leavers (Argent & Walmsley 2008 and Alston & Kent 2004a). As a result, rural populations are facing the problem of ageing populations and young males are facing a shortage of potential partners (Larson 2006). Although this phenomenon is largely independent of drought, drought (with its negative economic and social consequences) has been associated with increased exodus (Alston & Kent 2004a).

Drought has impacted upon men and woman differently. In many cases, woman are forced to either increase on farm work or, with men unable to abandon farm duties, undertake off farm employment (Alston 2007; Alston & Kent 2004a; Stehlik, Lawrence & Gray 2000). With the isolation of many rural households and the limited employment opportunities in drought affected towns, this need for off farm employment has often resulted in involuntary family separation (Alston 2007 and Alston & Kent 2004a). Furthermore, women have often been required to undertake greater responsibility in the management of household finances (Alston 2007; Alston & Kent 2004a; Stehlik, Lawrence & Gray 2000).

Educational access has also suffered as a result of drought. Rural residents face barriers to education as a result of geographical isolation and limited government provision. This is made worse by drought through the effects of rural outmigration and reduced household incomes. Outmigration has led to reduced local enrolments and therefore educational service provisions have decreased (Alston & Kent 2006). Financial constraints have limited access to tertiary education and high school

retention has decreased partially in response to students not wanting to financially burden their family (Alston & Kent 2006).

2.3 Rural Health

2.3.1 Physical and Mental Health – Provision and Prevalence

Analysis of the issue of rural health has focused on both the disparities between health outcomes for rural and urban Australians, as well as the disparities in the access to health services. The supply of medical doctors, as well as dentists, is significantly lower in rural Australia, although the supply of nurses is more evenly distributed (AIHW 2008B & Australian Government Department of Health and Ageing (AGDHA) 2008). Due to government incentive schemes, a higher proportion of overseas born doctors practice in rural areas and stakeholder evidence suggests this situation may be problematic, with overseas doctors lacking the necessary training to deal with medical practice in the rural context (AGDHA 2008). In addition to lower levels of service, rural residents are subject to inferior health outcomes, with higher mortality levels (AIHW 2006 & AIHW 2005), comparatively higher instances of injury, communicable disease, disability and lower self assessed health status (AIHW 2005). Using data from the Household, Income and Labour and Dynamics in Australia (HILDA) survey, Hogan et. al. (2008) found poorer physical health outcomes of rural respondents compared to urban.

In addition to physical health problems, mental health in rural Australia also needs to be considered. CRMH (2005) reported that farmers and farming families faced stress

from financial instability, variable whether, decision making responsibility and in some cases intergenerational conflict. However it was also found that in most cases people were able to cope with the difficulties of rural life with support from family and friends, work and maintenance of a positive outlook.

Although the relatively low provision of mental health care services for rural communities is well documented (Judd & Humphreys 2001), low levels of services are not the only factors limiting access to mental health care in rural communities. CRMH (2005) identified three factors that restricted access to mental health services. These were: residents' preference to seek help from friends and family, the presence of a social stigma about mental health and low knowledge of and access to mental health care services. Despite these issues, mental health outcomes do not seem to be worse for those living in rural areas.

Andrews et. al. (1999) found there was little difference in the prevalence of mental health disorders between capital cities and regional areas. AIHW (2005) found that in general people in regional areas were subject to the same levels of mental health as those in urban areas, although males in outer regional areas were more likely to suffer from anxiety. A more recent study found no statistical difference between levels of anxiety or depression although males in outer regional and remote areas were more likely to report high levels of psychological distress (AIHW 2008A). In contrast to there being little or no mental health disparity, Hogan et. al. (2008) identified that rural residents were in fact in better mental health than those people living in urban areas.

2.3.2 Rural suicide

The issue of suicide is of significant importance in rural communities. It is well documented that rural men, particularly young men, are at higher risk of suicide than men living in urban areas (Page et. al. 2007; Taylor et. al. 2005; Caldwell, Jorm & Dear 2004; Dudley et. al. 1998). Lower socioeconomic status of rural residents may partly explain this differential (Taylor et. al. 2005 and Page, Morrell & Taylor 1998). Evidence suggests that this differential is not the result of poorer mental health with studies suggesting no significant difference between the mental health of rural or urban residents, (Taylor et. al. 2005) although rural residents suffering from mental conditions do appear less likely to seek help (Taylor et. al. 2005).

2.4 Youth Exodus

Rural youth migration has been widely discussed in the media and academic literature. Rates of rural youth outmigration have been high and increasing, with rates for young females particularly high (Gibson & Argent 2008). Structural factors including limited educational and employment opportunities have dominated explanation of this trend (for example see Geldens 2007; Eacott & Sonn 2006; Alston 2004). It has also been suggested that social factors may have some influence with some young people reporting migration as a natural progression and the presence of a stigma that those left behind were 'failures' (Geldens 2007 and Eacott & Sonn 2006).

With chronic youth exodus, there are obvious economic implications. The trend is leaving rural towns with ageing labour markets. Maintaining the rural economy will

become increasingly difficult as the age and productivity of the general population decreases. The implications are worse if those people who migrate are more skilled than those who stay. Indeed, this ‘brain drain’ concern has been expressed in the media (Gabriel 2002). Furthermore, with declining populations, provision of government services has been decreasing which has a reinforcing impact on the youth exodus trend (Pritchard & McManus 2000).

2.5 Summary

Rural Australia has faced a number of unique social and economic problems in recent years. Largely in response to limited educational and employment opportunities, rural communities are facing pervasive outmigration (largely comprising of younger people) which is a threat to the economic future of rural Australia. This phenomenon is resulting in a relatively aged rural population, and with particularly high instances of young female leavers, a gender mismatch.

Although some rural communities have enjoyed economic prosperity, the majority have faced relative economic disadvantage in recent years. This has been in response to restructuring of the agricultural sector, globalisation, economic reform as well as the outmigration phenomenon. Recent periods of severe drought have placed further economic and mental strain on rural communities. Even so, rural residents seem to report feeling at least as happy or satisfied (perhaps even more so) than urban dwellers.

Rural residents have faced limited access to services including health care. Furthermore, poor health outcomes and rates of injury for rural populations have been higher than for urban populations. Access to mental health care is also restricted by low provision as well as social barriers. However, evidence suggests that levels of mental health are fairly consistent across rural and urban Australia. Suicide remains a problem for males in rural areas, who are largely overrepresented in the figures.

2.6 Conclusion

Although the preceding chapter has highlighted economic and social disparities that appear to favour urban living, it is important to recognise two things. Firstly, as stated throughout, rural Australian towns are uniquely characterised and the general circumstances discussed cannot simply be applied to all rural Australian communities. Secondly, identification of a number of rural-urban disparities does not imply that life in rural towns is worse than life in urban cities. There are many well known aspects of urban living such as high housing costs, pollution, traffic and anonymity, which are likely to detract from the attractiveness of urban life. Recall that studies have not found that people are any happier in urban areas. This thesis is concerned with the outcomes of those who move from rural to urban areas. It appears that economic circumstances are worse in rural areas (in a broad sense), but does this imply that those who move actually realise better financial outcomes? Are they more satisfied with life in general compared to if they had not moved? These questions have received limited attention in the literature with respect to urban movers in Australia (indeed, literature regarding the latter question is minimal in respect to any level of internal migration). From a contextual perspective, there certainly appears to be scope

for migratory gains, particularly from those areas suffering significantly from outmigration and drought. Migrants who move should be better able to access services and increase employment opportunities. Furthermore, migration may be a means of escaping rural economic and social problems that might occur in the future in relation to current population trends for example. In this case the outcome of migration would not necessarily be to increase life satisfaction above its current level today but to avoid future decreases below its current level. If migrants are able to benefit from moving this may be of interest to policy makers as it will highlight an aspect of disparity between rural and urban life. The results of answering these two questions will also be of relevance to potential movers. Rural residents will of course be interested in whether movers have benefited when making their own migration decisions. A failure to receive benefits will question the rationality of leaving one's rural home. In respect to the non-financial returns to migration, given the vast differences between rural and urban living, this aspect is likely to be very interesting to study because expectations about living circumstances are likely to be subject to significant uncertainty (although economic theory does suggest that this uncertainty should be taken into account by movers so that on average migration is beneficial).

3. Literature review

3.1 Theoretical models of migration

A simple neoclassical labour market approach to the phenomenon of rural to urban migration would dictate that profit seeking individuals migrate from rural to urban areas (and visa versa) in response to higher earnings. If in the short run earnings were higher in the urban area, there would be a migratory response by the rural labour force, thereby increasing the supply of labour in the urban area (and putting downward pressure on the wage rate) and reducing labour supply in the rural area (putting upward pressure on the wage rate). In the long run we would expect the wage rates to equalise and migration to cease. That is, positive migration is consistent with short run disequilibrium. Of course, wages are not the only consideration of the individual. Hence economists generally think of migration as a utility maximisation decision, of which wages are merely one of the considerations of the migration decision. Two theoretical models will be considered in the following sections. The Todaro (1969) model shows the micro level problem faced by the potential migrant with uncertainty about destination employment. More emphasis will be placed upon the Harris and Todaro (1970) extension which considers the problem from a two sector (rural and urban) perspective and considers the macroeconomic implications of migration. Following this we will consider hedonic pricing models, which emphasise the role of local wages and costs as adjusting variables to equalise utility given each areas endowment of amenities.

3.1.1 Uncertainty: Migration in Response to Expected Income - Todaro (1969) and Harris and Todaro (1970)

One of the major shortcomings of the simple neoclassical approach to migration presented above is that it assumes there is no uncertainty in regards to finding employment. People simply move from the low paying job in the domestic area to the high paying job in the foreign area. Todaro (1969) and Harris and Todaro (1970) made a seminal contribution to the rural-urban migration (and indeed, general migration) literature by mathematically formalising a model of rural to urban migration that incorporated both wage differentials as well as the probability of finding employment. The model was applied to less developed countries where it was observed that rural to urban migration flows were pervasive despite high urban unemployment.

Todaro (1969) presented a dynamic model of the migration process that was “strictly concerned with the formulation of a positive theory of urban unemployment in developing nations” (Harris & Todaro 1970, pg. 126 fn. 3), whereas in Harris and Todaro (1970) a two-sector model that considered migration in the context of “aggregate and inter-sectoral welfare considerations” was presented. Key to both papers was that a migration response from the rural sector was dependent upon expected earnings which were a function of both the wage differential and the probability of finding employment.

Todaro (1969) used expected urban real income as a proxy for all elements considered a part of real income. This included wages, costs of living as well as urban amenities.

As a result, the model was comprehensive in its treatment of the determinants of net migration flows, although the analysis primarily focused on the impact of unemployment and wages. An increase in the rural-urban real income differential was expected to induce urban immigration. The pool of people contesting for employment would be larger in the following period. This would put downward pressure on the rate of migration somewhat, with the probability of migration (the equilibrating variable) decreasing. As this process continued, eventually the supply of migrants would desist so that in equilibrium migration would be zero.

Although the model developed by Todaro (1969) was useful in explaining the rationality behind the migration decision, it has been the two sector model developed by Harris and Todaro (1970) (which considered both the welfare implications of aggregate levels of migration to the urban area as well as more broadly the policy implications) that has garnered significant attention in the migration literature. Before exploring this model further it is important to note that it was intended to explain rural to urban migration in less developed countries. Consequently, it is perhaps of less relevance to developed nations where employment opportunities are more abundant and government policy more effective (although it is indeed true that for much of rural Australia, earnings are relatively lower).

In Harris and Todaro (1970) the urban sector produced a single manufactured good and the rural sector produced a single agricultural good. These goods could be traded between the two sectors. Rural labour could either be used to produce the agricultural good or exported to the urban sector in exchange for wages (paid in terms of the manufactured good). The urban labour force consisted of some permanent members

as well as the available rural supply. Selection of an urban jobseeker (either permanent or migrant) for employment was random. Urban workers were paid some fixed, government determined, minimum wage. Perfect competition was assumed for producers in both sectors. A fixed supply of capital was assumed for each sector as well as a fixed supply of land for the rural sector.

The model developed gave rise to some interesting findings. It was found that urban expansion may paradoxically increase the absolute level of unemployment because of the migratory incentive. The effect of increasing the urban minimum wage became more complicated. An increase in the minimum wage would decrease output in not only the urban sector (as labour demand decreases), but also the rural sector, with workers migrating from the rural sector in response to higher expected wages diminishing rural production. Another finding was that rural sector output could be increased without sacrificing urban output (which seems quite logical given that urban unemployment could exist in equilibrium) although the reverse was not true. This implied that despite rational migration occurring, the welfare maximising level of output was not attained.

An important and perhaps counterintuitive finding from the Harris and Todaro (1970) model (mentioned in the previous paragraph) was that if there was industrial growth, which increased urban employment opportunities, the absolute number of people unemployed would increase. The logic behind the result was that industrial growth increased expected urban income, inducing a migratory response and the migratory response may exceed the absorption of those people already unemployed in the growing industrial sector, thereby worsening the level of unemployment. Stark, Gupta

and Levhari (1991) have warned this ‘Todaro paradox’ needs to be carefully considered, showing that it may only arise if urban demand for labour is sufficiently elastic. In the case that urban demand for labour is inelastic or isoelastic, unemployment will in fact fall. Raimondos (1993) extended the standard Harris and Todaro model, with rural labour markets characterised by monopsonistic behaviour, also finding the paradox does not exist in the very likely case that more people are employed in the urban sector than are unemployed.

Undoubtedly, the development of the Harris and Todaro model has been of enormous worth to the migration literature. The original model was not without shortcomings however. For example, the original model made the restrictive assumption of fixed levels of capital in each sector. The ability for capital to flow between the rural and urban sectors gave rise to a new paradox (and questioned one of the findings from the original model) of potential increases in urban output and employment in response to an increase in the minimum wage (Corden & Findlay 1975). The impact of economies of scales was also ignored. In some extensions agglomeration effects have been added to the basic model (for example Basu (2004); Shukla & Stark (1990); Panagariya & Succar (1986)). The probability of a migrant being selected for employment was random while it is very plausible that the probability of being selected for a particular job is higher for a person who has been living in the city longer and has a better understanding of the urban job market (for an example of this extension see Raimondos (1993)). Although one might argue that increases in the level of unemployment have negligible impacts upon rural wage levels (recalling that wages are fixed at the minimum wage level), it is very possible that significant inflows of rural migrants might raise the urban cost of living (i.e. through higher land rents).

Under such a situation the migratory response, in response to urban employment growth, would be dampened with increases in living costs decreasing expected income. This has been modelled by Bruekner and Kim (2001) & Bruekner and Zenou (1999) where employment growth does not necessarily lead to increased unemployment, thereby challenging the ‘Todaro paradox’.

3.1.2 Regional Amenities and Hedonic Pricing

It has been commonplace to treat the act of migration as a utility maximising decision with potential migrants considering both monetary (wage and cost) differentials as well as amenity differentials in deciding whether to migrate. As the Todaro (1969) & Harris and Todaro (1970) frameworks are particularly suited toward less developed countries, for a more thorough treatment of rural to urban migration in developed countries it is necessary to discuss some of these more general hedonic price models.

Models that focus on utility derived from area specific amenities are useful in explaining phenomenon such as high in-migration into low wage areas or high outmigration from high wage areas. Following such a train of thought, wage inequality between rural and urban areas need not entail a migratory response. As is logically obvious, people will migrate when expected utility in the foreign area exceeds expected utility in the domestic area. For a general model of this nature, which takes into account the job search and psychic costs from leaving the familiar area,⁷ see for example Farber (1978). The problem with such individually focused

⁷ The novelty of these factors is that they have implications for repeat migration. For example, psychic and job search costs will tend to be lower in an area a migrant has previously lived in. For a lifecycle model of repeat migration see Dierx (1988).

models is that they fail to account for the equilibrating impact of wages and living costs that arise when labour supply is reduced in one area and increased in another.

Graves and Linneman (1979) and Haurin (1980) have modelled migration under the assumption of utility maximising households and amenity differentials (the latter focusing on climate), considering only the consumer side of the market. Incomes and housing costs were expected to adjust so that household utility was equalised between regions. In other words, higher wages and housing costs act as compensating differentials for low amenity areas. If utility was not equal across all regions, migration would occur. Graves and Linneman (1979) identified three sources of variation in demand for amenities (referred to as 'non-traded goods') which would in turn affect a household's propensity to migrate. These were expected lifecycle considerations (e.g. people expect changes in income at different levels of age and this will affect demand for amenities), changes in the value of an independent variable specific to the household (e.g. death of a child or divorce) and unexpected changes in the values of external factors that affect demand for amenities in a direct and indirect manner. They empirically tested their model with supportive results. As suggested by Roback (1982), analysis of this manner should consider both the consumer and firm aspects. To formalise the hedonic migration view it is convenient to consider the simple model developed by Roback (1982 esp. pg1259-1262), ignoring the housing market.

Begin by assuming a homogenous labour force that supplies a single unit of labour independently of the wage rate. Roback (1982) denotes the fixed level of local

amenities, s , single commodity consumed, x , and the residential land consumed, l^c .

Consumers choose x and l^c to maximise utility subject to a budget constraint.

$$\begin{aligned} \max \quad & U(x, l^c; s) \\ \text{subject to: } & w + I = x + l^c r \end{aligned}$$

Where w is the wage paid, I is non-wage income and r is land rent. A conventional indirect utility function is given in the following form.

$$V(w, r; s) = k$$

Note that the utility function must be equal across all regions (spatial equilibrium is required). If it were not equal there would be an incentive for migration.

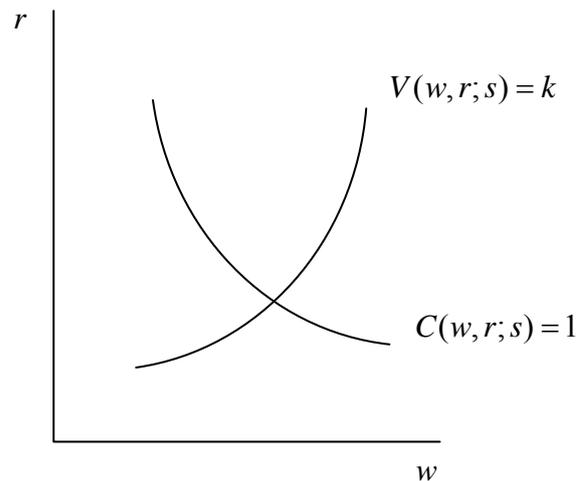
A constant returns to scale production function is assumed, with output, X , a function of commercial land, l^p , the total number of workers in the city, N , and the fixed level of amenities. Assuming product price is unity, and noting that since constant returns to scale are assumed a unit cost function can be used, the firms' decision problem is to minimise costs subject to the production function ($X = f(l^p, N; s)$) which gives:

$$C(w, r; s) = 1$$

If costs exceeded unity, firms would have an incentive to migrate to other regions. As has been seen in the Todaro (1969) Harris and Todaro (1970) models (and is consistent with simple neoclassical rationalisation), migration is a disequilibrium

phenomenon, in this case for both individuals and for firms. Diagrammatical representation of the consumers' utility equilibrium function and the producers' cost equilibrium function is useful for analysing the characteristics of the model.

Figure 3.1 Wage/rent Trade-off for Individuals and Firms



Source: Adapted from Roback (1982) pg. 1261, Figure 1.

The negatively sloped curve shows the various combinations of wages and rents that equalise firm costs for a fixed level of amenities. Similarly, the positively sloped curve shows the various combinations of wages and rents that equalise consumer utility for a fixed level of amenities. If we consider an identical city with higher amenity level, the impact on our utility function is clear. Since an amenity is of positive addition to utility by definition ($\partial V / \partial s > 0$), an increase in s will result in $V > k$. To return to equilibrium the wage rate must fall and rent increase (with $\partial V / \partial w > 0$, $\partial V / \partial r < 0$). This entails a leftward shift of the $V(w, r; s) = k$ curve.

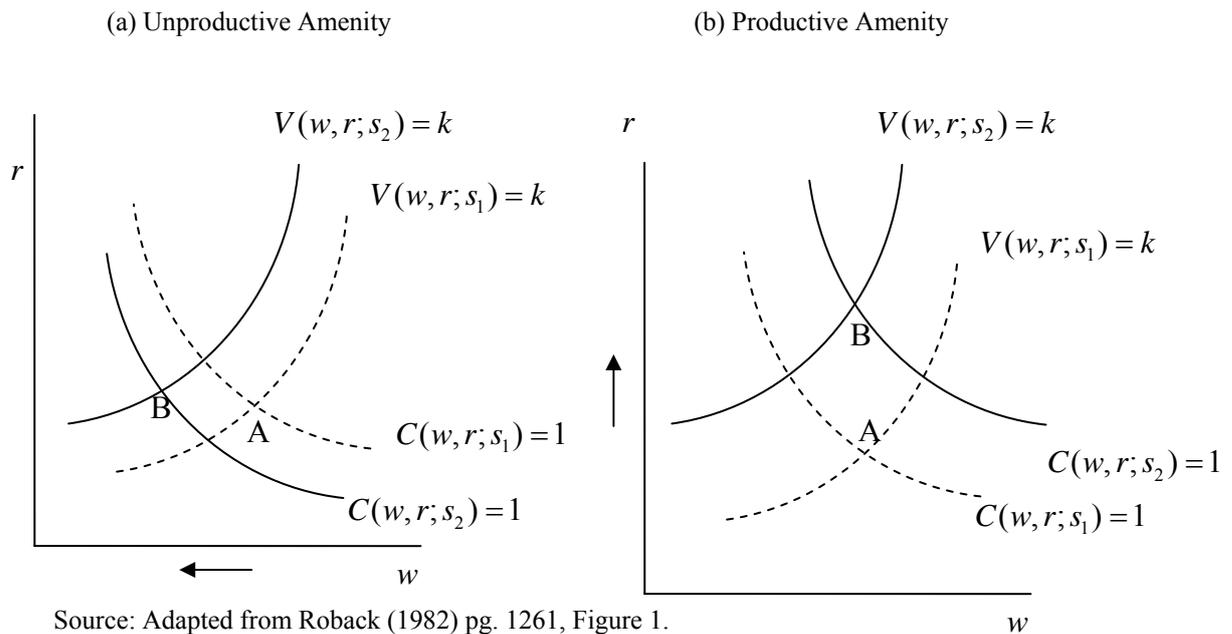
The firm impact is less obvious. The partial derivative of the cost function with respect to amenities is ambiguous. Roback labels an amenity that is unfavourable to production ($\partial C / \partial s < 0$) as 'unproductive' and one that is favourable ($\partial C / \partial s > 0$) as

‘productive.’ Roback identifies clean air as an example of the former (because firms face costs to maintain this amenity) and a lack of severe snow storms as an example of the latter. If we first consider the case that the amenity is unproductive, firms will require lower factor costs to maintain the same level of C . In this case, the $C(w, r; s) = 1$ curve will shift left. This reinforces the lower wage in the second region. However, since firms find the low s region disadvantageous (putting downward pressure on rents), while consumers find it advantageous (putting upward pressure on rents), whether or not rents are higher in the better amenity level region remains uncertain.

If the amenity is productive, the $C(w, r; s) = 1$ curve will shift right. This will act to raise the price of rent and increase wages. In this case the overall impact on wages remains unclear, whereas rents will unambiguously rise. The key insight from this analysis (from a migration perspective) is that different costs and wages are not necessarily able to predict migration because these differentials may reflect differing endowments of amenities. Therefore, it is not clear whether a ‘before’ and ‘after’ snapshot of a particular migrant would reveal a person economically better off, however it should reveal a person who reports a higher level of well-being. Figure 3.2 shows the possible effects of an amenity level increase.

In a similar approach to Roback (1982), Hoehn, Berger and Blomquist (1987) have also modelled the equilibrating characteristics of the housing and wage markets in response to regional utility equality. Shields (1995) considered the household as a producer to examine the impact of region specific time-saving technology. In an attempt to explain migration in the ‘wrong direction’ Mueser (1997) showed that even

Figure 3.2 Impact of Amenity Level Increase



Source: Adapted from Roback (1982) pg. 1261, Figure 1.

with a homogenous population, it could be optimal for a person to spread their lifetime residency between areas of different levels of utility. A static analysis dictates that people always move to the region with the highest instantaneous level of utility. Mueser (1997) showed that a person may benefit from spending some part of their lifetime in a high income and low amenity region, while saving relatively more, to better enjoy a low income and high amenity region later in life. In a life-cycle model of migration Althaus (2004) has analysed the role of ‘amenity capital.’ The motivation behind amenity capital was that the actual value of a location specific amenity may be a function of the time actually spent in the particular location.

In contrast with most models of migration Schachter and Althaus (1989) have modelled migration in an equilibrium context. That is, migration is not necessarily a product of disequilibrium. This was consistent with the view that some migration was unrelated to utility differentials. In their model, gross in-migration and outmigration

flows continued to occur, even in equilibrium. It was net migration that was expected to be zero with wages the compensating mechanism. They presented empirical results for the United States (US) which they claimed were “consistent with the equilibrium model” (pg. 155). However, these results have been criticised by Evans (1990) and Harrigan and McGregor (1993) (the latter re-developed the model with rational expectations) while Graves and Mauser (1993) have argued that the high correlation between outmigration and in-migration observed by Schacter and Althaus (1989) is likely to be the consequence of a heterogeneous population.

3.2 Wage Returns to Internal Migrants

Although a large body of literature exists seeking to explain why individuals migrate, less attention has been placed upon determining whether migrants actually realise their desired outcomes. The number of studies that specifically measure the outcomes for rural to urban migrants is particularly small. For migration to be an effective equilibrating device for regional wage disparities, migrants who leave low wage areas for high wage areas are required to actually attain the higher wage. It is often assumed in models of migration that migrants instantaneously earn this higher wage, while realistically this may not necessarily be the case. For example, consider a person who leaves the home location and is immediately unemployed. This person will face job search disadvantage because of minimal social networks and local knowledge. The person may be required to undertake low income work while trying to find higher income employment.⁸ We may assume that the longer the tenure in the new location,

⁸ Note that this situation is explicitly considered in the rural-urban migration model developed by Harris and Todaro (1970) where it is assumed unemployment is high in the urban labour market. Hedonic pricing models however, generally assume earnings are instantaneously realised.

the greater the chance of finding higher income employment. In this case, although the migrant may eventually realise an economic return to migration through higher wages, over some period they were actually made worse off. In this section we examine the historical development of literature on internal migration (at a general level as well as rural to urban) in developed countries with a focus on the findings and the methodologies used.

3.2.1 Wage returns to Internal Migrants in General

The idea that migration is an investment in human capital was popularised by Sjaastad (1962) where it was put forth that a migrant will calculate their discounted expected return to migration relative to the cost and move if the benefit outweighs the cost. Migration is therefore an investment in human capital because it is a strategic decision to increase lifetime earnings. This explanation of migration has been the basis of much empirical work. Although in many cases the results of empirical work adhere to the human capital explanation, the evidence is not entirely consistent.

Wertheimer (1970) presented evidence that American males who left the South for the North and who left rural areas for urban areas earned more than those who did not migrate, even when adjustments were made for cost of living differentials.⁹ It was found that in the first five years migrants would generally not earn significantly more than non-migrants however (an exception is in the case of migration from rural areas to cities of population greater than 750 000). Masters (1972) confirmed Wertheimer's findings and further found that although migration was beneficial for both African Americans

⁹ Females are included in his sample however no strong evidence is found supporting the hypothesis that they will earn more post migration.

and Whites, the return was lower for African American males than for White males. The methodology used by these authors was relatively simple and common of early internal migration studies. They used multiple regression analysis of a cross section of the United States with dummy variables for whether a person had migrated or not migrated and how long ago the move occurred. Both of these studies used people residing in the destination as the benchmark group which is conceptually problematic (if the objective is to measure the wage 'return' to migration) and therefore rarely employed in modern studies. In the case that we want to know whether a migrant is earning more than had the move not occurred, it is necessary to compare earnings between the migrants in the destination and similar non-migrants in the original location.

An earlier study by Lansing and Morgan (1967) used a similar specification to Wertheimer (1970) and Masters (1972) and found that migrants from the Deep South and migrants from rural areas were expected to earn higher hourly wages than non-movers. This conclusion was reached by benchmarking the migrants earnings function against those in the domestic area who had not migrated. In contrast to the results of Wertheimer (1970) and Masters (1972), they made the observation that people living in a location who were former migrants earned less than those in the area who had not migrated. They suggested that this may serve as evidence that relative disadvantage in the area one grew up may have permanent reduced income effects.

As noted in Greenwood (1997), these early studies suffered because they did not use the now conventional semi-log form as well as not controlling for the potential

selectivity bias associated with micro data. Greenwood (1997, pg. 697, fn. 49) provides three reasons for the desirability of the semi-log functional form. (1) A semi-log form is appropriate because earnings tend to be skewed to the right (as earnings can generally not be negative), (2) logging the dependent variable will make normality more plausible and (3) the general concave shape of the earnings profile is better suited to the semi-log form. The four most likely sources of sample selection problems identified by Greenwood (1997, pp. 692-693) are: sampling design/population coverage, panel attrition, time-dependent selectivity problems and differential behavioural responses. The latter of these is the typical source of bias (Greenwood 1997) and is often referred to as self-selection bias. It can occur if the decision to migrate is endogenous (that is, migrants differ from non-migrants in unobserved ways that are correlated with wages).

To account for the self-selection problem limiting the results of early studies, Nakosteen and Zimmer (1980) developed an empirical model which treated the decision to migrate as endogenous. A two stage procedure was used with estimation of a selectivity variable which was then incorporated into an earnings function (this procedure to correct for self-selection was developed by Heckman (1979) and has been used in other migration studies since). The US study found evidence of self-selection in the earnings of non-migrants, although not for migrants, which the authors suggested may reflect non-migrants not expecting more favourable returns elsewhere. In an extended study, Nakosten and Zimmer (1982) also found evidence of self-selection in people moving between industries in addition to between regions. Migrants were also found to have a comparative advantage in realised earnings. Using a similar, although more comprehensive, framework as Nakosteen and Zimmer

(1980), Robinson and Tomes (1982) have found evidence of sample selection bias in the interregional migration decisions in Canada.¹⁰

In a more comprehensive US study of the returns to migration than the earlier work, Harris (1981) used individual person data from the Panel Study of Income Dynamics (PSID) with significant controls for personal characteristics, including previous earnings, finding that those who had migrated from low income to high income areas and those who had migrated from high unemployment to low unemployment areas were more likely to experience higher hourly earnings than had they not migrated. This was not however true for those migrating in the reverse direction. For Canada, Grant and Vanderkamp (1980) found only weak evidence that migrants gained from migration (the results did not extend to females, particularly those who were married) and the gain was only experienced after several years. These studies, along with others of the same period (e.g. Lichter 1983 and Krumm 1983) dealt with the problem of self-selection and unobserved heterogeneity by either expressing their dependent variable as a change in earnings or controlling for previous earnings.¹¹ Lichter (1983) found that married female movers in the US experienced a wage penalty from migration, while Krum (1983) found that for male headed households wage growth was higher for those that that migrated in the year after moving. In later studies the problem of selectivity bias has tended to be treated in more detail.

¹⁰Robinson and Tomes (1982 pg. 479, fn. 6) also express their concerns that the model estimated by Nakosten and Zimmer (1980) is seriously mis-specified due to the absence of many common control variables from their earnings functions (these variables are present in the 1982 model) as well as their use of an industry change variable (where it is required that a variable related to earnings but unrelated to migration be specified) which is expected to be highly correlated with the decision to migrate.

¹¹ Previous wage levels should be different between future movers and future stayers if unobserved traits that influence earnings (such as motivation) differ between the two groups. The problem of self-selection (or selectivity bias) is considered in more detail when we undertake our empirical analysis in Chapter 5.

Using panel data of young American males Hunt and Kau (1985) found that repeat migrants could expect to earn approximately 13% more than non-migrants, while single move migrants fared no better than non-migrants (as pointed out by the authors we could conclude they were in fact made worse off because they incurred the cost of the move with no return). The model was estimated using the Fuller-Battese variance component model (see Fuller & Battese 1974) which controlled for individual and time specific factors thereby largely circumventing the problem of selectivity bias. The results were suggestive that local experience may be important in actually attaining returns to migration. Again using US panel data, Shaw (1991) found that estimated wage growth for males who changed region was significantly higher than those who did not, although the results were insignificant for those individuals changing both region and industry.¹² In this case the returns were also measured four years after the move. To control for selectivity the wage equations of movers and stayers were estimated using the Heckman correction.

Rather than estimate multiple regressions for different durations since migration (although they do this as well for comparison) Borjas, Bronars and Trejo (1992) specified a model using US panel data of young adults which explicitly included the time effects of migration in the regression equation. The results implied that initially migrants faced economic disadvantage and experienced lower wages in the destination before receiving higher growth at a declining rate. This implied that after a few years (they estimate three with repeat movers excluded) the initial disadvantage faced by migrants disappeared. The initial disadvantage was found to rise in line with the distance moved and fall if the destination was characterised by more favourable

¹² Although the coefficient was positive, with only 38 movers changing both region and industry the standard error was predictably large. Yankow (2003) has more comprehensively examined the impact of simultaneous occupation and regional change.

employment growth (if employment growth was sufficiently high there may be no initial disadvantage). The authors found no evidence of selectivity bias in their sample. To examine the returns for both single and married men and woman Krieg (1996) estimated separate equations for each group using an alteration of the Heckman two step procedure which applied a selection correction term into a single wage equation for both migrants and non-migrants (rather than estimating both equations separately and examining the difference of the expected returns to each group). Whereas Borjas, Bronars and Trejo (1992) found no evidence of selectivity bias in their data, Krieg (1996) found selectivity bias was present for single people, particularly females. Krieg (1996) also considered the impact of joint regional and occupational change, finding that single males received higher earning one year after moving but lower earnings in the year of the move if it was associated with an occupational change. Single females experienced a decrease in wages in the year of the move and similarly for married females if the move was associated with a change in occupation.

Using both random and fixed effects regression of inter-county migrants in the US, Rodgers and Rodgers (2000) found significant economic returns to male migrants in general, which were present six years after the move occurred. They explored the implications of migration on several subcategories of migrants, finding that males younger than 40 years of age experienced returns of about 24% (hourly wage) compared to if they had not moved (six years after the move), while those above the age of 40 experienced no significant change in hourly income and a reduction in annual earnings. The authors suggested that older migrants may have either not been motivated by monetary incentives or lacked the decision making power of younger

migrants. Returns to migration were particularly large for those who were less affluent (51% annual earnings premium), while highly affluent individuals experienced no significant return, suggesting no adverse impact on the equality of the distribution of income from migration. In contrast to earlier studies which found a negative impact on the wife's earnings, virtually no impact was observed on the earnings of the spouse.

In contrast to most studies which view migration simply as a change of location, Yankow (2003) treated migration as a particular type of job change. He used those who changed jobs but stayed within the same area as the benchmark group against job changing migrants. Using fixed effects regression of a sample of young American males he found that low educated migrants experienced an instantaneous return to mobility in compensation for lower wages the year prior to moving. Returns to highly educated migrants were more significant although rather than being instantaneous, they accrued over time (earnings are higher 1-2 years after migration and returns continue to increase up to 5+ years). Yankow (1999) has also measured the returns to interstate migration in the US for young males without respect to job change. He found that wages did not differ substantially between migrants and non-migrants in the years previous to migration. Increasing positive returns were experienced in all years after migration with the fixed effects results predicting an approximate 5% wage growth premium after five or more years.

The returns to migration have also been measured for European countries. A study of Finnish internal migrants by Pekkala (2002) found initial returns to migration in the form of higher income and in some instances subsequent higher income growth. The

results varied depending upon the migratory region with economically favourable regions (i.e. low unemployment, high average incomes) promising higher returns (in terms of both income level and growth). De´tang-Dessendre, Drapier and Jayet (2004) found that young French males, with both low and high levels of education, did not experience any significant change in their wage levels following internal migration. Their results may reflect the datasets used, which only allowed measurement of wage changes shortly after the move, as other studies have found the returns to migration can take time to materialise. In Britain it was found that working class male migrants were likely to experience increased wage growth immediately following migration and in the case that they remained permanently employed, for the subsequent medium term (Boheim & Taylor 2007). Men who changed both location and job received the largest returns. In Germany, Lehmer and Mo¨ller (2008) found that mobile workers received lower incomes in the year previous to migration before experiencing significant returns upon arrival. Various regional destinations, skill and experience levels were examined, with the general results suggesting that migrants could expect to earn the same or more in the destination than those already residing there in most cases (this is despite finding that migrants had less favourable characteristics).

Few studies exist on the returns to internal migration at any level within Australia. Using data from the first six years of HILDA, Mitchell (2008) measured the financial returns to migration in the form of whether or not a person would experience a wage increase post migration. In contrast to most studies which have used some measure of earnings, a probit model with a bivariate dependent variable was used with one indicating a wage increase and zero representing no change or deterioration. Two models were estimated with moves represented by either changes in statistical local

areas (SLAs) or moving home more than 30kms. For both models, changing location significantly increased an individual's chance of achieving a higher wage (even with controls for selectivity bias) although the probability was greater using the SLA distinction. Lower skilled workers had lower probability of increasing earnings than higher skilled workers however this was not enough to offset the positive influence of migration for this group. Adrienko (2009) has modelled the returns to general internal migration in Australia with particular attention given to the relationship between returns and distance moved. For those people who indicated an economic motive for migration, a wage return which increased with distance moved was observed. This was only the case however for those earning less than median level income. People moving for family reasons were observed to actually incur a wage penalty.

One noteworthy finding from the literature is that women have frequently been observed to either not gain or to incur an earnings penalty from migration. Lichter (1983) found that married females incurred a wage penalty even for those women who had greater financial power (measured by the level of earnings relative to the husband). Maxwell (1988) examined more closely the link between marital status and migratory returns. Using data from the National Longitudinal Survey it was found that for females the highest returns went to those who were never married while for males the highest returns went to those who were separated.¹³ Married women were found to experience negative returns to migration. Migrating and getting married in conjunction did not change the growth path of earnings for either men or women. Krieg (1996) observed a wage penalty to single females and married females who changed occupation. Rodgers and Rodgers (2000) did not find evidence of a wage

¹³ Married men were found to receive the same returns as those never married which was suggestive that marriage did not constrain returns for males.

penalty but observed virtually no change in the earnings of the female spouse. For Sweden, Nilsson (2006) found that returns to migration were far greater for men (for some groups of female movers returns were negligible or even negative) and that the discrepancy was worsened by the household having children. These results all suggest that females were perhaps less motivated by their own financial considerations when migrating, although there is no reason to believe this pattern remains the case, or will not be subject to change in the future.

Many studies (e.g. Boheim & Taylor 2007; Pekkala 2002; Mitchell 2008; Marré 2009) have used instrumental variable regression to control for possible self-selection. The basic principle of this procedure is that observed migration be replaced with predicted propensity to migrate with the new independent variable providing consistent estimators (estimators may be inconsistent under OLS due to the disturbance being correlated with migration status). The problematic aspect of using IV regression to overcome self-selection for the researcher is that the procedure requires a valid identifying instrument to be used in the first stage equation (Murray 2006), while in reality many variables related to the decision to migrate are also likely to be related to earnings. Fixed effects specification has also been used in many cases where the researcher has access to panel data (e.g. Rodgers & Rodgers 2000; Yankow 1999, 2003; Glaeser and Maré 2001; Boheim & Taylor 2007). This can eliminate the problem of self-selection if unobserved characteristics that distinguish movers from non-movers are time invariant (this is discussed in more detail in Chapter 5).

3.2.2 Wage Returns to Rural to Urban Migrants

Although only a limited number of studies exist which specifically focus on the case of rural to urban migration, most have found positive returns to movers. Wertheimer (1970) found wages were higher for those people who had moved from rural areas in the US, although keep in mind the shortcomings related to this study previously discussed (as well as the fact it is very much out of date). In perhaps the first paper to examine the returns to rural to urban migrants in the U.S. using panel data, Rodgers and Rodgers (1997) found a strong and persistent effect of migrating on real annual, hourly and family unit income. The study examined the returns to working age males using multiple pooled regressions for up to six years after the move. A 38.6% wage premium was identified after six years and a 15.6% premium in the first year for the real annual income. To test for self-selection bias the authors examined the wage growth of future movers previous to migration, finding no substantial difference between movers or stayers, supporting the integrity of their findings.

Glaeser and Maré (2001) empirically identified the significant urban wage premium in the U.S. and used the wage pattern of migrants to test whether the premium was a wage level effect or a wage growth effect. To do this they tested whether a male mover experienced an instantaneous change in their income (wage level effect) or a change in their income growth rate post migration. An increasing growth rate would support the theory that cities act to enhance human capital (e.g. through externality effects from highly integrated working environments) and therefore higher productivity would explain higher urban wages. Using two micro data sets (the PSID and the National Longitudinal Youth Survey) and using fixed effects regression the

authors found evidence of both effects operating for rural to urban migrants. Rural to urban migrants were expected to experience immediately higher wages (although this gain did not fully represent the observed wage premium) and subsequently experience higher wage growth.

Recently, Marré (2009) found rural to urban migration to have had no discernable influence on income during the periods 1979-85, 1985-91 and 1991-97, using data from the PSID. The author concluded (pg. 26), “During this time it appears that the most powerful predictor of one's household income was the level of one's human capital, regardless of where that capital was used.” This result was in contrast to previous work using the same data source (Rodgers & Rodgers 1997 and Glaeser & Maré 2001). The results were based upon income at the end of each period with control variables taken from the beginning of each period which was perhaps problematic in the case of time variant characteristics. Marré (2009) also used instrumental variable methods to control for the potential self-selection. The validity of this specification is strongly related to the instruments chosen.¹⁴

Hillman and Rotham (2007) attempted to measure the financial and non-financial returns to young Australian's migrating from non-metropolitan to metropolitan areas. Comparisons between earnings of three groups were made, namely rural stayers, leavers and leavers who had subsequently returned. No significant differences in earnings were observed, although the analysis failed to control for the potential heterogeneity in the sample by relying upon mean comparisons rather than using

¹⁴ Although the instruments varied slightly for each period examined, area one grew up was commonly used (i.e. rural area, urban area). From a theoretical perspective this instrument appears flawed (for example, educational opportunities may be less in rural areas). When included as an additional regressor however, the area in which one grew up was found to have no statistically significant effect upon earnings.

regression techniques. The data was taken from the Longitudinal Survey of Australian Youth (LSAY) following a cohort of youth from grade 9 to an average age of 23 in 2004 (they used observations from this year only). This is potentially limiting because many individuals in the sample may have still been completing tertiary education in 2004 and as the timing of the move is not considered many of the moves may have been a family decision rather than individual (although more leavers did live away from their parents in 2004 than non-leavers).

3.2.3 Summary

The evidence for developed countries as to whether internal migrants experience positive financial returns (as is expected under the human capital paradigm although not necessarily consistent with utility maximisation) is not entirely consistent. Some studies have found no significant economic return over any period, while others have found no return in the short run or an initial wage penalty. Most recent studies have found a positive return to migration, perhaps reflecting better knowledge of the destination by migrants or changing motivations for moving. Women do not appear to have experienced the same wage returns as men (in some studies women have been found to incur a wage penalty). Yankow (2003) found that joint regional and occupational change was associated with better wage outcomes than simply changing occupation within the domestic labour market. There is also some evidence that in the U.S. (Rodgers & Rodgers 2000) and Australia (Adrienko 2009) the returns have been more favourable for those in the lower portion of the income distribution. For those who move from rural to urban areas in the US, returns appear to have been positive and non-transitory in most cases although recent work by Marré (2009) has

challenged this. Most modern studies have tested and where necessary corrected for the potential endogeneity of the migration decision in an effort to eliminate selectivity bias. This is often in the form of fixed effects specification or instrumental variables regression. Little research exists for Australia and the only analysis for rural to urban movers, conducted by Hillman and Rotham (2007), was limited by the sample used and statistical techniques employed. It is hoped that this thesis will give a more complete analysis on the financial returns for rural to urban migration in Australia and help to fill the current research void.

3.3 The Well-being of Internal Migrants

Assessment of the non-financial returns to internal migrants has been largely ignored by economists. This has occurred despite accepted economic theory suggesting a far clearer outcome to migrants in terms of subjective well-being relative to earnings. If migration is a utility maximising decision, one would expect subjective well-being (synonymous with utility) to increase while earnings may or may not be positively affected. Of course, earnings are likely to have some bearing on well-being and in the case that migrants are incapable of assessing the impact of the destination on other facets of their quality of life, may rely upon earnings as a proxy for expected utility. This is unlikely to be universal however. Murray, Madison and Rehdanz (2008) have found that happiness differentials have significant explanatory power in terms of internal migration flows in Germany for example. Some research in other social science fields such as sociology and psychology exists and will also be reviewed.

3.3.1 Empirical Studies

Early studies using panel data on subjective well-being returns in the US offered little support to the utility maximising framework. Martin and Lichter (1983) found that migration had no impact upon one's change in self reported life or work satisfaction within a period of five years. Their study used regression analysis to control for observable characteristics and the *change* in life satisfaction as the dependent variable to reduce possible selectivity bias. One issue with their analysis is that they grouped all migrants together, irrespective of the duration since migration, while it is likely that life and work satisfaction would be related with destination tenure (for example people are likely to take some time to form new social and workplace networks). A possible conclusion suggested by the authors was that migrants failed to accurately perceive the benefits of moving to the destination. Previous empirical research using regression techniques by Willits, Bealer and Crider (1978), looking at longer term returns of a sample of rural migrants (not necessarily making rural-urban moves), found that of a group of high school sophomores interviewed in 1947 and subsequently in 1971, those who had moved more than 50kms were no better off in terms of community satisfaction as well as aspects of and general life satisfaction and happiness (again, the duration since the move was not considered).

Best, Cummins and Lo (2000) compared subjective life quality among a cross-section of Victorian farmers, metropolitan residents and ex-farmers in a metropolitan locality. Using a seven point subjective quality of life scale they found no statistical difference between the three groups, again suggesting no return to migration. Some evidence was found for so called 'domain compensation' with ex-farmers less satisfied with

their productivity compared to those still farming but with this compensated by more satisfaction in terms of intimate relationships. Not all empirical studies have failed to find positive returns. Using survey data for the five Nordic countries, Lundholm and Malmberg (2006) found that 83% of respondents indicated an increase in overall life satisfaction since moving, with respondents surveyed within two years of migration and asked to assess the impact of the move on satisfaction. Further analysis found that while overall satisfaction was statistically the same between all types of migrants in terms of domestic and destination population, those moving from densely populated to sparsely populated areas were likely to report higher environmental satisfaction and lower satisfaction in terms of services and facilities, while the opposite was true for those migrating from sparsely to densely populated areas. This is perhaps an example of domain compensation suggested by Best, Cumming and Lo (2000).

Surveying welfare recipients who had recently moved from either non-metropolitan to metropolitan regions or the reverse in two Australian states (New South Wales and South Australia), Burnley et al (2007) found that 56% of metropolitan movers thought they were better off (20% worse off) after the move while 72% of non-metropolitan movers thought they were better off. The majority of metropolitan movers also indicated being more satisfied with their work opportunities (64%). In a counter-urbanisation study of migration to the NSW north coast Walmsley, Epps and Duncan (1998) conducted surveys of in-migrants to two coastal communities. The majority of respondents had moved from urban areas with environmental 'pull' factors largely driving their moves. Average responses to five scale questions regarding eight aspects of life quality suggested improvements in all facets of life except education and training opportunities. Note that their study was largely the reverse of this thesis as

they were examining movers into relatively rural (at least less urban) areas. Stimson and Minnery (1998) found that of a sample of long distance in-migrants to the Gold Coast (QLD), 87% indicated they were equally as happy, or happier, than before migration. The problem with cross sectional surveys of this nature (in addition to problems of survey design and responding person biases) is that the response is reflective (this is also the case for Lundholm and Malmberg (2006)) and therefore could be biased due to psychological factors that prevent one's ability to accurately assess their previous state of well-being (Stone, Shiffman and DeVries (1999) – Easterlin (2001) also shows that through a positive relationship between material aspirations and income, assessment of past utility could be misleading).¹⁵

Hillman and Rotham (2007) have compared the subjective responses on career and general life satisfaction between young metropolitan leavers, stayers and returners (both male and female). They found no statistically significant difference between the groups, indicating no well-being return to migration. Although they used data from a longitudinal survey (NLSY), Hillman and Rotham (2007) used a cross section of responses in 2004, rather than allowing for individual comparisons over time. This may be problematic if migrants, or simply the migrant's personal response scales, differ to those of the other groups. For example, it could be the case that previous to migration migrants scored significantly lower than non-migrants. Finding that the results between the groups were statistically the same in 2004 should therefore be interpreted as a well-being gain to migrants. This is not accounted for by the authors.

¹⁵ Both Walmsley, Epps and Duncan (1998) and Stimson and Minnery (1998) drew their samples from movers into largely recognised high amenity regions. As such, the moves were likely to be lifestyle motivated rather than economically motivated and it is perhaps more likely than that these movers would feel more satisfied compared to other movers.

3.3.2 Summary

Only a limited number of studies examining the returns to subjective well-being in developed nations exist.¹⁶ Early studies using regression techniques and panel data did not find any significant returns.¹⁷ Cross sectional studies using survey data have generally been more suggestive of positive returns, although these studies are perhaps controversial as they have generally not considered the heterogeneous characteristics of the sample population, they often use reflective comparisons, and they are vulnerable to unobserved individual specific response biases. One notable omission from the current research is consideration of the time path effect on subjective well-being. Utility maximisation theories, as well as the well known ‘culture shock’ phenomenon (Oberg 1960) are dynamic processes and there is no reason to assume that well-being returns will be instantaneous or stationary. There has been little support for significant returns to rural-urban migrants in Australia (Best, Cumming and Lo (2000), Hillman and Rotham (2007)) although the current research is characterised by many of the above mentioned problems.¹⁸

¹⁶ For developing nations, De Jong, Chamrathirong and Tran (2002) have examined post-move satisfaction with living arrangement, employment opportunities and community facilities in Thailand and Knight and Gunatilaka (2010) for overall happiness of rural to urban movers in China.

¹⁷ Theory taken from psychology literature suggests that people quickly adapt to changes in life circumstances, returning to a stable level of well-being (Frederick & Lowenstein 1999). The implication of this on assessing the impact of migration on subjective well-being is discussed in Chapter 6.

¹⁸ Burnley et al (2007) did find the majority of welfare recipient movers to metropolitan areas indicated they were more satisfied with life, however as their study asked respondents directly about the move it is not comparable with this thesis.

4. Theoretical Framework

4.1 Theoretical Perspective

A logical explanation for voluntary migration is that utility maximising individuals calculate their discounted expected utility from migration relative to the expected cost. The expected cost includes both the utility the individual would have received by staying in the home area as well as the cost (both monetary and psychological) associated with the actual act of moving. Monetary costs are obvious while psychological costs are less observable and more individual specific. They relate to the emotional loss that may be experienced when leaving an area that is generally familiar and imbedded with friends and family. In the case that this psychological cost is large, the incentive offered by the receiving area must also be large to induce a migratory response. This incentive might be in the form of higher wages or better amenities for example. The current analysis uses conventional utility maximising logic to formalise a simple cost-benefit model of migration with emotional attachment treated as time variant. The implications of this analysis form the predictive framework of our empirical work to be carried out.

For the moment it is convenient to assume utility U derived from residing in a particular area i at time t as a function of location specific income I , locations specific amenities A and location specific emotional attachment E . This perspective on migration is similar to that of Althuas (2004). In his paper the term amenity capital is similar to term emotional attachment used here. For simplicity assume that costs are equal between areas and that income and amenities are constant over time.

$$U_{it} = f(\bar{I}_i, \bar{A}_i, E_{it}) \quad (4.1)$$

In continuous time we have the following, with the discount rate r indicating the degree to which the person is myopic (with higher r indicating a higher preference for ‘consumption’ today and less value attributed to consumption in the future).

$$PV = \int_{t=0}^T e^{-rt} U_i dt \quad (4.3)$$

It is likely that the longer a person resides in an area the greater their emotional attachment. Over time people are able to establish social networks gain local knowledge and appreciation and are more likely to have children attending local schools which the parents may not wish to disrupt. E will therefore be increasing with time.

$$\frac{\partial E}{\partial t} > 0$$

That is, emotional attachment is positively related to time spent in a particular location. Consequently, the current value of a particular location (U_{it}) increases with residential tenure (as $t \rightarrow T$), with income and amenities held constant. That is, $\partial U_{it} / \partial t > 0$. It is now necessary to express the migratory decision problem. Assume only two areas, 1 (e.g. rural) and 2 (e.g. urban). Current residency is in Area 1. The present value of staying in Area 1 is simply:

$$PV_1 = \int_{t=0}^T e^{-rt} U_1 dt \quad (4.4)$$

The present value of living in Area 2 must take into account the costs involved in migrating. MC represents the explicit moving costs which include for example the price paid to a removalist. The psychological cost is assumed to be a function of the emotional attachment to the original area ($C(E)$) with $\partial C / \partial E = f'(E) > 0$.

$$PV_2 = \int_{t=0}^T e^{-rt} U_2 dt - MC - C(E_{1t}) dt \quad (4.5)$$

The decision to migrate is simple. If $PV_1 > PV_2$ than the person will stay. If $PV_1 < PV_2$ the person will migrate. Alternatively, we can rearrange (5.3) and (5.4) in terms of net present value of staying in location 1. If net present value is greater than zero there is no incentive to move.

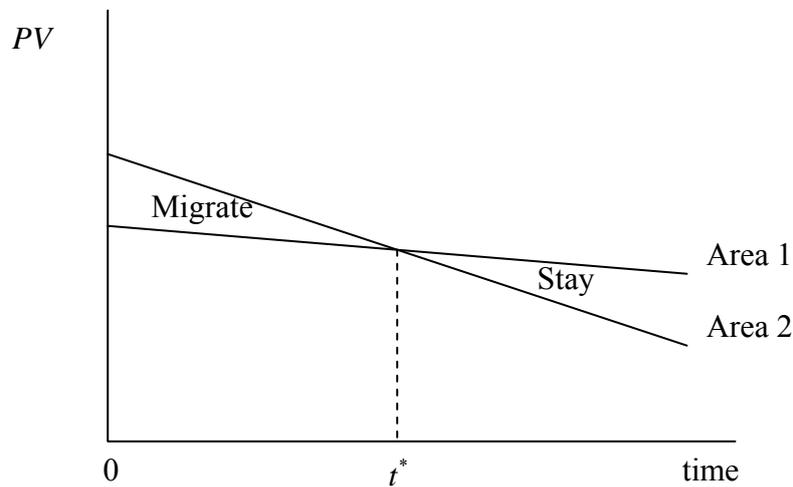
$$NPV_1 = \left(\int_{t=0}^T e^{-rt} U_1 dt \right) - \left(\int_{t=0}^T e^{-rt} U_2 dt - MC - C(E_{1t}) dt \right) \quad (4.6)$$

$$\therefore NPV_1 = PV_1 - PV_2$$

Given the time path of E the value of each area with respect to time can be depicted in the following manner. Figure 5.1 shows that at each time before time t^* the individual would choose to migrate. Assuming there are no structural constraints to migration, this person would therefore choose to migrate at $t = 0$. Note that Figure 4.1

shows the present value of each location conditional on the individual currently residing in Area 1.

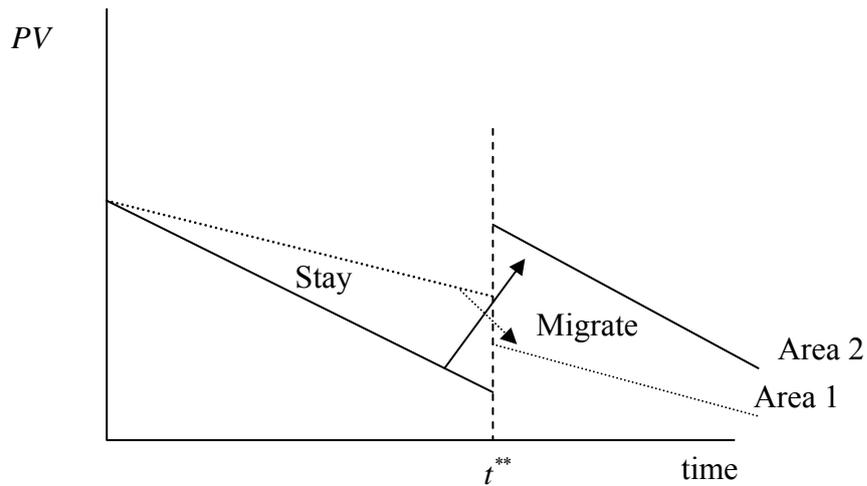
Figure 4.1 The Decision to Migrate



Both curves are downward sloping because individuals have a fixed lifetime T in which to realise value flows. The present value of residing in area 2 is also decreasing with residential tenure through two distinct channels. Because the psychological cost increases with tenure in a location this acts to decrease present value over time. Secondly, as a person's lifetime approaches T the future discounted emotional value that can be achieved living in a new location decreases. The result of decreasing present value is consistent with the empirically observed fact that younger people have a higher propensity to migrate, as the benefit of a new location will be lower with age, particularly if a significant amount of time has been spent in the original location. In this stylised example there are only two areas with equal costs and fixed wages and amenities. Hence we are able to predict the critical age where our person will definitely not migrate as age at time t^* .

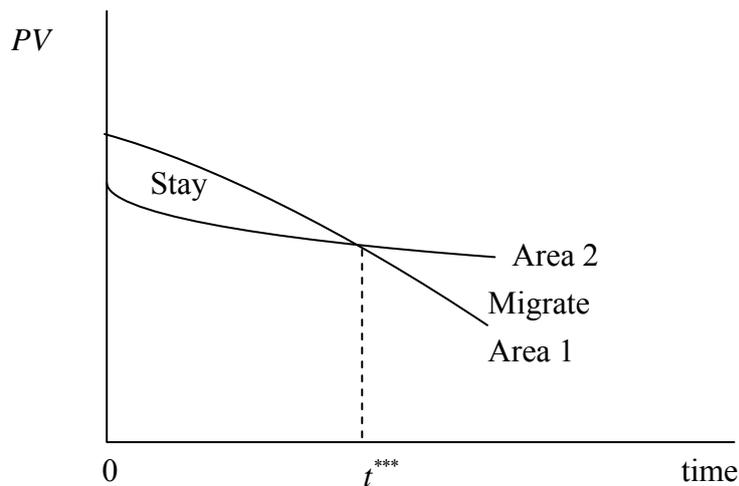
Migration at an older age could be explained by an exogenous upward shift in the Area 2 or a downward shift in the Area 1 curve. This seems unlikely to come from changes in average income as economic opportunities will generally decrease with age. Furthermore the utility derived from consumption may also decrease. The alternatives are either an increase in the value of destination amenities (shifting the Area 2 curve) or a decrease in emotional attachment (shifting the Area 1 and Area 2 curves). It is not hard to imagine either of these situations occurring. Although emotional attachment has until this stage been assumed to increase with tenure in a location, this may not realistically always be the case. In the case that friends and family move away from an area for example, this would result in a decrease in emotional attachment and increase the propensity to migrate. Note that shocks to emotional attachment could occur at any stage over the lifecycle. It is possible even to imagine a situation where the emotional attachment to an area has a negative impact on utility. For example, if a loved one passed away in a particular area and the loss of this person was associated with the residential location emotional attachment could take on a negative form. In this case we may observe people rationally migrating to an area with both lower amenity levels and income. The case of an increase in amenity value in Area 2 and a decrease in either amenity value and/or emotional attachment in Area 2 is shown in Figure 4.2. The situation presented shows a person who would have stayed in one location for a large part of their life, moving at an older age (perhaps during retirement).

Figure 4.2 A Change in Area Preferences



We do not need to restrict ourselves to exogenous life events or shocks to emotional attachment. It is possible that the longer a person resides in the same location the more they are vulnerable to boredom or detachment. It may be the case that emotional attachment has a quadratic relationship with residential tenure. Attachment may increase up to a critical point where boredom or detachment begins to take control. In this situation a non-linear depiction of present values of Areas 1 and 2 is necessary. Because $\partial E_i / \partial PV_i > 0$ by definition, with income and amenities fixed, present value of Area 1 will decrease at a greater rate after some period. Emotional attachment to Area 2 enters our equation through the psychological cost of migration which is assumed to increase with the level of emotional attachment to Area 1 ($\partial C_{2t} / \partial E_{1t} > 0$). Because this cost decreases the present value of utility in Area 2, with emotional attachment to Area 1 decreasing, the cost of moving will also decrease and the present value of Area 2 will start to decrease at a slower rate. This is shown in Figure 5.3 where a rational individual will decide to migrate at any point in time after and including t^{**} .

Figure 4.3 Boredom or Detachment over Time



As income and amenities both increase utility, if the income in an area or amenity level exceeds that of another area, people have an incentive to move. As discussed in Chapter 3, theory has commonly focussed on the role of wages and housing costs as compensating differentials for regional amenity differentials. This occurs with amenity levels relatively fixed while wages and costs are more flexible. This model assumes that the act of migration has no impact upon the wage rate or living costs in the destination, which is likely to be the case for any individual, although not on an aggregate scale. The above model will now be linked to the objective of this thesis, namely to determine the economic as well as non-economic well-being outcomes related to rural to urban migration. Results of previous studies and contextual perspectives will also be considered.

4.1.1 Income Motive

From a theoretical perspective it is unclear whether we would expect to observe higher earnings as a result of migrating to an urban area, as migration is related to

more than simply the monetary returns. Furthermore, as our individual is forward looking, they may incur some financial penalty in the short term in the pursuit of longer term benefits. From a contextual perspective however, it is very possible that migrants will receive higher earnings, even if the primary motivation for migration is not necessarily economic. This expectation comes from the fact that earnings tend to be higher in urban areas. Assuming an individual is simply able to move into a similar urban job, they should therefore be compensated at a higher rate. If they cannot however find equal employment, earnings could be lower, at least for some period of time. From the perspective of general research on migration, positive earnings returns have often, although not always, been experienced and these higher earnings in many cases have taken some period of time to be realised. From the more specific perspective of previous research on rural to urban migration, the expectation is generally for positive earnings returns. Wertheimer (1970), Rodgers and Rodgers (1997) and Glaeser and Maré (2001) found positive returns for rural-urban migrants although Marré (2009) did not. All of these papers refer to the US. For Australia, Hillman and Rotham (2007) found no significant returns for migrating youths, although it should be noted that in the current analysis a less narrow, general population cohort is utilised and they used a different area distinction to classify regions as metropolitan or non-metropolitan.

4.1.2 Migrant Utility

As the model predicts individuals move to maximise utility, we should observe positive returns to some measure of utility used as a dependent variable in a regression model. However, keep in mind that our theoretical framework assumes a

forward looking individual. It is therefore important that any attempt to estimate the change in the utility of migrants incorporate several years of post-move observations. Note that cultural and functional differences between the areas may determine the individual's subjective well-being, irrespective of his or her expectations based upon amenity and income differentials. For example, the popular notion of 'culture shock' (Oberg 1960) implies that movers go through a short honeymoon phase before experiencing cultural and functional frustration and detachment or resentment towards the new area. Eventually migrants become familiar with the processes of the new area and overcome previous difficulties, thereby mastering their social adjustment. Although this process is typically applied to international migration, it may be the case that rural/urban life differs to such an extent that some culture shock is experienced by movers. Another possibility is that of hedonic adaptation (see Frederick & Lowenstein 1999) which dictates (in its most extreme case) that people fully adapt to changes in their circumstances and therefore any action which aims to increase well-being will have no lasting impact. In this case, any increase in utility as a result of migration would only be transitory (although movers may not realise this when choosing to leave).

5. Measuring the Financial Returns for Rural to Urban Migrants

Introduction

In this chapter the financial returns from rural to urban migration in Australia will be estimated. We are interested in whether a wage advantage exists for those who decide to move. This information may be useful for potential movers as well as policy makers concerned with the chronic migration trend towards urban areas. In section 5.1 we describe the source of our data. In section 5.2 our chosen classification of ‘rural’ and ‘urban’ is discussed. In section 5.3 we discuss what constitutes a mover and our sample restrictions. These sections are also relevant to Chapter 6 as we use the same data when we measure the non-financial returns to migration. We spend some time describing the characteristics of our movers and stayers in section 5.4 before conducting our empirical analysis. In section 5.5 our results are discussed.

5.1 Data

For the purpose of measuring returns to migration, longitudinal data is most suitable. When the same individuals are observed over several periods of time greater detail can be established regarding the nature of the move (i.e. how long ago it occurred, whether it was a short term relocation etc) and unobserved heterogeneity can be more easily controlled for. The results will also be less temporarily biased compared to cross sectional estimates that examine only one point in time. Data from The Household, Income and Labour Dynamics in Australia (HILDA) survey was used in

this thesis. The survey began in 2001 with a large national probability sample of Australian households comprising of 19 914 people. There are currently seven waves of data available (2001 to 2007) and this thesis makes use of all available waves. People who join responding households (for example through birth or marriage) join the sample in subsequent waves.

There is considerable utility in use of the HILDA survey. By design it aims to represent the national population, hence necessary observations of rural Australian's are available. In the case of migration, returns to individuals may not be instantaneous or non-transitory and to account for this several years of data may be necessary. With seven years of observations, we are able to observe returns several years post migration. HILDA provides a rich source of individual demographic and location variables to account for heterogeneity. As well as providing financial information, respondents are also surveyed on matters of subjective well-being, which will be addressed in Chapter 6. Whereas previous Australian research has used data consisting only of youth¹⁹ (Hillman & Rotham 2007), use of HILDA enables a broader perspective as respondents represent the general population.

5.2 Defining Rural Australia

The definition of 'rural' is somewhat controversial as no universally exercised classification exists. Households in the HILDA database can be classified using either the Australia standard geographical classification major statistical region structure (MSR), the remoteness structure based on the Accessibility/remoteness index of

¹⁹ The Longitudinal Survey of Australian Youth (LSAY).

Australia (ARIA) or the section of state (SOS) structure based on population size. The MSR classifies regions are either state capital city or balance of state. Outer parts of capital cities which may have small populations or low accessibility to services are not identified as well as relatively urban locations away from the main city. As a result this classification is unsuitable.

The remoteness classification categorises localities based upon distance by road to key services (ABS 2008). Research on rural disadvantage has primarily been concerned with areas with relatively low access and as such it would be ideal to examine the movements of people from these areas. Unfortunately, sample size limitations do not provide sufficient observations for meaningful analysis. Australia is a highly urbanised nation, with 68.6% of the population living in major cities (ABS 2009). As the HILDA survey is representative of the population, only a small number of people reside in remote and very remote areas.²⁰ If we comply with the classification employed by Hillman and Rotham (2007) we can use the remoteness structure to distinguish between metropolitan and non-metropolitan Australia as moves from areas not classified as major cities to areas classified as major cities. Alternatively, we can use the SOS classification. This classification is specifically able to make distinction between rural and urban Australia according to population size. Areas are classified as either urban, other urban, bounded locality (rural) or rural balance. Both the remoteness structure and SOS structure use census districts, which are roughly classified as an area one census collector can cover delivering and receiving census forms in a ten day period (see ABS 2008 for more details), to determine region population and access characteristics.

²⁰ Furthermore, those in very remote area are under-sampled.

The SOS structure does not distinguish between urban areas on the fringe of major cities or those which are spatially isolated (ABS 2001). This may appear to be a limitation, however it could well be argued that the labour market conditions of an isolated community with a relatively large number of residents are similar to those of an urban labour market with a relatively small number of residents that is closer to a major city. Of course, the ability of one to commute negates this argument to some extent, and the ARIA does weight areas by their own population. The real world example of Darwin, the capital city of the Northern Territory, is worth considering. Due to its large distance from any population greater than 250 000, Darwin finds itself classified as ‘outer regional’ despite having a population of more than 100 000 people. It is therefore unsurprising that regions with similar remoteness structures would vary dramatically in population size (AIHW 2004). As already noted, the remoteness index would be particularly useful for measuring returns to those movers from remote areas of Australia, however as a broader measure of rurality must be used to cope with limited sample size, the SOS structure is adopted in this thesis. Table 5.1 shows the population distribution of areas classified using the SOS. Populations of less than 1000 people (bounded localities and rural balance) are used in this thesis as the definition of a rural area.

Table 5.1 SOS Structure

Category	Population	Classification
Major Urban	$\geq 100\ 000$	Urban
Other Urban	≥ 1000 and $< 100\ 000$	Urban
Bounded Locality	≥ 200 and < 1000	Rural
Rural Balance	Remainder	Rural

5.3 Movers

Some areas which are classified as rural under the SOS structure are in fact relatively close to areas classified as urban. This becomes apparent when we examine the number and distance of moves of rural to urban movers between 2001 and 2007 in Table 5.2. People under the age of 18 years and those who are full time students are excluded from the sample. The migratory pattern of this group is likely to be outside the realm of current theory (as they are likely to be driven by parental and educational opportunity considerations) and their wage rates largely tied in with parent's income. Approximately 37.7% of moves are under 20kms. The distances given are calculated using the greater circle method applied to the latitude and longitude of the previous and current address. Note that this methodology results in distances which are 'as the crow flies.' This would tend to understate the significance of distance in respect to changes in labour markets.

Table 5.2 Number and distance of moves (Waves 1-7 of HILDA)

	1-9km			10-19km			≥20km			Total		
	M	F	T	M	F	T	M	F	T	M	F	T
Number of movers	42	45	87	43	42	84	135	148	283	220	235	455
% of total movers	9.2	9.9	19.1	9.5	9.2	18.5	29.7	32.5	62.2	48.4	51.6	100
Number of movers with wage >\$150	32	23	55	28	17	45	74	53	127	134	93	227
% of total movers	14.1	10.1	24.2	12.3	7.5	19.8	32.6	23.3	55.9	59.0	41.0	100

Table 5.2 makes apparent a limitation in the data due to a relatively small number of observed rural to urban moves. This is particularly true for wage earning movers.²¹

Given the relatively small number of urban movers who are wage earners, it is not

²¹ Individuals earning a weekly wage of less than \$150 are considered outliers and are therefore not included in the financial returns analysis.

feasible to simply put a large restriction on distance moved, although this would ensure moves were associated with a change in labour market. Furthermore, the use of an unbalanced panel is necessary, although due to the statistical specifications used only those individuals observed in more than one wave make a meaningful contribution.²² Previous research by Mitchell (2008) restricted moves to be ≥ 30 km. As this thesis is measuring the returns to rural-urban migrants, not general internal migrants, the number of observed movers is considerably less hence a slightly smaller restriction of ≥ 20 kms is implemented. As respondents who move less than this distance are not suitable members of the rural comparison group, they are eliminated from the sample. Previous research on Victorian commuting has suggested that only about 15% of workers commute more than 20kms (notably this is not ‘as the crow flies’) and the median distance travelled to work in 1994 was 9.9kms (ABS 1995). This is perhaps comforting on some level, as it suggests the majority of our moves exceed standard Australian commuting distances. We retain 62.2% of our rural to urban migrants with 283 observed moves when short distance moves are excluded. In addition, 10 movers are dropped due to experiencing multiple rural to urban moves in which not all were greater than 20km, making their returns and migratory behaviour difficult to interpret. It is important to note that as different questions are answered about the financial and non-financial returns to movers in the following sections, this number (n =273) is subject to change due to non-response on particular questions.

There are a small number of movers (22 males and 20 females) who make subsequent inter-urban moves of ≥ 20 kms after their initial rural-urban move. These people are included in the analysis on the basis that we are making a clear distinction between

²² In the empirical analysis, dependent variables are generally expressed in growth terms or using fixed effects specification, making it necessary to have multiple observations of individuals.

the urban labour market and community structure and the rural labour market and community structure.²³ One final point to be made about movers is in respect to the duration since the move. Movers are identified by a change in residence between interviews. Most interviews are conducted roughly annually, although some people are interviewed at a later than normal date (see Wooden and Watson (2007) for details). As we base our migratory status simply on the observed location change between interviews, a mover may have moved only a few weeks ago or perhaps an entire year ago. As such, the returns to say one year are in fact for less than or equal to one year. For two years they are for less than or equal to two years but more than one year, and so on.

5.4 The Financial Returns

5.4.1 Descriptive Analysis

To measure the financial returns to migrants we need to know the wage they are earning after the move and the wage they would have been earning had they not moved. The latter is unobservable. To overcome this one could assume that had the migrant not moved they would simply earn the average income in the home region. Accordingly, a simple comparison can be made between the new wage in the urban destination and the average wage in the rural home location. Such a methodology is however unsuitable in the case of a heterogeneous labour force, where workers are characterised by unique characteristics that impact upon earnings. Observable characteristics can be formally controlled for with the aid of regression analysis, as

²³ Conclusions about the financial returns to both male and female movers were insensitive to the inclusion or exclusion of this group.

will be undertaken in section 4.4.2. In this section, we will examine the descriptive statistics associated with our sample of movers and stayers, as well as employing comparisons of mean earnings between groups. The utility of this exercise is that we can better understand the effect of individual characteristics in terms of masking observed returns to migration when we conduct more formal investigation as well as identifying those groups most likely to migrate. Although this section begins our analysis of the financial impact of migration, the descriptive characteristics presented are also important for measuring the non-financial impact, as variables acting as approximations of utility are likely to be influenced by an individual's lifecycle status such as marital situation, age, occupation and more.

Two measures of earnings will be used throughout, the weekly wage and the hourly wage. The former examines whether or not the budget constraint will shift due to migration. This is important because it answers the question, 'will I have more money to spend if I move?'²⁴ The hourly wage answers the question, 'will I receive higher compensation for my time and skills?' In the case that rural dwellers are underemployed, they may be more concerned with the first question as they are seeking more work hours, not necessarily higher compensation for productivity. Of course, they would be most pleased with both higher weekly and hourly wages. If they are currently satisfied with their hours worked, or even working more than they would ideally choose, they may be more concerned with the second question. To express wages in real terms they are deflated by the national consumer price index. It would be ideal to divide wages by local price levels to account for likely costs

²⁴ Of course, having more money to spend may be meaningless if costs of necessities such as food and housing are sufficiently higher to offset any wage gain experienced. Housing costs tend to be higher in major cities and decrease with remoteness while the opposite is true for the price of food and petrol (AIHW 2005).

differentials between regions (particularly in the case of rural to urban movers). In Australia however, no suitable regional price index exists.

Note that in this thesis the returns for both sexes will be estimated. In previous research it has been common to consider only males, as wage outcomes tend to be more complicated for females with issues such as maternity leave and traditional family roles. However, to keep in touch with modern changes in labour force participation of females, as well changing household dynamics and workplace dynamics that have resulted in a more significant wage earning role for women in Australia (Department of the Prime Minister and Cabinet 2008), it seems appropriate to consider both groups.

The characteristics of males and females in the sample are shown in Tables 5.3 and 5.4 respectively. Characteristics are compared between both rural to urban and inter-rural movers and rural stayers. An observant reader might note that the number of rural to urban movers is only 270 (not 273). This slight discrepancy is the result of people not meeting the selection criteria in the year previous to migration being eliminated from the sample. Also, our number of wage earning movers differs from Table 5.2 because we are in this case restricting ourselves to those earning a valid wage before moving. Accurate recordings of the number of wage earning movers who are utilised in our analysis can be found in Tables 5.5-5.8 where we estimate the wage growth of movers. One other unusual observation is that a small percentage of male and female stayers who are supposedly not working are earning positive wages (0.18% and 0.56% respectively). This obvious deficiency in the data requires this very

small group of observations be eliminated as these people cannot be properly controlled for in terms of their occupational status.

When we measure the financial returns to migration we of course only include those people earning a positive wage. Nominal wages less than \$150 were excluded from the analysis because this number was felt to be too low to constitute serious labour market participation. This restriction eliminated approximately 5% of movers and stayers. When we consider the non-financial returns to migration there is no requirement that individuals be wage earners. Hence the characteristics of the general population of movers and stayers and the characteristics of those who are wage earners are reported separately. The variable indicating an individual's level of work experience was subject to non-response and invalid response. Such observations were discarded in the earners sample because work experience is likely to be important in determining one's wage rate. Two tail z tests were used to test the hypothesis that the differences between movers (both rural to urban and inter-rural) were statistically different from zero for proportional statistics. For continuous variables a two tail t test was used.

Consistent with previous research, and as predicted by the theoretical framework, the average age is lower for movers than non-movers. People of a younger age are perhaps less likely to have strong emotional attachment to the home area and certainly have more time available to accrue returns to migration. Reflecting the lower age of movers, they also tend to have less work experience. The only group of movers that do not have a significantly different average age and level of work experience than stayers are inter-rural female wage earners, who notably are a relatively small group

Table 5.3 Characteristics of Male Movers and Stayers (year before move)

Characteristics	Full sample			Wage earners (weekly wage >\$150)		
	Urban movers N = 129	Inter-rural movers N = 74	Stayers N = 5327	Urban movers N = 60	Inter-rural movers N=40	Stayers N = 2273
Age	44.36***	46.66**	50.73	34.72***	39.05***	44.01
Experience (years)^	25.18***	26.90***	31.74	16.92***	20.90***	26.49
Area socioeconomic status ^a	3.41***	3.59*	4.06	3.58***	3.30***	4.45
Long term health condition	27.13%	25.68%	28.82%	10.00%	12.50%	15.53%
Aboriginal/Torres Straight^	1.92%	0.00%	2.10%	1.85%	0.00%	2.29%
Origin^						
- Australia	85.95%	88.57%	83.89%	90.00%	90.00%	86.19%
- Main Eng.	9.09%	8.57%	10.66%	6.67%	7.50%	10.56%
- Other	4.96%	2.86%	5.45%	3.33%	2.50%	3.26%
Household relationship						
- Couple with child <15	19.38***	27.03%	30.96%	30.00%**	25.00%**	43.07%
- Couple with dependent student	0.78%**	1.35%	4.79%	1.67%	2.50%	5.59%
- Couple with independent child	3.88%	2.70%	5.03%	5.00%	2.50%	4.05%
- Couple without child	38.76%	40.54%	38.01%	28.33%	30.00%	29.65%
- Lone parent with child <15	0.00%	0.00%	0.98%	0.00%	0.00%	1.23%
- Lone parent with dependent student	0.78%	1.35%**	0.21%	1.67%**	2.50%***	0.18%
- Lone parent with independent child	0.78%	1.35%	0.49%	0.00%	0.00%	0.09%
- Non-dependent child	14.73***	4.05%	4.99%	16.67%***	7.50%	5.46%
- Other family member	2.33%	0.00%	1.26%	0.00%	0.00%	1.14%
- Lone person	15.50%	20.27%**	12.20%	11.67%	27.50%***	8.84%
- Unrelated to all household members	3.10%**	1.35%	1.09%	5.00%***	2.50%	0.70%
Occupation						
- Non response	6.20%	5.41%	7.34%	0.00%	0.00%	0.00%
- Not working	32.56%	24.32%	26.91%	0.00%	0.00%	0.18%
- Managers	13.18***	16.22%	23.47%	10.00%**	12.50%	22.23%
- Professionals	6.98%	8.11%	7.85%	15.00%	15.00%	16.02%
- Technicians and trades	15.50%	12.16%	12.02%	26.67%	17.50%	19.06%
- Community and personal service	3.10%	9.46%***	2.44%	6.67%	17.50%***	5.15%
- Clerical and administration	1.55%	2.70%	2.25%	3.33%	5.00%	4.71%
- Sales	2.33%	0.00%	1.92%	3.33%	0.00%	3.87%
- Machinery operators and drivers	5.43%	9.46%	7.85%	11.67%	17.50%	14.96%
- Labourers	13.18%**	12.16%	7.94%	23.33%**	15.00%	13.82%
Education^						
- Masters or doctorate	0.00%*	1.43%	2.35%	0.00%	2.50%	3.87%
- Grad dip/Grad cert	0.83%	1.43%	3.38%	1.67%	0.00%	5.46%
- Bachelor or honours	6.61%	10.00%	6.00%	11.67%	17.50%**	8.10%
- Advance dip/Dip	9.09%	12.86%	7.80%	8.33%	15.00%*	7.64%
- Cert III or IV	31.40%	24.29%	30.82%	40.00%	25.00%	33.13%
- Cert I or II	4.13%**	2.86%	1.56%	6.67%**	5.00%	2.16%
- Cert undefined	0.00%	1.43%	0.67%	0.00%	0.00%	0.79%
- Year 12	10.74%	7.14%	7.88%	13.33%	5.00%	8.80%
- Year 11 and below	37.19%	38.57%	39.53%	18.33%**	30.00%	30.05%

*significant at 10% level, **5% level and ***1% level

^Variable subject to non-response. Averages reported are based upon responding subpopulation of sample.

^aScale from 1-10 with 10 representing the top end range of socio-economic status of the area

Table 5.4 Characteristics of Female Movers and Stayers (year before move)

Characteristics	Full sample			Wage earners (weekly wage >\$150)		
	Urban movers N = 141	Inter-rural movers N = 64	Stayers N = 5094	Urban movers N = 52	Inter-rural movers N=25	Stayers N = 1951
Age	43.16***	46.09*	49.67	36.19***	41.12	43.51
Experience (years)^	14.35***	16.89*	19.85	15.00***	19.10	20.89
Area socioeconomic status ^a	3.38***	4.08	4.08	4.31	4.48	4.45
Long term health condition	25.53%	18.75%	25.27%	9.62%	8.00%	13.48%
Aboriginal/Torres Straight^	10.26%***	3.70%	2.73%	4.88%	0.00%	2.00%
Origin^						
- Australia	84.78%	84.38%	84.40%	78.85%	84.00%	84.52%
- Main Eng.	10.14%	9.38%	9.94%	11.54%	8.00%	10.56%
- Other	5.07%	6.25%	5.67%	9.62%	8.00%	4.92%
Household relationship						
- Couple with child <15	24.82%*	29.69%	31.92%	21.15%***	24.00%	39.67%
- Couple with dependent student	1.42%*	1.56%	5.01%	1.92%	4.00%	7.33%
- Couple with independent child	3.55%	3.13%	5.14%	5.77%	0.00%	4.87%
- Couple without child	36.88%	40.63%	38.65%	38.46%	40.00%	34.03%
- Lone parent with child <15	12.06%***	9.38%**	4.24%	3.85%	4.00%	5.13%
- Lone parent with dependent student	1.42%*	0.00%	0.37%	3.85%***	0.00%	0.51%
- Lone parent with independent child	0.71%	0.00%	1.71%	1.92%	0.00%	0.77%
- Non-dependent child	4.96%*	3.13%	2.45%	5.77%	8.00%	2.67%
- Other family member	0.00%	3.13%	1.45%	0.00%	4.00%	0.87%
- Lone person	12.77%**	9.38%	8.15%	13.46%***	16.00%***	3.64%
- Unrelated to all household members	1.42%	0.00%	0.90%	3.85%***	0.00%	0.51%
Occupation						
- Non response	2.13%	0.00%	3.00%	0.00%	0.00%	0.00%
- Not working	53.90%***	46.88%	40.68%	0.00%	0.00%	0.56%
- Managers	7.09%	6.25%	11.48%	9.62%	4.00%	10.25%
- Professionals	14.18%	10.94%	11.82%	38.46%	24.00%	27.73%
- Technicians and trades	0.71%	4.69%	2.43%	1.92%	12.00%	4.77%
- Community and personal service	5.67%	9.38%	7.09%	13.46%	16.00%	15.07%
- Clerical and administration	6.38%*	4.69%	10.97%	15.38%	8.00%	20.66%
- Sales	2.84%	3.13%	4.12%	7.69%	8.00%	8.41%
- Machinery operators and drivers	1.42%	3.13%*	0.90%	3.85%	4.00%	1.59%
- Labourers	5.67%	10.94%	7.50%	9.62%	24.00%**	10.97%
Education^						
- Masters or doctorate	2.90%	0.00%	1.64%	5.77%	0.00%	3.08%
- Grad dip/Grad cert	6.52%	7.81%	5.38%	11.54%	16.00%	10.15%
- Bachelor or honours	13.04%***	9.38%	7.33%	25.00%***	4.00%	11.69%
- Advance dip/Dip	2.17%**	4.69%	7.99%	3.85%	4.00%	9.12%
- Cert III or IV	18.84%*	29.69%***	13.86%	19.23%	40.00%***	15.79%
- Cert I or II	0.72%	1.56%	2.02%	0.00%	0.00%	1.03%
- Cert undefined	0.72%	0.00%	0.61%	0.00%	0.00%	0.10%
- Year 12	12.32%	17.19%	12.83%	19.23%	24.00%	15.22%
- Year 11 and below	42.75%	29.69%***	48.33%	15.38%***	12.00%**	33.83%

*significant at 10% level, **5% level and ***1% level

^See Table 5.3

^aSee Table 5.3

(n=25). For inter-rural female movers in general, the age difference is only significant at the 10% level.

For both sexes, rural to urban migrants appear less likely to be in couple relationships with children under the age of 15 years. It may be more costly for this group to migrate because for them the act is a family decision. They must consider not only the costs and benefits they receive themselves, but also the costs and benefits to their children. This may be related to neighbourhood safety or school relocation for example. For females, single parents with a child under 15 years are overrepresented in both rural to urban and inter-rural movers in general (not for wage earners). Unless this result is reflecting women leaving a relationship with their children and seeking a ‘fresh start’ in a new locality, the reason for this overrepresentation is not obvious.

The data also suggests that males and female wage earners with a dependent student are more likely to be rural to urban movers, although the actual proportions are relatively small.²⁵ Male movers appear more likely to be a non-dependent child which suggests that the rural to urban move is the traditional ‘leaving home’ life event for some. This is confirmed when we examine the characteristics of movers in the year after the move takes place (not reproduced). This group is not overrepresented (2.93% of the sample) and are therefore not overwhelmingly moving with their families. Unsurprisingly, single person relationships (i.e. dependent student, lone person and

²⁵ The ABS (2006) defines a dependent student as “a natural adopted, step, or foster child who is 15-24 years of age and who attends a secondary or tertiary educational institution as a full-time student and for whom there is no identified partner or child of his/her own usually resident in the same household” and a non-dependent child as “a natural, adopted, step or foster child of a couple or lone parent usually resident in the household, who is aged 15 years and over and is not a full-time student aged 15-24 years, and who has no identified partner or child of his/her own usually resident in the household.”

unrelated to household) are generally more mobile for both sexes. These people are not constrained in their decision to migrate by spousal or child considerations.

Males working as managers are less likely to be rural to urban movers. The opposite is true for labourers. The respective immobility and mobility of these occupations may reflect management (in many cases) embodying much firm specific knowledge. People who are managers would therefore sacrifice this firm specific human capital which would of course make the option of moving less attractive. For labourers however, as their skills are likely to be highly transferable, the act of migration is relatively less costly. This explanation is not well supported by the empirical literature which suggests that occupation specific capital is far more important than firm specific capital (Neal 1995; Parent 2000; Zangelidis 2008; Kambourov & Manovskii 2009). If there exists structural constraints however, that prevent rural managers from becoming urban managers (i.e. they face a low probability of migrating and maintaining the same occupation), the explanation is plausible. One alternative explanation is that managers may simply be more likely to be on long term contracts. The result for male managers extends to inter-rural wage earners although the result for labourers does not. Instead those employed in community and personal service work are more likely to be movers, a phenomenon not explored here. Labourers are overrepresented in the group of female inter-rural movers, although, as previously noted, the sample is relatively small. The only other significant difference in occupation is that female rural to urban movers are less likely to be working. This could be interpreted in many ways. It might suggest that females are in many cases not driven by an income motive, or that they are moving to accompany their spouse who is the primary income earner. It could also be that knowing they will be

migrating, some people cease their employment. Another possibility is that many movers do so because they are seeking employment and opportunities might be greater elsewhere. In many cases movers originate from an area of relatively lower socioeconomic status. This result is particularly true for males although only true for female rural to urban movers in general.

A priori we would expect movers to have more education because greater skills can increase the potential size of one's labour market. This is supported by much of the data, with female rural to urban movers and inter-rural male wage earners having a greater proportion of people with a bachelor or honours degrees than stayers. Furthermore, people who have only completed year eleven or less are underrepresented in female inter-rural movers, female rural to urban wage earners and male rural to urban wage earners. The fact that education levels between male movers and stayers in general are very similar is unsurprising as the population of this sample is largely comprised of non-wage earners. Expectations about education and mobility are based upon labour market considerations.

We will now compare earnings between movers and stayers for up to three years after the move. The results of this analysis are in themselves not definitive because they impose the heroic assumption of a homogenous rural labour force. As we have discovered, migrants differ from non-migrants in observable ways which must be controlled for to obtain robust results. When we measure the financial returns using formal techniques in section 5.4.2, the discrepancy between our mean comparisons and formal estimates will suggest the extent to which observable (and unobservable) biases are shielding the 'true' level of returns.

The return to migration in any year can simply be interpreted as the difference between the wages a mover has received since migrating and the wages that would have been received had migration not occurred. Denoting movers with subscript M and urban or rural locality with U and R respectively, an appropriate equation can be written in the form of 5.1. Time T is the base year and t is the years since the move occurred.

$$\log Y_{T+t}^{M|U} - \log Y_{T+t}^{M|R} = \left[\log Y_{T+t}^{M|U} - \log Y_T^{M|R} \right] - \left[\log Y_{T+t}^{M|R} - \log Y_T^{M|R} \right] \quad (5.1)$$

The problem with equation 5.1 is that $\log Y_{T+t}^{M|R} - \log Y_T^{M|R}$ remains unobserved by the researcher. As indicated at the beginning of the section, we could assume that $\log Y_{T+t}^{M|R} - \log Y_T^{M|R}$ would be equal to the average wage change of those who do not make a rural to urban move. In this case we can modify equation 5.1 into 5.2, which can now be estimated. S denotes our group of rural stayers.

$$\log Y_{T+t}^{M|U} - \log Y_{T+t}^{M|R} = \left[\log Y_{T+t}^{M|U} - \log Y_T^{M|R} \right] - \left[\log Y_{T+t}^{S|R} - \log Y_T^{S|R} \right] \quad (5.2)$$

This specification has been used by Rodgers and Rodgers (1997), where the results from equation (5.2) were also compared to those of more formal regression analysis. The results for males are provided in Tables 5.5 and 5.7 and for females in Tables 5.6 and 5.8. A two tail t test was used to test the null hypothesis that the expression in the equation (5.2) was equal to zero (the alternate hypothesis being that the wage difference was not equal to zero) with the resulting p-values given in parenthesis. To

be consistent with our distinction between a rural sector labour market and an urban sector labour market, inter-rural movers are included in our sample of stayers (later this group will be formally controlled for).

Table 5.5 Males Weekly Wage Mean Comparisons

Years	RU movers		Stayers		Difference
	Observations	Wage growth	Observations	Wage growth	
0-1	49	10.00%	1610	1.70%	8.29%* (0.090)
1-2	37	18.80%	1221	2.68%	16.12%*** (0.007)
2-3	29	25.31%	890	3.15%	22.16%*** (0.003)

Table 5.6 Females Weekly Wage Mean Comparisons

Years	RU movers		Stayers		Difference
	Observations	Wage growth	Observations	Wage growth	
0-1	33	7.94%	1324	3.00%	4.94% (0.427)
1-2	26	5.65%	1009	5.06%	0.58% (0.941)
2-3	24	11.45%	748	6.62%	4.83% (0.569)

Table 5.7 Males Hourly Wage Mean Comparisons

Years	RU movers		Stayers		Difference
	Observations	Wage growth	Observations	Wage growth	
0-1	45	6.72%	1511	2.38%	4.33% (0.396)
1-2	33	12.19%	1148	3.70%	8.49% (0.174)
2-3	27	20.83%	846	4.14%	16.69%** (0.023)

Table 5.8 Females Hourly Wage Mean Comparisons

Years	RU movers		Stayers		Difference
	Observations	Wage growth	Observations	Wage growth	
0-1	32	12.04%	1270	1.75%	10.29% (0.105)
1-2	26	16.43%	962	3.14%	13.28%* (0.072)
2-3	24	13.72%	710	3.29%	10.43% (0.180)

Note: P values in parenthesis for two tail t test that Difference =0. *significant at 10% level, **5% level and ***1% level

The average wage growth of our male movers is statistically significantly higher two and three years after moving. For the hourly wage, the difference is significantly higher only after three years. For females, only the two year hourly return is significant and at the 10% level. Differences in the weekly wage rate are relatively smaller than the hourly wage rate while the opposite is true for men. In all cases (male and female), differences are in a positive direction to movers.

Taken at face value, the results would suggest higher total compensation to males, which is not necessarily immediately earned. Males also receive higher compensation for their time although the evidence for this was less overwhelming and the return only realised after three years. Females appear to not earn any more per week and only weak evidence was found of higher hourly compensation. Notably, the results are limited by the small number of observed movers. This is particularly true in the case of females. The sample for our hourly returns differs because, in addition to our weekly wage restriction, they were constrained to be within the bounds of \$6.50 and \$100.²⁶ Observations less than \$6.50 are well below the Australian federal minimum wage rate and as such were considered suspicious. One further source of sample loss in the case of the hourly returns came from the fact that some people with a valid weekly wage did not record a valid response on hours worked so no hourly rate could be calculated for this group.

²⁶ The impact of this restriction on our conclusions is discussed in section 5.4.2.

5.4.2 Formal Analysis and Results

It is quite obvious that simply comparing mean wage growth values between groups of movers and stayers is insufficient to analyse the financial returns to migration. In this section we will use formal techniques to control for both observable and non-observable differences between movers and stayers when estimating financial returns. Three main specifications will be used. Our base model is a simple difference-in-difference model of wage growth which we measure for up to three years following the move. By specifying our equation in differences, time invariant individual specific heteroskedasticity is eliminated. The weakness of this specification is that it does not consider changes that occur in individual characteristics between years when we take for instance the three year difference (for this reason it would be unsuitable to specify this equation for more than a few years). The advantage of this specification is that we can make some attempt to estimate wage equations which take into consideration the endogeneity in the decision to migrate, in the case that the endogenous nature of the decision to migrate is not time invariant. If selectivity bias is present and we fail to account for this, our estimates will be biased and inconsistent due to relevant information being omitted. Our final model uses a time-path flexible form fixed effects specification which considers all observed changes to individual characteristics over the time period while also controlling for unobserved time invariant differences. The model allows us to examine the earnings path of migrants before and after they move for a duration of four plus years.

The potential for selectivity bias to affect results of migration studies is well recognised by modern researches. Most modern studies have attempted to

meaningfully test and correct for this potential problem. Greenwood (1975, pg 403) provides a useful explanation of the potential selectivity bias associated with migration.

Presumably, by examining the earnings of otherwise comparable individuals who do not migrate, we take into account what an individual would have earned had he not moved. However, the fact that individual A migrates, while otherwise comparable B does not, suggests that an important difference does exist between the individuals. These differences may be in the way they view costs. The differences may also be in the way they view benefits. Individual A, for example, may be more highly motivated to invest in human capital formation, not only in migration, but in other forms as well. If such were the case, the earnings of the remaining cohort from which the migrant is drawn may provide a lower bound for the earnings the migrant would have received in the absence of migration.

In the case that the unobserved differences between migrants and non-migrants are time-invariant, fixed effects regression will provide unbiased and consistent estimates. As a result such models are often estimated without a selectivity correction (Greenwood 1997). This assumption seems plausible if the unobserved bias is simply inherited ability. If however, the bias occurs as a result of changes in the resources or characteristics of our individual that remain unobserved, estimation with fixed effects will be problematic. To allow for possible endogeneity in the migration decision we will estimate a selectivity corrected wage growth equation using difference-in-difference methods to control for time invariant individual characteristics. The results from this analysis will then be used to assess whether or not self-selection appears to be a problem and if so, the direction of the bias. It is often assumed that self-selection will upwardly bias estimates on the returns to migration. This may not be the case if

those who move do so because of unobserved traits that lower their chances of favourable earnings outcomes in the home region. For example, if opportunities are much higher in the urban sector, less motivated and skilled people may be overrepresented in the rural-urban migration flow as the likelihood of these people finding good employment in the relatively less opportunistic rural area may be such that it is beneficial to leave. We begin with an earnings equation (5.3) where we have as the dependent variable the log of the weekly or hourly wage.

$$\ln Y_{it} = \beta_0 X'_{it} + \beta_1 m^U_{it} + \beta_2 m^R_{it} + v_i + \delta_t + \mu_{it} \quad (5.3)$$

X'_{it} is a vector of individual i characteristics at time t . v_i represents the time invariant individual specific fixed effects and μ_{it} is a random error term. m^U is simply a dummy variable with a value of one if a person is an urban migrant and m^R a dummy variable indicating whether a person is an inter-rural migrant. Also included is δ_t which indicates the macroeconomic factors during each time period that might impact upon the general wage level.

Assuming that all unobserved characteristics which can potentially bias our estimates are time invariant, we can correct for the potential selectivity problem simply by taking the first difference of equation (5.3).

$$\begin{aligned} \ln Y_{it} - \ln Y_{it-1} = & \beta_3 (X'_{it} - X'_{it-1}) + \beta_4 (m^U_{it} - m^U_{it-1}) \\ & + \beta_5 (m^R_{it} - m^R_{it-1}) + (\delta_t - \delta_{t-1}) + (\mu_{it} - \mu_{it-1}) \end{aligned} \quad (5.4)$$

Notice that the fixed component of equation (5.3) v_i is eliminated by taking the first difference. As previously stated, it may be unrealistic to assume that the selectivity bias aligned with migration is time invariant. To control for the potential endogeneity in the decision to migrate instrumental variable (IV) regression is used. Because the endogenous variable is a binary choice, treatment effects IV regression is used which explicitly accounts for the binary nature of the choice (migration) variable. For this method we also need to consider equation (5.5).

$$M_{it} = Z_{it} + \varepsilon_{it} \quad (5.5)$$

M_{it} is a binary variable with a value of one if the person is a rural-urban migrant and zero otherwise. Z_{it} is a vector of individual specific characteristics assumed to influence one's probability of migration. Note that Z_{it} should contain at least one variable related to the decision to migrate but unrelated to earnings (that is, not included in X_{it}') for robust results. The restriction variables chosen are the respondents answer to the question, 'how likely are you to move in the next twelve months?' at the interview previous to migration and whether or not the person was a home owner in the year of the move.²⁷ It is expected that indicating a high likeliness to move will be correlated with actual migration and that home ownership will be negatively related to migration as home ownership implies a financial commitment to the rural locality (this variable has been used by Mitchell (2008) and Bill and Mitchell (2006) in their migration research using HILDA). A five scale response indicating

²⁷ Home ownership is recorded as of the interview in the period 0-1 year after migration. By doing this, in addition to the basic postulation that owning a home reduces mobility, we are indicating that if a person has bought a home in the last twelve months they are perhaps less likely have also made a rural to urban move during that same twelve months.

preference to move was transformed into a dummy variable with one indicating the individual was ‘likely’ or ‘very likely’ to move. Equation (5.5) can be estimated by probit regression.

The second stage requires that the fitted values from equation (5.5) (i.e. the probability of migration for the entire population) be substituted for actual migration in equation (5.4). Assuming that the selected instruments are valid, we can test whether self-selection bias is present in the decision to migrate by testing whether $\text{Cor}(\mu_{it} - \mu_{it-1}, \varepsilon_{it}) \neq 0$ (Maddala 1983). If the error terms from the first stage and second stage regression are correlated, this will indicate that self-selection is indeed a problem (see Appendix 1). If selectivity bias does not appear to be a problem, our difference-in-difference estimates will be preferable to our IV estimates as they will be more efficient. The second stage regression is shown in equation (5.6) with \hat{M}_{it} now replacing $(m_{it}^U - m_{it-1}^U)$. Note that the selectivity correction only applies to rural-urban migrants as this is the group we are primarily concerned with.

$$\begin{aligned} \ln Y_{it} - \ln Y_{it-1} = & \lambda_1 (X'_{it} - X'_{it-1}) + \lambda_2 (\hat{M}_{it}^U) + \lambda_3 (m_{it}^R - m_{it-1}^R) \\ & + (\delta_t - \delta_{t-1}) + (\mu_{it} - \mu_{it-1}) \end{aligned} \quad (5.6)$$

The results from both equation (5.4) and equation (5.6) are presented below for the one year return to migration. Included in the vector X' are controls for whether a person is a rural-rural migrant and the duration since the move, socio-economic status of the residing area²⁸, household relationship (e.g. couple with children, lone person

²⁸ The SEIFA 2001decile of index of socio-economic advantage/disadvantage was used. This categorises region with a score between one (lowest socio-economic status) and ten (highest). Dummy variables were created for if the area scored between 0-3, 4-6 and 7-10.

etc), self reported long term health condition, union membership, occupation and years of work experience (given as a continuous variable). To account for location differences, dummy variables are also included for each of Australia's seven states and territories. To control for possible macroeconomic influences (δ_t), dummy variables for each of the seven years are included. Although education was not entirely time invariant for our sample, we did not include education categories because there was such little variability in our education data (i.e. we observed an insufficient number of people increase their highest level of education for meaningful analysis) that our coefficients would have been misleading.²⁹ For brevity the results from the first stage regressions are presented in Appendix 1. The likelihood ratio chi squared for the weekly wage return was 152.83 ($p = 0.000$) for males and 167.34 ($p = 0.000$) for females and the pseudo R^2 was 0.3460 for males and 0.5390 for females.³⁰ Both instruments were significant at the 1% level with the expected positive sign on indicating a high likelihood of moving in the next twelve months and the expected negative sign on home ownership. This gives us some comfort as to the validity of our instruments.

Table 5.9 One Year Weekly Wage Return

Variable	Men (n=1659)		Women (n=1357)	
	First Diff (5.4)	IV (5.6)	First Diff (5.4)	IV (5.6)
RU migrant	0.0693 (0.269)	0.0056 (0.958)	0.0857 (0.120)	0.0992 (0.358)
R^2	0.0647		0.0447	
Lambda		0.0400 (0.488)		-0.0115 (0.865)
Wald χ^2		112.61*** (0.000)		63.17*** (0.002)

Note: Robust standard errors adjusted for individual clustering reported for the difference-in-difference models. P values in parenthesis. *, **, *** is significance at the 10%, 5% and 1% level respectively.

²⁹ Recall that we previously found educational differences between mover and stayers. Hence in equation 5.5, Z_{it} does contain education categories.

³⁰ For the hourly wage, the results were almost identical (if it was not for our hourly wage restriction and some people giving invalid responses to hours worked they would be identical) and for brevity are not reproduced.

Table 5.10 One Year Hourly Wage Return

Variable	Men (n=1556)		Women (n=1302)	
	First Diff (5.4)	IV (5.6)	First Diff (5.4)	IV (5.6)
RU migrant	0.0427 (0.476)	0.0242 (0.834)	0.1117* (0.085)	0.1779* (0.095)
R ²	0.0430		0.0307	
Lambda		0.0115 (0.854)		-0.0612 (0.389)
Wald χ^2		69.45*** (0.001)		41.70 (0.202)

Note: Refer Table 5.9 in respect to standard errors. Hourly wages of less than \$6.50 or in excess of \$100 are considered outliers and are not included in the analysis. The sample size in weekly wage and hourly wage models differs due to this restriction as well as invalid or non-responses in respect to hours usually worked.

Interestingly but perhaps not unexpectedly, neither males nor females experience any immediate return to migration with respect to the weekly wage. In contrast to our previous comparison of earnings with no controls for personal characteristics, it is the coefficient on returns to females that is the largest, although statistically insignificant in both the difference-in-difference and IV models. Not experiencing immediate returns could be explained by a number of theoretical and structural considerations. Human capital theory assumes that people maximise lifetime earnings. It is therefore possible that movers are willing to experience no immediate return under the belief that returns will occur at a later date. Structural factors such as delayed job transfer and job search would be weighed against future expected earnings by the mover. It is also important to keep in mind that wages are merely one of the factors that might influence a person's decision to migrate and that movers who are seeking to maximise lifetime utility may be motivated by other factors such as local amenities or proximity to family. Self-selection does not appear to be an issue in the returns to migration for women in particular, with the coefficients varying only slightly between the difference-in-difference and IV models and the lambda coefficient (indicating the correlation between the error terms of the first and second stage equations) highly

insignificant. The lambda coefficient is also insignificant for males although the estimated migration coefficients differ by a relatively larger amount.

In terms of hourly compensation, weak evidence is found in both the difference-in-difference and IV models that women experience an hourly wage premium after moving to an urban locality. The migration coefficient is significant at the 10% level in both models and is particularly large in the IV model (17.8% premium), suggesting that if selectivity bias is present it is in fact downwardly biasing our results. Again though, the lambda coefficient is insignificant for both men and women. No evidence is found for an hourly wage premium for men.

It is now necessary to extend our model beyond a contemporaneous return. Theory does not specify that returns to migration are immediately earned and previous research has found that returns are subject to the labour market assimilation of movers (Borjas, Bronars & Trejo 1992). To measure the longer term returns we estimate an extended wage equation in a similar manner to Yankow (1999, 2003), Rodgers and Rodgers (2000) and Boheim and Taylor (2007).

$$\ln Y_{it} = \rho_0 X_{it}^n + \rho_1 M_{i7t}^u + \rho_2 M_{i7t}^r + \alpha_i + \delta_t + \eta_{it} \quad (5.7)$$

Equation (5.7) can be estimated using fixed effects regression. As with first difference estimation, time invariant unobserved heterogeneity is eliminated which avoids potential omitted variable bias. Fixed effects regression estimates each coefficient as a

deviation from its mean value during the period t_1 to t_7 .³¹ In this way, variables that are not time invariant but have constant growth (such as age) can be incorporated in the vector X'' . As a result X'' differs from X' in equations (5.4) and (5.6). Again, the unobserved individual specific fixed effects represented by α are eliminated and δ is controlled for with dummy variables for each of the seven years. M^U is equal to one for rural to urban movers and M^R is equal to one for inter-rural movers. The estimable equation takes the form of (5.8) with ρ_4 (for different durations of migration) our primary coefficient of interest. δ_t is easily controlled for with dummy variables for each year and for simplicity is not included in (5.8).

$$\ln Y_{it} - \ln \bar{Y}_i = \rho_3(X''_{it} - \bar{X}''_i) + \rho_4(M^U_{i\gamma t} - \bar{M}^U_i) + \rho_5(M^R_{i\gamma t} - \bar{M}^R_i) + \rho_6(\eta_{it} - \bar{\eta}_i) \quad (5.8)$$

γt captures the time since migration. Four durations of post migration are specified: 0-1 year, 1-2 years, 2-3 years and 3-4+ years as well as dummies for the year before and two years previous to migration. Specifying the largest duration as four or more years allows us to gain extra observations of movers (if we did not amalgamate this group there would be very few observations). This variable is coded such that a mover would receive a zero for every observation before four years of tenure in the urban locality and a one for each observation after and including four years tenure. Dummy variables are included for both rural-urban (M^U) and rural-rural (M^R) movers. In addition to the variables included in X' , X'' also includes controls age and age squared. For comparison and to verify any role of unobserved self-selection, equations (5.4) and (5.6) are re-estimated using difference-in-difference and IV

³¹ Recall that the time period under consideration is 2001-2007. This process is equivalent to including a dummy variable for each individual in our sample when we estimate our wage equation.

regression respectively for up to three years after the move ($Y_{it} - Y_{it-3}$). This could be important as the sample of movers differs for different durations. For example, the sample of $t-3$ movers excludes some movers who have subsequently returned to a rural locality³² as well as people who have left the survey and it is possible these events distinguish this group of movers from $t-1$ movers. Furthermore, $t-3$ movers can only be observed if the move took place between 2004-2005 or earlier.

For brevity, coefficients on control variables and inter-rural migration variables are only recorded for the fixed effects models. The results are reported in Table 5.15. Few control variables are significant. This is not unexpected as many of our variables are fixed for each individual over the sample period. Additionally, it may be that time invariant individual characteristics largely explain earnings irrespective of a number of characteristics. In any case, we were merely concerned with controlling for these variables to gain robust estimates of the wage returns to migration. The actual slope coefficients of these factors are not important to the objective of this thesis. No clear pattern emerged for the relationship between age or work experience and wages for males. For females, the typical inverted U relationship is observed for work experience with respect to weekly earnings. Male and female sales workers and male managers earned lower hourly wages compared to most other groups (the control group was labourers). Some other occupations are observed to have different earnings, however the results are typically restricted to either males or females and either the weekly or hourly wage (not both).

³² It is possible that this group constitutes some people who have failed to succeed in the urban environment and subsequently return. Note that if an individual had returned to the rural locality in the last year they were not included in the analysis.

Table 5.11 Weekly Wage Returns to Male Rural to Urban Movers

Years since move	D-in-D ¹ (5.4)	IV ² (5.6)	Fixed effects ³ (5.8)
-1--2 years			0.0496 (0.393)
-1-0 years			0.0844 (0.229)
0-1 years	0.0693 (0.269)	0.0056 (0.958)	0.1286* (0.080)
1-2 years	0.1500** (0.020)	0.1560 (0.140)	0.2109*** (0.002)
2-3 years	0.2325** (0.011)	0.2961** (0.012)	0.2504*** (0.005)
3-4+ years			0.3229*** (0.000)

¹ n = 1258 and 919 for the 1-2 and 2-3 years returns

² n = 1236 and 902 for the 1-2 and 2-3 years returns

³ n = 2639

Note: Robust standard errors adjusted for individual clustering reporting for D-in-D and FE models. P values in parenthesis. *, **, *** is significance at the 10%, 5% and 1% level respectively. Sample size varies slightly between D-in-D and IV models because home ownership is recorded in the year t whereas wage growth is recorded for year t - 1 to t + x and some people are not observed in year t. Log wage used as dependent variable.

Table 5.12 Weekly Wage Returns to Female Rural to Urban Movers

Years since move	D-in-D ¹ (5.4)	IV ² (5.6)	Fixed effects ³ (5.8)
-1--2 years			0.0341 (0.645)
-1-0 years			0.0407 (0.603)
0-1 years	0.0857 (0.120)	0.0992 (0.358)	0.0520 (0.506)
1-2 years	0.0619 (0.383)	0.0473 (0.702)	0.0531 (0.598)
2-3 years	0.0518 (0.579)	0.0562 (0.698)	0.0582 (0.516)
3-4+ years			0.0181 (0.865)

¹ n = 1035 and 772 for the 1-2 and 2-3 years returns

² n = 1009 and 746 for the 1-2 and 2-3 years returns

³ n = 2223

Note: See Table 5.8

Table 5.13 Hourly Wage Returns to Male Rural to Urban Movers

Years since move	D-in-D¹ (5.4)	IV² (5.6)	Fixed effects³ (5.8)
-1--2 years			-0.0536 (0.386)
-1-0 years			-0.0436 (0.572)
0-1 years	0.0427 (0.476)	0.0242 (0.834)	0.0020 (0.979)
1-2 years	0.0834 (0.216)	0.0724 (0.512)	0.0173 (0.813)
2-3 years	0.1857** (0.035)	0.2037* (0.093)	0.0321 (0.719)
3-4+ years			0.0979 (0.258)

¹ n = 1181 and 873 for the 1-2 and 2-3 years returns

² n = 1162 and 857 for the 1-2 and 2-3 years returns

³ n = 2496

Note: See Table 5.8

Table 5.14 Hourly Wage Returns to Female Rural to Urban Movers

Years since move	D-in-D¹ (5.4)	IV² (5.6)	Fixed effects³ (5.8)
-1--2 years			0.0453 (0.423)
-1-0 years			0.0137 (0.824)
0-1 years	0.1117* (0.085)	0.1779* (0.095)	0.0593 (0.398)
1-2 years	0.1735** (0.010)	0.2375** (0.040)	0.1322** (0.044)
2-3 years	0.0702 (0.261)	0.1029 (0.442)	0.1554** (0.040)
3-4+ years			0.1033 (0.231)

¹ n = 988 and 734 for the 1-2 and 2-3 years returns

² n = 962 and 708 for the 1-2 and 2-3 years returns

³ n = 2146

Note: See Table 5.8

Table 5.15 Fixed Effects Full Specification

Variables	Log Weekly wage		Log hourly wage	
	Males	Females	Males	Females
RR (-2--1yrs)	0.0700 (0.428)	-0.1520* (0.062)	0.0255 (0.762)	-0.0235 (0.757)
RR (-1-0yr)	0.0350 (0.660)	0.0099 (0.923)	0.0003 (0.995)	0.0872 (0.420)
RR (0-1yr)	0.0533 (0.474)	-0.1246 (0.383)	-0.0517 (0.406)	-0.0304 (0.776)
RR (1-2yrs)	0.0879 (0.444)	0.0621 (0.627)	-0.0177 (0.825)	0.0652 (0.505)
RR (2-3yrs)	-0.0010 (0.993)	-0.2947* (0.057)	-0.0714 (0.556)	-0.0598 (0.646)
RR (3-4+yrs)	-0.1013 (0.394)	0.0568 (0.719)	-0.2733** (0.032)	0.0386 (0.680)
Age	0.0910 (0.275)	-0.0858* (0.096)	0.0211 (0.730)	-0.0004 (0.993)
Age ²	-0.0009 (0.271)	-0.0001 (0.792)	0.0001 (0.847)	-0.0003 (0.447)
Work exp.	-0.0006 (0.993)	0.1517*** (0.000)	0.0226 (0.637)	0.0344 (0.382)
Work exp. ²	0.0001 (0.883)	-0.0007* (0.077)	-0.0006 (0.360)	0.0001 (0.727)
Long term health cond.	0.0155 (0.510)	-0.0102 (0.701)	0.0220 (0.299)	-0.0348 (0.202)
Union member	0.0413 (0.152)	0.0371 (0.248)	0.0342 (0.174)	0.0288 (0.232)
Manager	-0.0102 (0.828)	0.1203* (0.091)	-0.1189*** (0.004)	-0.0914 (0.163)
Professional	0.0458 (0.463)	0.1278 (0.116)	-0.0600 (0.279)	-0.0193 (0.800)
Technician and trades	0.0821* (0.053)	-0.0220 (0.792)	-0.0066 (0.856)	-0.0791 (0.311)
Community and personal	-0.0645 (0.355)	-0.0104 (0.888)	-0.0354 (0.610)	-0.0250 (0.708)
Clerical and admin.	-0.0068 (0.913)	0.0667 (0.365)	-0.0409 (0.385)	-0.0976 (0.134)
Sales workers	-0.0678 (0.274)	0.0579 (0.442)	-0.1250** (0.031)	-0.1150** (0.046)
Machinery operators/drivers	0.0731* (0.073)	0.1708 (0.106)	0.0388 (0.290)	0.1571** (0.022)
Couple with child <15	0.0443 (0.746)	-0.2257 (0.069)*	-0.0714 (0.468)	0.0970 (0.440)
Couple with dependent student	0.0790 (0.586)	-0.0764 (0.535)	-0.0493 (0.644)	0.0937 (0.446)
Couple with independent child	-0.0124 (0.929)	-0.0324 (0.787)	-0.1249 (0.225)	0.0097 (0.939)
Couple without child	0.0917 (0.479)	0.0487 (0.658)	-0.0674 (0.463)	0.0588 (0.610)
Lone parent (child <15)	-0.1322 (0.443)	-0.1767 (0.219)	-0.1200 (0.372)	0.1268 (0.394)
Lone parent with dependent student	0.0307 (0.854)	-0.1128 (0.410)	-0.0994 (0.610)	-0.0881 (0.586)
Lone parent with independent child	0.7051*** (0.000)	-0.1808 (0.210)	-0.1421 (0.185)	-0.3116* (0.081)
Non-dependent child	-0.0403 (0.768)	-0.0703 (0.497)	-0.1479 (0.201)	-0.0566 (0.624)
Other family member	0.1650 (0.287)	-0.0571 (0.614)	0.0300 (0.801)	-0.1017 (0.397)
Lone persons	0.0958 (0.472)	0.1038 (0.315)	0.0127 (0.892)	0.0127 (0.914)
n	2639	2223	2496	2146
F statistic	22.56 (0.000)***	361.60 (0.000)***	8.52 (0.000)***	8817.90 (0.000)***

Note: Robust standard errors adjusted for individual clustering reported. P values in parenthesis. *, **, *** is significance at the 10%, 5% and 1% level respectively. RR is inter-rural movers. The omitted category for occupation is labourers and for family relationship is unrelated to all household members. State, year and socio-economic status dummy variables were also included.

An important feature of the results that requires discussion is the hourly wage returns to males. Two aspects of these results require some attention, namely the sensitivity of our conclusions to our lower bound outlier restriction and the inconsistency of our difference-in-difference and IV models with the results from our fixed effects model for the three year return. The criterion used to eliminate suspicious lower bound hourly wages was to set the cut-off point at roughly half the federal minimum wage during the period. A nominal hourly wage restriction of \$6.50 was imposed (the minimum hourly wage in 2007 was \$13.47, increasing to \$13.74 in October (Australian Industrial Relations Commission 2007), although note that real hourly wages (deflated by the CPI) were used in the analysis. This reduced our sample size by approximately 5.42% for males and 3.46% for females in our fixed effects models, which was considered a reasonable trade-off given the difficulty in interpreting the hourly earnings of these people. One could argue that these people were perhaps low productivity workers earning a salary income (or workers on training programs who may be excluded from minimum wage laws) in which case they may constitute valid observations. Considering this, our fixed effects equations were re-estimated with only a \$2.50 restriction.³³ For females, conclusions were unchanged (although estimated returns were slightly higher). For males however, some sensitivity was observed with the coefficient on the four or more years return becoming significant at the 5% level and indicating a 19.70% hourly wage premium to movers (reproduced in Appendix 2). Because observations below \$6.50 were far from the minimum wage, it was felt that conclusions should be drawn from our higher end restriction. Furthermore, the fact that we only observe a positive return when we restrict wages to

³³ \$2.50 was the highest hourly wage cut-off that affected our conclusions. With the wage cut-off set at \$3 the four or more years coefficient was only significant at the 10% level.

be greater than \$2.50 does not provide us with any strong evidence of an hourly wage premium because the results are obviously sample driven.

With our \$6.50 restriction, there is inconsistency with our difference-in-difference and IV models and our fixed effects model, with the former estimating a return of around 19-20% and the latter highly insignificant with a coefficient of about 3%. If migrants earned a lower than normal hourly wage in the year previous to migration, this difference could simply be explained by the fact that the difference-in-difference and IV models are expressed in growth terms.³⁴ The coefficient on the one year previous to migration in the fixed effects model is however insignificant (although it is negative). This is not enough to reject this explanation however as we use an unbalanced sample and only a portion of those people in our (M-1) group are observed in (M+3). Movers were reduced to a subset of only those observed for three consecutive years and re-estimated using our fixed effects specification (results in Appendix 2). Although the (M-1) coefficient had decreased to -10.88% (which indicated the result was potentially sample driven), it remained insignificant ($p=0.140$). This may serve as evidence that our IV and difference-in-difference models were mis-specified as they remained inconsistent with our fixed effects model which is superior in that it allows for changes in characteristics in each of the years since migration. Whether, the results are due to omitted information in our differenced models, or simply a characteristic of our sample of movers who are observed for three years, as it is only the three years coefficient that is significant and as our fixed effects model is favoured in the seemingly likely case that time variant self-selection bias is

³⁴ The estimated coefficient of these models is essentially (M+3)-(M-1) from our fixed effects specification and could therefore differ if migrants earned less than average wages before moving.

not important (in none of our equations was lambda significant), no strong evidence exists of an hourly wage return to male rural to urban movers.³⁵

In brief, the results indicate a weekly wage premium to males, which increases over time, while females receive no return in terms of their weekly wage. A reversal is the case for the hourly wage however, with females earning a return of 15% (based upon our fixed effects model) after three years. Although the coefficient on the hourly wage for females for four or more years is insignificant, the reader should keep in mind that the number of movers in this group was relatively small (see Appendix 3) and this does not strongly suggest that the returns to females were only transitory in nature.

Comparing the models for the weekly return to males, the coefficients are relatively similar and all except the IV model for the two year return were significant at the 5% and 1% levels. The insignificance of the two year IV model is not particularly important as the lambda coefficient from this equation was not indicative of selectivity. In fact, in none of the models estimated did self-selection bias appear to be a major problem. Interestingly, in some cases, if self-selection was present it appeared to be downwardly biasing our estimates. As the fixed effects model considered all changes in individual characteristics over the time period, it is considered the more robust model in the seemingly likely case that time variant selectivity is not a major issue. Our results from this model indicate that a male mover earns a 32% weekly wage premium four or more years after leaving his rural location (significant at the 1% level). Earnings do not appear to differ in the two years before migration which

³⁵ In case it was our weekly wage rather than hours worked data that was suspicious, our weekly wage models for males were re-estimated with an additional \$6.50 restriction on the hourly wage (not reproduced). Although the estimated return to moving was slightly smaller, conclusions were unaffected.

can be interpreted as supporting the notion that self-selection is not a problem as we would perhaps expect to see a difference in earnings even before leaving the rural locality.³⁶

For women, although the migration coefficients are consistently positive they are insignificant in all weekly wage models. It appears that females simply do not experience any change in their weekly earnings after migration. Although previous research has indicated that married women experience negative or insignificant returns to migration (Lichter 1983; Maxwell 1988; Kreig 1996; Rodgers & Rodgers 2000), this result is somewhat surprising given the increased labour market participation and wage earning role of women in modern Australian society. It became clear however, after the regressions were re-estimated with the hourly wage as the dependent variable, that perhaps women were not compensated with greater total income but instead with greater compensation for their time. As with men and their weekly wage return, it appears females may not experience any immediate return but after two years experience a positive and statistically significant premium. Although the models are generally similar when estimating the two year return to migration, for the three year return only the fixed effects model is significant. This might be because the difference-in-difference and IV models omit important changes in population characteristics between the three years. The fixed effects model predicts an hourly wage premium of 15% after three years (significant at the 5% level).

³⁶ Keep in mind though that the labour market behaviour of a potential mover, particularly in the year before migration, may be different to his or her behaviour when there is no expectation of a move in the near future. If we were to test for selectivity by examining the wage behaviour of future movers in the years before migration it would be more appropriate to go back more than two years. This was not feasible in this study because there were not enough observations of movers. Furthermore, because an unbalanced panel was used, we would only be testing for selectivity in a subgroup of movers (if we examined four years previous to migration, it would be those who moved in 2005 or later and who were in the survey for at least four waves previous to this).

When we simply compared mean wage growth between movers and stayers, the results for males in terms of the weekly wage return were very similar (in fact slightly less generous) to those found here. For females, the results here more conclusively suggest an hourly wage premium and the size of the premium appears larger than in our mean comparisons. It seems therefore, that observed and unobserved biases in our sample are having a minimal net effect and the direction of their effect is in fact to downwardly estimate the true size of returns rather than misleadingly suggesting a positive outcome to movers. The only case in which this is not true is the hourly return to males, with the results of our fixed effects model suggesting individual characteristics were accounting for the premium observed in our mean comparisons.

The final outcome to report is that for inter-rural movers. As with rural to urban movers, this group was restricted to those who had moved at least 20kms. Hence we can assume the move involved a change in labour market conditions for much of the sample. We can also assume the move would have involved some form of distance related cost (for example, loss of proximity to social networks), which theory suggests should be compensated for in some form. The results do not suggest this compensation is realised in the form of higher wages for either males or females. The weekly wage coefficient for males is negative after four or more years and the hourly wage coefficient for females is negative after two to three years. These results are unlikely to be robust given that the number of movers in these groups were fifteen (only six different individuals) and eleven respectively. Given our data, it is likely that only the short term returns to males can be discussed with any credibility.

5.4.3 Discussion

Previously we outlined two financial returns questions to be answered. They referred to the quantity of money available to spend after migration, and the compensation per unit of time. Males who make rural to urban moves appeared to earn about 32% more than had they not moved in a period of four or more years. No strong evidence was found however that they earned any extra compensation for their time. The opposite was found to be true for female movers. We will firstly try and explain the results from what is known about migration and labour market theory and the Australian context. We will then discuss the individual level and policy level implications of the results. Lastly, we will briefly comment on the results for inter-rural movers.

Before trying to explain why males did not experience an hourly wage premium, as well as why females did not experience a weekly wage premium, it is important to note that having only a relatively small number of movers in our sample largely reduces the precision of our estimates (see Appendix 3 for actual numbers). It would be ideal to repeat the above exercise with a larger group of movers, however, we are bound by the data available. As more waves of HILDA become available there will be a larger number of movers making for more robust results.

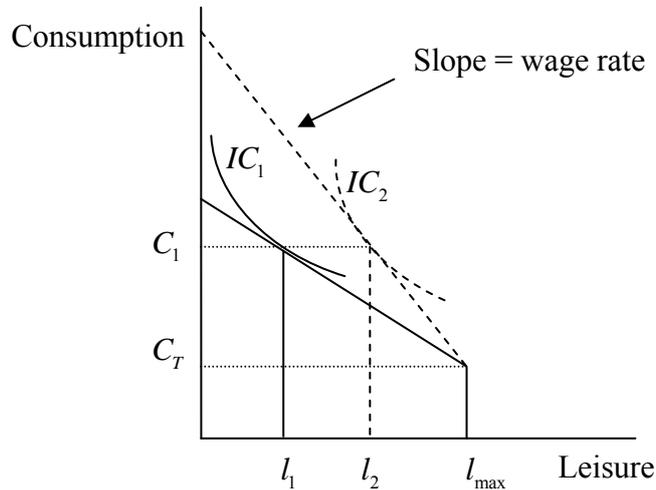
The results for male movers will be considered first. Consistent with the notion that migration is a strategic decision to increase life-time earnings, male movers earned a higher weekly wage. There was no hourly wage gain however. In itself, not finding a wage premium is attributable to a number of considerations. Utility maximisation considers more than simply income and as such movers are not necessarily motivated

by monetary incentives. There is also the argument that migrants face a labour market disadvantage in the urban locality as they lack important social networks and local knowledge. Some evidence of this was found in the fact that only very weak support was found for an immediate weekly wage premium (coefficient significant at 10% level in the fixed effects model). Movers may face a labour market disadvantage in the short term and still earn a higher weekly wage if it is simply because working hours are longer in urban areas on average. Note that we do not require a negative migration coefficient for there to be earnings disadvantage because to check this we would need to compare earnings to an urban control group rather than rural stayers. It could be the case that urban employers were unwilling to compensate movers at a higher rate for their time (or that movers were unable to secure employment that compensated at a higher rate) but were willing to offer longer working hours because of larger operations for example. One final consideration is that the data may simply be unreliable. Recall that when the hourly wage restriction was dropped to wages greater than \$2.50, the results gave some evidence of an hourly wage premium. However, observations between \$2.50 and \$6.50 were considered suspicious given Australian minimum wage rates. The number of hourly wages was simply a matter of recall by the individual being interviewed and may therefore be subject to misreporting.

For females, only weak evidence was found of an immediate hourly wage gain (recall the results from the difference-in-difference and IV models), while stronger evidence was found for a two and three year premium. There appeared to be no weekly wage advantage. This suggests that females earned a greater return on their time but were

unable to secure longer employment. This could be a matter of choice. Consider Figure 5.1 below.

Figure 5.1 Consumption/leisure Trade-off



Shown is the trade-off between hours of leisure (time spent not in work) and consumption (this could well be replaced by the weekly wage for example as it is determined by income). By giving up more leisure, one can increase their level of income (through more work hours) and therefore the amount of goods and services that can be consumed. Included is a wage paid to those who seek no hours of work, C_T , which can be compared to government transfer payments such as pensions, welfare or unemployment benefits. Originally our individual is earning a weekly wage that allows consumption at level C_1 and working $l_{\max} - l_1$ hours per week. An increase in the hourly wage rate, in our case because of moving to the better compensating urban area, increases the slope of the consumption/leisure trade-off frontier, reflecting the fact that for the same level of leisure (and therefore work hours) our individual would earn a higher weekly wage and therefore be able to consume a greater quantity. Given the indifference curves in our example, the individual prefers to ‘trade-in’ on the fact they earn their original weekly wage with less hours of work by substituting

any hours of work that make the wage exceed its original level with hours of leisure (hours worked decrease from $l_{\max} - l_1$ to $l_{\max} - l_2$). This well known example of a ‘backward bending supply curve’ results when the income effect (the effect from increasing the budget constraint) dominates the substitution effect (the substitution of leisure with work in response to increasing the slope of the budget constraint).

The unchanged weekly wage for females may also be a matter of opportunity. It may be the case that females were only able to find jobs that offered relatively low employment hours, but were compensated at a greater hourly rate simply because the average hourly wage in urban areas is higher. Similarly, females may have found themselves restricted to (or choosing) part time rather than full time work, which tends to attract higher hourly compensation. To test this, our fixed effects model was re-estimated with a dummy variable for part time employment status. This was done for both females and males and for both the weekly and hourly wage. The reason for not controlling for part time or full time status originally was that we wanted to estimate the pure wage effect from migration and that full time or part time status might not be a matter of choice for each individual, in which case it would be inappropriate to compare for example an urban part time worker with a rural part time worker because it may be unrealistic to assume that the worker would be only part time employed in the rural sector. Conclusions were sensitive to the inclusion of a part-time dummy variable in our female hourly wage fixed effects model although none of our other conclusions were affected.³⁷ The coefficient on the two year return became insignificant while the coefficient on the three year return decreased to 13% and was only significant at the 10% level ($p=0.068$). One caveat to keep in mind is

³⁷ Coefficients were only slightly changed, with the estimated weekly wage returns to males decreasing to about 29.5% after four or more years.

that the impact of imposing a part time work status constraint was sensitive to the lower bound wage outlier restriction. For example, with the restriction decreased to \$5 (from \$6.50) conclusions were unchanged (and in fact returns were slightly higher than those presented in section 5.4.2 – see Appendix 2 for the results of our estimates with both wage restrictions imposed). Nevertheless, we have found some evidence that the hourly wage premium received by females can be explained by the fact they were working in part time employment in the urban sector.

Ignoring the possibility of cost differentials, is it financially advisable for those people considering making a rural to urban move to actually do so? The answer to this question depends upon the current and desirable level of employment. If the prospective migrant is currently an underemployed male who would willingly work longer hours at the same hourly rate of pay, if given the opportunity, then the large increase in his weekly wage he is likely to experience should provide a strong incentive. If he was, however, currently satisfied with his quantity of current income, no such incentive appears to exist. Assuming that our results suggest female movers are not subject to any weekly wage premium (that is, they are not simply choosing to work less hours because of higher time compensation), there is no gain in total income to female movers. Therefore, if they are underemployed they are likely to remain this way. They should, however, experience a greater work-life balance because they do earn more per hour worked. Keep in mind however that the inclusion of a part time dummy variable did reveal some sensitivity in our estimates, implying that females may be earning more per hour because they are more likely to be part time employees. Full time employees are subject to greater job security and non-wage benefits which might detract from the attractiveness of the urban sector for some.

As outlined in Chapter 2, the rural to urban migration trend is increasing economic hardship in rural Australia, as the supply of labour decreases, the population ages and the rural economy shrinks. It is possible the large premium found in this study for males is in part the result of economic hardship in rural Australia. That is, we may be picking up a negative effect on stayers rather than a positive effect on movers to some extent. Furthermore, recall that the period examined was one of severe drought which may have been detrimental to the earnings of some of our rural stayers. This thesis does not attempt the task of answering whether the rural to urban migration trend is overall beneficial to the Australian economy. What has been discovered, however, is an inequality of opportunity. If on average a rural male can expect to experience a 32% wage premium over a period of around four years if he decides to leave his rural home, obviously financial opportunities for this man are far greater in urban Australia (perhaps so for women with respect to the hourly wage as well). If the government does decide that policies should be implemented to reduce the current migration flow it should perhaps consider addressing this issue of opportunity inequality, as while this opportunity exists so does a financial incentive for people to migrate.

It was discovered that inter-rural movers do not experience any significant wage gain from migration. In their study on male rural to urban migrants in the US, Rodgers and Rodgers (1997) also found that inter-rural movers experienced no monetary gain while rural to urban movers experienced large and significant returns. This result can easily be explained by utility maximising theory which suggests that it might simply be non-financial factors dictating people to make inter-rural moves. If we think about rural to urban movers in comparison to inter-rural movers, the former group is likely

to experience a more significant cost to migration. This is because their move involves a far more significant change in environment and is likely to be subject to greater social and perhaps labour market uncertainty. As a result, we would expect this group to require a larger return, perhaps in the form of a significant wage premium. Finally, recall that the number of inter-rural wage earners earning a positive wage is quite small (particularly for females) and because of this limitation it is likely to be a futile exercise trying to explain the results of inter-rural movers using the data at hand.

5.6 Summary and Conclusions

It was found that male rural to urban movers experienced a large weekly wage gain but no change in hourly compensation. This weekly wage gain was non-transitory and increased with tenure in the urban locality (movers earned approximately 32% more than non-movers after four or more years). The opposite was found for females although the hourly wage premium observed was likely to be partly driven by female movers being more likely to be in part time employment. These results were unlikely to be driven by self-selection (i.e. those who migrate have unobserved traits affecting wage outcomes) as we used regression techniques to control for unobserved factors and did not find evidence of selectivity bias in any of our specifications. No clear wage outcomes were observed for inter-rural movers (although we lacked sufficient observations for meaningful analysis).

The results of this analysis may provide useful information to potential movers. The results may also be useful to policy makers as they suggest a wage earning inequality

of opportunity exists between urban and rural males in Australia (the evidence is weaker for females). Finally, perhaps the most significant shortcoming of the preceding analysis was the small number of observed moves of which to base our conclusions upon. It would be desirable to confirm our findings with results from either different data sources or using future waves of HILDA which will provide us with a larger sample size.

6. Measuring the Non-financial Returns for Rural to Urban Migrants

Introduction

Higher earnings do not necessarily translate into increased subjective well-being or life satisfaction. As migration is largely accepted as being a utility maximising decision, it is important to consider not only the financial returns but also the implicit returns to well-being. Examples of migration studies that have attempted this are minimal. Furthermore, most studies have failed to examine the time path of returns, aggregating all migrants based upon whether they have moved regardless of the tenure in the destination (for example Willits, Bealer and Crider (1978); Martin and Lichter (1983); Best; Cummins and Kai Lo (2000); Hillman and Rotham (2007)). The subsequent analysis aims to partially fill in the current research void in this area and, by examining the time path of returns, offer potentially interesting insights into the social assimilation process of rural to urban migrants.

HILDA provides several variables with subjective responses to different aspects of well-being. The most important variable used in this analysis is that of total life satisfaction, given as a subjective score between zero and ten. It is also interesting to consider other indicators of well-being to determine the specific areas (if any) rural to urban migrants experience differing levels of satisfaction. In addition to total life satisfaction, satisfaction with community, home, neighbourhood, financial situation and employment opportunities will also be considered. We will first examine the impact of migration on home, neighbourhood and community aspects of life

satisfaction (section 6.1) by comparing responses in the interview previous to moving and the interview after the move takes place. Following this we will rigorously determine the time path of returns to employment and financial satisfaction (section 6.2) as well as overall life satisfaction (section 6.3) using a fixed effects specification to control for unobservable factors affecting subjective responses. Our results are discussed in section 6.4.

The validity of life satisfaction data is questionable due to a number of potential biases that may occur as a result of how the data is collected, as well as the subjective interpretation used by individuals when indicating their responses. Schwarz and Strack (1999) provide a useful discussion of many of the potential sources of bias related to such data. For example, the ordering of questions, factors such as the weather, one's current mood and very recent events (as seemingly insignificant as finding a penny) have been shown to influence responses. Due to these issues Bertrand and Mullainathan (2001) argue that subjective responses are not suitable dependent variables. Others (Frey & Stutzer 2002 and Clark, Frijters & Shields 2008) have been more optimistic regarding subjective data as a reflection of utility due to its consistency with biological and neurological responses, physical actions (such as smiling) and economic theory.

One source of bias we attempt to control for relates to personality and subjective response scaling (i.e. whether 5/10 from person *A* implies they are less satisfied than person *B* who responded with 6/10). By exploiting the panel aspect of the data with a fixed effects specification, assuming these factors are time invariant we are able to eliminate their effect. This should make inter-personal comparisons more meaningful.

6.1 Neighbourhood, Community and Home Satisfaction

In this section we compare the individual's response to aspects of life satisfaction related to the residing neighbourhood, the individual's home and the local community in the period before they move and the period after the move. By doing this we are implicitly assuming that had the individual not migrated, their response would be the same as in the year before moving (if we are to infer the change in satisfaction is due to migration). In other words, these factors are considered to be related to the location but not to time. As one's household, neighbourhood and community are unlikely to change over a short period of time, it is plausible that satisfaction with these factors should be stable (at least in the relatively short term). In the longer term changes in neighbourhood and community structure would be likely to occur making such comparisons unsuitable. As respondents are able to give a zero value of satisfaction variables (and a browse of the data revealed several respondents reporting such a value for each satisfaction variable used in this section) we do not use the logarithm of satisfaction as our dependent variable. Only those people with a valid response to neighbourhood/home satisfaction and who met our selection criteria (over 18 years of age and not studying full time) in both the year before and the years after moving (for up to three years) were included in the analysis.

If we were to specify a model with a control group of rural stayers, as we did when measuring the wage returns to migration, we would be assuming that had the individual not migrated they would have experienced the average level of satisfaction of those left behind in the broad rural sector. As home, neighbourhood and community satisfaction are likely to be determined at a very micro level, and as our

sample of stayers is spread across a number of uniquely characterised localities, generalising the rural community and neighbourhood as one entity is subject to controversy. As a result however, our estimations must be interpreted with caution. For example, a positive coefficient would imply an improvement in satisfaction compared to when the individual was residing in the rural locality but would not necessarily imply a positive return to migration. We can only imply this on the assumption that had the person not moved they would have continued to experience the same level of satisfaction.

To control for the likely impact of personal characteristics on satisfaction over time, our models include a rich set of independent variables covering age, age squared, disposable household income, education, family relationship, occupation, disability status, number of bedrooms, dwelling arrangement (e.g. renting, loan), tenure at same address, state and year dummy variables. Our sample is restricted to movers who are observed for at least one year prior and at least three years after migration and who gave valid responses to life-satisfaction questions for all years. This is necessary because our control group is meant to be the same group of people the year before moving (in this sense our sample is balanced although they are taken from a pool of all seven waves). By restricting ourselves to only movers we do of course largely decrease our number of observations. This makes fixed effects estimation problematic because there is little or no variation in many of our time variant independent variables and as such they are unlikely to be measured precisely. We therefore specify our model using ordinary least squares (OLS) with dummy variables equalling one if it is one year after moving (zero otherwise) and so on for up to three years. Each dependent variable is estimated with only migration dummies and with a full set of

additional regressors. The results are presented in Tables 6.1 and 6.2 for males and females respectively. The coefficient for M(0-1yr) shows the change in life satisfaction one year after moving and so on for two and three years (M(1-2yrs), M(2-3yrs)). The results are presented with a control variable for the log of household disposable income. Because household disposable income is not necessarily the most relevant income variable to control for (i.e. households are merely people living together, not necessarily sharing finances) each model was also re-estimated with the log of personal disposable income (not presented) with only minimal changes to coefficients and unchanged conclusions. Because we are only concerned with measuring the effect of migration, and for brevity, the coefficients for our control variables are not presented.³⁸

The results do not suggest that migrants experience any change in levels of home, neighbourhood or community satisfaction compared the last year spent in the rural locality. This result holds for both males and females. The only migration coefficients significant at the 10% level are for males' community satisfaction one and two years after moving. These coefficients are negative, implying a loss in community satisfaction post migration. However, even if we are satisfied with 10% significance, to believe these estimates we need to assume that average life satisfaction of the sample would not have been affected by changes in personal characteristics over time, a seemingly strong constraint. When additional regressors were included in the models, as shown in Table 6.1, these coefficients became highly insignificant. It is interesting that we do not observe any change in these three aspects

³⁸ Furthermore, it would be misleading to draw any conclusions from these coefficients as we have only 62 different males and 70 different females in our sample, who are a subgroup of movers and therefore not representative of any general population.

Table 6.1 Neighbourhood, Community and Home Satisfaction of Male Movers

Var	Neighbourhood		Community		Home	
	No controls	Full control	No controls	Full control	No controls	Full control
M(0-1yr)	0.0806 (0.845)	0.1710 (0.733)	-0.6613* (0.095)	-0.1591 (0.799)	-0.4032 (0.257)	-0.0973 (0.858)
M(1-2yrs)	-0.1774 (0.655)	-0.3831 (0.440)	-0.5968* (0.091)	-0.1182 (0.863)	0.0489 (0.880)	0.0835 (0.873)
M(2-3yrs)	-0.2258 (0.568)	-0.4316 (0.440)	-0.1774 (0.601)	0.4538 (0.539)	-0.2419 (0.510)	-0.5074 (0.414)
R ²	0.0044	0.2746	0.0153	0.2767	0.0083	0.4381
n	248	248	248	248	248	248

Note: Robust standard errors adjusted for individual clustering reported. P values in parenthesis. *, **, *** is significance at the 10%, 5% and 1% level respectively. Coefficients show the difference between life satisfaction reported in the year before moving and M years after moving.

Table 6.2 Neighbourhood, Community and Home Satisfaction of Female Movers

Var	Neighbourhood		Community		Home	
	No controls	Full control	No controls	Full control	No controls	Full control
M(0-1yr)	-0.3000 (0.446)	-0.3526 (0.495)	-0.0571 (0.866)	0.5338 (0.221)	0.4143 (0.194)	0.5955 (0.155)
M(1-2yrs)	0.1143 (0.744)	-0.1137 (0.808)	0.1714 (0.587)	0.2016 (0.733)	-0.1571 (0.617)	-0.4131 (0.391)
M(2-3yrs)	0.2429 (0.482)	-0.0654 (0.898)	0.5286 (0.110)	0.2956 (0.684)	0.3714 (0.172)	-0.0052 (0.991)
R ²	0.0097	0.2542	0.0085	0.3208	0.0147	0.4523
n	280	280	280	280	280	280

Note: See Table 6.1.

of life satisfaction as migration involves a complete change in neighbourhood, community and of course home. The change is likely to be particularly strong in the case of rural to urban migration as the environmental and social structure of these two localities is expected to be vastly different.

6.2 Financial and Employment Satisfaction

Previously we found that males can expect to earn a greater weekly wage and females a greater hourly wage after moving to the urban locality. These wage premiums do not necessarily imply greater financial satisfaction however. For instance, males are quite obviously able to secure a greater quantity of work, however they do not receive any extra compensation for their time which is not necessarily ideal for each person.

Conversely, females may not feel any more satisfied because the quantity of money they are earning is no different compared to if they had not moved. Furthermore, when we restricted ourselves to hourly and weekly wage premiums, likely cost differentials were ignored. AIHA (2005) has found that housing costs tend to be higher in Australian major cities, although the cost of food and petrol tends to increase with remoteness. An individual's self assessment of their level of financial satisfaction is expected to reflect the actual purchasing power of their income rather than simply the level. For these reasons it is important that we estimate the likely impact of migration on financial satisfaction. Specifically, our variables are how satisfied one is with their financial situation and how satisfied one is with their employment opportunities.

Whether we expect employment satisfaction to increase or decrease is uncertain. People who migrate may be subject to job search disadvantage in the new labour market and therefore find they are less satisfied with the options available to them. Indeed, Bill and Mitchell (2006) have found that employed internal migrants in Australia (at a general level of internal migration, not just rural to urban) are more likely to be unemployed in the year following migration than those who do not move. Conversely, movers may be motivated by the fact that employment prospects are higher (or the type of employment more desirable) in the destination therefore increasing their employment satisfaction because they perceive their opportunities are greater. Using survey responses, Burnley et al (2007) found that 64% of welfare recipients moving to major cities in Australia indicated being more satisfied with their work opportunities. In the case that employment satisfaction does not immediately increase following migration, it will be interesting to examine the time path of returns,

as we would perhaps expect the initial labour market disadvantage to diminish over time thereby increasing employment satisfaction with urban tenure.

Because financial and employment satisfaction are labour market level factors we do not restrict our sample to movers and we therefore treat these satisfaction indicators in the same way we treated wages and assume that the level of satisfaction experienced by the mover had they not moved is equal to the average level of rural stayers. Our equation is therefore specified in a similar manner to equation (5.8). The conceptual framework used to define the model for financial satisfaction revolves around the assumption that financial satisfaction will be largely dependent upon income and the purchasing power of income (in other words income and costs) and personal characteristics that can be controlled for by the researcher (see Appendix 4 for a formal argument). An important characteristic may be family relationships for example. An individual with a family would be likely to value money and costs in a different way to someone with no dependents. Similarly, arguments can be made for other characteristics typically controlled for in wage equations. As a result we control for all the same characteristics that were controlled for in section 5.4.2 when measuring financial and employment satisfaction returns.³⁹

Note that for the purpose of this section, income refers to yearly disposable income (after tax income including family tax benefit part A and part B but excluding windfall income) not wage income because non-wage earners (and indeed wage earners themselves) of course earn some form of income through means such as

³⁹ As a reminder these are; socio-economic status of the residing area, household relationship, self reported long term health condition, union member, occupation, years of work experience and its squared value, age and its squared value, occupation as well as state and year dummies. Because we now have unemployed people in our sample, we also include an unemployed dummy.

transfer payments and investments which cannot be ignored. The use of yearly disposable income as a control variable is not without problems however. Firstly, the one year return is likely to include financial year income from the previous locality and is therefore subject to measurement error. Secondly, as it is income for the current financial year rather than income at the particular point in time, it is not necessarily the best indicator of financial satisfaction (for example a recent increase in a person's current wage through say job promotion would not be well reflected by this variable). We are however bound by the data available. One final consideration involves judgement as to which level of income (individual or household) is most relevant to financial satisfaction. Household disposable income was used in the analysis because spousal considerations are likely to be important and the majority of respondents are in a coupled relationship. The problem with household income comes from the definition of a household (which is roughly, simply people living together) which does not specify any financial relationship. As such we re-estimated the model where applicable (not shown) with controls for personal disposable income with unchanged conclusions.

We observe the income of each individual and household, but not the cost of living. Assuming that our fixed effects equation adequately controls for non-income and personal cost-related factors of satisfaction so that the only effect remaining is that of purchasing power, by controlling for disposable income we are answering the question, 'does person X in the urban sector, with the same characteristics and *income* as person Y in the rural sector, experience any difference in their level of financial satisfaction?' If they do, this would perhaps suggest a cost differential between the two areas if we believe *all* other factors are properly accounted for (i.e.

because cost is the only factor not controlled for related to financial satisfaction, any deviation from zero for our migration coefficient will occur because costs are different between the rural and urban areas and we are capturing this correlation between costs and migration). Note that by controlling for income we may not be measuring the ‘true’ financial satisfaction return. The reason for this is that we would be implicitly assuming that had the individual not moved they would have experienced the same level of disposable income after moving because we would be comparing each person to a rural stayer with the same characteristics and *the same level of income*. From our previous analysis we know this may not be a realistic assumption, and if income of movers exceeds that of stayers our results will be downwardly biased. Although exclusion of disposable income as a control variable may bias our other variables, it is in theory more appropriate to do this to capture the actual financial return to moving. In essence, we are estimating the bias on our migration coefficient caused by the exclusion of an income and cost regressor. The reason for doing this is that the act of migration itself is not expected to influence financial satisfaction, but rather its indirect effect upon income (and costs) may have some impact. Both satisfaction equations are estimated with and without a control for disposable income which should help us evaluate the role of income in determining our results. As there is less of a clear theoretical link between income level and employment opportunity satisfaction (although it is very well possible a relationship exists) the inclusion or non-inclusion in our employment satisfaction model of income is perhaps less controversial.

Reported in Tables 6.3 and 6.4 are the results for labour force participants in our sample. Non-labour force participants are less likely to motivated by financial and

employment opportunities (in fact most non-labour force participants do not give a valid response for employment satisfaction). As with our previous analysis of the observed monetary returns to moving, we include dummy variables not only for those that make rural to urban moves but also inter-rural movers. As previously noted, several non-observations for years of work experience exist in which case the observation is dropped as this variable is likely to be correlated with both financial and employment satisfaction. Recall that the scale for satisfaction variables was zero to ten. A total of 110 and 102 financial and employment satisfaction responses respectively included in our sample were equal to zero (total dissatisfaction). Because these are relevant responses and our results are slightly sensitive to the inclusion or exclusion of these observations, our employment and financial satisfaction variables are expressed in level form rather than logarithms. As such, the slope coefficients do not measure the semi-elasticity but simply the effects of each variable in terms of units of life satisfaction. As with our wage return equations, our sample is an unbalanced panel of respondents from all seven available waves of HILDA who are over the age of eighteen and not studying full-time. As income may not be linearly related to satisfaction we specify income in log form. To deal with the fact that income can be negative or zero, a dummy variable equal to one if this is the case is also included.

For male rural to urban labour force participants, no satisfaction advantage or disadvantage is observed for any period post migration. Weak evidence is found of an employment satisfaction return after three years although the coefficient was only significant at the 10% level without an income control and the four or more year

Table 6.3 Financial and Employment Satisfaction of Male Movers

	Financial Satisfaction		Employment Satisfaction	
	No income	With income	No income	With income
<i>Rural to Urban</i>				
-2--1 years	0.2211 (0.435)	0.2009 (0.478)	0.4827 (0.108)	0.4656 (0.119)
-1-0 year	-0.1028 (0.680)	-0.1150 (0.640)	0.1545 (0.672)	0.1413 (0.695)
0-1 year	0.0683 (0.843)	0.0545 (0.875)	0.5237 (0.192)	0.5114 (0.201)
1-2 years	-0.0689 (0.851)	-0.1362 (0.709)	0.1504 (0.742)	0.1125 (0.803)
2-3 years	0.2549 (0.518)	0.1740 (0.655)	0.7276* (0.084)	0.6774 (0.104)
3-4+ years	0.5644 (0.158)	0.4770 (0.227)	0.5539 (0.227)	0.5416 (0.236)
<i>Inter-rural</i>				
-2--1 years	0.0783 (0.793)	0.0503 (0.867)	-0.6251** (0.026)	-0.6391** (0.022)
-1-0 year	-0.2281 (0.455)	-0.2535 (0.405)	-0.6643* (0.057)	-0.6813** (0.049)
0-1 year	0.2768 (0.491)	0.2753 (0.489)	-0.2195 (0.513)	-0.2104 (0.530)
1-2 years	-0.3274 (0.390)	-0.2660 (0.484)	-0.3040 (0.414)	-0.2693 (0.457)
2-3 years	-0.5530* (0.079)	-0.5522* (0.080)	-0.6307 (0.186)	-0.6370 (0.184)
3-4+ years	-0.7539** (0.050)	-0.6878* (0.069)	-0.3578 (0.295)	-0.3170 (0.346)
Log Income		0.3751*** (0.000)		0.1993 (0.112)
Income ≤\$0		2.792*** (0.000)		1.4807 (0.300)
n	4012	4012	3720	3720
F	111.25*** (0.000)	124.25*** (0.000)	38.39*** (0.000)	37.75*** (0.000)

Note: Robust standard errors adjusted for individual clustering reported. P values in parenthesis. *, **, *** is significance at the 10%, 5% and 1% level respectively.

return is insignificant in both specifications. For inter-rural males there is some indication of a negative return to financial satisfaction after three years, which is then higher after four or more years (again, all coefficients are only significant at the 10% level though and this result is based upon a relatively small sample). Although no employment satisfaction return was observed after migration, the fact that the return two and one year before migration is negative and significant (5% and 10% level respectively) and all coefficients post migration are insignificant suggests inter-rural movers are able to go from a disadvantageous position to one of equivalence with

Table 6.4 Financial and Employment Satisfaction of Female Movers

	Financial Satisfaction		Employment Satisfaction	
	No income	With income	No income	With income
<i>Rural to Urban</i>				
-2--1 years	0.2289 (0.471)	0.2116 (0.506)	-0.1454 (0.698)	-0.1585 (0.671)
-1-0 year	0.3179 (0.255)	0.3147 (0.268)	0.3602 (0.298)	0.3507 (0.311)
0-1 year	0.5577* (0.067)	0.5892* (0.051)	0.6296** (0.049)	0.6333** (0.048)
1-2 years	0.0022 (0.995)	-0.0340 (0.917)	0.4833 (0.235)	0.4704 (0.248)
2-3 years	0.9765*** (0.008)	0.9047** (0.014)	0.8957* (0.053)	0.8749* (0.058)
3-4+ years	0.3585 (0.407)	0.3203 (0.421)	0.6917 (0.141)	0.6832 (0.147)
<i>Inter-rural</i>				
-2--1 years	0.2503 (0.417)	0.2232 (0.465)	0.9552** (0.014)	0.9439** (0.015)
-1-0 year	0.5092 (0.186)	0.4779 (0.219)	0.5619 (0.138)	0.5531 (0.145)
0-1 year	0.5495 (0.306)	0.5656 (0.294)	1.4942*** (0.003)	1.4988*** (0.003)
1-2 years	0.3884 (0.422)	0.4052 (0.400)	1.4235** (0.011)	1.4271** (0.011)
2-3 years	0.0597 (0.918)	0.1943 (0.730)	0.8212 (0.119)	0.8666* (0.096)
3-4+ years	0.1117 (0.811)	0.2247 (0.631)	1.3147*** (0.006)	1.3425*** (0.005)
Log Income		0.4069*** (0.000)		0.0836 (0.369)
Income ≤\$0		3.3263*** (0.000)		0.4232 (0.683)
n	3292	3292	3082	3082
F	3365.27*** (0.000)	2138.11*** (0.000)	7010.88*** (0.000)	7978.75*** (0.000)

Note: See Table 6.3

rural stayers. However, keep in mind that the actual slope coefficients did not increase in size substantially so the return may only be small.

Female rural to urban movers experienced an unusual time path of returns to financial satisfaction. In the immediate period, satisfaction is higher with significance slightly above the critical 5% level ($p=0.067$ and $p=0.051$). However, two years after migration the values of the coefficients are virtually zero, suggesting a transitory return. Three years after migration however, the coefficients are highly significant and

positive again. A similar pattern is observed for employment satisfaction although the coefficients on the two year return to migration are further from zero. Inter-rural female movers experience no financial return to migration, however a large return to employment satisfaction is observed. This result is not considered robust given the small number of movers it is based upon.

Income has statistically significant explanatory power in our financial satisfaction functions. Nevertheless, our conclusions as to the impact upon satisfaction were unaffected by the inclusion or exclusion of income. Assuming that costs are the only uncontrolled factor (this assumption is indeed a strong one), the fact that the results are unaffected by the inclusion or non-inclusion of an income control variable could be interpreted as evidence that movers are experiencing lower costs (see Appendix 4 – in any case, it suggests that the increase in satisfaction is largely unrelated to a change in income). Alternatively, if uncontrolled for factors exist which are positively related with migration and with financial satisfaction, they could also explain our findings. One such example relates to one's perception of how fairly they are compensated. For example, females were found to earn higher hourly wages post migration. Perhaps they are more satisfied because of this. In any case, if whatever factor(s) has (have) caused our positive results is (are) attributable to the decision to migrate (not simply the result of unobserved characteristics or phenomenon that would have occurred even if the individual had not moved) we can interpret our positive results as a return to migration. We cannot prove this is the case however.

Our results enable us to assess the impact of income upon financial satisfaction. Income was included as a logarithm so the interpretation of our *log income* coefficient

is the relative change in income for an absolute change in financial satisfaction. A 1% increase in household income has a slightly larger effect on the financial satisfaction of females than males (1% increase in income led to a 0.0041 unit increase in satisfaction of females and a 0.0038 for males). These figures are not overwhelmingly large. For example, a doubling of income would only increase financial satisfaction by 0.41 and 0.38 units for females and males respectively. Surprisingly, financial satisfaction is much higher for those with zero or negative income (for both males and females). Perhaps we need to understand why these people are not exhibiting positive income to explain these results. For instance, this group may be largely comprised of people heavily investing current income for future returns, in which case they do not expect to be permanently losing money (or breaking even).

6.3 Overall Life Satisfaction

Our key variable in this analysis is each individual's overall life satisfaction. This indicator is expected to roughly reflect utility, the key factor in our theoretical framework. In Chapter 4, a simple representation of the migration decision as a utility maximising choice was presented which predicted that forward looking individuals chose to move or stay based upon lifetime utility maximisation. Whereas a failure for movers to attain any financial returns to migration is not disallowed by our theoretical framework, failure to receive higher utility would be in direct conflict to what is generally considered by economists to be the conventional logic of the migrating individual. This aspect of micro migration theory has been largely ignored by empirical researchers. In this section we will again use fixed effects regression to test the theoretical predictions of our model.

Along with most of the characteristics used when measuring the financial and employment satisfaction returns, life satisfaction at any point in time is likely to be influenced by current life events. Life events are assumed to shock one's given level of well-being and should therefore be controlled for in formal analysis. We control for the following: the birth/adoption of a child, the death of a close friend, the death of a close relative or family member, the death of a spouse or child, a major improvement in one's finances, a major worsening in one's finances, being fired or made redundant, serious illness or injury to a family member, serious illness or injury to oneself, close family member detained in jail, got married, you or your partner got pregnant, reconciled with a spouse, retired from the workforce and separated from one's partner. Assuming these events represent a temporary shock to personal well-being (rather than having a non-transitory impact) we would expect the impact to diminish over time.⁴⁰ There is no clear theoretical foundation for how long these events will impact upon individual well-being. As such, it is appropriate to use multiple dummy variables for different durations since the event. In this analysis we use different dummies for if the event occurred within the last six months, or occurred more than six months but less than twelve months ago, with the a priori expectation that the coefficients will generally be larger and more significant the more recently the event occurred. It was initially hoped to include dummy variables for if the event occurred in the last three months, however there were insufficient observations for meaningful analysis. Indeed, even with the time period extended, observations of many life events remain relatively small.

⁴⁰ This is consistent with the psychologists' theory of 'hedonic adaptation' (see Frederick and Lowenstein (1999) for an overview).

Again we use a fixed effects specification to control for unobserved time invariant heterogeneity as well as a rich set of individual characteristics. Included are controls for area socioeconomic status, family relationships, disability status, occupation, age, age squared, state dummies, year dummies, tenure at current address, tenure at current address squared, dwelling arrangement and household disposable income. Life satisfaction of movers is compared to rural stayers under the assumption that had movers remained in their rural location they would have obtained the same level of satisfaction experienced by stayers. Dummy variables are also included for inter-rural movers, who are not excluded by migration theory and therefore should be expected to earn a positive life satisfaction return. We continue with an unbalanced panel of respondents from all seven available waves of HILDA.

Although life satisfaction is indicated on a scale between zero and ten, only twelve individuals in our sample responded with a zero (total dissatisfaction). As this number is negligible, it is convenient to exclude these people and specify our dependent variable as the logarithm of life satisfaction. By doing this we can express our returns in percentages rather than levels (as was necessary in the previous sections). It may also better account for the skewed nature of our life satisfaction data. From a theoretical perspective it is plausible that tenure at current address would be an influential variable. As emphasised in the theoretical framework (Chapter 4), residential tenure may have a positive relationship with life satisfaction if emotional attachment to the locality increases over time (e.g. through increased social networks and local knowledge). The relationship may be quadratic if, for instance, people begin to experience boredom or ‘itchy feet’ after living in the same area for an extended period. Given the theoretical justification for this variable, 22 females and 27 males

who did not give valid responses are also excluded from the analysis. The results of our life satisfaction model with and without life event control variables are presented in Tables 6.5 and 6.6 below. The analysis is repeated for the general population of movers and only those in the labour force. In Appendix 5 we provide results with our full specification of regressors for the general male and female populations.

Table 6.5 Overall Life Satisfaction of Male Movers

Variables	Labour Force Participants	General Population
<i>Rural to urban</i>		
-2--1 years	0.0068 (0.801)	0.0149 (0.517)
-1-0 year	-0.0386 (0.299)	-0.0067 (0.820)
0-1 year	-0.0519 (0.180)	-0.0470 (0.219)
1-2 years	-0.0470 (0.258)	-0.0310 (0.368)
2-3 years	-0.0230 (0.584)	-0.0181 (0.604)
3-4+ years	-0.0368 (0.445)	-0.0344 (0.403)
<i>Inter-rural</i>		
-2--1 years	-0.0075 (0.843)	-0.0373 (0.313)
-1-0 year	-0.0821** (0.013)	-0.0427 (0.160)
0-1 year	-0.0015 (0.961)	-0.0097 (0.711)
1-2 years	0.0043 (0.898)	-0.0082 (0.797)
2-3 years	-0.0412 (0.374)	-0.0440 (0.224)
3-4+ years	0.0096 (0.798)	-0.0288 (0.501)
Residential tenure	-0.0003 (0.915)	0.0004 (0.856)
Residential Tenure ²	-0.000004 (0.924)	-0.00004 (0.435)
Log Income	0.0172** (0.021)	0.0152** (0.010)
Income ≤\$0	0.1806** (0.031)	0.1725** (0.012)
n	4055	5591
f	10.88*** (0.000)	8.56*** (0.000)

Note: Robust standard errors adjusted for individual clustering reported. P values in parenthesis. *, **, *** is significance at the 10%, 5% and 1% level respectively. Dependent variable (overall life satisfaction) is expressed as a logarithm.

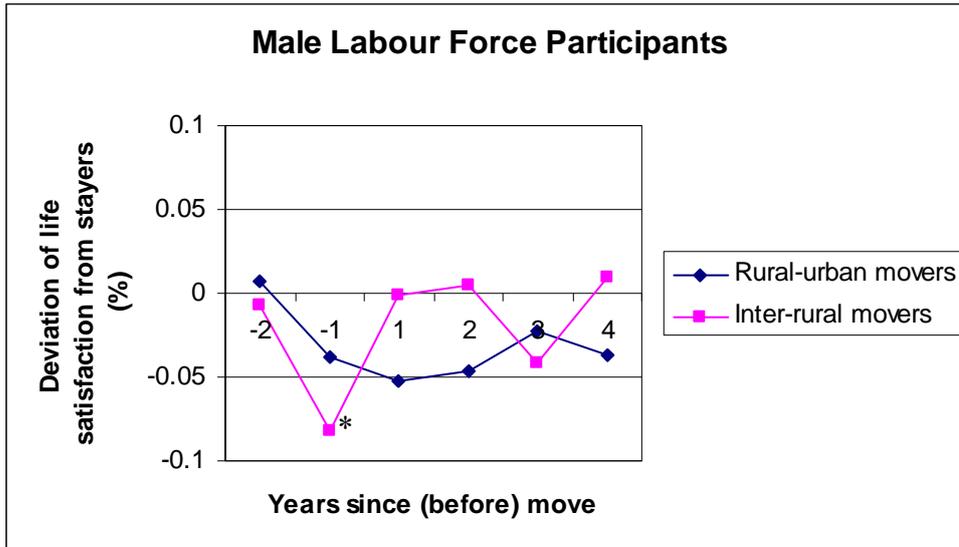
Table 6.6 Overall Life Satisfaction of Female Movers

Variables	Labour Force Participants	General Population
<i>Rural to urban</i>		
-2--1 years	-0.0141 (0.647)	-0.0156 (0.577)
-1-0 year	-0.0651 (0.159)	-0.0283 (0.308)
0-1 year	0.0028 (0.935)	0.0271 (0.319)
1-2 years	-0.0149 (0.699)	0.0166 (0.625)
2-3 years	0.0556 (0.128)	0.0726** (0.044)
3-4+ years	0.0339 (0.399)	0.0607 (0.152)
<i>Inter-rural</i>		
-2--1 years	-0.0058 (0.881)	-0.0126 (0.690)
-1-0 year	0.0000 (1.000)	-0.0388 (0.319)
0-1 year	-0.0184 (0.669)	0.0121 (0.695)
1-2 years	0.0226 (0.581)	0.0104 (0.841)
2-3 years	0.0278 (0.523)	-0.0086 (0.853)
3-4+ years	-0.0535 (0.407)	-0.0345 (0.484)
Residential tenure	0.0023 (0.278)	0.0030 (0.138)
Residential Tenure ²	-0.0001 (0.156)	-0.0001** (0.028)
Log Income	0.0138 (0.121)	0.0141 (0.136)
Income ≤\$0	0.1248 (0.190)	0.1316 (0.196)
n	3326	5657
f	276.16*** (0.000)	262.75*** (0.000)

Note: See Table 6.5

Male rural to urban movers are no better or worse off at any stage after the move. Figures 6.1 and 6.2 (which are simply our estimated coefficients transformed into a time path graph of deviation in the level of life satisfaction from the level of those who do not move) show that movers experience a slight decrease followed by a subsequent increase in satisfaction (although never above the level of rural stayers), however none of our estimated coefficients are significantly different from zero. The results for male inter-rural movers in the labour force are more compliant with

Figure 6.1 Time Path of Life Satisfaction (male labour force participants)



* Statistically significant from zero at 5% level.

Figure 6.2 Time Path of Life Satisfaction (male general population)

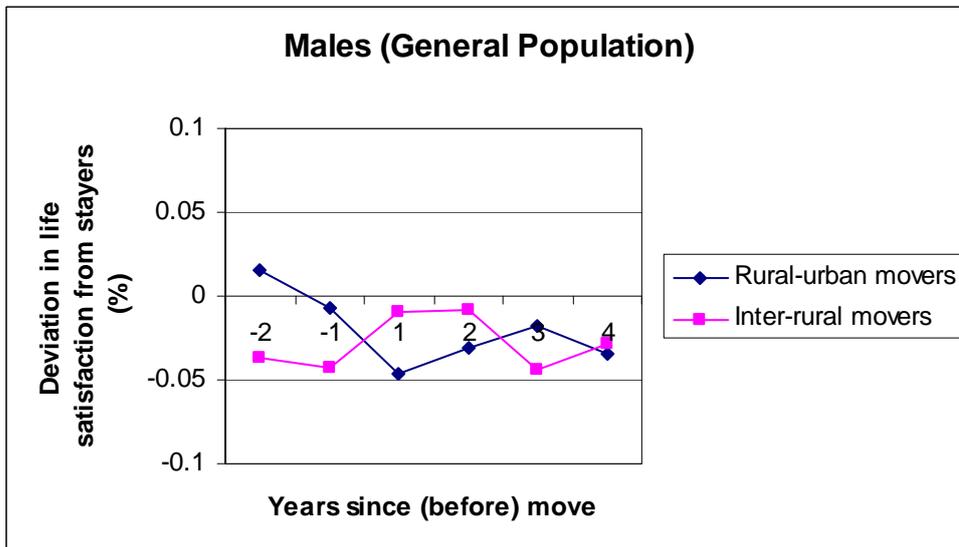


Figure 6.3 Time Path of Life Satisfaction (female labour force participants)

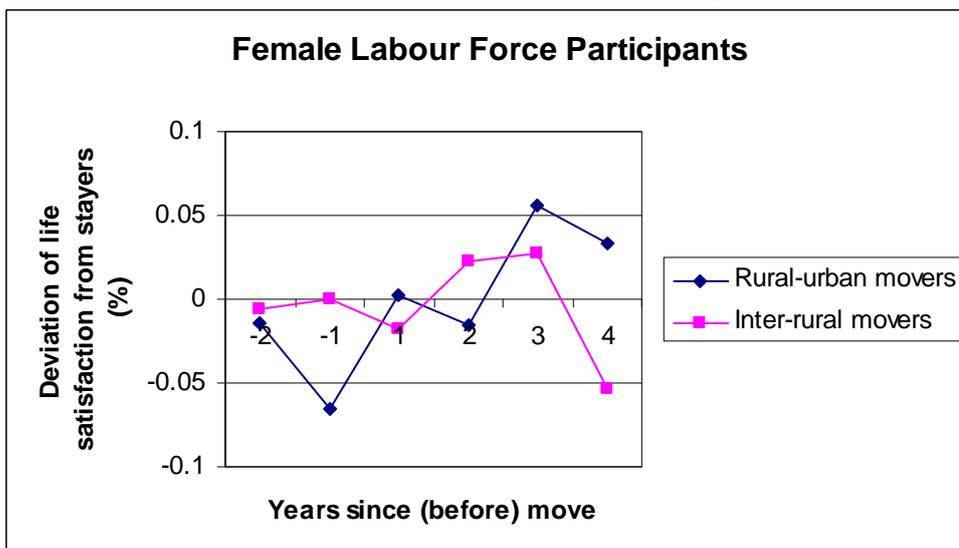
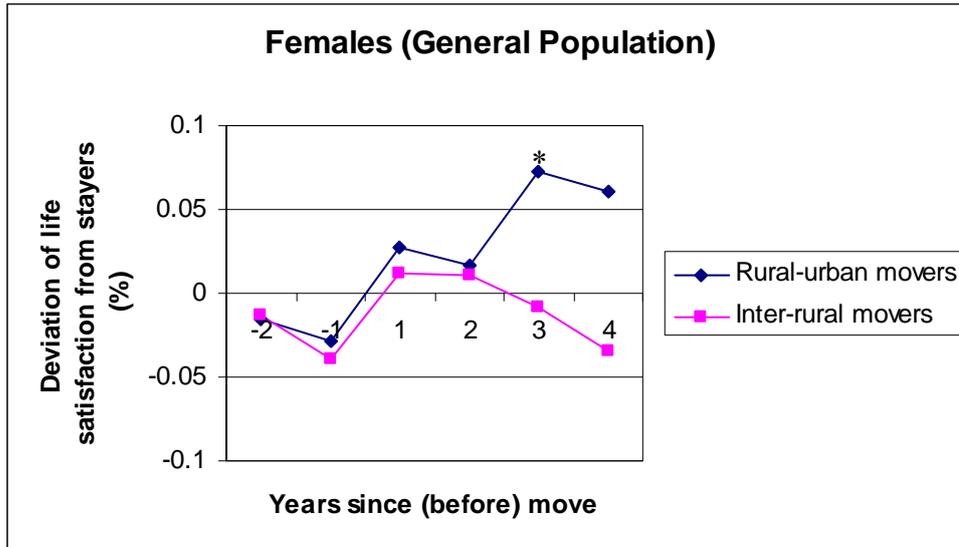


Figure 6.4 Time Path of Life Satisfaction (female general population)



theoretical prediction. Although no positive return is observed, the coefficient on the year previous to migration is negative and highly significant. This is perhaps an example of a negative shock to utility (which in this case was not picked up by our life event regressors) inducing a migratory response as the coefficients on the years post migration do not significantly differ from zero. This was modelled in Figure 4.2. The results for inter-rural movers do not carry over to the general population however, with none of the migration coefficients significantly different from zero at the conventional levels.

Although no coefficients are significant, the direction of life satisfaction deviation was within the realm of utility maximisation for female rural to urban labour force participants. The coefficients for this group are below that of stayers before moving and above post migration (but insignificant at conventional levels). For females in the general population, the result is significant for the three year return with a life satisfaction gain of about 8% compared to if no migration had taken place. An F test of the hypothesis that the difference between the coefficient for the three year return

and the year previous to migration was equal to zero was rejected at the 1% level for female labour force participants, suggesting that females both in general and those in the labour force experience an increase in satisfaction post migration.⁴¹ This suggests that female labour force participants may only be more satisfied because they are less satisfied in the year before moving however. No life satisfaction advantage or disadvantage was observed for female inter-rural movers.

6.4 Discussion

We found that there was no change in community, neighbourhood or home satisfaction for rural to urban movers. Movers were found to be no better or worse off in these aspects compared to the last year spent in the rural locality. Restricting ourselves to labour force participants, no evidence was found of an increase in financial satisfaction to males and only weak evidence for an increase in employment satisfaction after three years. Stronger evidence was found for females in respect to both financial and employment satisfaction. Both inter-rural males and females experienced increased employment satisfaction (the former by escaping a disadvantageous level of satisfaction in the years before moving). Inter-rural males had no immediate change in financial satisfaction, however they experienced a decrease three and four or more years after moving. In themselves, our results for these five outcomes are interesting for understanding the areas in which returns (or penalties) are received by movers. We do not however require that any of these returns be significant, as our utility maximising framework for the migration decision does not specify from what source increased utility will accrue. Accordingly, our

⁴¹ $F(1,763) = 12.77$, $\text{prob} > F = 0.0004$

premier variable was each respondent's overall satisfaction which will now be discussed in some detail.

In addition to answering the obvious question, 'are those who move urban subjectively better off than those who stay,' specifying life satisfaction as our dependent variable adds to the literature one of the first micro examples of which the accepted utility maximising framework of migration can be tested. Knight and Gunatilaka (2010) observed that people living in urban China who had moved from rural areas were less happy than the rural population as well as the non-migrant urban population. The fact that these people were less happy than those who had not migrated was contradictory to utility maximising expectations and the authors attempted to explain this mainly through expectation shortcomings. In the following sections we will follow the lead of Knight and Gunatilaka (2010) and discuss whether theory related to expectations supports our results. Rather than rely on income level considerations to explain our results however, we also consider the role of *hedonic adaptation*. In addition we assess the extent to which our results are consistent with utility maximising theory and by exploiting the time path specification of our model briefly check if 'culture shock' is present in the case of rural to urban migration in Australia.

6.4.1 Culture Shock

If rural to urban movers are met with difficulties adjusting and functioning in their new urbanised locality, they may experience a negative shock to well-being after moving before assimilating and mastering the new environment (Oberg 1960). This

may come after some short term 'honeymoon' period for example. If these predictions prove true, we should observe a U shaped return to life satisfaction (ignoring the possibility of a honeymoon period which may be too short to observe).

For males there is a weak resemblance to what culture shock theory would predict in our time path of returns to rural to urban migrants. This is shown in Figures 6.1 and 6.2. The four or more years return does however decrease, which is not compliant with the theory. Furthermore, none of our coefficients were statistically different from zero, so we cannot actually say that returns are any different in any of the years, which essentially does not suggest culture shock occurs in the case of rural to urban males.

For females, we do not observe any culture 'shock' but do perhaps observe the effect of time on area assimilation (females are only more satisfied after three years). This may be because of the time taken to establish new social networks and adapt to the new physical environment for example. For both male and female inter-rural movers, no obvious culture shock pattern was observed, although this is not unexpected as we would expect these people to experience a less significant environmental (and perhaps also social) transition into their new locality.

6.4.2 Utility Maximising Framework

In Chapter 3, macro level models of migration were discussed (e.g. Roback 1982) that posed utility differentials drove the flow of migration, with wages and housing costs adjusting so that in equilibrium all areas would be subject to the same level of utility.

This was presented at the micro level in Chapter 4 with a simple model of migration (used as the conventional framework in most migration discussions) that essentially argued that a move would be made if the expected future discounted benefit (in terms of utility) outweighed the cost. The prediction of this framework was that movers should receive positive utility (satisfaction in our case) returns, although the exact timing remained unknown. Assuming four years is a long enough period, we should therefore expect that at least one of our coefficients be positive and significant. Alternatively, as shown as an example in Figure 4.2, a negative shock to utility may induce migration in which case a negative and significant coefficient in the year before moving would comply with theory if the coefficient in the year after moving became positive or simply insignificant. In Chapter 4 we also discussed some properties of residential tenure on ones level of utility which will also receive some brief discussion.

For male rural to urban movers, only employment satisfaction for labour force participants after three years (but not after four or more) was weakly significant and it appeared this did not translate into overall life satisfaction as neither the general population or only labour force participants achieved any increase in overall life satisfaction. Our utility maximising predictions were also unrealised in the case of inter-rural female movers and male inter-rural movers in general. For female inter-rural labour force participants, there were relatively few observed moves (28 for the one year return). Due to the unbalanced sample used, observations for longer durations since the move for all inter-rural mover groups were relatively small which should be considered when interpreting the results (see Appendix 2).

The results for females and the results for inter-rural male labour force participants were consistent with theory. No coefficients were significant for female labour force participants, however an F test found that the difference between the level of satisfaction after three years and the year before moving was significantly different from zero. Furthermore, the actual difference between the year before and three years after moving was larger than for the general population.

Inter-rural males experienced a significantly lower level of satisfaction in the year before moving, with an insignificant level there after. This can be interpreted as an 8% gain in life satisfaction and as evidence these people were perhaps moving to escape lower than average utility (recalling our results from section 6.2, the increase in life satisfaction may be partly attributable to higher satisfaction with employment opportunities). A more conventional return was found for women in general with insignificant returns in the two years before and two years after moving (as previously discussed, the fact that returns are not immediate may reflect the social and environmental assimilation of movers). After three years females are about 7% more satisfied and after four or more years 6% although this coefficient was insignificant at conventional levels. A portion of these returns could be attributed to greater financial and employment satisfaction. One possible explanation for why women experience increased life satisfaction compared to men draws upon the demographic context of rural Australia. Recall that females are underrepresented in rural Australia, largely because they are overrepresented in migration flows (Argent & Walmsley 2008). It might be that rural localities do not provide the same opportunities (not necessarily financial – perhaps social) for females as they do for men (this may be worsened by the fact the period examined has been challenging for rural Australia particularly due

to drought). Alternatively, it may be that for some reason rural females were more able to adapt to urbanised living compared to males.

In Chapter 4 we discussed the implications of residential tenure on migration. We saw that by assuming residential tenure had a positive relationship with area utility (that is people grow more attached to an area over time), *ceteris paribus* the value of moving would decrease over time. This would partially explain, for example, the common observation that the young are more mobile. We also discussed the implications of having attachment to an area increase up to a critical point before eventually beginning to decline (e.g. people may become bored with an area – see Figure 4.3). To test both of these possibilities, a variable was included in our life satisfaction equations that indicated in years how long a person had lived at their current address. This was by no means an entirely ideal variable, as we would prefer to know how long a person had resided in the same area, not the same address. To allow for a quadratic relationship (i.e. Figure 4.3) we included the squared value of this variable. For male labour force participants, both coefficients were negative although highly insignificant. When we included the whole population, our *res* variable was positive and our *res*² variable negative (consistent with attachment increasing to a critical point) although again the coefficients were highly insignificant. Surprisingly, for females it appeared that residential tenure was having a negative impact at an increasing rate with no positive effect at all. For the general female population, our *res* variable was insignificant while our *res*² was negative and significant at the 5% level. When we ran the regression without *res*² (not shown), our *res* variable was negative but insignificant. It appears that our estimates do not confirm with our theoretical discussion in Chapter 4. They imply that men are not affected by the time

they have spent at the same address, while for females spending time at one address has a negative impact upon utility in every year after arrival.⁴² It would be an interesting exercise to confirm the relationship between residential tenure and life satisfaction controlling for years spent in an area rather than at a particular address.

6.4.3 Explanations for Unchanged Life Satisfaction

As our results were only consistent with migration theory for two groups of movers, it is appropriate that we discuss some possible explanations as to why we have not consistently observed positive returns to movers. A number of possible explanations exist, with reference to both economic and psychological literature. We will consider the possibility of aspirations with respect to income and adaptation to living circumstances, the influence of relative consumption, as well as the possibility of consistency of the results with lifetime utility maximisation.

Before proceeding with our explanations, it is important to remind ourselves that although subjective responses may be a useful source of information, no measure is able to perfectly capture utility. Although health related experiments and neurological examinations have been supportive of subjective responses reflecting *current* emotional state (Frey & Stutzer 2002; Kahneman & Krueger 2006; Clark, Frijter & Shields 2008), the fact that at each point in time there are countless sources of contextual bias is problematic.

⁴² Interestingly, Shields, Wheatly Price and Wodden (2009) found no significant relationship between tenure at current address and life satisfaction for women and a positive effect for men using the same data source as this thesis (their sample was however very different, using only the first wave HILDA and not being restricted to rural Australian's and urban migrants).

Our model may not be sufficient to capture the benefit of migration if movers are very forward looking. For example, Mueser (1997) has shown that it may be rational for a utility maximising individual to work in a high wage, high cost, low amenity region during some period of their life (i.e. 'roughing it') to derive greater utility from a low wage, low cost, high amenity region later in life. In this case our individual may report lower levels of well-being for some period of time after the move because they are forward looking and realise that by sacrificing some utility now they may experience significantly higher utility in the future. This could be the case for some people in our sample who plan on returning to the rural locality at some stage in their life. This does however seem less plausible for inter-rural movers who were not observed to experience any wage advantage from moving. Many movers may also be influenced by family rather than personal well-being (e.g. they may perceive opportunities are greater for their children if they live in an urbanised area). This could even be true for those without children if they perceive the urban (or different rural) area is a superior location to start and raise a family.

Material aspirations were discussed by Easterlin (2001). His argument was motivated by three empirical observations (Easterlin 2001, pg. 472): (1) at any point in time those with higher incomes are on average more happy than those with lower incomes, (2) people tend to evaluate themselves as being more happy than they were in the past and expect that they will be happier in the future than they are now and despite this (3) happiness over the life-cycle tends to remain constant. The theory used to explain these observations was relatively simple. Income is assumed to have a positive effect upon utility and aspirations a negative effect. As income is increased, material aspirations rise and this may completely offset the effect of income, with

utility therefore remaining constant over the life-cycle. If we were to ask a person how satisfied they will be in say five years, knowing that their income will be higher at the end of this period, they would be likely to respond as being more satisfied as they will base their expected satisfaction on their future income but their current aspirations. Similarly, if they are currently earning more than they were previously they would be likely to respond that they are more satisfied in the present than in the past because they do not account for the fact their aspirations were lower in the past (it should become obvious from this point that studies using recall measures to analyse whether migrants have gained from moving are likely to be biased if this holds true).

Aspirations may partly explain our findings. Many of our movers may have been motivated by the allure of higher income without accounting for the subsequent rise in their material aspirations. However, this is unlikely to account for the results of our non-labour force participants or our inter-rural movers (recall that in Chapter 5 they were not found to experience any wage changes). If male movers were largely motivated by monetary incentives, our estimated income coefficients show that it would take a very large increase in income to increase life satisfaction by any substantial amount.⁴³ For example, a 30% increase household income is expected to increase life satisfaction by only 0.046% for males.⁴⁴ For females, the size of our income coefficient was similar although it failed to reach significance at conventional levels.

⁴³ Using the same logic used when measuring the financial returns to migration, one could argue that income should not be included as a regressor in our life satisfaction models. However, as is obvious from our estimates, income had such a small marginal effect, its inclusion or non-inclusion was not important to our conclusions.

⁴⁴ This is calculated from the results of the general population. For labour force participants only, the effect of income was only slightly greater.

A more general explanation which encapsulates but does not specify the non-effect of income but rather the reversion of well-being to a stable point following a shock to one's standard level of well-being from any event, is that of *hedonic adaptation*, a concept prevalent in the psychology literature which has recently been considered by economists modelling lifetime utility/happiness (e.g. Graham & Oswald 2006 and Rayo & Becker 2007). Hedonic adaptation argues that people respond to stimuli through a series of processes which reduce the stimuli's impact (Frederick & Lowenstein 1999). An event such as an increase in money (positive) or a serious injury (negative) is expected to only impact upon well-being in the short term as over time people adapt to their new conditions and well-being returns to some long term average. In the context of migration, people would choose to move because they perceive life will be better in the new region. This is consistent with utility maximisation where 'decision utility' motivates the move. From here there are two possibilities. Movers who expect to be happier immediately following the move may experience increased well-being in the short term as a result of increased amenities or income for example. However, after some period, they may base their well-being upon the higher level of favourable conditions they are now accustomed to (i.e. their well-being is subject to a moving reference point). The impact of having a moving reference point will mean that activities to increase well-being in the short term will have no lasting impact. If movers expect returns to be experienced some time in the future this could result in some negative effect being experienced before a temporary positive deviation. Research has found evidence that people may pre-emptively adapt by setting their reference point to match their future (i.e. superior) conditions, thereby decreasing current well-being (Frederick & Lowenstein 1999). For example, prisoners

have been found to be most frustrated in the final days of their sentence (Frederick & Lowenstein 1999).

Whether or not hedonic adaptation occurs in reality is not entirely clear. Deiner et al (1999) and Frederick and Lowenstein (1999) point out that many studies have found lasting effects from some events, or slow adaptation. Eaterlin (2003, 2005) argues that many non-pecuniary events (e.g. marriage, divorce, disability) have a lasting effect on well-being while income does not. He prefers a partial adaptation approach whereby the impact of a stimulus decreases with time although there is some lasting impact. In any case, the hedonic adaptation framework fits well with our results. If adaptation is sufficiently fast, it may be the case that our one year return coefficient is unable to capture any impact from migration upon utility. The only exception to this is that females have an increase in life satisfaction after three years.⁴⁵ Although the four or more years coefficient was insignificant, the fact that the sample of movers in this group was relatively small and that the actual value of the coefficient was only marginally less than the three year coefficient does not allow us to conclude that the return was only transitory with total confidence.

Recall that a number of regressors were included to control for various life events which we believed would shock current utility. These regressors were included for the cases in which the event occurred within the last six months or seven to twelve months ago. Our estimated coefficients of these variables can be used to give credence to the concept of hedonic adaptation. Keep in mind however that for many

⁴⁵ Note that our results for inter-rural male labour force participants are consistent with both our utility maximising framework and hedonic adaptation. This group of movers may have prematurely adapted, thereby reducing utility in the year before moving because they perceived they would be happier after migration and they used this future level of happiness as their reference point.

of these variables number of observations was relatively small. There was some evidence of adaptation to the birth of a child and major worsening of ones finances for males in general. When restricted to labour force participants only, there was evidence of adaptation after the death of a child or spouse.⁴⁶ For females in general, pregnancy was found to only temporarily increase life satisfaction, although given that pregnancy is a unique and ongoing process, it is perhaps not a good example of adaptation. Having a major improvement in finances actually increased life satisfaction in both periods (the coefficient was however larger if the improvement occurred within the last six months). For female labour force participants, the fact that the death of a child or spouse coincided with an increase in life satisfaction is probably not a robust result as this was based upon a small number of observations and is highly counterintuitive. Some events such as retirement, reconciling with a spouse, having a family member subject to injury or illness (for males): being fired, a worsening of finances, sickness or injury and having a family member detained in jail (for females) were found to have an impact only in the later period implying that some events take a period of time to effect well-being. Interestingly, many of these results were not in the intuitive direction (for example the coefficients on being fired and having a family member in jail were positive for females – possible explanations are that after six months many of these people would have recently found new employment and that seven to twelve months could perhaps have coincided with the release dates of many detainees).

One final consideration is that utility might be a function of relative rather than absolute consumption or wealth. This is analogous to the popular notion of ‘keeping

⁴⁶ Note that results for labour force participants only were not reproduced. Non participation in the labour force was controlled for in our regressions for the general population however.

up with the Joneses.’ Shields, Wheatley Price and Wooden (2009) have found that neighbourhood effects do have a significant impact upon self reported life satisfaction, although individual characteristics have significantly more explanatory power. Luttmer (2005) found a negative relationship between neighbours earnings and self reported happiness. Therefore it may be the case that our movers perceive they will be more satisfied after moving because they will be better off compared to their current position and current reference group, but do not realise that their reference group will change. This does not necessarily imply migration is motivated by income. For example, movers may be motivated by better amenities while the utility they gain from these amenities is offset by the utility lost because their relative consumption level has decreased (the latter effect not accounted for in the migration decision). As suggestive evidence that this could be a factor in the life satisfaction returns to rural to urban movers, Tables 6.7 and 6.8 show the average level of area socio-economic status before and one year after moving (this variable is a ranking between one and ten with the highest status areas receiving ten). As socio-economic status is higher after moving, migration may be associated with a higher consumption reference group. Note however, that Shields, Wheatley Price and Wooden (2009) did not find an overwhelmingly large role for neighbourhood effects (although the effects were significant) upon self reported life satisfaction, so it might be unrealistic to assume a change in reference group can largely explain our results. Furthermore, there is no change in area socio-economic status for inter-rural movers so for these movers there is less support for the possibility of relative consumption considerations.

Table 6.7 Changes in Area Socio-economic Status of Male Movers

	Year before move	Year after move	Difference
RU movers (n =129)	3.41	4.14	0.73** (0.017)
RR movers (n =74)	3.59	3.68	0.08 (0.814)

Note: The results of a two tail t test of the hypothesis that the difference between the year after the move and the year before the move was equal to zero are reported. P values are in parenthesis. *, **, *** is significance at the 10%, 5% and 1% level respectively.

Table 6.8 Changes in Area Socio-economic Status of Female Movers

	Year before move	Year after move	Difference
RU movers (n =138)	3.37	4.00	0.63** (0.030)
RR movers (n = 62)	4.06	4.00	-0.06 (0.870)

Note: See Table 6.7

6.4.4 Policy

In the case of male rural to urban movers, no life satisfaction gain to migration was observed. For females there was a positive gain in satisfaction after three years (this appeared to also be the case for labour force participants only with the difference between life satisfaction three years after and the year before migration significantly different from zero). If policy makers are concerned with maximising the aggregate level of well-being of rural Australians, it may be appropriate to pursue policies which affect the perceived value of migration (particularly for males, although bearing in mind that females are underrepresented in rural populations, this is likely to be problematic). Outmigration flows are likely to have a negative impact upon those left behind. If those who leave do not realise any utility gain because of their decision to move, then the utility loss experienced by stayers remains uncompensated. As such, policy consistent with maximising population well-being would require the act of migration to become less beneficial (from a practical perspective it is probably easier to image policies which make the benefits of staying greater, such as increased

subsidies to those who choose to do apprenticeships in rural areas etc). One additional policy implication which is solely related to women is that we may be observing a shortage of opportunity (perhaps social opportunity, the source is unclear). This same argument was made in section 5.4.3 in respect to the weekly wage return to male movers. In this case, if a female mover can gain utility by moving, this may reflect some disadvantage faced by women living in rural areas. Further research would be required to investigate this suggestion and identify the source (if any) of the disadvantage.

6.4.5 Results from our Full Regression

Table A5.1 (Appendix 5) shows the results from our full regression. These results will only receive a brief mention here and are designated to the appendix because they are not related to the main objectives of this thesis. There were some interesting differences between males and females. Males in couple relationships (with and without children) were found to be more satisfied than males who were not coupled. This was not the case for females however, suggesting that females did not benefit from relationships as much as males did. For males, age was positively related with satisfaction while for females it was negatively correlated. Again we observed those with zero or negative income to be more satisfied (at least for men). One very startling (if we believe the result to be true and not due to some systematic bias) result was that men seemed to be becoming less and less satisfied over the sample period. Females on the other hand reported relatively stable levels of satisfaction (if anything they become more satisfied although most year dummies were insignificant). These findings might suggest that the problems faced by rural populations in recent years are

impacting upon the well-being of at least male residents. Perhaps future research could more thoroughly explore the factors affecting life satisfaction of rural Australians.

6.5 Summary and Conclusions

In this chapter we estimated returns to subjective indicators of well-being. Rural to urban movers did not experience any change in home, neighbourhood or community satisfaction compared to the last year spent in the rural locality. Males were no more satisfied with their financial position or employment opportunities, while some evidence was found that females were more satisfied in respect to these two factors. Inter-rural male movers were less financially satisfied after three and four or more years (although this finding was based on a relatively small group of movers) but went from a disadvantageous employment satisfaction position in the years before moving to one of equivalence with rural stayers after moving.

With overall life satisfaction as our dependent variable, only females after three years experienced a positive deviation in life satisfaction. Inter-rural male labour force participants went from a disadvantageous position in the year before moving to equivalence with rural stayers in the years post migration. As the conventional explanation for migration is that people are driven by utility maximising considerations, we sought explanations as to why we only observed a positive return for limited groups of movers. The importance of unexpected changes to material aspirations and relative rather than absolute income were discussed as well as the possibility that movers were either making a strategic lifetime utility decision not

captured by our analysis or motivated by family rather than personal well-being. Referring to the literature on hedonic adaptation, our non-results may simply be the result people adapting to their new localities too rapidly to observe any effect. This was merely a suggestive explanation however. As a direction for future research, it would perhaps be interesting to observe the life satisfaction change of movers within a much shorter period than examined here (for example the change in life satisfaction after a few months). HILDA does provide data that could handle this if we were to analyse internal migration at a general level, however sample size constraints restrict any meaningful analysis in the case of rural to urban migration.

7. Summary and Conclusions

7.1 Results

The objective of this thesis was to estimate the wage returns and the returns to overall life satisfaction for those people who move from rural to urban areas in Australia. We did this for both males and females, exploiting the panel aspect of our data to control for both observable and unobservable heterogeneity in our sample. Although they were not our primary group of interest, we also measured the returns to inter-rural movers.

It was found that males experienced a large weekly wage gain from migration (this was estimated to be 32% after four or more years). Hourly wages were however unchanged for males. The opposite was found for females with higher hourly wages observed (15% after three years) but no change in weekly wages. Returns were also found to increase with the time spent in the urban locality and no wage premium was observed for either males or females in the year after moving. This result suggests some level of labour market assimilation was taking place. After controlling for unobserved factors using difference-in-difference methods, we found no evidence of self-selection bias (in fact, when we corrected for self-selection our results were in many cases more favourable to movers). Our preferred specification was therefore using fixed effects regression to account for all observed changes in individual characteristics over the sample period (2001-2007). For both males and females, inter-rural movers were not found to experience any change in wages and we observed wage penalties in some instances.

After measuring the wage returns to moving we focused upon subjective indicators of well-being. Using a balanced sample of rural to urban movers only and estimating whether satisfaction with one's neighbourhood, community or home changed from the year before moving to up to three years after moving, we found no difference in reported levels of satisfaction for either males or females. We then estimated whether satisfaction with one's employment opportunities or financial situation was affected by migration for up to four (or more) years after the move. In this case a fixed effects specification was used and we benchmarked the returns to our movers against those of rural residents who did not move over the sample period. Males did not experience any change in satisfaction while some evidence was found that females were more satisfied in respect to both measures. We also estimated the returns to inter-rural movers finding that males experienced decreased financial satisfaction after three years and females experienced increased employment satisfaction immediately. Males were also found to go from a disadvantageous employment satisfaction position to one of equivalence with non-movers after migration.

Our final task was to measure the returns to overall life satisfaction. This variable was considered to be our best indicator of utility or happiness although (as discussed in Chapter 6) it may be subject to certain levels of bias. Males making rural to urban moves were no more satisfied with their lives than those who did not move. Similarly for inter-rural females and inter-rural males in general. Rural to urban female movers and inter-rural male labour force participants did appear to benefit from migration. The former group were found to have higher life satisfaction three years after moving, perhaps suggesting that social assimilation and environmental adjustments prevented

immediate returns. Inter-rural male labour force participants went from a disadvantageous position in the year before moving to one of equivalence with non-movers the year after the move took place (this may have been partly attributed to being more satisfied with employment opportunities).

7.2 Conclusions and Implications

Males were found to increase the quantity of money received each week, but were not found to be compensated at a higher rate for their time. If underemployment is a problem in rural areas this may be promising information for rural workers. From a policy perspective, it may represent some level of work opportunity inequality as a male rural worker is obviously able to earn significantly more if he decides to relocate. Females were compensated at a higher hourly rate but did not increase weekly earnings. Again, this might indicate some level of inequality and certainly suggests one motivating factor for moving. Inclusion of a part time dummy variable did have some impact on our results, suggesting females were perhaps more likely to be in part time employment in urban areas, which tends to attract higher hourly compensation but offers lower non-income benefits. It was also noted that the wage premiums observed may have been partially the result of disadvantage to non-movers, particularly as the period examined was characterised by severe drought. The fact that inter-rural movers did not experience any changes in wage levels could easily be explained by different migration motivations for those moves.

Even though males earned more, they were no more satisfied with their financial position after moving. They also experienced no change (there was only weak

evidence of an increase after three years) in satisfaction with employment opportunities. This result may be due to changing costs, spousal considerations or increased material aspirations for example. Females did experience increased financial and employment satisfaction (although the time path of returns was not smooth). This suggested that from a labour market perspective, rural to urban migration was more favourable to females. For overall life satisfaction, we expected to observe positive returns, although the possibility of culture shock and social assimilation may have delayed the realisation of said returns. The fact that only females benefited from rural to urban migration could be explained in a number of ways. It may be that females faced lower opportunities (perhaps social) in the rural area in which case we would be more likely to observe females benefiting from migration. Females may also have been more able to adapt to the urban environment. Using theory from both economics and psychology we discussed possible explanations for why not all groups of movers we examined experienced positive returns to migration. One possibility was that people were adapting to their new living standards too rapidly to observe any return. This concept of hedonic adaptation drew upon the idea that well-being was subject to a moving reference point of what one perceives as normal circumstances. If this holds true, life satisfaction should be relatively stable over the life cycle (this seems to be the case – see Easterlin (2001)).

The fact that males did not gain from migration may motivate policy toward increasing the cost (increasing the benefit) of moving (staying). This is because outmigration is expected to negatively impact upon those left behind and it appears this negative impact is uncompensated for by those who move. This was not true for females however, so it may be appropriate for future research to confirm that females

benefit from migration and then explore the reasons behind this. Outmigration of females is a significant problem in rural areas and it may be that females face some form of life satisfaction disadvantage when residing in rural areas (perhaps worsened by this trend).

7.3 Future Research

Perhaps the greatest limitation of this study was that we were forced to deal with only a small number of movers. This was particularly true in our wage earning samples and for inter-rural movers (although this group was not of primary interest). It would therefore be ideal for complimentary research to emerge to confirm (or perhaps question) the findings of this study.

Several directions of future research have emerged from this paper, particularly due to the fact it has answered two main questions (i.e. what is the financial return, and what is the non-financial return to rural to urban migration in Australia?). HILDA is an excellent source of data for studies of internal migration, however, as discovered in this thesis, it only provides a relatively small number of observations of rural to urban moves. It may be appropriate to now examine more specifically the effect of cities on wage outcomes by expanding our control area from 'rural' to simply 'non-metropolitan' or non-major city. This could be used to test whether cities in Australia act to increase human capital or simply compensate at a higher rate (this may due to compensating differentials for example (Roback 1982). This hypothesis has been tested in the U.S. by Glaeser and Maré (2001).

It is our analysis of the outcomes to overall life satisfaction that offers perhaps the most significant avenue of future research. Economists have been increasingly using subjective well-being data (Clark, Frijters & Shields 2008) and as migration is generally considered a utility maximising choice it seems natural that the internal migration literature also considers the potential insights of these data. From what we have observed in this thesis, it may be that although movers expect to be better off in the new locality, unaccounted for psychological factors prevent this in the longer term. This may not have been the case for female movers in our analysis as we could not strongly conclude that they received only a transitory increase in satisfaction after three years. What is required is a study with some measure of subjective well-being, life-satisfaction or happiness as the dependent variable of the well-being return to general internal migration. Given the possibility of adaptation it would be ideal to include a dummy variable for if the move was say three months ago, six months ago and so on to account for the fact that well-being might only be temporarily affected. HILDA is suitable for this type of analysis if we examine internal migration at a general level. It is also important that any future research attempts to meaningfully control for the possible bias associated with individual personalities (this was done using fixed effects specification in this study).

Finally, finding that women did gain from migration in terms of overall life satisfaction may motivate research to better understand the pressures and struggles of females living in rural areas. It is well recognised that females are overrepresented in outmigration flows and our estimates suggest it is rational for females to continue to leave. The gender mismatch and population decline caused by this trend are damaging

to the rural community and as such any future research on this topic may be very valuable to policy makers.

References

- Adrienko, Y. 2009, The role of distance in returns to geographical mobility: Evidence from HILDA Survey, *Paper presented at the International on Policy Modeling, EcoMod 2009*, Ottawa, Canada, 24–26 June
- Alston, M. 2004, “You don’t want to be a check out-chick all your life’: The out-migration of young people from Australia’s small rural towns’, *Australian Journal of Social Issues*, Vol. 39, no. 2, pp 299-313
- Alston, M. 2006, *The impact of drought on secondary education access in Australia’s rural and remote areas: A report to DEST and the Rural Education Program of FRRR*, Centre for Rural Social Research, Charles Sturt University, Wagga Wagga, NSW
- Alston, M. & Kent, J. 2004a, *Social impacts of drought: A report to NSW Agriculture and the NSW Premiers Department*, Centre for Rural Social Research, Charles Sturt University, Wagga Wagga, NSW
- Alston, M. & Kent, J. 2004b, ‘Coping with a Crisis: Human Services in Times of Drought’, *Rural Society*, Vol. 14, no. 3, pp 214-227
- Althaus, P. G. 2004, ‘A Life-Cycle Model of Locational Choice in a Two-Region Economy’, *Journal of Regional Science*, Vol. 44, no. 2, pp. 351-366
- Andrews, G., Hall, W., Henderson, S. & Teesson, M. 1999, *The Mental Health of Australians*, Commonwealth Department of Health and Aged Care, Canberra
- Argent, N. & Walmsley, J. 2008, ‘Rural Youth Migration Trends in Australia: an Overview of recent Trends and Two Inland Case Studies’, *Geographical Research*, Vol. 46, no. 2, pp. 139-152
- Australian Bureau of Agricultural and Resource Economics 2008, *Australian Farm Survey Results 2005-06 to 2007-08*, ABARE, Canberra
- Australian Bureau of Agricultural and Resource Economics 2009, *Australian Farm Survey Results 2006-07 to 2008-09*, ABARE, Canberra
- Australian Bureau of Statistics 1995, *Travel to Work, School and Shops, Victoria October 1994*, Cat no. 9201.1, ABS, Canberra
- Australian Bureau of Statistics 2001, *Outcomes of ABS Views on Remoteness Consultation, Australia*, Cat no. 1244.0.00.001, ABS, Canberra
- Australian Bureau of Statistics 2004, *Year Book Australia, 2004*, Cat no. 1301.0, ABS, Canberra
- Australian Bureau of Statistics 2006, *Census Dictionary Australia 2006 (reissue)*, Cat no. 2901.0, ABS, Canberra

- Australian Bureau of Statistics 2008, *Australian Standard Geographical Classification (ASGC)*, Cat no. 1216.0, ABS, Canberra
- Australian Bureau of Statistics 2009, *Regional Population Growth, Australia, 2007-08*, Cat no. 3218.0, ABS, Canberra
- Australian Government Department of Health and Ageing 2008, *Report on the Audit of Health Workforce in Rural and Regional Australia, April 2008*, Commonwealth of Australia, Canberra
- Australian Industrial Relations Commission 2007, *Wages and Allowance Review 2007*, Online, <http://www.airc.gov.au/fullbench/2007aircfb684.htm>
- Australian Institute of Health and Welfare 2004, *Rural, regional and remote health: a guide to remoteness classification*, Cat no. PHE 53, AIHW, Canberra
- Australian Institute of Health and Welfare 2005, *Rural, regional and remote health: indicators of health*, Rural Health Series no. 5, Cat. No. PHE 59, AIHW, Canberra
- Australian Institute of Health and Welfare 2005, *Rural, regional and remote health: mortality trends 1992-2003*, Rural Health Series no. 7, Cat. No. PHE 71, AIHW, Canberra
- Australian Institute of Health and Welfare 2008A, *Rural, regional and remote health: indicators of health system performance*, Rural Health Series no. 10, Cat. No. PHE 103, AIHW, Canberra
- Australian Institute of Health and Welfare 2008B, *Rural, regional and remote health: indicators of health status and determinates of health*, Rural Health Series no. 9, Cat. No. PHE 97, AIHW, Canberra
- Basu, B. 2004, 'Efficiency wages, agglomeration, and a developing dual economy', *The Annals of Regional Science*, Vol. 38, no. 4, pp. 607-625
- Baum, S., O'Conner, K. & Stimson, R. 2005, *Fault lines exposed: advantage and disadvantage across Australia's settlement system*, Monash University Press, Melbourne
- Bertrand, M. & Mullainathan, S. 2001, 'Do People Mean What They Say? Implications for subjective Survey Data', *The American Economic Review*, Vol. 91, no. 2, Papers and Proceedings of the Hundred Thirteenth Annual Meeting of the American Economic Association (May, 2001), pp. 67-72
- Best, C. J., Cummins, R. A. & Lo, S. K. 2000, 'The quality of rural and metropolitan life', *Australian Journal of Psychology*, Vol. 52, no. 2, pp. 69-74
- Beyond Blue 2008, *beyondblue Research Book 2001-2007: Targeted research in depression, anxiety and other related disorders*, Online, http://www.beyondblue.org.au/index.aspx?link_id=6.993

- Bill, A. & Mitchell, W. 2006, 'Great expectations – migration and labour market outcomes in Australia', Centre of Full Employment and Equity, Working paper no. 06-08, University of Newcastle
- Boheim, R. & Taylor, M. P. 2007, 'From the dark end of the street to the bright side of the road? The wage returns to migration in Britain', *Labour Economics*, Vol. 14, no. 1, pp. 99-117
- Borjas, G. J., Bronars, S. G. & Trejo, S. J. 1992, 'Assimilation and the Earnings of Young Internal Migrants', *The Review of Economics and Statistics*, Vol. 74, no. 1, pp. 170-175
- Brueckner, J. K. & Kim, H. A. 2001, 'Land Markets and the Harris-Todaro Model: A New Factor Equilibrating Rural-Urban Migration', *Journal of Regional Science*, Vol. 41, no. 3, pp. 507-520
- Brueckner, J. K. & Zenou, Y. 1999, 'Harris-Todaro models with a land market', *Regional Science and Urban Economics*, Vol. 29, no. 3, pp. 317-339
- Bureau of Meteorology 2007, *Six years of widespread drought in southern and eastern Australia November 2001-October 2007*, Special Climate Statement 14, accessed 27/11/2009, <http://www.bom.gov.au/climate/current/statements/scs14.pdf>
- Burnley, I. H., Marshall, N., Murphy, P. A. & Hugo, G. J. 2007, 'Housing Factors in Welfare Migration to and from Metropolitan Cities in Australia', *Urban Policy and Research*, Vol. 25, no. 3, pp. 287-304
- Caldwell, T. M., Jorm, A. F. & Dear, K. B. G. 2004, 'Suicide and mental health in rural, remote and metropolitan areas in Australia', *Medical Journal of Australia*, Vol. 181, no. 7, pp s10-s14
- Carroll, N., Frijters, P. & Shields, M. A. 2009, 'Quantifying the cost of drought: new evidence from life satisfaction data', *Journal of Population Economics*, Vol. 22, no. 2, pp. 445-461
- Centre for Rural Mental Health 2005, *Depression in farmers and farming families*, Project Report 2005, Online, http://beyondblue.org.au/index.aspx?link_id=6.801&tmp=FileDownload&fid=652
- Ciurej, M., Tanton, R. & Sutcliffe, A. 2006, *Analysis of the Regional Distribution of Relatively Disadvantaged Areas using 2001 SEIFA*, ABS cat no. 1351.0.55.013, Canberra
- Clark, A. E., Frijters, P. & Shields, M. A. 2008, 'Relative Income, Happiness, and Utility: An Explanation for the Easterlin Paradox and Other Puzzles', *Journal of Economic Literature*, Vol. 46, no. 1, pp. 95-144
- Corden, W. M. & Findlay, R. 1975, 'Urban Unemployment, Intersectoral Capital Mobility and Development Policy', *Economica*, Vol. 42, no.165, pp. 59-78

De Jong, G. F., Chamrathirong, A. & Tran, Q. 2002, 'For Better, for Worse: Life Satisfaction Consequences of Migration', *International Migration Review*, Vol. 31, no. 3, pp. 838-863

Department of the Prime Minister and Cabinet 2008, *Families in Australia: 2008*, DPMC, Canberra

De'tang-Dessendre, C., Drapier, C. & Jayet, H. 2004, 'The Impact of Migration on Wages: Empirical Evidence from French Youth', *Journal of Regional Science*, Vol. 44, no. 4, pp. 661-691

Diener, E., Suh, E. M., Lucas, R. E. & Smith, H. L. 1999, 'Subjective Well-Being: Three Decades of Progress', *Psychological Bulletin*, Vol. 125, no. 2, pp. 276-302

Dierx, A. H. 1988, 'A Life-Cycle Model of Repeat Migration', *Regional Science and Urban Economics*, Vol. 18, no. 3, pp. 383-397

Dudley, M. J., Kelk, N. J., Florio, T. M., Howard, J. P. & Waters, B. G. H. 1998, 'Suicide among young Australians: an interstate comparison of metropolitan and rural trends', *Medical Journal of Australia*, Vol. 169, no. 2, pp 77-80

Eacott, C. & Sonn, C. C. 2006, 'Beyond education and employment: Exploring youth experience of their communities, place attachment and reasons for migration', *Rural Society*, Vol. 16, no. 2, pp 199-214

Easterlin, R. A. 2001, 'Income and Happiness: Towards a Unified Theory', *The Economic Journal*, Vol. 111, no. 473, pp. 465-484

Easterlin, R. A. 2003, 'Explaining Happiness', *Proceedings of the National Academy of Sciences of the United States of America*, Vol. 100, no. 19, pp. 11176-11183

Easterlin, R. A. 2005, 'A puzzle for adaptive theory', *Journal of Economic Behaviour and Organisation*, Vol. 56, no. 4, pp. 513-521

Edwards, G., Gray, M. & Hunter, B. 2008, '*Social and economic impacts of drought on farm families and rural communities: Submission to the Drought Policy Review Expert Social Panel*', Australian Institute of Family Studies, Submission no. 234

Edwards, G., Gray, M. & Hunter, B. 2009, 'A Sunburnt Country: The Economic and Financial Impact of Drought on Rural and Regional Families in Australia in an Era of Climate Change', *Australian Journal of Labour Economics*, Vol. 12, no. 1, pp. 109-131

Evans, A. W. 1990, 'The Assumption of Equilibrium in the Analysis of Migration and Interregional Differences: A Review of Some Recent Research', *Journal of Regional Science*, Vol. 30, no. 4, pp. 515-531

Farber, S. C. 1978, 'A Directional Flow Migration Model', *Southern Economic Journal*, Vol. 45, no. 1, pp. 205-217

- Frederick, S. & Lowenstein, G. 1999, 'Hedonic Adaptation' in Kahneman, D., Diener, E. & Schwartz, N. (eds), *Well-Being: The Foundations of Hedonic Psychology*, Russell Sage Foundation, New York, pp. 302-329
- Freebairn, J. 2003, 'Economic policy for rural and regional Australia', *The Australian Journal of Agricultural and Resource Economics*, Vol. 47, no. 3, pp 389-414
- Frey, B. S. & Stutzer, A. 2002, 'What Can Economists Learn From Happiness Research?' *Journal of Economic Literature*, Vol. 40, no. 2, pp. 402-435
- Fuller, W. A. & Battese, G. E. 1974, 'Estimation of Linear Models with Crossed Error Structure', *Journal of Econometrics*, Vol. 2, no. 1, pp. 67-78
- Gabriel, M. 2002, 'Australia's regional youth exodus', *Journal of Rural Studies*, Vol. 18, no. 2, pp 209-212
- Garnett, A. M & Lewis, P.E.T 2007, 'Population and Employment Changes in Regional Australia', *Economic Papers*, Vol. 26, no. 1, pp 29-43
- Geldens, P. 2007, 'Outmigration: Young Victorians and the Family Farm', *People and Place*, Vol. 15, no. 1, pp 80-87
- Gibson, C. & Argent, N. 2008, 'Getting On, Getting Up and Getting Out? Broadening Perspectives on Rural Youth Migration', *Geographical Research*, Vol. 46, no. 2, pp 135-138
- Gleaser, E. L. & Maré, D. C. 2001, 'Cities and Skills', *Journal of Labour Economics*, Vol. 19, no. 2, pp. 316-342
- Graham, L. & Oswald, A. J. 2006, Hedonic Capital, IZA Discussion Paper 2079, Available at SSRN: <http://ssrn.com/abstract=898574>
- Grant, E. K. & Vanderkamp, J. 1980, 'The Effects of Migration on Income: A Migration Study with Canadian Data 1965-71', *The Canadian Journal of Economics*, Vol. 13 no. 3 pp. 381-406
- Graves, P. E. & Linneman, P. D. 1979, 'Household Migration: Theoretical and Empirical Results', *Journal of Urban Economics*, Vol. 6 no. 3, pp. 383-404
- Graves, P. E. & Mueser, P. R. 1993, 'The Role of Equilibrium and Disequilibrium in Modelling Regional Growth and Decline: A Critical Reassessment', *Journal of Regional Science*, Vol. 33, no. 1, pp. 69-84
- Greenwood, M. J. 1975, 'Research on Internal Migration in the United States: A Survey', *Journal of Economic Literature*, Vol. 13, no. 2, pp. 397-433
- Greenwood, M. J. 1997, 'Internal Migration in Developed Countries', in M. Rosenzweig & O. Stark (eds.), *Handbook of Population and Family Economics*, Amsterdam: Elsevier, pp. 647-720

- Harrigan, F. J. & McGregor, P. G. 1993, 'Equilibrium and Disequilibrium Perspectives on Regional Labour Migration', *Journal of Regional Science*, Vol. 33, no. 1, pp. 49-67
- Harris, J. R. & Todaro, M. P. 1970, 'Migration, Unemployment and Development: A Two-Sector Analysis', *The American Economic Review*, Vol. 60, no. 1, pp. 126-142
- Harris, R. J. 1981, 'Rewards of Migration for Income Change and Income Attainment 1968-73', *Social Science Quarterly*, Vol. 62, no. 2, pp. 275-293
- Haurin, D. R. 1980, 'The Regional Distribution of Population, Migration, and Climate', *The Quarterly Journal of Economics*, Vol. 25, no. 2, pp. 293-308
- Hillman, K., & Rotham, S. 2007, *Movements of Non-metropolitan Youth towards the Cities*, The Australian Council for Educational Research, Longitudinal Surveys of Australian Youth, Research Report 50, Melbourne
- Hoehn, J. P., Berger, M. C. & Blomquist, G. C. 1987, 'A Hedonic Model of Interregional Wages, Rents, and Amenity Values', *Journal of Regional Science*, Vol. 27, no. 4, pp. 605-620
- Hogan, A., Polidano, C., Russell, J. & Stakelum, P. 2008, *The Social Wellbeing of Rural Australians: An Analysis of the Household, Income and Labour Dynamics in Australia Longitudinal Dataset*, Report prepared for the Drought Review Branch, Australian Government Department of Agriculture, Fisheries and Forestry, Canberra
- Horridge, M., Madden, J. & Wittwer, G. 2005, 'The impact of the 2002–2003 drought on Australia', *Journal of Policy Modeling*, Vol. 27 no. 3, pp 285-308
- Hunt, J. C. & Kau, J. B. 1985, 'Migration and Wage Growth: A Human Capital Approach', *Southern Economic Journal*, Vol. 51, no. 3, pp. 697-710
- Jones, E. 2002, 'Rural Finance in Australia: A Troubled History', *Rural Society*, Vol. 12, no. 2, pp 160-180
- Judd, S. & Humphreys, J. 2001, 'Mental Health Issues for Rural and Remote Australia', *The Australian Journal of Rural Health*, Vol. 9, no. 5, pp 254-258
- Kahneman, D. & Krueger, A. B. 2006, 'Developments in the Measurement of Subjective Well-being', *Journal of Economic Perspectives*, Vol. 20, no. 1, pp. 3-24
- Kambourov, G. & Manovskii, I. 2009, 'Occupational Specificity of Human Capital', *International Economic Review*, Vol. 50, no. 1, pp. 63-115
- Knight, J. & Gunatilaka, R. 2010, 'Great Expectations? The Subjective Well-being of Rural–Urban Migrants in China', *World Development*, Vol. 3, no. 1, pp. 113-124
- Krieg, R. G. 1996, 'Occupational Change and Differing Returns to Migration by Gender', *Journal of Socio-Economics*, Vol. 25, no. 5, pp. 591-599

- Krumm, R. J. 1983, 'Regional Labour Markets and the Household Migration Decision', *Journal of Regional Science*, Vol. 23, no. 23, pp. 361-376
- Lansing, J. B. & Morgan, J. N. 1967, 'The Effect of Geographical Mobility on Income', *The Journal of Human Resources*, Vol. 2, no. 4, pp. 449-460
- Larson A. 2006 'Rural health's demographic destiny', *Rural and Remote Health* 6 (online), 2006: 551, Available from: <http://www.rrh.org.au>
- Lehmer, F. & Mo"ller, J. 2008, 'Group-specific Effects of Inter-regional Mobility on Earnings – A Microdata Analysis for Germany', *Regional Studies*, Vol. 42, no. 5, pp. 657-673
- Lichter, D. T. 1983, 'Socioeconomic Returns to Migration among Married Women', *Social Forces*, Vol. 62, no. 2, pp. 487-503
- Lundholm, E. & Malmberg, G. 2006, 'Gains and losses, outcomes of interregional migration in the five Nordic countries', *Geografiska Annaler: Series B, Human Geography*, Vol. 88, no. 1, pp. 35-48
- Luttmer, E. F. P. 2005, 'Neighbours as Negatives: Relative Earnings and Well-Being', *Quarterly Journal of Economics*, Vol. 120, no. 3, pp. 963-1002
- Maddala, G. S. 1983, *Limited-dependent and qualitative variables in econometrics*, Econometric Society Monographs in Quantitative Economics, Cambridge University Press, New York
- Marré, A. W. 2009, 'Rural Outmigration, Income, and Poverty: Are Those Who Move Truly Better Off?', *Paper presented at the Agricultural & Applied Economics Association 2009 AAEA & ACCI Joint Annual Meeting*, Milwaukee, Wisconsin, July 26-29, 2009
- Martin, J. K. & Lichter, D. T. 1983, 'Geographic Mobility and Satisfaction with Life and Work', *Social Science Quarterly*, Vol. 64, no. 3, pp. 524-535
- Masters, S. H. 1972, 'Are Black migrants from the South to the Northern Cities Worse off than Blacks Already There?', *The Journal of Human Resources*, Vol. 7, no. 4, pp. 411-423
- Maxwell, N. L. 1988, 'Economic returns to migration: marital status and gender differences', *Social Science Quarterly*, Vol. 69, no. 1, pp. 108-121
- Mitchell, W. 2008, 'Migration and labour market outcomes by skill in Australia', Centre of Full Employment and Equity, Working paper no. 08-02, University of Newcastle
- Mueser, P. R. 1997, 'Two-Way Migration in a Model with Identical Optimizing Agents', *Journal of Regional Science*, Vol. 37, no. 3, pp. 395-409
- Murray, M. P. 2006, *Econometrics: A Modern Introduction*, Addison-Wesley, Boston

- Murray, T., Madison, D. & Rehdanz, K. 2008, 'Do Differences in Average Happiness Levels Cause Migration? Evidence From Germany', *Paper Presented to University of Casino - Italy - 26/27 September 2008*, Wellbeing – Are we Happy with our Standard of Living?
- Nakosteen, R. A. & Zimmer, M. 1980, 'Migrations and Income: The Question of Self Selection', *Southern Economic Journal*, Vol. 46, no. 3, pp. 840-851
- Nakosteen, R. A. & Zimmer, M. 1982, 'The Effects on Earnings of Interregional and Interindustry Migration', *Journal of Regional Science*, Vol. 22, no. 3, pp. 325-341
- Neal, D. 1995, 'Industry-Specific Human Capital: Evidence from Displaced Workers', *Journal of Labour Economics*, Vol. 13, no. 4, pp. 653-677
- Oberg, K. 1960, 'Culture Shock: Adjustment to New Cultural Environments', *Practical Anthropology*, Vol. 7, pp. 177-182
- Page, A., Morrell, S. & Taylor, R. 1998, 'Suicide differentials in Australian males and females by various measures of socio-economic status, 1994-1998', *Australian and New Zealand Journal of Public Health*, Vol. 26, no. 4, pp 318-324
- Page, A., Morrell, S., Taylor, R., Dudley, M. & Carter, G. 2007, 'Further increases in rural suicide in young Australian adults: Secular trends, 1979-2003', *Social Science & Medicine*, Vol. 65, no. 3, pp 442-453
- Panagariya, A. & Succar, P. 1986, 'The Harris-Todaro Model and Economies of Scale', *Southern Economic Journal*, Vol. 52, no. 4, pp. 984-998
- Parent, D. 2000, 'Industry Specific Capital and the Wage Profile: Evidence from the National Longitudinal Survey of Youth and the Panel Study of Labour Dynamics', *Journal of Labour Economics*, Vol. 18, no. 2, pp. 306-323
- Pekalla, S. 2002, 'Migration and Individual Earnings in Finland: A Regional Perspective', *Regional Studies*, Vol. 36, no. 1, pp. 13-24
- Pritchard, B. & McManus, P. (eds) 2000, *Land of Discontent: the Dynamics of Change in Rural and Regional Australia*, UNSW Press, Sydney
- Raimondos, P. 1993, 'On the Todaro paradox', *Economic Letters*, Vol. 42, no. 2-3, pp. 261-267
- Rayo, L. & Becker, G. S. 2007, 'Evolutionary Efficiency and Happiness', *The Journal of Political Economy*, Vol. 115, no. 2, pp. 302-337
- Roback, J. 1982, 'Wages, Rents, and the Quality of Life', *The Journal of Political Economy*, Vol. 90, no. 6, pp. 1257-1278
- Robinson, C. & Tomes, N. 1982, 'Self-Selection and Interprovincial Migration in Canada', *The Canadian Journal of Economics*, Vol. 15, no.3, pp. 474-502

Rodgers, J. L. & Rodgers, J. R. 1997, 'The Economic Impact of Rural-to-Urban Migration in the United States: Evidence for Male Labour-Force Participants', *Social Science Quarterly*, Vol. 74, no. 4, pp. 937-954

Rodgers, J. R. & Rodgers, J. L. 2000, 'The Effect of Geographic Mobility on Male Labour-Force Participants in the United States', *Journal of Labour Research*, Vol. 21, no. 1, pp. 117-132

Schachter, J. & Althaus, P. G. 1989, 'An Equilibrium Model of Gross Migration', *Journal of Regional Science*, Vol. 29, no. 2, pp. 143-159

Schwarz, N. & Strack, F. 1999, 'Reports of Subjective Well-being: Judgemental Processes and Their Methodological Implications' in Kahneman, D., Diener, E. & Schwartz, N. (eds), *Well-Being: The Foundations of Hedonic Psychology*, Russell Sage Foundation, New York, pp. 61-84

Shaw, K. L. 1991, 'The Influence of Human Capital Investment on Migration and Industry Change', *Journal of Regional Science*, Vol. 31, no. 4, pp. 397-416

Shields, M. A., Wheatley Price, S. & Wooden, M. 2009, 'Life satisfaction and the economic and social characteristics of neighbourhoods', *Journal of Population Economics*, Vol. 22, no. 2, pp. 421-443

Shields, M. P. 1995, 'Time, Hedonic Migration, and Household Production', *Journal of Regional Science*, Vol. 35, no. 1, pp. 117-134

Shukla, V. & Stark, O. 1990, 'Policy Comparisons with an Agglomerations Effects-Augmented Dual Economy Model', *Journal of Urban Economics*, Vol. 27, no. 1, pp. 1-15

Sjaastad, L. A. 1962, 'The Costs and Returns of Human Migration', *The Journal of Political Economy*, Vol. 70, no. 5, pp. 80-93

Stark, O., Gupta, M. R. & Levhari, D. 1991, 'Equilibrium urban unemployment in developing countries – is migration the culprit?', *Economic Letters*, Vol. 37 no. 4, pp. 477-482

StataCorp. 2007, *Stata Statistical Software: Release 10 (Volume 3)*, College Station, Texas

Stehlik, D., Lawrence, G. & Gray, I. 2000, 'Gender and Drought: Experiences of Australian Woman in the Drought of the 1990s', *Disasters*, Vol. 24, no. 1, pp 38-53

Stimson, R. J. & Minnery, J. 1998, 'Why People Move to the 'Sun Belt': A Case Study of Long distance Migration to the Gold Coast, Australia', *Urban Studies*, Vol. 35 no. 2, pp. 193-214

- Stone, A. A., Shiffman, S. S. & DeVries, M. W. 1999, 'Ecological Momentary Assessment' in Kahneman, D., Diener, E. & Schwartz, N. (eds), *Well-Being: The Foundations of Hedonic Psychology*, Russell Sage Foundation, New York, pp. 26-39
- Taylor, R., Page, A., Morrell, S., Harrison, J. & Carter, G. 2005, 'Social and Psychiatric influences on Urban-Rural Differentials in Australian Suicide', *Suicide & Life-threatening Behaviour*, Vol. 35, no. 3, pp 277-290
- Todaro, M. P. 1969, 'A Model of Labour Migration and Unemployment in Less Developed Countries', *The American Economic Review*, Vol. 59, no. 1, pp. 138-148
- Walmsley, D. J., Epps, W. R. & Duncan, C. J. 1998, 'Migration to the New South Wales North Coast 1986-1991: Lifestyle Motivated Counterurbanisation', *Geoforum*, Vol. 29, no. 1, pp. 105-118
- Wertheimer, R. F. 1970, *The Monetary Rewards of Migration Within the U.S.*, The Urban Institute, Washington, DC
- Willits, F. K., Bealer, R. C. & Crider, D. M. 1978, 'Migrant Status and Success: A Panel Study', *Rural Sociology*, Vol. 43, no. 3, pp. 386-402
- Wooden, M. & Watson, N. 2007, 'The HILDA Survey and its Contribution to Economic and Social Research (So Far)', *The Economic Record*, Vol. 83, no. 261, pp. 208-231
- Yankow, J. J. 1999, 'The Wage Dynamics of Internal Migrants within the United States', *Eastern Economic Journal*, Vol. 25, no. 3, pp. 265-278
- Yankow, J. J. 2003, 'Migration, Job Change, and Wage Growth: A New Perspective on the Pecuniary Return to Geographic Mobility', *Journal of Regional Science*, Vol. 43, no. 3, pp. 483-516
- Zangelidis, A. 2008, 'Occupational and Industry Specificity of Human Capital in the British Labour Market', *Scottish Journal of Political Economy*, Vol. 55, no. 4, pp. 420-443

Appendix 1

IV Regression with Binary Choice

A more detailed description of the IV estimation procedure using a first stage probit can be found in Maddala (1983). The following is merely used to show how λ is estimated and relates to the correlation between the first and second stage disturbances. These details are reproduced from StataCorp (2007, pp. 518-519).

We have a wage equation as follows with X representing exogenous explanatory variables and m^U are potentially endogenous migration dummy. For simplicity the time subscript is dropped and we specify our equation in levels, although when we estimate our wage equations in Chapter 5 it is the change in our left and right hand side variables that are used.

$$Y_i = \beta_0 X_i + \beta_1 m_i^U + \mu_i$$

m_i^U is assumed to be the result of an unobserved latent variable:

$$m_i^{U*} = z_i \gamma + \varepsilon_i$$

Observed decision to migrate is:

$$m_{it} = \begin{cases} 1, & \text{if } m_i^{U*} > 0 \\ 0, & \text{otherwise} \end{cases}$$

Where μ_i and ε_i are bivariate normal with mean zero and covariance matrix

$$\begin{pmatrix} \sigma & \rho \\ \rho & 1 \end{pmatrix}$$

Probit estimates of the first stage equation are obtained

$$\Pr(m_i^U = 1 | z_i) = \Phi(z_i \gamma)$$

where Φ is the cumulative distribution function of the standard normal distribution.

From the first stage estimates the hazard from each observation i is computed as

$$h_j = \begin{cases} \phi(z_i \hat{\gamma}) / \Phi(z_i \hat{\gamma}), & z_i = 1 \\ -\phi(z_i \hat{\gamma}) / \{1 - \Phi(z_i \hat{\gamma})\}, & z_i = 0 \end{cases}$$

ϕ is the standard normal density function. If

$$d_i = h_j(h_j + \hat{\gamma} z_i)$$

then

$$E(Y_i | m_i^U) = X_i \beta_0 + \beta_1 m_i^U + \rho \sigma h_i$$

$$\text{Var}(Y_i | m_i^U) = \sigma^2 (1 - \rho^2 d_i)$$

β_0 and β_1 are estimated by augmenting the regression equation with the hazard h . The regressors thus become $[X \ m \ h]$. STATA estimates the parameter b_h for the variable containing the hazard. A consistent estimate of the disturbance variance is obtained using the residuals from the augmented regression and the estimated b_h

$$\hat{\sigma}^2 = \frac{e'e + b_h^2 \sum_{i=1}^N d_i}{N}$$

The two-step estimate of ρ is then

$$\hat{\rho} = \frac{b_h}{\hat{\sigma}}$$

As $\sigma \neq 0$, for the correlation between u_i and ε_i to equal zero, so must b_h . This coefficient is reported by STATA as the hazard or lambda (λ) coefficient. It can be shown (StataCorp 2007, pg. 516) that the difference in expected wages of migrants and non-migrants is

$$E(Y_i | m_i^U = 1) - E(Y_i | m_i^U = 0) = \delta + \rho \sigma \left[\frac{\phi(z_i \gamma)}{\Phi(z_i \gamma) \{1 - \Phi(z_i \gamma)\}} \right]$$

If $\rho = 0$ the expected difference is δ , which can more efficiently be estimated by OLS. In this case we have no self-selection bias. Note that we can also use the sign of λ to predict the direction of the bias. For example, a negative λ coefficient will imply that OLS underestimates the return to migration. This can be confirmed by examining our IV and difference-in-difference estimates from Chapter 5, along with the λ coefficients from the IV models (Appendix 2).

Appendix 2

Table A2.1 First Stage Equation for One Year Weekly Wage Return
 Probit Estimation: Dependent Variable – One if Rural to Urban Mover, Zero Otherwise

Variable	Males		Females	
	Coefficient	P value	Coefficient	P value
<i>Likely to move</i>	0.9038***	0.000	1.6920***	0.000
<i>Home owner</i>	-0.8147***	0.000	-0.7472***	0.008
Socio-econ. 1-3	0.7118**	0.027	0.5998	0.204
Socio-econ. 4-6	0.4732	0.147	0.5830	0.221
RR move last year	0.0154	0.974	-7.5892	
Age	0.0294	0.807	-0.1326	0.389
Age ²	-0.0002	0.906	0.0011	0.575
Work exp.	-0.1023	0.156	0.0127	0.872
Work exp. ²	0.0014	0.340	-0.0002	0.931
Long term health cond.	-0.0069	0.980	0.0551	0.887
Union member	0.4077**	0.050	0.5394*	0.078
Manager	-0.6738*	0.051	-0.4195	0.566
Professional	-0.0078	0.982	0.4138	0.505
Technician and trades	-0.1918	0.448	-7.3332	
Community and personal	-0.6424	0.125	-0.0880	0.879
Clerical and admin.	-0.1520	0.742	-0.1040	0.843
Sales workers	0.2260	0.617	-0.1424	0.809
Machinery operators/drivers	-0.4230	0.164	-5.1281	
Couple with child <15	-0.9101	0.106	-1.4636	0.161
Couple with dependent student	-0.9044	0.217	-5.9854	
Couple with independent child	-0.6968	0.331	-0.2296	0.835
Couple without child	-1.0668*	0.064	-1.0117	0.312
Lone parent (child <15)	-6.5386		-1.2522	0.287
Lone parent with dependent student	8.3998		0.4005	0.765
Lone parent with independent child	-4.9614		0.4864	0.685
Non-dependent child	-0.8316	0.168	-1.8258	0.122
Other family member	-6.399		-5.8951	
Lone persons	-1.1758*	0.052	-0.5819	0.587
Postgrad	-5.0577		-0.0604	0.940
Grad diploma/cert.	0.1207	0.853	-0.4169	0.512
Bachelor/honours	0.1595	0.684	0.3072	0.567
Advance dip./ Dip.	0.6702*	0.073	-5.8192	
Cert. III of IV	0.7408***	0.003	0.2998	0.486
Cert. I or II	0.6270	0.124	-4.0076	
Cert not defined	-4.958			
Year 12	0.4804	0.144	-0.0546	0.911
NSW	-0.0402	0.962	-1.0606	0.694
VIC	-0.6390	0.461	-2.2814	0.396
QLD	-0.4950	0.559	-1.4122	0.604
SA	-0.1260	0.884	-1.8229	0.486
WA	-0.6852	0.440	-1.6735	0.541
TAS	-0.6610	0.469	-1.8407	0.488
n	1659		1357	

LR chi squared	152.83***	0.000	167.34***	0.000
Pseudo R ²	0.3460		0.5390	

*, **, *** is significance at the 10%, 5% and 1% level respectively. The omitted category for occupation is labourers, for family relationship is unrelated to all household members and for highest level of education is year 11 or below. The Northern Territory is omitted for state controls and no observations exist for the ACT.

Table A2.2 Fixed Effects Results for Hourly Wage with Different Restrictions

Coefficients are for the duration before or after a rural to urban move.

Coefficients	Males – hourly wages >\$2.50	Males – Hourly wage >\$6.50 with only those observed for three or more years	Females – hourly wages >\$6.50 with part-time dummy	Females - hourly wages >\$5.00 with part-time dummy
	-2--1 years	-0.0063 (0.926)	-0.0199 (0.775)	0.0319 (0.597)
-1-0 year	0.0044 (0.958)	-0.1088 (0.140)	0.0069 (0.915)	0.0466 (0.475)
0-1 year	0.1063 (0.197)	-0.0721 (0.381)	0.0657 (0.338)	0.1035 (0.149)
1-2 years	0.1381* (0.076)	-0.0449 (0.494)	0.1058 (0.120)	0.1577** (0.025)
2-3 years	0.1275 (0.175)	-0.0533 (0.474)	0.1334* (0.068)	0.1762** (0.017)
3-4+ years	0.1970** (0.031)	0.0410 (0.606)	0.0960 (0.263)	0.1349 (0.117)
Part-time dummy			0.1945*** (0.000)	0.2219*** (0.000)
n	2623	2404	2146	2179
f statistic	8.27*** (0.000)	34.40*** (0.000)	4851.47*** (0.000)	81.58*** (0.000)

Note: Robust standard errors adjusted for individual clustering reported. P values on parenthesis. *, **, *** is significance at the 10%, 5% and 1% level respectively.

Table A2.3 Lambda Coefficients from IV Models (weekly wage)

Each Lambda value is from a different model of wage growth.

Years Since Move	Lambda Coefficient	
	Males	Females
0-1	0.0400 (0.488)	-0.0115 (0.865)
1-2	-0.0086 (0.897)	0.0110 (0.899)
2-3	-0.1062 (0.207)	-0.0125 (0.891)

Note: P values in parenthesis.

Table A2.4 Lambda Coefficients from IV Models (Hourly Wage)

Each Lambda value is from a different model of wage growth.

Years Since Move	Lambda Coefficient	
	Males	Females
0-1	0.0115 (0.854)	-0.0612 (0.389)
1-2	-0.0095 (0.893)	-0.0585 (0.470)
2-3	-0.0656 (0.444)	-0.0287 (0.735)

Note: P values in parenthesis.

Appendix 3

Observations of Movers in Fixed Effects Models

Table A3.1 Number of Movers for Different Durations since the Move (males)

<i>Dependent Variable</i>	<i>0-1yr</i>	<i>1-2yrs</i>	<i>2-3yrs</i>	<i>3-4+yrs</i>
Weekly Wage (RU)	67	56	46	67 (36)
Weekly Wage (RR)	34	23	13	15 (6)
Hourly Wage (RU)	65	56	45	67 (36)
Hourly Wage (RR)	33	23	13	15 (6)
Life Satisfaction (LF - RU)	81	61	52	73 (39)
Life Satisfaction (LF - RR)	48	32	20	23 (11)
Life Satisfaction (all - RU)	122	92	74	107 (55)
Life Satisfaction (all - RR)	70	45	28	36 (17)

Note: Rural to urban movers (RU) and inter-rural movers (RR). LF is labour force participants only. Number of observed movers for fixed effects models for each duration since the move used in our analysis. For the 3-4+yrs group, number of different individuals in brackets. These numbers refer to movers in our fixed effects models.

Table A3.2 Number of Movers for Different Durations since the Move (females)

<i>Dependent Variable</i>	<i>0-1yr</i>	<i>1-2yrs</i>	<i>2-3yrs</i>	<i>3-4+yrs</i>
Weekly Wage (RU)	49	40	35	52 (23)
Weekly Wage (RR)	13	15	13	19 (9)
Hourly Wage (RU)	48	40	35	52 (23)
Hourly Wage (RR)	13	15	11	18 (9)
Life Satisfaction (LF - RU)	69	51	42	61 (30)
Life Satisfaction (LF - RR)	28	24	17	29 (13)
Life Satisfaction (all - RU)	137	98	78	115 (57)
Life Satisfaction (all - RR)	62	45	31	41 (17)

Note: Refer Table A3.1.

Appendix 4

Formal Explanation for Financial Satisfaction Equation

Financial satisfaction is assumed to be influenced by three factors: (1) one's income, (2) one's level of costs and (3) a set of individual characteristic. These are denoted by I , C and X respectively.

$$FS_{it} = f(I_{it}, C_{it}, X_{it}) \quad (A4.1)$$

It is logically obvious that as income increases so will financial satisfaction ($\partial FS / \partial I > 0$) and that as costs increase financial satisfaction will decrease ($\partial FS / \partial C < 0$). Importantly, migration (M) does not directly influence ones level of financial satisfaction, although it may have an indirect effect through I and C . Assume equation (A4.1) can be estimated as a linear function in the following form.

$$FS = \alpha_0 + \alpha_1 X_{it} + \alpha_2 M_{it} + \alpha_3 I_{it} + \alpha_4 C_{it} + v_{it} \quad (A4.2)$$

v is simply a random error component. Since M does not enter equation (A4.1), the expected value of α_2 is zero. If we were to estimate equation (A4.2) with all X_{it} , I_{it} and C_{it} known, we would not be able to say anything about the financial satisfaction returns to migration.

If we specify equation (4.3) without controlling for income and costs we have:

$$FS = \beta_0 + \beta_1 X_{it} + \beta_2 M_{it} + \varepsilon_{it} \quad (\text{A4.3})$$

Where: $\varepsilon_{it} = \sigma_{it} + \beta_3 I_{it} + \beta_4 C_{it}$

From previous analysis we have reason to believe that $\text{corr}(M_{it}, I_{it}) > 0$ (that is, movers experience an income return to migration). Since $\partial FS / \partial I > 0$, if $\text{corr}(M_{it}, C_{it}) = 0$ (i.e. costs are the same in the rural and urban locality), by estimating equation (A4.3), with no control for income, we will have upwardly biased estimates of β_2 (our migration coefficient). As β_2 has an expected value of zero, whatever value of β_2 we observe we can attribute to the income advantage gained by moving to the urban locality. This is the true return to migration as it was through the act of moving that I was increased. If however, $\text{corr}(M_{it}, C_{it}) \neq 0$, we will not know whether the observed return is due to differing costs or differing income.

If we control for income we have the equation:

$$FS = \lambda_0 + \lambda_1 X_{it} + \lambda_2 M_{it} + \lambda_3 I_{it} + \mu_{it} \quad (\text{A4.4})$$

Where: $\mu_{it} = \eta_{it} + \lambda_4 C_{it}$

If $\text{corr}(M_{it}, C_{it}) \neq 0$, any coefficient we observe for migration (λ_2) will be the result of differing costs. For example, if costs are higher after moving to the urban area, we would expect λ_2 to be negative. Hence by controlling for income we can deduce

whether the return or penalty of migration (if any) is the result of differing costs. If λ_2 is insignificant and β_2 significant this would imply the converse.

Note that in an empirical setting, the precision of our estimates will be bounded by the characteristics we can control for (X). If characteristics that should be included in X are excluded and are correlated with migration (M), this would of course bias our estimates and falsify the inferences made about the migration coefficients estimated in equations (A4.3) and (A4.4). Because costs are unobserved in this analysis, we cannot estimate equation (A4.2) and simply test the hypothesis that $\alpha_2 = 0$ (as is specified by this conceptual framework). Note that if characteristics correlated with migration are due to the act of moving (i.e. not because movers differ from non-movers in some unobserved way) we will still be measuring a meaningful return to migration, although we will be unsure for what reason movers satisfaction has changed.

Appendix 5

Table A5.1 Life Satisfaction Full Regression (individual fixed effects)

Dependent Variable is log of Overall Life satisfaction

Variables	Males		Females	
	Coefficient	P value	Coefficient	P Value
Socio-econ. 1-3	0.0004	0.987	-0.0090	0.701
Socio-econ. 4-6	0.0399	0.181	-0.0374	0.132
Age	0.0266**	0.028	-0.0520*	0.060
Age ²	0.0001	0.148	0.0001	0.111
Long term health cond.	-0.0085	0.298	-0.0164*	0.052
Non-labour force	-0.0316	0.114	-0.0039	0.888
Unemployed	-0.0194	0.532	-0.0206	0.297
Manager	0.0175	0.344	-0.0315*	0.072
Professional	0.0285	0.153	-0.0022	0.916
Technician and trades	0.0244	0.122	0.0071	0.793
Community and personal	0.0567	0.260	-0.0146	0.542
Clerical and admin.	0.0136	0.562	-0.0159	0.405
Sales workers	0.0432	0.159	-0.0117	0.550
Machinery operators/drivers	0.0080	0.690	-0.0276	0.243
Couple with child <15	0.1149***	0.007	0.0803	0.260
Couple with dependent student	0.0951**	0.029	0.0449	0.518
Couple with independent child	0.1112**	0.012	0.0787	0.241
Couple without child	0.1431***	0.001	0.1009	0.116
Lone parent (child <15)	0.0488	0.383	-0.0464	0.591
Lone parent with dependent student	0.0536	0.205	-0.0400	0.707
Lone parent with independent child	-0.0368	0.593	0.0481	0.594
Non-dependent child	0.0301	0.571	0.0557	0.441
Other family member	-0.0128	0.872	0.0764	0.263
Lone persons	0.0129	0.756	0.0536	0.382
Years at current address	0.0004	0.856	0.0030	0.138
Years at current address ²	-0.00004	0.435	-0.0001**	0.028
Home Owner	0.0254	0.169	0.0016	0.931
Rent-buy Scheme	-0.0275	0.513	0.0223	0.535
Live rent free	0.0652***	0.006	-0.0183	0.412
Log household income	0.0152***	0.010	0.0141	0.136
Household income ≤0	0.1725**	0.012	0.1316	0.196
<i>Life events (0-6 months ago)</i>				
Birth/adoption of child	0.0444*	0.057	0.0306	0.191
Friends death	0.0069	0.482	-0.0066	0.556
Close Relatives Death	0.0074	0.452	0.0099	0.314

Death of child or spouse	-0.1172	0.258	0.0338	0.580
Major finance improvement	0.0109	0.465	0.0404**	0.016
Major finance worsening	-0.0707**	0.031	-0.0256	0.332
Fired or made redundant	0.0301	0.234	-0.0279	0.516
Injury/illness to relative/family	0.0037	0.694	-0.0061	0.457
Injury/illness to self	-0.0072	0.615	-0.0203	0.249
Close family in jail	0.0128	0.754	0.0084	0.888
Got married	0.0126	0.717	-0.0026	0.933
Pregnant	-0.0449	0.142	0.0386**	0.028
Reconciled with spouse	-0.1760	0.114	0.0032	0.947
Retired	0.0146	0.530	0.0247	0.337
Separated from spouse	-0.0420	0.312	0.0572	0.253
<i>Life events (7-12 months ago)</i>				
Birth/adoption of child	0.0071	0.783	-0.0292	0.343
Friends death	-0.0029	0.829	0.0015	0.915
Close Relatives Death	-0.0029	0.815	0.0024	0.857
Death of child or spouse	0.0063	0.892	-0.0577	0.285
Major finance improvement	0.0029	0.893	0.0322*	0.054
Major finance worsening	-0.0374	0.248	-0.1321**	0.028
Fired or made redundant	-0.0047	0.885	0.1104*	0.052
Injury/illness to relative/family	-0.0111	0.314	-0.0028	0.799
Injury/illness to self	-0.0101	0.468	-0.0423	0.145
Close family in jail	0.0235	0.703	0.0900	0.102
Got married	-0.0196	0.410	-0.0157	0.580
Pregnant	0.0162	0.452	0.0242	0.243
Reconciled with spouse	-0.0884	0.150	-0.0584	0.439
Retired	-0.0523**	0.024	0.0233	0.376
Separated from spouse	0.0334	0.390	0.0184	0.720
2002	-0.0292**	0.025	0.0354	0.173
2003	-0.0692***	0.001	0.0841*	0.088
2004	-0.0972***	0.000	0.1301*	0.077
2005	-0.1367***	0.000	0.1468	0.133
2006	-0.1765***	0.000	0.1889	0.121
2007	-0.2077***	0.000	0.2184	0.133
n	5591		5657	
f	8.56***	0.00	262.75***	0.000

Note: Robust standard errors adjusted for individual clustering reported. P values in parenthesis. *, **, *** is significance at the 10%, 5% and 1% level respectively. The omitted category for occupation is labourers, for family relationship is unrelated to all household members, for home situation is renters and for year is 2001. Also included in the models were state and territory dummies.