THE IMPACT OF RURAL TO URBAN MIGRATION ON WELLBEING IN AUSTRALIA

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ABSTRACT: In this paper the wellbeing outcomes of rural to urban movers in Australia are studied. This is done using regression techniques to control for observable and unobservable factors that may influence outcomes. Data from the Households, Income and Labour Dynamics in Australia survey is used. It is found that males do not experience any change in wellbeing due to moving, while females experience a 7 per cent increase after 2-3 years. Implications of both economic and psychological theories are discussed in relation to the likely effect of moving upon wellbeing. It is argued that the findings here justify further research into rural wellbeing with a focus on gender specific outcomes.

1. INTRODUCTION

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 and Sutcliff 2006).[3] The rural problem of pervasive out-migration (particularly of young people) has been partially attributed to these inequalities (Gibson and Argent 2008). In the case of young people, structural factors including limited educational and employment opportunities have dominated explanation of this trend (Geldens 2007; Eacott and 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; Eacott and Sonn 2006).

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[1] The author is from Personal and Retirement Income Division, the Australian Treasury. This article has been adapted from a thesis submitted in partial fulfilment of the requirements for the award of the degree Bachelor of Commerce (Hons) at the University of Wollongong. That thesis was supervised by Dr Oleg Yerohkin and Dr Martin O'Brien. The views expressed in this article are those of the author and not necessarily those of the Australian Treasury.

[2] This paper was accepted for publication in 2010. Through no fault of the author, this issue of the journal did not appear until June 2012. The author would like to draw the reader's attention to two papers that have appeared since this paper was accepted; these papers have adopteded a similar method to that used in this paper to analyse internal migration in the United Kingdom (Nowok *et al*. 2011) and migration from Eastern to Western Germany (Melzer 2011).

[3] 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 and Stimson 2005).

The migration trend has been apparent for many years with the rate of net migration to remote areas equal to -6.2 per cent between 1991 and 1996 and -7.6 per cent between 1996 and 2001 (Garnett and Lewis 2007). If inland areas are included in the classification of 'rural,' the trend is still apparent although less severe, with net migration figures of 1.9 and 2.4 per cent for the periods 1991 to 1996 and 1996 to 2001 respectively. More than half of the migrants from inland and remote Australia have migrated to capital cities and other metropolitan areas with populations of more than 100,000 people. Australian Bureau of Statistics (ABS) (2003) census data reaffirms this, showing that country Australia had a net migration loss of -91,487 people, at a rate of -226 per 1,000 of the usual resident population in 2001, between 1996 and 2001.[4]

An important factor for policy makers concerned about maximising the overall wellbeing of rural populations is that while many of those who move may benefit personally, those who do not move may be negatively affected. As stated by the ABS (2003, p. 22):

> *Rural areas that young people are moving away from usually experience associated declines in population and increasingly older age profiles. In some areas, these population changes also coincide with a decline in key industries and the withdrawal of services, both public (e.g. schools and hospitals) and private (e.g. banking and retail). In turn, such changes may make living in rural areas less attractive to young people, and further impact upon on the wellbeing and sustainability of the remaining community.*

The main aim of this paper is not to analyse the impact of outmigration upon those who are left behind; this is left for future research. Rather the returns to subjective wellbeing for those people who move will be estimated.[5] This is done using data from the Household Income and Labour Dynamics in Australia (HILDA) survey.[6] As the impact of a person's migration from a rural to an urban locality upon wellbeing may not be contemporaneous, a dynamic model is estimated to examine the time path of changes to the wellbeing for movers.

The use of subjective wellbeing data by economists has significantly increased in recent times and Australia has not been isolated from this trend. For a review of the literature using the life satisfaction variable used as the dependent variable in this study, see Wooden and Watson (2007). For rural Australia, the

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[4] Unfortunately there is no more recent release by the ABS with numbers and rates from broad rural areas; however in ABS (2009a, pp. 44-45) it is made clear that inland and remote Australia continued to experience significant net migration losses between 2001 and 2006.

[5] The terms 'wellbeing,' 'utility' and 'life satisfaction' are used synonymously in this paper.

[6] 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.

wellbeing impact of drought has been estimated using such data (Carrol, Frijters and Shields 2009). Given the growing acceptance among economists that this data is indeed meaningful, it seems appropriate that subjective wellbeing be considered in the context of rural to urban migration.

The results of this study may be useful for people concerned about rural population wellbeing and may promote further investigation by policy makers in the area. For example, if movers are observed to have higher wellbeing compared to if they had stayed, this might suggest a need for increased involvement in areas of rural wellbeing. This is particularly true if outmigration leads to negative externalities upon those who are left behind.

This paper also advances the literature on rural to urban migration by using regression techniques to control for both observable and unobservable bias when estimating the returns to wellbeing in Australia. In the broader field of internal migration studies, it is one of the first papers internationally to meaningfully account for unobserved heterogeneity and to consider the time path of returns to wellbeing.

The paper is organised as follows. Section 2 is a review of the literature on rural to urban migration. Data constructs are discussed in section 3. In section 4 the fixed effects model used in this paper is discussed and estimated. Section 5 provides a detailed discussion of the results in this paper and of various factors that may influence results of similar studies. Section 6 concludes the paper.

2. LITERATURE

2.1 Migration theory

Todaro (1969) and Harris and Todaro (1970) have developed theoretical models of the migration decision for rural to urban movers in developing countries based upon employment uncertainty and high urban wage returns. More general models of internal migration have emphasised the role of migration as an equilibrating mechanism for regional amenity and wage disparities (Graves and Linneman 1979; Haurin 1980; Roback 1982; Hoehn, Berger and Blomquist 1987). Assuming a homogenous population, if utility derived from any region exceeds that of other regions, immigration will occur, and those who move will have higher utility in the short term. This immigration is expected to increase labour supply, thereby lowering wages and increasing housing costs. In the long run equilibrium, derived utility should be equal in all regions and no migration should exist.

A simpler approach to migration, considering the decision from the micro level perspective, is that a move will occur if the future discounted present value from moving exceeds that of staying (accounting for all explicit and implicit moving costs). This implies that post move utility should be higher, but says nothing about wage rates. Despite this, economists have been predominantly concerned with measuring the wage outcomes of movers. There may be several reasons for this, such as the lack of data reflecting wellbeing, a notion that wages are an accurate reflection of utility and concerns over the reliability of data attempting to capture wellbeing.

2.2 The wellbeing of movers

The empirical literature on the impact of migration upon subjective measures of wellbeing in developed countries is limited. The literature on the outcomes of rural to urban movers is particularly scarce. For developing nations, De Jong, Chamratrithirong 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. In contrast to theory, both studies found some evidence of movers experiencing decreased wellbeing.

In Australia, Best, Cummings 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. Hillman and Rotham (2007) looked at the subjective responses on career and general life satisfaction between young Australian metropolitan leavers, stayers and returners (both male and female). They also found no statistically significant difference between the groups, indicating no wellbeing return to migration.

Regression techniques have been used to assess the outcomes of internal migration in the U.S.A, although not specifically for rural to urban migration (Martin and Lichter 1983; Willits, Bealer and Crider 1978). These studies did not find any difference in subjective wellbeing between movers and stayers.

Not all studies have used formal statistical methods to determine whether moving acts to increase wellbeing. Some studies have used direct responses to specific questions asking the respondent whether or not they are better off since moving. In contrast to studies using statistical techniques to compare wellbeing at one point in time to another, these retrospective studies have been more complimentary to the utility maximising hypothesis. For example, using survey data for the five Nordic countries, Lundholm and Malmburg (2006) found that 83 per cent of respondents indicated an increase in overall life satisfaction since moving, with respondents surveyed within two years of migration. Stimson and Minnery (1998) found that of a sample of long distance in migrants to the Gold Coast (Queensland), 87 per cent indicated they were equally as happy, or happier, than before migration.

Reflective responses are not used in this study and it is arguable that such data are highly vulnerable to various biases. In addition to responding person biases and problems related to survey designs (such as sampling methods), the fact that the response is reflective creates difficulties due to psychological factors that prevent peoples' ability to accurately assess their previous state of wellbeing (Stone, Shiffman and DeVries 1999). Easterlin (2001) also demonstrates how evolving material aspirations may distort peoples' view of their wellbeing in the past.

Using direct question responses, there has been stronger evidence of increased wellbeing due to rural to urban migration. Surveying welfare recipients who had recently moved from either non-metropolitan to metropolitan regions or in the reverse direction in two Australian states (New South Wales and South Australia), Burnley *et al*. (2007) found that 56 per cent of metropolitan bound

movers thought they were better off (20 per cent worse off) after the move while 72 per cent of non-metropolitan bound movers thought they were better off. The majority of metropolitan bound movers also indicated being more satisfied with their work opportunities (64 per cent).

The current study aims to advance the literature on subjective returns to wellbeing. This will be done by: (1) using regression techniques to control for both observable and unobservable factors biasing subjective responses; (2) examining the returns to moving in discrete intervals rather than simply comparing movers to non-movers irrespective of how long ago the move occurred; and (3) using a general population sample rather than a specific demographic (such as only young people).

3. DATA

For the purpose of measuring returns to migration, longitudinal data are 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 temporally 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 paper. The survey began in 2001 with a large national probability sample of Australian households comprising of 19,914 people. This study uses the first seven waves of data (2001-2007). People who join responding households (for example through birth or marriage) join the sample in subsequent waves.

There is considerable value in the use of HILDA. By design it aims to represent the national population, hence necessary observations of rural Australians 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 can 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 wellbeing. Whereas previous Australian research (Hillman and Rotham 2007) has used data consisting only of youths, use of HILDA enables a broader perspective as respondents represent the general population.[7]

3.1 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 Australian standard geographical classification major statistical region structure (MSR), the remoteness structure based on the Accessibility/remoteness index of Australia (ARIA) or the section of state (SOS)

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[7] Hillman and Rotham (2007) used a cross section from the Longitudinal Survey of Australian Youth.

structure based on population size. The MSR classifies regions as 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, unless an appreciably broad classification of rural is accepted.

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 per cent of the population living in major cities (ABS 2009b). As the HILDA survey is representative of the population, only a relatively small number of people reside in remote and very remote areas. If we comply with the classification employed by Hillman and Rotham (2007) we can use the ARIA 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 distinguish 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 ARIA and SOS classification 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.

The SOS structure does not distinguish between urban areas on the fringe of major cities or those which are spatially isolated (ABS 2001). This is certainly a limitation worth noting; however it could well be that the labour market conditions and community life of an isolated community with a relatively large number of residents are in many cases 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 (Australian Institute of Health and Welfare 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 study. Table 1 shows the population distribution of areas classified using the SOS. Populations of less than 1000 people (bounded localities and rural balance) are defined as rural.

Table 1. Section of state structure

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

3.2 Movers

Some areas which are classified as rural under the SOS structure are in fact relatively close to areas classified as urban. This is apparent when examining the number and distance of moves of rural to urban movers between 2001 and 2007 in Table 2. People under the age of 18 years and those who are full time students are excluded from the sample (this restriction is also imposed on stayers). The migratory pattern of these groups is likely to be outside the realm of current theory (as they are likely to be driven by parental and educational opportunity considerations). Approximately 37.7 per cent 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 and communities.

Table 2. Number and distance of moves (Waves 1-7 of HILDA)

Distance	1-9km			10-19km			≥20km			Total		
Gender	M	F	T	M	F	T	M	F	T	M	F	T
No. 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
No. of movers 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

Note: M = Male; F = Female; T = Total.

As revealed in Table 2, the sample size of movers is not very large. Given the relatively small number of urban movers, it is not feasible simply to put a large restriction on distance moved, although this would ensure moves were associated with a change in labour market and community. Furthermore, the use of an

unbalanced panel is necessary, although due to the statistical specifications used in the paper only those individuals observed in more than one wave make a meaningful contribution. Mitchell (2008) restricted moves to be ≥ 30km when using HILDA data to examine the wage outcomes of moving. As this study is measuring the returns to rural to urban movers, not the general population, the number of observed movers is considerably less, hence a slightly smaller restriction of ≥ 20kms 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.

Two hundred and eighty three moves are of valid distance. Ten of these movers are dropped due to experiencing multiple rural to urban moves in which not all were ≥20km, making their returns and migratory behaviour difficult to interpret.

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

One final point 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 approximately annually, although some are interviewed at a later than normal date (see Wooden and Watson 2007 for details). As migratory status is based 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.

4. EMPIRICAL STRATEGY

Because males and females may have unique experiences due to migration, they are considered separately in this paper. People who make rural to rural moves are also separated, however the sample size for this group is too small for meaningful analysis except perhaps in the period immediately after the move.

The basic objective is to measure the level of self-reported life satisfaction, the wellbeing variable, in each year following a move and determine whether that level differs from the level that would have been experienced had no move occurred. To do this the panel aspect of the data is exploited to estimate a dynamic fixed effects model with different years since the move being the coefficients of interest. It is assumed that had no move occurred the individual would have realised the average level of wellbeing in the rural sector (that of 'stayers'), *ceteris paribus*.

We begin with Equation 1 where the dependent variable (ln W) is the log of self-reported life satisfaction (wellbeing). Although this variable is categorical and constrained within the bounds of 0-10, it is treated as continuous, and therefore cardinality is assumed, in this paper. Although this may induce some bias, it reduces computational and interpretive complexity, especially in the

context of a fixed effects specification. Furthermore, the distinction between cardinality and ordinality has been relatively unimportant in previous empirical studies (Kristoffersen 2010).

$$\ln W = \beta_0 X_{it}^{'} + \beta_1 m_{i\gamma t}^{U} + \beta_2 m_{i\gamma t}^{R} + v_i + \delta_t + \mu_{it} \tag{1}$$

$X_{it}^{'}$ is a vector of observable characteristics of person i in time t. $m_{i\gamma t}^{U}$ is a dummy variable equal to one if the person is a rural to urban mover with γt indicating the time since the move. $m_{i\gamma t}^{R}$ is also a dummy variable with γt indicating the time since the move but for rural to rural movers. v_i is a time invariant unobserved effect that may bias the results if ignored. δ_t reflects the macroeconomic or time period factors affecting all people equally and μ_{it} is the random error term.

To account for the unobserved time invariant heterogeneity the data can be 'de-meaned' in the form of estimable Equation 2. Each variable is transformed into its deviation from its mean value during the period 2001 to 2007.

$$\ln W_{it} - \ln \overline{W}_i = \rho_0 (X_{it}^{'} - \overline{X}_i^{'}) + \rho_{\gamma 1} (m_{i\gamma t}^{U} - \overline{m}_i^{U}) + \rho_{\gamma 2} (m_{i\gamma t}^{R} - \overline{m}_i^{R})$$
$$+ (\delta_t - \overline{\delta}) + (\mu_{it} - \overline{\mu}_i) \tag{2}$$

Note that due to the transformation v_i has dropped out of the equation. The importance of this is discussed in the following section. Equation 2 represents the model to be estimated.

4.1 Measurement error and unobserved heterogeneity

The validity of life satisfaction data is contested 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 and Stutzer 2002; Clark, Frijters and 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.

In this study, bias introduced by individual specific time invariant heterogeneity (v_i) is controlled for through a fixed effects specification. This is important when using subjective measures of wellbeing as a dependent variable to account for individual personalities (perhaps those who are more predisposed to being happy/unhappy are also more likely to migrate) 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). This specification makes inter-personal

comparisons more meaningful. Unfortunately, if wellbeing is measured with error, attenuation bias will be more pronounced with a fixed effects specification and there is a risk of incorrectly finding no relationship between migration and wellbeing.

4.2 Panel and variables

Because of the small number of moves in the sample and the fact that not all movers are present in all waves, it is necessary to use an unbalanced panel for meaningful analysis. Movers are coded in such a way that we are able to analyse their wellbeing in the two years before moving and up to seven years after moving. As the number of people observed making a move 3-4 or more years ago is relatively small, they are amalgamated into a single category.

Included in X'_{it} are a rich set of controls for a number of factors that may be correlated with wellbeing and/or migration. Included are controls for area socioeconomic status, family relationships, disability status, labour force status, occupation, age, age squared, state dummies, year dummies (for δ_t), tenure at current address, tenure at current address squared, dwelling arrangement and household disposable income.[8] The dependent variable is the respondents answer to the question "all things considered, how satisfied are you with your life?" with ten representing complete satisfaction and zero complete dissatisfaction. Respondents can only choose whole numbers between zero and ten.

In addition to the standard controls listed in the previous paragraph, 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 wellbeing and should therefore be controlled for in formal analysis to avoid measurement error. Dummy variables are included 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 wellbeing (rather than having an ongoing impact) we would expect the impact to diminish over time. This is consistent with the psychologists' theory of 'hedonic adaptation' (see Frederick and Lowenstein 1999 for an overview). There is no clear theoretical foundation for how long these events will impact upon individual wellbeing. As such, it is appropriate to use multiple dummy variables for different durations since the event. In this analysis different dummies are used 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

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[8] It is arguable that income should not be controlled for to allow for the possibility that wellbeing is increased by people moving and increasing their earnings. The conclusions were unaffected by the inclusion or exclusion of income however, and the impact on the coefficients was negligible.

coefficients will generally be larger and more significant the more recently the event occurred. It would be ideal to include dummy variables 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.

The sample of movers and stayers was restricted to only those people with valid responses to all control variables. Furthermore, twelve people (all stayers) were dropped because they indicated a zero score for life satisfaction. Such scores may be considered outliers and additionally, their exclusion allows the log of life satisfaction to be used without transforming the data. This means that migration coefficients can be interpreted as the percentage change in life satisfaction from moving (the semi elasticity). Note that the conclusions were qualitatively unchanged when the absolute value of life satisfaction was used. The number of movers observed for the durations after the move is shown in Tables 3 and 4.

Table 3. Number of male movers in analysis

Mover Type	0-1yr	1-2yrs	2-3yrs	3-4+yrs
Rural to urban	**122**	**92**	**74**	**107 (55)**
Rural to rural	70	45	28	36 (17)

Note: Number of observed movers for fixed effects models for each duration since the move used in the analysis. For the 3-4+yrs group, number of different individuals is in brackets.

Table 4. Number of female movers in analysis

Mover Type	0-1yr	1-2yrs	2-3yrs	3-4+yrs
Rural to urban	**137**	**98**	**78**	**115 (57)**
Rural to rural	62	45	31	41 (17)

Note: Number of observed movers for fixed effects models for each duration since the move used in the analysis. For the 3-4+yrs group, number of different individuals is in brackets.

4.3 Results

A priori, we should expect to see movers with higher utility after migration, assuming the decision to migrate is utility maximising. Whether these returns are instantaneous, accumulate over time or are transient is not specifically dictated by migration theory. This is because movers are assumed to be forward looking and seek to maximise utility over their lifetime, subject to some personal discount for utility derived in the future.

From the perspective of previous research, the likely outcome is less clear. Even at a general level of internal migration, I am unaware of any study using regression techniques that has found a positive relationship between migration and wellbeing (see Knight and Gunatilaka 2010; Martin and Licther 1983; Willits, Bealer and Crider 1978). It should be noted however that the literature is minimal and many previous studies have suffered by not properly accounting for unobservable heterogeneity and not considering the temporal nature of returns to moving (e.g. somebody who moved one year ago should be considered separately to someone who moved three years ago).

Table 5. Impact of moving on life satisfaction

Variables	**Males**	**Females**
Rural to urban		
-2 - -1 years	**0.0149**	**-0.0156**
	(0.517)	(0.577)
-1 - 0 year	**-0.0067**	**-0.0283**
	(0.820)	(0.308)
0 - 1 year	**-0.0470**	**0.0271**
	(0.219)	(0.319)
1 - 2 years	**-0.0310**	**0.0166**
	(0.368)	(0.625)
2 - 3 years	**-0.0181**	**0.0726****
	(0.604)	(0.044)
3 - 4+ years	**-0.0344**	**0.0607**
	(0.403)	(0.152)
Inter-rural		
-2 - -1 years	**-0.0373**	**-0.0126**
	(0.313)	(0.690)
-1 - 0 year	**-0.0427**	**-0.0388**
	(0.160)	(0.319)
0 - 1 year	**-0.0097**	**0.0121**
	(0.711)	(0.695)
1 - 2 years	**-0.0082**	**0.0104**
	(0.797)	(0.841)
2 - 3 years	**-0.0440**	**-0.0086**
	(0.224)	(0.853)
3 - 4+ years	**-0.0288**	**-0.0345**
	(0.501)	(0.484)
n	5591	5657
f	8.56***	262.75***
	(0.000)	(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.

To begin with, Equation 2 is estimated for males and for females separately. The full results of these models are provided in the Appendix in Table A1. Table 5 only focuses on the main coefficients of interest, the migration coefficients. The results for rural to rural movers are also provided.

Male rural to urban movers are no better or worse off at any stage after moving. This is also true for male rural to rural movers. Furthermore, movers do not experience lower life satisfaction before moving, which we might expect if movers were moving in response to some negative influence in the original locality.

The results for females were more consistent with utility maximisation with a life satisfaction premium of 7 per cent compared to if no move had taken place after 2-3 years (P = 0.044). After 3-4 or more years the premium decreases marginally to 6 per cent and the coefficient becomes insignificant (P = 0.152). However, given that the sample for which this finding is based contains only 57 individuals (115 observations) it is not clear that this 2-3 year peak in life satisfaction is only transitory. No gain in life satisfaction was observed for female rural to rural movers.

5. DISCUSSION

In addition to answering the question, 'are those who move from a rural to urban locality subjectively better off than those who stay, in Australia,' specifying life satisfaction as the dependent variable adds to the literature one of the first microeconomic examples of which the accepted utility maximising framework of migration can be tested. Due to the fact that this study did not find overwhelming support for utility maximisation for males, although did however find support for females, and other studies have failed to find positive returns to movers, a detailed discussion about the possible relationship between migration and utility is justified with consideration of theory and the Australian context.

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 the results. Rather than rely on income level considerations to explain the results, I also consider the broader role of 'hedonic adaptation'. In addition I assess the extent to which the results are consistent with utility maximising theory and by exploiting the time path specification of the model briefly check if 'culture shock' is present in the case of rural to urban migration in Australia.

5.1 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 wellbeing 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). Culture shock theory seems to suggest psychological responses may dominate economic (utility maximising) motivations, at least in the short term.

Rather than fully accept the notions of culture shock theory, which has been more commonly applied to expatriation studies, we can draw from it the principal that movers may require time to adjust to their new locality. The implication here is that wellbeing may increase several years after the move takes place rather than instantaneously. To check this visually, the results from Table 5 were converted into Figures 1 and 2 which show the time path of deviations from life satisfaction from the level of stayers in the two years before and 3-4 or more years after moving for males and females respectively.

For males, there is a slight U shape resemblance with life satisfaction decreasing and subsequently increasing (although never above the level of stayers). However, as already detailed, none of the coefficients were significant. Females do not experience any 'shock' however there is evidence of an adjustment process as it takes 2-3 years for life satisfaction to rise. There is also some visual indication of lower life satisfaction before moving however this was insignificant. The results for rural to rural movers will not be discussed in any detail given they are only likely to be credible for the period immediately before and following the move due to sample size. However, it is worth noting that it did not appear that either female or male rural to rural movers experienced an immediate increase in life satisfaction

5.2 Utility maximising framework

If movers decide to move to maximise lifetime utility the intuitive expectation is that movers will have higher utility than stayers. There are however other possibilities, some of which are beyond the model that has been estimated.

A possibility that is within the model is that movers are escaping some form of negative utility being experienced in the rural locality. For example, a sudden preference for city amenities or a relationship breakdown might have a negative effect on utility if the person decides to stay. In this case a mover may have lower than average utility before moving and average or higher than average utility after moving. By including dummy variables for up to two years before the move I was able to test for this and found no evidence that this is overwhelmingly the case.

There are also possibilities not accounted for by the model. The 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 utility maximising individuals 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 individuals may report lower levels of wellbeing 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 the sample who plan on returning to the rural locality at some stage in their life.
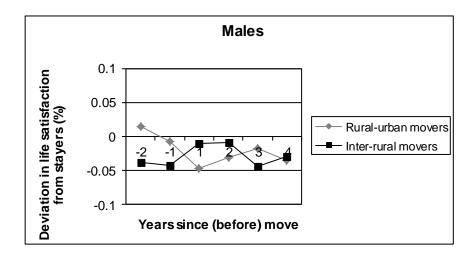
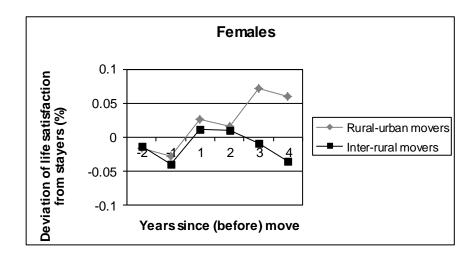**Figure 1.** Time path of life satisfaction for male movers

Figure 2. Time path of life satisfaction for female movers

Many movers may also be influenced by family rather than personal wellbeing (e.g. they may perceive opportunities are greater for their children if they live in an urbanised area, or be moving for the benefit of a spouse). This could even be true for those without children if they perceive the urban area is a superior location to start and raise a family. One final possibility that is virtually impossible to address is the possibility that the level of utility experienced by stayers is not an adequate reflection of the level of utility that would be achieved had the move not occurred. It is impossible to know what level of utility would be achieved if a mover had decided to stay, however the two most obvious assumptions seem to be the level of stayers and the individuals level of utility in the year(s) before moving (this assumes utility would remain constant). These assumptions are both within the model estimated due to the inclusion of dummy variables for up to two years before the move occurs.

5.3 Aspirations and adaptation

Material aspirations were discussed by Easterlin (2001). His argument was motivated by three empirical observations (Easterlin 2001, p. 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; and (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 she will be in say five years, knowing that her income will be higher at the end of this period, she would be likely to respond as being more satisfied as she will base her expected satisfaction on her future income but her current aspirations. Similarly, if she is currently earning more than she was previously she would be likely to respond that she is more satisfied in the present than in the past because she does not account for the fact her 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 may be biased if this holds true when the move results in an increase in disposable income).

Aspirations could partly explain the findings. Many 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 non-labour force participants who make up a significant portion of the sample (27.5 per cent of males and 41.2 per cent of females) as well as those people not moving to access monetary returns. If male movers were largely motivated by monetary incentives, the estimated income coefficients show that it would take a very large increase in income to increase life satisfaction by any substantial amount. For example, a 30 per cent increase in household income is expected to increase life satisfaction by only 0.046 per cent for males. For females, the size of the income coefficient was similar although insignificant at

conventional levels.

A more general explanation, which encapsulates but is not limited to the non-effect of income, is 'hedonic adaptation'. A concept prevalent in the psychology literature, hedonic adaptation contends that wellbeing reverts to a stable point following a shock to one's standard level of wellbeing from any event. This concept has recently been considered by economists modelling lifetime utility/happiness (e.g. Graham and Oswald 2006 and Rayo and Becker 2007). Hedonic adaptation theory argues that people respond to stimuli through a series of processes which reduce the stimuli's impact (Federick and Lowenstein 1999). An event such as an increase in money (positive) or a serious injury (negative) is expected to only affect wellbeing in the short term as over time people adapt to their new conditions and wellbeing 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 wellbeing in the short term as a result of increased amenities or income for example. However, after some period, they may base their wellbeing upon the higher level of favourable conditions they are now accustomed to (i.e. their wellbeing is subject to a moving reference point). The impact of having a moving reference point will mean that activities to increase wellbeing 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 wellbeing (Frederick & Lowenstein 1999). For example, prisoners have been found to be most frustrated in the final days of their sentence (Frederick and Lowenstein 1999).

The extent to which 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 wellbeing 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 the results for males. If adaptation is sufficiently fast, it may be the case that the 0-1 year return coefficient is unable to capture any impact from migration upon utility. This was not the case for females who experienced an increase in life satisfaction after 2-3 years. Although the 3-4 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 2-3 year coefficient does not allow for a conclusion that the return was only transitory with total confidence.

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). This would allow a greater understanding of the role of adaptation in the context of migration. 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.

5.4 Relative rather than absolute wellbeing

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 up with the Joneses.' Shields, Wheatley Price and Wooden (2009) have found that neighbourhood effects do have a statistically significant impact upon self-reported life satisfaction in Australia, although individual characteristics have significantly more explanatory power. Luttmer (2005) found a negative relationship between neighbours' earnings and self-reported happiness in the United States. Therefore it may be the case that 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, in particular males who are perhaps more apt to relative comparisons, Tables 6 and 7 show the average level of area socio-economic status before and immediately 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 in Australia, so it might be idealistic to assume a change in reference group can largely explain the results.

Table 6. Change in area socioeconomic status for male movers

	Year before move	Year after move	Difference
Rural to urban (n =129)	3.41	4.14	0.73** (0.017)
Rural to rural (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 7. Change in area socioeconomic status for female movers

	Year before move	Year after move	Difference
Rural to urban (n =129)	3.37	4.00	0.63** (0.030)
Rural to rural (n =74)	4.06	4.00	-0.06 (0.870)

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.

5.5 Explanation for results

From the preceding discussion it is clear that several factors, such as life-cycle considerations, family considerations, adaptation and relative comparisons, can be used to explain the absence of effect or relationship between migration and wellbeing. However, we only observed no relationship for males.

If males were more likely to base their move on utility maximising considerations outside of the model, or more affected by adaptation and/or relative comparisons than females due to biological reasons, this could explain the results. However, the literature is not advanced enough to advise on whether males have different wellbeing outcomes from migration than females do.

One possible explanation for why women experience increased life satisfaction compared to men draws upon the demographic context of rural Australia. Females are underrepresented in rural Australia, largely because they are overrepresented in migration flows (Argent and 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 (the Bureau of Meteorology 2007 provides a useful description of the climatic situation in Australia during the sample period). Alternatively, it may be that rural females were more able to adapt to urbanised living compared to males.

5.6 Other results

Results for non-migration coefficients will only receive a brief mention because they are not related to the main objectives of this paper. 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.

The relationship between age and life satisfaction was interesting. The typical finding is that satisfaction decreases with age up to a critical point before increasing in later years. This was the relationship observed for rural Australians by Carrol, Frijters and Shields (2009) for both sexes. In this study however, the

typical relationship was observed for females (note that while the coefficients were marginally insignificant, this has occurred elsewhere when fixed effects are applied (e.g. Scutella and Wooden 2005) while a statistically significant positive relationship between age and life satisfaction was observed for males.

Males living rent free and males with negative household income were found to be more satisfied than others. The latter could be a reasonable finding if these people were not struggling financially but simply net borrowers during the financial year. Results from the life event control variables were interesting however readers should not draw too heavily from these results as the number of observations in each category was generally small. Frijters, Johnston and Shields (2011) provide a detailed analysis of the effects of these life event variables on life satisfaction using HILDA, although not specifically for the rural populous. A major worsening in finances affected men in the short term while females experienced much lower life satisfaction only after six months. A major improvement in finances on the other hand saw females more satisfied before and after six months. Males who retired were less satisfied after six months. Perhaps due to the significant mental stresses associated with child birth for females, only males reported higher satisfaction after the birth or adoption of a child.

One very startling result was that men seemed to be becoming 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). The concern is that this finding represents an actual trend in which males in rural Australia are facing reduced levels of wellbeing. Possible explanations include drought and the impact of shrinking populations, although these possibilities are not explored here. This reinforces the suggestion drawn from the migration results that perhaps future research could more thoroughly explore the factors affecting life satisfaction of rural Australians and the current and future pressures upon rural wellbeing with a focus on gender specific outcomes.

6. CONCLUSION

In this paper the impact of rural to urban migration upon wellbeing in Australia was estimated. This adds to the literature by: (1) using regression techniques to control for both observable and unobservable factors biasing subjective responses; (2) by examining the returns to moving in discrete intervals rather than simply comparing movers to non-movers irrespective of how long ago the move occurred; and (3) using a general population sample rather than a specific demographic (such as only young people). Few studies on internal migration have attempted to analyse the impact upon wellbeing, instead focusing on wage returns to moving.

The most significant shortcoming of this study was the relatively small number of observed movers and this should be considered when interpreting its conclusions. Males were not found to benefit from moving, while females did not immediately benefit but experienced a 7% increase in life satisfaction 2-3 years after the move. Rural to rural movers were also included in the analysis,

however the results for this group were not discussed in any detail due to the small sample size of this group. A detailed discussion of the possible factors determining and impacting upon wellbeing due to migration was provided. It is hoped that in the future more researchers will consider the impact upon wellbeing not only for rural to urban movers but for all internal movers. This will help to determine if the different results for females and males are due to gender differences or due to contextual reasons. Although no specific policy prescription is advised, it is argued that the findings here justify further research into rural wellbeing with a focus on gender specific outcomes.

APPENDIX

Table A1. Full results for fixed effects life satisfaction model

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
Age²	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 address²	-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
Life events (0-6 months ago)				
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

Table A1 (Continued). Full results for fixed effects life satisfaction model

Variables	Males		Females	
	Coefficient	P value	Coefficient	P Value
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
Life events (7-12 months ago)				
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.

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