



Final Report

Housing affordability, housing stress and household wellbeing in Australia

authored by
Steven Rowley and Rachel Ong

for the
**Australian Housing and Urban
Research Institute**
Western Australia Research Centre

September 2012

AHURI Final Report No. 192

ISSN: 1834-7223
ISBN: 978-1-922075-09-3



Authors	Rowley, Steven	Curtin University
	Ong, Rachel	Curtin University
Title	Housing affordability, housing stress and household wellbeing in Australia	
ISBN	978-1-922075-09-3	
Format	PDF	
Key words	Housing affordability, housing stress, housing need, household wellbeing	
Editor	Anne Badenhorst	AHURI National Office
Publisher	Australian Housing and Urban Research Institute Melbourne, Australia	
Series	AHURI Final Report, no.192	
ISSN	1834-7223	
Preferred citation	Rowley, S. and Ong, R. (2012) <i>Housing affordability, housing stress and household wellbeing in Australia</i> , AHURI Final Report No.192. Melbourne: Australian Housing and Urban Research Institute.	

ACKNOWLEDGEMENTS

This material was produced with funding from the Australian Government and the Australian states and territory governments. AHURI Limited gratefully acknowledges the financial and other support it has received from these governments, without which this work would not have been possible.

AHURI comprises a network of universities clustered into Research Centres across Australia. Research Centre contributions, both financial and in-kind, have made the completion of this report possible.

We would like to thank Mike Dockery and Simon Colquhoun for their valuable input into the literature review and the members of the AHURI policy panel for the stimulating policy discussion which informed this Final Report. The members of the panel were; Helen Fletcher, Bruce Headey, Roger Wilkins, David Wilson, Gabrielle Hummel, Marque Raymond and Jay Martin.

This report uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) survey. 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 in this report, however, are those of the authors and should not be attributed to either FaHCSIA or MIAESR.

DISCLAIMER

AHURI Limited is an independent, non-political body which has supported this project as part of its programme of research into housing and urban development, which it hopes will be of value to policy-makers, researchers, industry and communities. The opinions in this publication reflect the views of the authors and do not necessarily reflect those of AHURI Limited, its Board or its funding organisations. No responsibility is accepted by AHURI Limited or its Board or its funders for the accuracy or omission of any statement, opinion, advice or information in this publication.

AHURI FINAL REPORT SERIES

AHURI Final Reports is a refereed series presenting the results of original research to a diverse readership of policy-makers, researchers and practitioners.

PEER REVIEW STATEMENT

An objective assessment of all reports published in the AHURI Final Report Series by carefully selected experts in the field ensures that material of the highest quality is published. The AHURI Final Report Series employs a double-blind peer review of the full Final Report – where anonymity is strictly observed between authors and referees.

CONTENTS

LIST OF TABLES	V
LIST OF FIGURES	VII
ACRONYMS	VIII
EXECUTIVE SUMMARY	9
Key findings	10
Why is there disconnect between housing stress and household wellbeing?	12
Improving the measurement of housing stress	13
1 INTRODUCTION	15
1.1 Policy context.....	15
1.2 Unpacking housing affordability	17
1.3 Aims and contributions.....	19
1.4 Report outline	20
2 LITERATURE REVIEW	21
2.1 What is household wellbeing?.....	21
2.2 Defining housing stress and housing affordability.....	23
2.3 Measuring housing affordability.....	25
2.4 The relationship between housing stress and financial stress	26
2.5 The relationship between housing stress and health	29
3 DATA AND METHOD	32
3.1 Data and unit of analysis.....	32
3.2 Variable measurement.....	32
3.2.1 Traditional housing stress measure	32
3.2.2 Wellbeing outcomes.....	34
4 RESULTS	38
4.1 Housing stress: key indicators from the HILDA data	38
4.1.1 Housing stress by income bands	38
4.1.2 Housing stress by tenure	39
4.1.3 Housing stress by region.....	42
4.1.4 Housing stress across the life cycle	44
4.2 The relationship between housing stress and wellbeing.....	45
4.2.1 Financial wellbeing.....	47
4.2.2 Health	52
4.2.3 Neighbourhood quality	54
4.2.4 Summing up.....	58
4.3 Why is there disconnect between the housing stress measure and household wellbeing?	59
4.3.1 An arbitrary benchmark.....	59
4.3.2 Trade-offs	62
4.3.3 Access to housing.....	66
4.3.4 Choice versus constraint.....	67

5	IMPROVING THE MEASUREMENT OF HOUSING STRESS	71
5.1	Differentiating between medium-level and high-level housing stress.....	71
5.2	Duration of housing stress	74
5.3	Identifying choice versus constraint.....	75
5.4	Removing households with high net worth	76
6	HOUSING NEED ANALYSIS AS AN ALTERNATIVE TO HOUSING STRESS	78
7	CONCLUSIONS AND POLICY IMPLICATIONS	82
7.1	Further Research	84
	APPENDIX	85
	REFERENCES	90

LIST OF TABLES

Table 1: Wellbeing variables	36
Table 2: Average housing cost:income ratio and incidence of housing stress, per cent, 2001–10.....	39
Table 3: Percentage of households paying more than 30 per cent of income in housing costs, by income band, 2001–10	39
Table 4: Average housing cost:income ratios, incidence of housing stress and housing and income indicators by housing tenure, per cent, 2001–10.....	40
Table 5: Housing cost estimates for owner purchasers in 2002, 2006 and 2010, by number of years since home was purchased ^a	42
Table 6: Incidence of housing stress based on the 30:40 rule and housing indicators by housing tenure, per cent, 2001–10	43
Table 7: Incidence of housing stress based on the 30:40 rule and housing indicators, by housing tenure, per cent, 2001–10	44
Table 8: Financial stress indicator, by housing stress status based on the 30:40 rule, 2009, per cent by column.....	49
Table 9: Is there a statistical link between housing stress status and financial stress? ^a	50
Table 10: Is there a statistical link between a movement out of housing stress and an improvement in financial wellbeing? ^a	51
Table 11: Mean SF-36 health outcomes, by housing stress status based on the 30:40 rule, 2010, value on a scale of 0–100.....	53
Table 12: Is there a statistical link between housing stress status and health? ^a	53
Table 13: Is there a statistical link between a movement out of housing stress status and an improvement in health? ^a	54
Table 14 Neighbourhood liveability and community participation, by housing stress status based on the 30:40 rule, 2010, per cent by column	55
Table 15: Expenditure and neighbourhood satisfaction	55
Table 16: Neighbourhood SEIFA decile, by housing stress status based on the 30:40 rule, 2010, per cent by column	56
Table 17: Is there a statistical link between housing stress and neighbourhood liveability or community participation? ^a	57
Table 18: Is there a statistical link between housing stress and neighbourhood socio-economic status? ^a	57
Table 19: Is there a statistical link between a movement out of housing stress and an improvement in neighbourhood socio-economic status? ^a	58
Table 20: Number of hours spent travelling to places of paid employment in a typical week, by housing stress status based on the 30:40 rule, 2010.....	63
Table 21: Number of hours spent travelling to places of paid employment in a typical week by new purchasers in 2002, 2006 and 2010.....	64
Table 22: Distribution of public housing stock across SEIFA deciles, 2010	64

Table 23: Quality of location and housing of public housing tenants compared to other housing tenures, 2002 ^a , per cent.....	65
Table 24: Young people and home ownership, 2004.....	67
Table 25: Percentage of independent adults who only left their parental home at 25 years old or later, 2010	67
Table 26: Is there a statistical link between a movement into housing stress and a move into a neighbourhood with higher socio-economic status? ^a	68
Table 27: Is there a statistical link between a movement into housing stress and a move into a neighbourhood with lower socio-economic status? ^a	69
Table 28: Incidence of financial stress, by housing stress status under alternative binary rules, per cent, 2009.....	73
Table 29: Wellbeing outcomes, by duration of housing stress status, 2009.....	75
Table 30: Financial stress, by housing stress status under alternative rules that take into account housing cost burden, income and net worth, 2009	77
Table 31: Summary of the Scottish housing needs framework (adapted from Newhaven 2010).....	79
Table 32: Stages of a housing needs study with sources of data (adapted from DCLG 2007)	80
Table 33: Future research suggestions	84
Table A1: Indicators of cash flow and financial deprivation problems, by income and housing tenure, region and age band, 2001 and 2009	85
Table A2: Indicators of debt reliance and satisfaction with housing-related aspects of life, by income and housing tenure, region and age band, 2001 and 2010.....	86
Table A3: Definitions and measurement of explanatory variables in the regression models	87

LIST OF FIGURES

Figure 1: First home buyer activity (per cent of all dwellings financed)	41
Figure 2: Perceived prosperity given current needs and financial responsibility, by housing stress status based on the 30:40 rule, 2010, per cent.....	48
Figure 3: Self-reported health outcomes, by housing stress status based on the 30:40 rule, 2010, per cent	52
Figure 4: Percentage of households in each net housing cost:income ratio band, by housing tenure, 2010	60
Figure 5: Propensity of a major life event occurring among households that move into housing stress versus households that remain outside housing stress, 2009–1070	

ACRONYMS

ABS	Australian Bureau of Statistics
AHURI	Australian Housing and Urban Research Institute Limited
CPI	Consumer Price Index
CRA	Commonwealth Rent Assistance
DCLG	Department of Communities and Local Government (UK)
FaHCSIA	Department of Families, Housing, Community Services and Indigenous Affairs
FHOG	First Home Owners Grant
FTB(A)	Family Tax Benefit Part A
HES	Household Expenditure Survey
HILDA	Household, Income and Labour Dynamics in Australia
HPI	House Price Index
MIAESR	Melbourne Institute of Applied Economic and Social Research
NATSEM	National Centre for Social and Economic Modelling
NRAS	National Rental Affordability Scheme
OECD	Organisation for Economic Co-Operation and Development
SEIFA	Socio-Economic Indexes for Areas
SPRC	Social Policy Research Centre

EXECUTIVE SUMMARY

The role of housing as a social policy tool has risen in prominence and recent research has highlighted how housing policy needs to reflect both shelter and non-shelter outcomes such as workforce participation, access to employment opportunities and education attainment (e.g. Burke et al. 2007; Dockery et al. 2008). Smith (2009) identified dimensions of wellbeing such as social and economic participation, health and financial stability, as becoming increasingly critical measures against which the success of housing policy interventions will be gauged by government in the coming decades.

There currently exists a critical gap between the increasing push for housing to play a social policy role, the measurement of housing affordability and its impact on household wellbeing. Household wellbeing is a multidimensional concept that spans both the financial and non-financial domains, and the wellbeing impacts of housing stress rely significantly on the 'experience' of affordability, which differs across socio-demographic groups and even varies between members of the same household that may experience this 'stress' to different degrees.

This report argues that traditional indicators of housing affordability do not address the wider outcomes of housing affordability but simply the financial burden of housing costs. The most widely used binary indicator of housing stress is the 30:40 rule, where a household is defined as being in housing stress if its housing costs exceed 30 per cent of income and the household is in the bottom 40 per cent of the income distribution (Yates 2007). The measure splits the population into those in housing stress and those not in housing stress. However, as we demonstrate in this report, there are households that fall within the traditional measure of stress that consider their levels of wellbeing acceptable. Additionally there are households that fall outside the measure that are suffering considerable economic and social hardships (Burke et al. 2007).

The problem with measuring housing affordability is the individual nature of the housing consumption choice and the extent of variations in the outcomes as a consequence of that choice. This will include financial and non-financial outcomes. For example, a household may take on a high housing cost burden in order to consume housing in a location which minimises travel to work costs or is within close proximity to that household's existing community. The consumption choice may place an unreasonable burden on that household's finances but they are securing other benefits from the decision. Conversely, a household may take on a housing cost burden that does not place them within a situation of financial stress but they may have had to make a compromise in terms of location or housing quality. The consequences of their decision may not have major financial implications but could impose other costs on that household to the detriment of overall household wellbeing. The main argument throughout this report is that housing affordability measured through housing stress provides only a narrow measure of the outcomes of a housing decision on household wellbeing, i.e. financial, and this measure does not provide an assessment of the wider implications of housing consumption we consider vital if housing policy is designed to improve household wellbeing.

We argue that housing stress underestimates the housing affordability issues in Australia by concentrating only on the financial burden faced through direct housing consumption. In reality, housing affordability encompasses deposit and payment constraints preventing household formation; quality and location trade-offs and the overall costs of housing consumption including utility bills, for example. Policy-makers must take all of these factors into account when discussing housing affordability.

This report shows how the proportion of households in housing stress has remained remarkably stable since 2001, although the number of households in stress has risen in line with overall household growth. This should not be taken to mean that there has been no decline in housing affordability but simply there has been no decline in the proportion of households in housing stress; the distinction is important and the focus of this research.

This Final Report addresses four main research questions through the analysis of the Household, Income and Labour Dynamics in Australia (HILDA) Survey for the period 2001–10:

- How does the traditional measure of a household's level of housing stress compare with that household's wellbeing outcomes?
- Are there demographic, housing tenure and regional variations in housing stress and if so, do these differ from the regional, demographic and housing tenure variations in wellbeing among households in the same income band?
- How does the traditional measure of housing stress compare with the quality and suitability of a household's housing and neighbourhood conditions?
- Do households moving out of housing stress exhibit wellbeing improvements? Do those moving into housing stress experience any deterioration in wellbeing? What events move households into stress, e.g. choice or hardship?

Key findings

We analysed HILDA data to determine the proportion of all households in housing stress. The results show how the proportion of households in stress under the 30:40 rule remained stable from 2001–10 and currently sits at 7 per cent of ALL households. By definition, the concept of housing stress is only relevant to owner purchasers and private renters, because outright owners, public housing tenants and many in employer subsidised housing, pay less than 30 per cent of their income on mortgage or rental costs. The data shows owner purchasers and private renters on moderate to higher incomes paying more and more in housing costs but cost burdens have remained relatively unchanged for those in the bottom 40 per cent of income earners. On the surface, this would indicate low–moderate-income households have seen little decline in housing affordability over the study period, provided housing stress is used as the sole measure of affordability. However, it tells us little about those potential households unable to form or those that have made quality or location trade-offs to access housing. With three figure growth in house prices and average mortgage loan commitments doubling over the study period, the housing stress figure does not seem to provide a reliable indication of housing affordability outcomes.

Given the findings of the housing stress analysis, we analysed the relationship between housing stress and household wellbeing indicators to try and determine whether housing stress is a reliable measure of the positive and negative benefits of housing consumption decisions. We started with the relationship between housing stress and financial wellbeing using a range of subjective and quasi-objective measures to assess the link. Households in housing stress are more likely to report that they are 'just getting along', 'poor' or 'very poor'. On the other hand, households not in housing stress are more likely to perceive themselves as being 'comfortable' or 'prosperous'. However, if housing stress measures a negative financial position we wouldn't expect 45 per cent of households in housing stress to regard themselves as financially 'reasonably comfortable' or 'very comfortable'. This supports the proposition that a significant proportion of low–moderate-income households can sustain housing cost burdens exceeding 30 per cent of their income and still be in a

financially sustainable position. However, 'just getting along' was the most frequent rating of financial prosperity in housing stress households, compared to 'reasonably comfortable' for non-stressed households. These findings echo those of Hulse et al. (2010) who stated that housing stress is less of an indicator of financial stress and more of an indicator of the potential risks of falling into hardship.

The quasi-objective measures within the HILDA data showed how households in housing stress are more likely to have a cash flow problem. Forty per cent of those in housing stress have at least one cash flow problem indicator; the figure is only sixteen per cent for non-stressed households. When it comes to financial deprivation, 23 per cent of housing stress households reported at least one financial deprivation indicator, three times the proportion of non-stressed households. Regression analysis described how housing stress increases the probability of experiencing at least one cash flow problem by just 12 per cent; similarly, the probability of suffering from at least one financial deprivation problem is higher by only 11 per cent. There is a weak link between housing stress and financial stress when based on the frequency of occurrences of both types of stress, but the majority of those in housing stress did not report a financial stress indicator in 2009.

On the basis of our findings it would be erroneous to assume that traditional housing stress measures such as the 30:40 rule would be broadly indicative of being in financial stress. Even if we were to restrict attention to a household's ability to meet housing-related costs on time, the housing stress measure can only claim to account for a 22 per cent rise in a household's inability to meet their mortgage or rent payments on time. Furthermore, a striking finding is that there are no statistically significant relationships between a movement out of housing stress and an improvement in financial wellbeing. This again casts doubts on the use of the 30:40 rule in making judgments about the financial position of a household. If a household's financial wellbeing is not improved by a movement out of housing stress, this suggests that the measure does not accurately reflect their financial position.

We move on to the results of our analysis of the relationship between housing stress and health. We report a very weak link between housing stress and subjective self-assessed health. However, when duration in housing stress is added as a variable, the health implications of stress duration are significant. There are clear health implications associated with longer durations in stress with large reductions in health wellbeing when households have been in stress for three years or more. This evidence would suggest there is merit focusing the housing stress measure on households that have been in stress for three years or more to provide a better indication of the long-term impact of housing cost burdens. If the numbers in long-term stress are growing over time, there are serious wellbeing implications that would require a policy intervention. Modifying the measure to include only households that have spent three or more years in stress not only shows clear links between stress and health outcomes, but also households that have been in housing stress for longer than a single year are more likely to have cash flow or financial deprivation problems. Households may drop in and out of stress regularly due to interest rate payments, rent increases or income changes, but a situation of temporary stress may not have serious wellbeing implications for a household and may be taken on by choice.

Uniquely, this report examined the relationship between housing stress and neighbourhood quality outcomes. The HILDA survey asked respondents their views on a number of neighbourhood liveability and community participation events. There were some minor differences between the neighbourhood outcomes of households within and outside housing stress. Those in stress were more likely to report noise

issues and appear to experience lower levels of community participation, but otherwise there are few distinctions between the two groups. Regression results indicated no statistically significant relationships between housing stress status and neighbourhood quality, the exception being a weak link detected between housing stress and people in the community frequently being hostile to one another. A falling proportion of households are highly satisfied with their house and neighbourhood which could indicate households are making quality trade-offs to keep housing costs low.

We identified a clear association between housing stress status and the socio-economic profile of neighbourhoods as represented by the Socio-Economic Indexes for Areas (SEIFA) deciles. Households in housing stress are more likely to be located in areas of lower socio-economic status lacking economic resources, education and occupation amenities. Households in housing stress are clustered in the disadvantaged areas, perhaps forced into areas lacking the quality services and amenities desired by households. In this respect there is a link between housing costs and household wellbeing. However, research needs to dig deeper to uncover the implications of such clustering. However, once again there are problems associated with housing stress as a proxy for affordability outcomes. Low-income households are still able to consume housing in areas regarded as the most desirable, i.e. those of the highest social economic status, and a proportion of these households are in stress. Low-income households in these locations may be households that bought into the area a number of years ago and have seen the area improve around them. Households may also report a low-income but have generated significant wealth in the past enabling them to purchase in such an area. Whatever the case, it is likely that such established households will have accrued significant capital gains in their houses and, although classified as being in housing stress under the 30:40 rule, are in fact relatively wealthy households without a housing affordability issue. The broad nature of the 30:40 rule includes asset wealthy households within the definition of stress.

Why is there disconnect between housing stress and household wellbeing?

Given the weak links identified between housing stress and household wellbeing outcomes, we examined why there would be such disconnect between the two. If policy-makers are to continue to use housing stress within housing affordability debates, it must be made clear why the measure is flawed and how it could be improved.

We identified four reasons why there is only a weak relationship between housing stress and household wellbeing:

- 30 per cent is an arbitrary benchmark
- location trade-offs
- housing accessibility
- choice versus constraint.

The arbitrary 30 per cent benchmark is problematic. Work on the residual method assessing affordability has shown how households on moderate incomes with specific structures, such as lone person or no children, can comfortably afford to pay more than 30 per cent in housing costs (Burke et al. 2011). However, it may be a fair reflection for low-income households with children, for example. The 'one rate fits all' approach does not work because it fails to address the different circumstances of households, even if incomes are equalised.

The work by Hulse et al. (2010) highlights the difficulties faced by new purchasers, particularly those with families who are being forced to move to the urban fringes to access affordable and appropriate housing. While levels of housing stress may not have increased, more and more households may be affected by wider housing affordability issues, i.e. being forced to locate in an area with inadequate infrastructure.

Public housing tenants are, by definition, excluded from the housing stress measure. However, public housing tends to be located in areas of greatest socio-economic disadvantage with fewest economic resources and poorest education and occupation opportunities. Some households within 'affordable housing' may be living in a dwelling that is inappropriate for their needs or perhaps located a significant distance from family or the household's original community. These concentrations of disadvantage may provide affordable accommodation but present other problems in terms of housing inappropriate for needs. Households in such accommodation may be the ones suffering the greatest financial pressures from rising utility bills, transport costs or the need for child care if forced to locate away from family. Overcrowding, especially problematic within Indigenous households, is another facet of affordability that must be taken into account when assessing a policy response. Once again a simple housing stress figure will exclude such households from the necessary evidence base.

We analysed the views of home purchase from a special youth module within the 2004 HILDA survey and, in particular, the chances of being able to enter ownership. The lack of a deposit was identified as a critical barrier preventing home ownership for many existing households and households yet to form. However, housing stress measures fail to take into account barriers to future household formation or tenure transition. We present evidence showing independent adults are leaving home later in life, which will be a choice for many but forced on others. The issue of young people being unable to leave home is an important one and such constraints are integral to discussions about housing affordability. In fact, a proportion of multi-generational homes are unlikely to be in a position of housing stress as they often contain more than one working adult, but there is still an affordability issue for any member of the households unable to leave due to a lack of accommodation options.

The 30:40 rule does not distinguish between those who fall into housing stress as a result of financial constraints and those who choose to take on higher cost burdens in order to enjoy better quality housing or locations. A movement into housing stress is associated with a 40–50 per cent increase in the probability of achieving a higher quality housing environment through improved neighbourhood socio-economic status. The findings clearly support the hypothesis that many households are choosing to take up higher housing costs in return for improved neighbourhood conditions. Households changing residences are much more likely to move into housing stress than out of it. This would suggest some degree of choice unless the move is precipitated by a negative event such as a marriage breakup. That movement into stress may well be to secure a dwelling appropriate for housing needs. Individual households have very different circumstances and a single housing stress measure does not adequately address the wide variety of outcomes resulting from housing affordability.

Improving the measurement of housing stress

Although it was outside the scope of this project to develop an improved measure of housing affordability, the report identified four ways that the measure of housing stress could be improved to make it a more reliable indicator of household wellbeing outcomes:

- Differentiating between medium-level and high-level housing stress. Households with higher levels of housing stress tend to have poorer wellbeing outcomes.
- Accounting for a household's duration in housing stress. Households that have spent longer in stress have poorer wellbeing outcomes.
- Identifying choice versus constraint. Households that have chosen to take on higher cost burdens to enjoy the benefits of higher quality housing or location should be excluded. The measure should concentrate on households forced into stress.
- Removing households with high net worth. Households may have a low-income but a high net worth, generated through growth in housing equity for example. Removing such households improves the relationship between housing stress and financial wellbeing outcomes.

Even with modifications, the traditional housing stress measure does not provide policy-makers with the evidence base they need to develop housing policy aimed at improving household wellbeing. Existing policy tools designed to improve housing affordability are limited. In the past, demand side subsidies such as the first home owners grant and first home savers accounts have been used to help households into home ownership. Commonwealth Rent Assistance has been used to aid those on low incomes in the private rental market. This is helping households access largely existing housing rather than providing a supply of new housing for those on low–moderate incomes. Supply side policies have largely been limited to the NRAS (National Rental Affordability Scheme) program and stimulus package expenditure on new social housing, but such funding has largely dried up. It is now down to regeneration agencies and state and local governments to secure affordable housing directly or through partnerships/negotiation with the private sector.

We have demonstrated that housing stress is an inadequate measure upon which to base housing policy decisions. In one sense it is too broad as it incorporates many households that are not suffering the negative consequences associated with the measure. On the other hand it is too narrow because it excludes certain groups and only addresses the negative financial outcomes of housing affordability and not the much wider implications of a household's housing consumption choice. Policy-makers need to be more concerned with addressing the needs of future households rather than the housing costs of those already within the owner purchasing sector. With mortgage default rates very low by international standards, particular focus should be on the affordability of the bottom end of the private rental sector and measures to increase the supply of affordable rental stock. Affordability indicators such as the residual method can help quantify an affordable rent but the traditional stress measure has limited relevance within policy development.

Affordability can only be improved through a significant reduction in market rents and prices, direct housing subsidies to households or, more realistically, through large scale new housing supply. Housing affordability prevents new household formation so policy must address this issue by overcoming existing housing supply barriers and quantifying the supply needed to deliver diverse and affordable housing for low–moderate-income groups. A strong evidence base is required to set specific local area affordable housing targets to meet the housing needs of low–moderate-income earners in their local housing markets. We recommend a move towards housing market and housing needs assessments, which include modelling the demand for various types of affordable housing, to provide a reliable evidence base for setting housing supply targets to address the negative outcomes of declining affordability.

1 INTRODUCTION

1.1 Policy context

In January 2009 the Australian Government introduced the National Affordable Housing Agreement (NAHA), highlighting the important role that affordable housing plays in promoting social and economic participation. The October 2011 conference, *Beyond the current NAHA: What next for national housing policy?* provided a critique of the current NAHA arguing that future agreements should be widened to include other policy levers such as planning and taxation issues and desired outcomes should be more explicit. The current NAHA was considered successful in providing a focus on community housing association growth and the provision of funds for a variety of affordable housing-related outcomes with the majority of those at the conference positive about the future of national housing policy reform going forward (Gronda & Costello 2011).

The implementation of NAHA took place during a decade of increased economic volatility with global housing and financial markets particularly affected. At the same time, governments have increasingly withdrawn from their role of public provision despite population ageing threatening fiscal sustainability in Australia and other developed nations in the coming decades. The role of housing as a social policy tool has risen in prominence, and recent research has highlighted how housing policy needs to reflect both shelter and non-shelter outcomes such as workforce participation, access to employment opportunities and education attainment (e.g. Burke et al. 2007; Dockery et al. 2008). Smith (2009) identified dimensions of wellbeing such as social and economic participation, health and financial stability, as becoming increasingly critical measures against which the success of housing policy interventions will be gauged by government in the coming decades. Indeed, we already see evidence of this within Australia's policy agenda; the terms of reference for Australia's future tax system review (Henry et al. 2009 p.vii) specify that recommendations to promote housing affordability fall within the broader scope of policies designed to address the economic and social wellbeing of Australians.

Nonetheless, there currently exists a critical gap between the increasing push for housing to play a social policy role and the measurement of housing affordability necessary to identify the failure of housing to meet minimum household wellbeing standards. Policy designed to improve housing affordability is based on measures of housing stress or price to income ratios which, this report argues, do not address the wider outcomes of housing affordability but address simply the burden of housing costs. Binary indicators of stress remain the key policy measure used to divide populations into two broad groups; those in housing stress and those not in housing stress. A conventional and widely used binary indicator of housing stress is the 30:40 rule, where a household is defined to be in housing stress if its housing cost exceeds 30 per cent of income and the household is in the bottom 40 per cent of the income distribution (Yates 2007). Housing policy focused on housing affordability needs to address not only the negative impacts of excessive housing cost burdens but also the impact of a decision to locate to an inappropriate dwelling or location in order to avoid excessive cost burdens. Such decisions can affect economic and social participation. Policy also needs to address further consequences of housing affordability, including the inability of households to actually form due to deposit constraints or increased living costs associated with movements to mortgage or rental cost appropriate housing located on the urban fringes.

Household wellbeing is a multidimensional concept that spans both the financial and non-financial domains, and the wellbeing impacts of housing stress relies significantly on the 'experience' of affordability, which differs across socio-demographic groups and even varies between members of the same household, all of whom face the same housing cost:income ratio but may experience this 'stress' to different degrees. There may be households that fall within the traditional measure of stress that consider their levels of wellbeing acceptable. Alternatively, there could be those that fall just outside the measure that are suffering considerable economic and social hardships (Burke et al. 2007). Importantly, as already noted, housing stress only directly addresses the financial aspects of household wellbeing and not the wider non-financial impact of housing quality or location, for example. This forms the main argument throughout this report: housing stress is a narrow measure which does not reflect the impact of housing consumption choices on household wellbeing.

Housing affordability is:

... concerned with securing some given standard of housing (or different standards) at a price or rent which does not impose, in the eyes of some third party (usually government), an unreasonable burden on household incomes. (Maclennan & Williams 1990)

A household consumes housing at a given cost which places a burden on income. The ratio of cost to income provides a measure of that burden placed on that household. However, that is where measures of affordability stop. Any discussion surrounding housing affordability should take into account the consequences of the household's housing consumption decision. This will include the financial implications of the housing choice and also the non-financial outcomes of a household's housing decision. For example, a household may take on a high housing cost burden in order to consume housing in a location that minimises travel to work costs or is within close proximity to that household's existing community. The consumption choice may place an unreasonable burden on that household's finances, but they are securing other benefits from the decision. Conversely, a household may take on a housing cost burden that does not place them within a situation of financial stress, but they may have had to make a compromise in terms of a location that adds to travel costs, is a considerable distance from their existing community, or the housing is of poor quality. The consequence of their decision may not have major financial implications but imposes other costs on that household.

We argue that housing affordability is much wider than simply the cost burden placed on a household; it also encompasses the wider implications of that housing decision on that household. The main argument throughout this report is that housing affordability measured through housing stress provides a narrow measure of the outcomes of a housing decision on household wellbeing, i.e. financial, but this measure does not provide an assessment of the wider implications of housing consumption that we consider vital if housing policy is designed to improve household wellbeing.

In this report, we test the relevance of traditional measures of housing stress to wellbeing outcomes and hereby offer a critique of the extent to which these conventional measures support accurate housing policy-making for the promotion of wellbeing. We focus on the housing cost:income ratios and in particular the 30:40 rule, commonly mooted in the literature as an effective measure of housing stress (Nepal et al. 2010; Yates & Gabriel 2006; Yates 2007). We argue that, for such a measure to be accurately informing policy aimed at dealing with the complex issues surrounding housing affordability, the measure should at least provide a reliable indicator of the financial position of a household as indicated by their reported

experience of financial hardship, such as their inability to meet mortgage, rental payments or utility payments on time, or being forced to go without basic needs such as food and heating. If so, policy measures to address housing stress would go some way towards improving household wellbeing. If a mismatch is found between the traditional stress measure and the range of wellbeing measures we adopt in this project, it brings into question the adequacy of the traditional housing stress measure for policy decision-making in the coming decades.

1.2 Unpacking housing affordability

An ongoing debate is whether there is actually a housing affordability crisis. Evidence such as the gap between house price and household income growth (Phillips 2011), the decline in rates of home purchase (Flood & Baker 2010) and growing price to income ratios (Soos 2011) would point to a growing problem. On the other hand, the number of mortgage defaults and rates of repossessions would suggest that little has changed within the owner purchaser market in the last two decades (Berry et al. 2010). This report details little change in the number of households in housing stress from 2001–09 (Chapter 4). On the surface, this evidence does not suggest a growing affordability problem if measured by housing stress, and perhaps that is the case when it comes to the financial wellbeing of existing homeowners (Hulse et al. 2010). This brings us to the first major problem with housing stress measures; they only examine the position of households currently consuming accommodation within the owner purchaser or private rental sectors. It certainly does not quantify those would-be households unable to form; those forced to move outside their existing communities to access appropriate accommodation; or those living in poor quality but cheap housing. It also, by definition, excludes public housing tenants who may have many housing affordability issues such as a lack of quality amenities, access to employment opportunities or quality schools.

The 30:40 rule applies the same threshold to all groups regardless of their geographic location and housing tenure. This 'one size fits all' approach prevents policy application from recognising differences across housing markets, population groups and the stage of housing career a household is at. Policies that target the wellbeing agenda need to target the 'experience' of housing affordability, which is more wide-ranging than can be appropriately reflected by a binary indicator relating housing costs to income.

Housing affordability measures the housing cost burden placed on a household. Households should be able to consume an adequate standard of housing without the cost burden placing financial pressures on the household. Households may make quality or location trade-offs to keep the cost burden to a minimum. Alternatively, they may consume the best housing they can while leaving just sufficient income for necessary expenditure. A housing stress measure includes the latter that may consume their housing preference but exclude the former who may be experiencing poor wellbeing outcomes due to their housing choice. The implications of housing affordability must be taken into account when discussing housing stress and when informing policy decisions.

Below are examples a range of possible financial and non-financial consequences of a low–moderate-income household's choice of housing. These are split between the positive outcomes of a decision to take on a high housing cost burden to maximise household wellbeing through housing choice and the associated negative implications of such a decision. These are followed by the positive outcomes of restricting housing expenditure to levels considered acceptable by government, 30 per cent of income, and the possible negative outcomes of that decision.

Positive outcomes: Housing cost burden exceeds 30 per cent	
Maximise location quality	Minimise travel to work costs; quality local amenities such as schools, shops, open space; close to existing community; high neighbourhood quality
Maximise housing quality	Adequate space for household needs; low maintenance costs; comfortable living conditions
Health	Benefits of quality housing and location

Negative outcomes: Housing cost burden exceeds 30 per cent	
Financial stress	Income only sufficient for essential expenditure; compromise on food quality; minimal holidays; unforeseen costs difficult to meet; no savings; credit card debt; no health or life insurance
Health	Implications of stress caused by financial worries

Positive outcomes: Housing cost burden below 30 per cent	
Financial	Income available for non-essential expenditures such as holidays, insurance, quality food; maintenance costs and unforeseen expenditure manageable
Health	Minimal stress through financial burden

Negative outcomes: Housing cost burden below 30 per cent	
Location trade off	Significant travel to work costs; long distance from existing family and friends; poor quality local amenities; lack of quality open space; poor quality neighbourhood
Housing quality	Children sharing rooms; lack of space; high maintenance costs
Health	Implications from low quality housing and poor quality neighbourhood, traffic noise etc.

When generating housing policy designed to maximise household wellbeing, policy-makers need to take into account the consequences of housing affordability, both positive and negative. Additionally, housing affordability should also reflect the inability of a household to consume appropriate housing. For example, a household is unable to form because they cannot save the necessary deposit to enter home ownership or cannot afford private market rents. In these circumstances, the 'affordability' barrier is preventing household formation or perhaps preventing households moving into their preferred tenure. Again, these are outcomes of the affordability equation.

The number of households in housing stress needs to convey the issues faced by those with low–moderate-income both within and outside stress, and those unable to form households, if it is to be used as a reliable measure of housing affordability and its consequences. This report assesses whether housing stress provides policy-makers with what they need; a measure of household wellbeing. If housing stress has

a strong relationship with a number of aspects of household wellbeing, then it is a useful measure of the implications of housing affordability and therefore a reliable base for housing policy. If relationships are weak, we need to modify the measure so it can better reflect the wellbeing outcomes of housing expenditure, both financial and non-financial.

1.3 Aims and contributions

Our analysis assesses how well (or poorly) traditional measures of housing stress reflect housing wellbeing. Housing stress is currently used within policy documents and the press to represent a solely negative outcome for a household. It is assumed that if a household is in housing stress then that household's wellbeing must be lower than a household outside stress. This is perhaps not how the measure was designed to be interpreted, but analysis showing increasing numbers of households in stress is used to support the wider notion of deteriorating housing affordability. We contend that housing stress does not necessarily mean a negative outcome in terms of wider household wellbeing; indeed households may take on higher housing cost burdens to access housing that will increase their overall levels of wellbeing. The analysis presented in this report examines the relationship between housing stress and various measures of wellbeing. If there is a relationship, then the use of housing stress as an exclusively negative measure of household wellbeing would be acceptable and could be used as a general measure of housing affordability. If there is not a relationship, policy-makers and the press need to use other measures that more accurately reflect the wider impacts of housing affordability and not just the housing cost element.

The research methods are designed to address four key research questions:

- How does the traditional measure of a household's level of housing stress compare with that household's wellbeing outcomes (e.g. financial security, social participation and health)?
- Are there demographic, housing tenure and regional variations in housing stress and, if so, do these differ from the regional, demographic and housing tenure variations in wellbeing among households in the same income band?
- How does the traditional measure of housing stress compare with the quality and suitability of a household's housing and neighbourhood conditions (e.g. dwelling & neighbourhood conditions, satisfaction with area of residence)?
- Do households moving out of housing stress exhibit wellbeing improvements? Do those moving into housing stress experience any deterioration in wellbeing? What events move households into stress (e.g. choice or hardship)?

We address the research questions using the 2001–10 HILDA Survey, which captures a comprehensive range of housing, income and wellbeing variables that allow us to effectively compare traditional housing cost:income ratios to a raft of wellbeing outcomes.

Our study contributes to the current debate on housing affordability in the following ways.

First; ours is the first nationally representative study to undertake a comprehensive assessment of housing stress measures against wellbeing outcomes. It complements the evidence base presented by Burke et al. (2007) drawn from their postal surveys of selected areas in New South Wales, Queensland and Victoria.

Second; this research explores the applicability of traditional housing stress measures to existing and new purchasers. With the significant rise in house prices

outpacing household income growth, it stands to reason that new purchasers have had to take on higher cost burdens when compared to existing purchasers in order to access similar quality housing. New purchasers would have to borrow more to fund the additional cost of homes and would, theoretically, have higher cost burdens and there would be higher incidences of housing stress, or more likely, lower levels of entry into the market. Alternatively, new purchasers have had to make trade-offs in terms of housing quality and location in order to keep housing cost burdens to affordable levels. We test these assumptions and identify if there are any trends in terms of extended commuting times and neighbourhood satisfaction.

Third; comparing a household's measure of housing stress with their ratings of neighbourhood and community allows, for the first time, an analysis of the link between areas of economic disadvantage and social wellbeing, providing an assessment of whether households in housing stress have lower levels of community satisfaction.

Fourth; the longitudinal nature of the data allows an analysis of how measures of wellbeing have changed as housing market conditions fluctuated during the last decade allowing us to address the critical question of the extent to which households are falling into housing stress by choice or hardship.

Finally; to ensure the policy implications of our findings were fully explored, a panel of key policy stakeholders was convened in Melbourne in November 2011. This Final Report reflects the input of the panel and we are grateful for their feedback.

1.4 Report outline

Chapter 2 of the report provides a literature review of the link between housing stress and wellbeing. A thorough review of housing affordability measures was conducted by Stone et al. (2011) and there is no need to repeat such an exercise here. Our report supports their argument that housing affordability is a much more complex issue than can be quantified in a simple ratio of housing costs to income. In Chapter 3, we set out the analysis methods adopted to address the research questions. Chapter 4 describes the results of the HILDA analysis, while Chapter 5 discusses why there is a disconnect between housing stress and household wellbeing. Chapter 6 suggests that policy-makers need to be using evidence from housing market assessments incorporating housing need analysis to inform housing policy and affordable housing targets to address affordability. Conclusions then follow providing an overall assessment of the relationship between housing stress and household wellbeing. Recommendations are also made that call for a greater understanding by policy-makers of the wider issues surrounding housing affordability. A movement away from policy informed by a set of ratios most relevant for those already consuming their preferred housing tenure towards addressing housing need would be the favoured outcome.

2 LITERATURE REVIEW

This Chapter covers the three main issues addressed in the report—household wellbeing, housing affordability and housing stress—by discussing the relationship between housing stress and elements of affordability and wellbeing

2.1 What is household wellbeing?

Wellbeing is not easily defined, either conceptually or empirically, but nevertheless the promotion or maximisation of wellbeing is increasingly being recognised as the overriding objective that social and economic policy should pursue. In assessing people's wellbeing, one can take a normative approach by declaring what people should value and what should make them better off, essentially adopting some moral and philosophical view of what constitutes 'the good life'. An individual's wellbeing can then be assessed in terms of the proximity of their actual life circumstances relative to this ideal. The Greek philosophers Aristotle and Socrates viewed wellbeing in terms of a concept of 'eudaimonia', roughly translating to 'living well and doing well', and implying some moral or ethical dimension underpinning wellbeing in addition to fulfilling personal wants (Michalos 2007).

The obvious downfall of this normative approach is that different individuals have very different value systems and preferences, and live within different social and cultural contexts. Economists instead use the term 'utility', and from the foundations of microeconomics have modelled utility strictly as a construct reflecting individuals' personal preferences only, and hence largely rejecting interpersonal comparisons of wellbeing or the summation of individual utilities into some aggregate welfare function. Consequently, neoclassical economics has relied upon income as determining wellbeing: for any individual, given their set of preferences and goods prices, an increase in their real income means that they have all the previous options available to them plus additional options. By assumption of individuals being both rational and utility maximising, it follows axiomatically that more income makes people better off. The macroeconomic extension of this, for which neoclassical economics has been roundly criticised, has been the focus on economic growth—GDP or GDP per capita—as the main goal of policy and the way to enhance wellbeing.

An alternative approach being embraced by a rapidly growing body of researchers, and that still allows for such heterogeneity in preferences, is to attempt to measure individual's wellbeing directly through their own assessments of the quality of their life. The 'revolutionary' (Frey 2008) aspect of this 'happiness' or 'subjective wellbeing' literature lies in the rejection of economics' long-held belief that it is not possible to measure utility, but only to infer utility from revealed preferences. The issue then becomes not so much one of what wellbeing is, since each individual determines this with reference to their own set of values and preferences, but whether measures of subjective wellbeing can be used to make valid inferences about individuals' utility and what factors are correlated with it. Common measures include self-rated levels of happiness and life-satisfaction according to some ordinal scale. To cite one of many available definitions of subjective wellbeing, Veenhoven defines life satisfaction as 'the degree to which an individual judges the overall quality of his life-as-a-whole favourably' (1991, p.10). The distinction has been made between 'cognitive' measures that are derived at following some process of evaluation, and 'affective' measures relating more to an individual's moods or emotions (Glatzer 1991). A new branch of psychology, termed hedonic psychology, pioneered by Daniel Kahneman, views wellbeing largely as the net balance of positive or favourable experiences, such

as achievement and pleasure, over negative experiences, such as pain and stress (see Kahneman 1999).

There is now a rapidly growing literature in economics studying the determinants of subjective wellbeing and the challenges that these empirical findings pose for policy. Personality traits have been shown to have a strong influence on subjective wellbeing e.g. extroverts tend to report higher levels of wellbeing than introverts. However, such individual fixed effects can be controlled for with the benefit of longitudinal data, and it is effects that may be influenced by policy that are usually of most relevance. Society-wide conditions, or factors beyond an individual's personal domain, do have a large effect on wellbeing (Diener & Gonzalez 2011, p.3). Some of the key factors shown to contribute positively to wellbeing include (Frey & Stutzer 2002; Strack et al. 1991; Veenhoven 1991):

- being mentally and physically healthy
- being married and having good quality relationships with friends and family
- being towards the top of the social ladder
- satisfying or meaningful employment
- freedom, independence and the right to participate in the political process.

Surprisingly, there have been mixed findings regarding the effect of education on subjective wellbeing. In the United States there is a strong positive relationship between individual's educational attainments, but in Australia the achievement of tertiary qualifications appears to be associated with lower happiness (Dockery 2010).

Psychologists and sociologists have emphasised personal factors such as a strong sense of identity, sense of community and of self-efficacy or agency as laying the foundations to wellbeing (Chandler et al. 2003; Desjardins 2008; Kahneman et al. 1999; Sarason 1974). Self-efficacy and agency relate to individuals having a sense of control over their lives and their ability to achieve desired outcomes: 'the capacity of an individual to act, i.e. to make choices and decisions and behave accordingly' (Desjardins 2008).

One of the key challenges that the study of subjective wellbeing has posed for traditional economics has been the finding of a weak association between subjective wellbeing and income, leading to the charge that policy has focused too much on maximising income and achieving perfect market conditions to the detriment of things that contribute more to happiness. Empirical evidence suggests that income is important for wellbeing, but with some significant qualifications. Beyond a certain level, the relationship becomes quite flat, so that very large increases in income would be needed to have the same effect on wellbeing as, say, a good marriage (van Praag et al. 2003). At the lower end of the income distribution, however, poverty and financial stress are indeed associated with low wellbeing. Unemployment in particular has been found to have a substantial negative effect on wellbeing (Clark & Oswald 1994). Second, again beyond some threshold living standard, it seems that it is relative income that matters as much as absolute income (Easterlin 2001; van Praag et al. 2003; Frey 2008; Frey & Stutzer 2002).

This 'rivalry', in which people's wellbeing is determined by their position relative to others with whom they compare themselves, has been one of the main explanations for the lack of an increase in average levels of subjective wellbeing over time as real living standards have increased. The second main explanation is adaptation. Significant life events may initially cause a large positive or negative effect on an individual's subjective wellbeing, but it has been shown that people have a

remarkable tendency to adapt to their new circumstances and for their subjective wellbeing to revert to previous levels. It has been argued that these rivalry and adaptation effects have contributed to the 'hedonic treadmill' in which people constantly pursue more income and consumption, but with no real benefits to wellbeing (Argyle & Martin 1991; Brickman et al. 1978; Cummins et al. 2003; Kahneman 1999, p.13). Despite these and other important measurement issues, subjective wellbeing has gained acceptance as a legitimate measure for empirical work, and has been validated against objective physiological measures such as brain activity and frequency of smiling (Layard 2003).

Bronfenbrenner's (1979) bioecological theory provides a useful framework for understanding the importance of housing to wellbeing outcomes. Bronfenbrenner's approach challenges the predominant view that individuals are free agents who act independently and whose wellbeing outcomes are a result of their own free choices. In reality, peoples' opportunities are significantly impacted by immediate social settings such as the home and neighbourhood, as well as the wider society and culture (Dockery et al. 2010). Dockery and Milsom (2006) note that since the 1970s, the significance of the home in people's lives has been researched in the fields of environmental psychology and environmental design. Since then, many studies have offered evidence highlighting important links between various aspects of housing and wellbeing. For example, children who grow up in owner-occupied homes have been found to benefit from better lifetime prospects than those in the rental tenure (Boehm & Schlottman 1999). Overcrowding results in a lack of privacy and a sense that one has no control over one's own life; it is a major source of stress that is experienced by both adults and children living in overcrowded conditions (Dockery 2011). The effect of housing affordability on wellbeing is closely tied to the detrimental effects of poverty on wellbeing. Housing costs often represent a significant cost to a family's income and determine to a large extent how much is left over for living costs. A high housing cost burden can impede the capacity of families to account for other necessities that affect wellbeing such as food, clothing and health care (Bratt 2002).

2.2 Defining housing stress and housing affordability

The concept of housing stress has been of interest to government since the mid-1990s, particularly the issues of definition and data (King 1994; Karmel 1998). The National Centre for Social and Economic Modelling (NATSEM) also started reporting the measure in the late 1990s (Landt & Bray 1997) and have continued to do so ever since. Policy-makers were quick to embrace the measure because it was easy to understand, provided a quick indicator of 'housing affordability', and was convenient to incorporate within policy documents to support housing strategies. According to Flood (2012), the ABS became aware of the conceptual problems associated with housing stress in the middle part of the last decade and became concerned because the measure was becoming so politically important. ABS at first modified the definitions and then rejected the indicator stating it did not measure what it was supposed to (Flood 2012). However, housing stress figures are still widely reported to support claims of housing affordability declines and calls for more affordable housing.

Gabriel et al. (2005) in their work for AHURI's national research venture defined housing stress as:

... a generic term to denote the negative impacts for households with insufficient income to secure adequate housing. It can also refer to other actors such as over-crowding and insecurity.

They argue that housing affordability debates should recognise how households experience affordability problems. Gabriel et al. viewed housing stress as

encompassing a range of financial circumstances including deposit constraints as well as ongoing or episodic periods where housing costs cannot be met by income. The authors also state it can incorporate issues such as over-crowding, insecurity of tenure and inappropriate facilities in the home (Gabriel et al. 2005, p.7).

Housing stress is currently being used as a proxy for all housing affordability driven outcomes. Policy-makers and the press tend to report all households that fall within the definition of housing stress as having financial problems and therefore there is a need for more 'affordable housing'. There is no mention of a household entering stress by choice and the positive benefits of such a decision. The definition being applied in this way also assumes that households not in stress have no negative housing-related wellbeing outcomes

A recent AHURI essay by Henman and Jones (2012) explored the concept of housing affordability. They stated:

The problem of housing affordability is contested political territory and measurement of housing costs and household income and interpretation of their relationship is not simply a technical or methodological issue. The representation of housing affordability in public policy necessarily transcends households' experiences of affordability, but households' perceptions of the impact of housing costs on their quality of life and wellbeing must be given important consideration ... (pp.5-6)

The trouble with existing debates surrounding housing affordability is the narrow focus on measuring the problem rather than understanding its wider implications. Ratio measures such as housing stress and price to income are applied in two ways. First, measures such as housing stress seek to quantify the affordability position of those already consuming housing, i.e. ignoring those that are homeless, in inappropriate housing or who cannot afford to form a household in an area within their existing community or with suitable employment opportunities. Second, price to income ratios establish a measure of general affordability at a defined spatial scale, commonly by suburb rather than defined housing sub-market. These ratios are usually designed to highlight how many multiples of income a median income household would require to consume typical housing within a suburb. These measures are headline grabbing because they provide an easy to understand quantification of affordability and are more applicable to assessing affordability for new purchasers rather than existing households.

The concept of housing affordability is far wider than these measures would indicate. Stone et al. (2011) and Leishman and Rowley (2012), among others, argue that affordability is much wider incorporating housing standards and appropriateness, economic participation and social and neighbourhood issues. For example, housing of an appropriate size and quality is not scattered randomly across cities and regions; there tend to be clusters of poor quality housing which is usually lower in price leading to concentrations of social disadvantage. Key workers such as nurses, teachers etc. tend to be relatively lowly paid at the beginning of their careers so are forced to live significant distances from their employment and incur commuting costs that are ignored in traditional affordability debates.

Neighbourhood issues also cannot be ignored. If a household is consuming housing at a cost considered 'affordable', to what extent is the quality of that neighbourhood taken into account when assessing the appropriateness of that housing? Just because the house is affordable and a household's physical requirements are met, should the characteristics of the soft infrastructure such as schools, healthcare, public transport, employment etc. be taken into account when assessing housing

affordability? The household may be forced to accept their housing option due to payment constraints and are forced to compromise on neighbourhood quality with an adverse effect on overall wellbeing. Bogdon and Can (1997) described spatial clustering of low-income households in areas of low cost housing that were also in areas which deprived residents of employment opportunities and acceptable services.

Household composition is generally ignored within traditional ratio affordability measures. Housing costs consuming 30 per cent of income may be far less onerous to a single person than a couple with three children (Burke et al. 2011). A price to income ratio of 5:1 is unachievable for a family but affordable to a single person household. Discussions of housing affordability cannot ignore household structure and generalisation based on median incomes and prices relatively meaningless when assessing affordability for individual households.

The wider concept of housing need encompasses many of these issues. Families on low incomes may be forced to under-consume housing, i.e. a position of overcrowding. A cost:income ratio would do nothing to identify such households as having an affordability issue if that household fell under the 30 per cent line. As such, households may also be forced to locate in areas lacking necessary services, particularly problematic in many areas of regional Australia. Similarly, a family containing a young adult unable to form a household because appropriate accommodation cannot be accessed in proximity to employment opportunities would not be considered to have an affordability issue.

Housing quality can also not be ignored. To what extent do households in accommodation considered affordable under traditional measures consume poor quality housing because there are no other alternatives? Stone (2006, p.151) sums up by defining affordability as:

... an expression of the social and material experiences of people, constituted as households, in relation to their individual housing situation.

He includes housing size, quality, neighbourhood, location and household composition in any analysis of affordability and removes the definition from a simple expression of income relative to costs and prices.

If housing stress and other measures based on ratios continue to be used by policy-makers and the press, such measures should at least have some relationship with the wellbeing of housing in terms of financial, neighbourhood and health outcomes. If this is the case, then such measures have some justification within affordability debates. It is these relationships that are explored in this report.

2.3 Measuring housing affordability

Stone et al. (2011) in their AHURI Positioning Paper provide a thorough review of housing affordability including a discussion of the term 'housing affordability' and the numerous measures used to quantify it including:

- Categorical: Statements about what is affordable housing, e.g. housing which does not cost so much that such a household is unlikely to be able to meet other basic living costs on a sustainable basis.
- Relative: Comparing affordability over time to track whether affordability (however it is measured) has improved or declined over time, e.g. HIA/CBA Housing Affordability Index.
- Family budget: Defining essential expenditure for households on given incomes, this includes defining a standard amount for housing expenditure.

- Ratio: Relationship between housing costs and incomes, or prices and income, and are the most widely reported. Includes the 30:40 measure of housing stress and price to income ratios of median incomes to median prices to provide a multiplier, e.g. Demographia International Housing Affordability surveys (Demographia 2012).
- Residual income: Housing expenditure is what remains after households pay for essential non-housing costs (Stone et al. 2011).

Stone's 2011 report sets out a methodology for calculating the residual income approach to housing affordability. This approach has the advantage of taking into account variable housing expenditure across household type. For example, a couple with two children can afford less in housing costs than a single person because essential living costs are higher. The Stone study and the Final Report (Burke et al. 2011) estimates that a single person household with an income of \$75 000 per annum could afford housing costs of \$800 per week (around 50% of gross income), but a couple with two children could only afford to spend around half that amount.

The residual income approach certainly has merit as long as realistic expenditure measures can be generated. However, it still suffers many of the same limitations as other current measures. Many major mortgage lenders use an approach similar to the residual method by assessing what households are able to pay given household composition and other non-essential sources of expenditure such as credit card debt. The key question is in defining what is essential as different households would have very different assessments of what constitutes such expenditure. For example, private medical insurance, school fees and holidays may be essential to one family but not another. How then to develop a measure that realistically calculate average expenditure? Stone et al. use budget standard measures developed in the late 1990s by the Social Policy Research Centre of the University of New South Wales (Saunders et al. 1998). Many will argue for the need for an updated set of essential household expenditure standards. Hulse et al. (2010) also use the residual approach within their analysis to help explain how low–moderate-income households have continued to be able to enter homeownership but how families have limited choice in terms of location as the result of housing price growth.

Measuring housing affordability is not just an Australian issue as discussed in Stone et al. (2010). A study by the Cambridge Centre for Housing and Planning Research (Whitehead et al. 2009) reviewed the common methods used to measure housing affordability and the data sources required for their use. Discussion of the spatial application of housing affordability in the UK came recently from Jones et al. (2011) who argue that measures of affordability should be tied to housing sub-markets to provide a better indication of local affordability. Housing stress is a concept alien to the UK, however price to income ratios are common.

2.4 The relationship between housing stress and financial stress

In recent years, there has been a series of studies that have attempted to identify the link or correlation between housing affordability and financial stress. Many studies have exploited the financial hardship variables in the microdata such as the Household Expenditure Survey (HES) and HILDA Survey, in particular the ones that represent experiences of deprivation, to examine the extent to which housing stress actually translates into financial hardship.

Yates (2007) and Hulse et al. (2010) both used the 2003–04 HES. The financial hardship indicators in the HES include inability to pay utility bills on time; inability to

heat one's home; having to seek assistance from welfare or community organisations, or family and friends; and having to pawn or sell an asset. Yates (2007) defined a household as being in housing stress according to the 30 per cent rule; a household was defined to be in some (high) financial stress if they reported one or more occurrence of any of the financial hardship indicators in the HES. Descriptive statistical analysis in the study shows that there is some positive correlation between housing stress and financial stress although this only applied to lower income households. Hulse et al.'s (2010) study on home owners appeared to support Yates' (2007) findings in that it found that 8.1 per cent of low-moderate-income home purchasers had at least three occurrences of the financial hardship indicators from the HES compared to only 2 per cent for those purchasers on higher incomes.

Burke et al. (2007) sent out postal surveys that contained similar financial hardship indicators as those listed in the HES to renters in New South Wales, Victoria and Queensland, and to recent home purchasers in New South Wales and Victoria. While the findings focused on differences between lower income (in the bottom 2 income quintiles) and higher income groups, rather than those in housing stress per se, the study did make comparisons between those paying more than 30 per cent of their income in housing costs with those paying less than 30 per cent among the lower income groups. The study's findings indicate that among lower income renters, households in housing stress according to the 30 per cent rule were significantly more likely to experience financial stress, such as having to go without meals or children having to forego adequate health or dental care. Those in housing stress among the lower income group were also less likely to perceive themselves as being able to make a transition into homeownership indicating that they find financial planning to save up for a deposit to purchase a home less manageable.

Another survey that contains similar financial hardship indicators to those found in the HES is the HILDA Survey, as used by Rowley et al. (2011) to examine the extent to which traditional measures of housing stress accurately reflect the true financial position of households for the year 2008. Traditional housing stress measures were defined according to the 30:40 rule, 30 per cent rule and 50 per cent rule, and compared with financial hardship indicators in the HILDA Survey including one's perception of one's level of prosperity given current needs and financial responsibilities (ranging from 'prosperous' to 'very poor'), indicators of difficulty in meeting food and shelter needs, and indicators of whether one has had to raise finances in an emergency, and difficulty raising \$2000 in an emergency. Rowley et al.'s (2011) analysis shows that persons in households that are in housing stress generally have lower financial wellbeing than those not in housing stress. Hence, housing cost burdens are linked to financial stress. For example, those in housing stress according to the 30:40 rule are much more likely to feel 'poor' or 'very poor' compared to those not in housing stress (14.3% compared to 2.4%). Of those in housing stress under the 30:40 rule, 24 per cent could not pay the electricity bill on time compared to just 10.9 per cent of households not in stress and 26.5 per cent of those in housing stress could not raise \$2000 compared to 7.9 per cent.

While existing studies appear to agree that there is some correlation between housing stress, as defined by conventional housing affordability ratios, and financial stress, these studies have raised questions about the adequacy of the conventional housing stress measures in accurately reflecting financial stress.

Hulse et al.'s (2010) study suggested that a binary housing affordability indicator is inadequate; rather a 'continuum of financial risk' exists for home purchasers and thus housing affordability measures need to reflect the needs of different household types

and income ranges. The study also noted that despite studies like the Yates and Gabriel (2006) finding that almost half of home purchasers in the bottom two income quintiles were paying more than 30 per cent of their income in mortgage repayments, rates of mortgage arrears and default rates had remained low during the 2000s and, as reported in Berry et al. (2009; 2010), rates of mortgage default were only marginally higher than long-term trends in Australia during the global financial crisis. The study concluded that while the 30 per cent rule could be seen as a measure of financial stress, it did not accurately reflect financial risk. The study also noted that aspects of financial stress, not taken into account by binary measures, are debt and savings. A minority of low–moderate-income home purchasers from the 2003–04 HES appeared to fall into at least three of the financial hardship categories, as well as having three additional types of debt. Low-moderate-income purchasers were also particularly financially vulnerable due to low levels of fluid cash left over after taking into account savings and debt levels.

Rowley et al.'s analysis (2011) supports Hulse et al.'s (2010) findings by highlighting that traditional housing stress measures are far too broad to provide a reliable indicator of the actual financial wellbeing of individual households. For example, almost 40 per cent of persons in households considered to be in housing stress under the traditional 30:40 rule actually rated their financial prosperity as 'reasonably comfortable' or better. Only 14.3 per cent of those in housing stress rated their financial prosperity as 'poor' or 'very poor'. Furthermore, it was noted that some households not in housing stress are actually suffering from financial stress.

An alternative approach to measuring the extent to which housing stress translates into financial hardship proposed in recent studies is the residual income measure of affordability (Hulse et al. 2010; Burke et al. 2011). This measure relies on the 'low cost' and 'modest but adequate' indicative budgets standards developed by the Social Policy Research Centre (SPRC) for 20 and 26 different household types respectively. However, it has also been adapted for 66 household types for each of 30 Queensland geographical divisions and applied, by Waite and Henman (2006), to private renters in Queensland who were Centrelink recipients. Analysis was later expanded by Waite et al. (2009) by adding a longitudinal dimension and extended across Australia using Centrelink's longitudinal administrative dataset to examine the financial hardship (as measured by the residual income approach) and exits from welfare of households across a period of three years. These papers highlighted the deficiencies of conventional affordability ratios as a measure of housing stress as they do not identify the actual distribution of housing problems.

Studies that have used the residual income approach argue that traditional measures such as the 30:40 rule or 30 per cent rule overstate the extent to which housing affordability translates into financial stress in Australia. Waite and Henman's (2006) findings on Queensland Centrelink recipients indicated that while 34 per cent of their sample paid more than 30 per cent of their income in housing costs, 63 per cent were found to be below the low cost after-housing budget standard in 2002. Using the residual income approach and the 2007–08 Survey of Income and Housing (SIH), Hulse et al. (2010) found that among low–moderate home purchasers with gross household incomes between \$30 000 and \$75 000, there were significantly lower percentages of households in financial hardship according to the residual income measure than implied by the 30 per cent rule. The study concluded that many low–moderate-income purchasers are able to afford to purchase housing if they are willing to forego some luxuries and live according to 'modest but adequate' or 'low cost' budget standards. This finding was later corroborated by Stone et al. (2011) in a more extensive study on the residual income approach.

The only Australian study that has attempted to quantify the causal link from being in housing stress to being in financial stress is Yates (2007). This study conducted logit modelling of the probability of being in financial stress as a function of housing stress and other socio-demographic characteristics. It found that once the socio-demographic factors are controlled for in multivariate analysis, the relationship between housing stress and financial stress becomes insignificant. Hence, the study concluded that the correlation between housing stress and financial stress is attributed to common risk factors that create housing stress and financial stress as proxied by socio-demographic characteristics, rather than housing stress per se.

2.5 The relationship between housing stress and health

The history of the relationship between housing, health and wellbeing has been a long and fruitful one. Housing improvements in the 19th and 20th centuries helped to prevent chronic diseases such as tuberculosis, cholera and typhus (Sandel & Wright 2006). In contemporary society, developing countries continue to have difficulty with poor housing and sanitation. Improvements in housing in the developing world have had a significant impact on living a longer life and improved child health (Sandel & Wright 2006).

Housing stress is described by Sandel and Wright (2006) as consisting of two types: physical and emotional. This is a much broader definition of housing stress which goes further than simply the financial implications highlighted using the 30:40 rule. This definition is referred to in the rest of this Chapter. Physical housing stress factors include substandard housing, housing quality, and housing characteristics. Emotional housing stress factors include overcrowding, lack of control, housing tenure, housing costs and residential instability.

One study looking at the relationship between housing stress and overall wellbeing found that housing stress accounted for a significant portion of variance in measures of mental health, general health and alcohol abuse. Location was also found to be a significant predictor of housing stress (Kearns et al. 1992). In a study conducted by Dunn (2002), he found poor physical and mental health associated with physical and emotional housing stress. Dockery et al. (2010) also documents that the stress attributed to housing affordability problems was found to be associated with parental impact on children's wellbeing.

Substandard housing and housing stress have been found to be connected with physical wellbeing. According to Krieger and Higgins (2002), the stress associated with substandard housing may increase allostatic load in the body. Allostatic load is the 'wear and tear accumulated by an organism as a result of physiological responses to environmental stressors' (Krieger & Higgins 2002, p.759). Housing characteristics including noise, floor level, presence of pests and dampness have been found to produce housing stress; poor mental health and lower perceived health status such as the effects of asthma. Noise as a result of poorly insulated housing, for instance, can lead to increased cortisol levels and higher psychological stress. Another study by McCarthy et al. (1985) found house age, type, floor level and location were found to lead to both housing stress and respiratory function (such as coughing and asthma). The impact of substandard housing is not limited to the urban areas; it was also found to occur in the rural areas (Sandel & Wright 2006). Also associated with substandard housing are environmental hazards within the home such as mould/mildew, asbestos, dust, tobacco smoke, and carbon monoxide. These hazards can have serious implications for health if not dealt with. For instance, inhaling secondary smoke has been found to be linked with cancer (Nazaroff & Singer 2004).

Evans (2003) examined the relationship between psychological wellbeing and housing quality. They argued that security of tenure concerns, repair difficulties, dealing with landlords, frequent moving, less controllable social interactions and stigma are associated with poor housing quality and can result in negative health outcomes. If housing quality can be improved this can have significant implications on the psychological stress experienced (Evans et al. 2000).

Sandel and Wright (2006) identified housing stress as having significant effects on housing quality, stress and childhood wellbeing as in order to meet housing cost, expenditure on food may be sacrificed (Campbell & McFadden 2006). The lack of affordable housing may lead to further stress for children due to child neglect (Robinson & Adams 2008).

Housing tenure can be associated with health outcomes. Renting can require more mobility and this mobility and the reduced capacity to consume housing in the desired manner can lead to greater housing stress and poorer health outcomes. The reverse is also true if movement is to better housing and better neighbourhoods (Acevedo-Garcia et al. 2004). Further studies have found people in public housing were less mobile, had greater control, were more settled and were ultimately less stressed (Baker & Tually 2008; Robinson & Adams 2008).

Overcrowding in housing can have physical and psychological consequences. Immigrants from a variety of countries including Asia, India and North and South America, and Indigenous communities experience more overcrowding which may lead to greater mental health illnesses and higher rates of infections. A lack of privacy can also lead to reduced physical wellbeing (Sandel & Wright 2006). Social support and stress associated with overcrowding has been found to result in significant increase in domestic violence (Baillie & Wayte 2006).

Residential instability is defined as 'a lack of stable housing, whether through frequent moving, living 'doubled up' with many families sharing one housing space or homeless in shelter situations' (Sandel & Wright 2006, p.944). Residential stability has been associated with reduced psychological stress and better health outcomes. Wong & Piliavin (2001) found that when homeless people were placed in permanent housing their psychological distress improved. Home ownership, as mentioned above, leads to improved health. Good social support and social networks can help to buffer negative stressors associated with a changing environment but only to a limited extent (Sandel & Wright 2006).

The lack of control over one's environment can result in poor health. For example, living near a toxic waste site may demonstrate a lack of control over one's environment and may result in increased health concerns and depression. A study of Japanese women found that their poor mental health was associated with housing which was perceived to be unhealthy for their children (Sandel & Wright 2006). Social support can occur between neighbours as a way of coping with similar stress. Rich et al (1995) also argued that community decision-making can be an empowering process. Subjective aspects of the housing environment related to residential satisfaction such as a person's needs and expectations, have been found to outweigh objective aspects of the housing environment and result in more psychological ill health (Sandel & Wright 2006).

The report identifies health as an essential element of housing affordability outcomes. Housing quality and cost burdens should not have a detrimental impact on the health of a household. Improving housing quality can improve household wellbeing but movements into housing stress or, alternatively, into low quality housing to avoid financial stress, could have significant health consequences. In Chapter 4 we report

the link between households in housing stress and their health wellbeing outcomes to establish whether policies designed to alleviate housing stress could have a positive impact on health outcomes.

3 DATA AND METHOD

3.1 Data and unit of analysis

We utilise the 2001–10 HILDA Survey to analyse relationships between traditional housing stress measures and wellbeing outcomes over the study period. A key feature of the HILDA survey is that it enables two key types of analysis. First, the survey is repeated every year and so enables repeated cross-sectional analysis whereby one can analyse the housing stress and wellbeing outcomes of each year's survey respondents. Second, the survey has a longitudinal design, which permits researchers to track survey respondents over time to observe how housing stress and wellbeing outcomes have changed for each individual over a period covering ten years, i.e. we are able to observe the same individuals over time. In the present context it is particularly useful as it contains a range of housing, income and wellbeing variables that offer ample opportunity to investigate the correlations between traditional housing stress measures and wellbeing outcomes.

Following Yates' (2007) AHURI National Research Venture (NRV3) study, we adopt the household as the unit of analysis. Housing cost burden is a household phenomenon, so conducting an analysis on a household basis would result in double-counting where there is more than one person living within a household. Of course, there are certain limitations when choosing the household as the unit of analysis, especially with respect to wellbeing outcomes, as individuals living within the same household can have different levels of wellbeing despite sharing the same housing cost burden. We address this limitation by analysing the wellbeing of the household member with the highest income; it is assumed that the highest income earner within the household would typically be more likely to bear the greatest responsibility for the household's housing costs than others living within the same dwelling.¹

3.2 Variable measurement

3.2.1 *Traditional housing stress measure*

A key methodological issue pertains to the measurement of the traditional housing stress measure. Conventionally, housing stress measures are based on housing cost:income ratios. Here, we measure housing cost and income on a household basis as both are shared among household members. Housing costs are generally defined in the literature as recurrent mortgage repayments for owner purchasers and rental payment for renters. Some studies, such as Yates (2007), include rate payments for homeowners using the cross-sectional SIH. However, information on rate expenditure is not available from the HILDA survey. Hence, studies that have used the HILDA survey to measure housing costs generally tend to exclude rate payments (Wood & Ong 2009; Rowley et al. 2011). In the present study, due to data limitations, we do not include rate payments in our housing cost measure.

However, it is important to recognise that housing assistance contributes to alleviating eligible households' housing cost burden. Public housing rent reported in the HILDA survey is already a net rent measure as public housing rents are typically set at approximately 25 per cent of the household's assessable income level up to the market rent of the property within which the household resides. However, private rental tenants within the HILDA survey are asked to report how much rent they pay per week. Some private renters are eligible for Commonwealth Rent Assistance

¹ It would be more accurate to rely on the responses of the household member responsible for paying the household bills. However, unfortunately this cannot be observed in every wave of the HILDA survey.

(CRA); however CRA is paid directly to eligible private renters themselves as a cash transfer and not directly to landlords. Hence, the rental payment amounts reported in the HILDA survey by private renters are actually gross amounts. For private renters, we calculate net housing costs by estimating the amount of CRA that each private renter household would be eligible for and deducting their CRA entitlement from reported rental payments.

To calculate the amount of CRA each household is eligible for, we adopt the following approach. First, we select private renter households in which at least one household member is a recipient of a means-tested pension or allowance, or who receives more than the base rate of Family Tax Benefit Part A (FTB(A)). These households are identified as being potentially eligible for CRA on the basis of their receipt of a pension, allowance or FTB(A). We then apply the second CRA eligibility criteria, which is that households have to be paying rent above a minimum rent threshold in order to receive CRA. Households that satisfy both criteria are classified as CRA eligible. Next, we proceed to calculate the CRA amount that each eligible household would receive in each year from 2001–10. CRA is paid at 75 cents for every dollar of rent above the minimum rent threshold. The CRA entitlement is capped when the household's rent breaches the maximum rent threshold. We account for the fact that households' minimum and maximum rent thresholds vary across household type, that is, the threshold values are dependent on whether the household is a lone person or couple household as well as the number of dependent children present within the household.²

Income definitions have varied more widely across studies, with certain studies such as Yates (2007) and Marks and Sedgwick (2008) experimenting with both gross and disposable income measures. In the present study, we adopt the use of disposable income in the measurement of housing cost burden, as we argue that it is the household's after-tax income that is used to contribute to its housing costs. As traditional housing stress measures rely on housing cost:income ratios, persons with negative or zero household income in a particular year are excluded from the analysis in that year as it is not possible to calculate housing cost:income ratios for these households. There is another intuitive explanation for the exclusion of this group. Typically, negative or zero incomes are the result of tax minimisation strategies or temporary losses from self-employment that do not reflect true underlying financial positions. We follow Buddelmeyer and Verick (2008) and Wood

² Private renter households include community housing tenants. There are some limitations to our methodology for calculating CRA entitlements. First, CRA entitlements are typically estimated on an income unit basis. The latest ABS definition of income unit, which is similar to the unit used in determining eligibility for various government pensions and allowances, is "one person, or a group of related persons within a household, whose command over income is assumed to be shared. Income sharing is assumed to take place within married (registered or de facto) couples, and between parents and dependent children" (ABS 2012, p158). We calculate CRA entitlement on a household basis. By doing so, we may not accurately represent the CRA entitlements received by multi-income unit households (a multiple-income unit household is a household comprising more than one income unit e.g. group households as opposed to a one-income unit household where a dwelling is occupied by persons comprising one income unit only). The limitation of using a household approach for imputing CRA entitlements applies to only a small proportion of households however, as over 85 per cent of households are one-income unit households. AHURI have funded the development of a microsimulation model, AHURI-3M, which allows accurate but complex calculations of CRA entitlements on an income unit basis. This model currently covers the period 2001–06 whereas the present analysis extends up to 2010. On this basis, the simpler 'household' approach to CRA imputation is adopted here, resulting in some limitations. Second, due to methodological difficulties in identifying the proportion of rent that each sharer contributes within group households, CRA rules for singles (rather than single sharers) have been applied to group households.

and Ong (2009) who omit these persons from their study of poverty and housing affordability dynamics respectively.

Following Yates (2007), we measure income distribution based on equivalised disposable income. Equivalence scales are typically applied; the study cited in this paragraph used the modified OECD scale assigning a weight of 1 to the first adult in the household, 0.5 to the second adult, and 0.3 to each child under the age of 15. Hence, the equivalised income of a single person household would be equal to its unequivalised income, whereas the equivalised income of a household with more than one member would be lower than its unequivalised income. The purpose of the use of equivalence scales allows for the economies of scale that arise from income sharing within households.

3.2.2 Wellbeing outcomes

Wellbeing outcomes can be measured across a number of different domains, which can be classified into financial wellbeing and health and neighbourhood quality. These wellbeing variables can then be broadly classified into subjective and quasi-objective variables that reflect the degree of objectivity. By subjective, we are referring to responses that rely heavily on individuals' perceptions of their wellbeing, e.g. perceived prosperity. By quasi-objective, we are referring to responses that can be more or less assessed on an objective basis, but are also dependent on individuals' personality traits, e.g. ability to pay rent or mortgage on time. Table 1 below describes in detail the wellbeing variables we have used in our analysis.

The perceived prosperity variable allows us an opportunity to observe how households rate their financial prosperity when taking into account their current needs and financial responsibilities by choosing a response from six categories ranging from 'prosperous' to 'very poor'. This is a subjective wellbeing variable, so we go further to achieve more objectivity by mining a range of quasi-objective variables in the HILDA survey that reflect financial stress. In accordance with Bray (2001) and Breunig and Cobb-Clark (2005), we define households as having cash flow problems if they are unable to pay their mortgage, rent or utility bills on time, or need to seek help from family or friends to address money shortage issues. These are symptoms that primarily reflect management of budgets rather than deprivation. Following the same two studies, we define households as suffering financial deprivation if they have had to sell assets, go without meals or heating, or seek help from welfare or community organisations due to a shortage of money.

As with the financial wellbeing variables, we investigate both subjective and quasi-objective wellbeing variables where health is concerned. Individuals are asked to assess their current health by choosing from five categories ranging from 'excellent' to 'poor'. We delve further by exploiting the wealth of health data based on the SF-36 health scores that are more rigorous than the wholly subjective self-assessed health outcomes. The SF-36 health measures were constructed to satisfy minimum psychometric standards required for comparisons across population groups. Various studies have been conducted to test for the validity of the measure and have found that it encompasses some of the more commonly represented health concepts in the population in comparison to other generic health surveys. For example, the SF-36 measures, with the exception of general health, have been found to predict approximately two-thirds of the reliable variance in individual assessments of current health status in countries such as the United Kingdom, United States and Sweden (Ware n.d.).

Finally, neighbourhood quality variables can be divided into neighbourhood liveability indicators, community participation variables and neighbourhood socio-economic

status. Neighbourhood liveability is assessed based on HILDA survey interviewees' quasi-objective responses to questions regarding the neighbourhood conditions that reflect whether the neighbourhood is suitable to live in, e.g. the regularity with which traffic noise is heard. Again, here respondents are asked to rate the frequency of such occurrences from five categories ranging from 'never happens' to 'very common'. The same applies to community participation indicators, though here the HILDA survey questions focus more on the social behaviour of residents in the neighbourhood. Neighbourhood socio-economic status is observed from variables representing the ABS Socio-economic Indexes for Areas (SEIFA) decile that households fall into. The SEIFA ranks areas according to criteria that reflect the level of social and economic wellbeing in that area. There are four indexes (ABS 2003):

- Index of advantage\disadvantage, whereby areas are ranked along a continuum from disadvantage to high disadvantage.
- Index of disadvantage, focusing on the extent to which areas exhibit high unemployment, and residents are low-income earners or possess relatively low educational qualifications.
- Index of economic resources, based on indicators reflecting the level of economic resources in an area including income by family type, mortgage and rent payments, and rental properties.
- Index of education and occupation, constructed based on education and occupation characteristics in an area.

Table 1: Wellbeing variables

Wellbeing variable	Measurement	Degree of objectivity	Data availability
Perceived prosperity given current needs and financial responsibilities	<i>Ordinal</i> : Prosperous, Very comfortable, Reasonably comfortable, Just getting along, Poor, Very poor	Subjective	Waves 1–10
Cash flow problems			
Could not pay electricity, gas or telephone bills on time	<i>Binary</i> : Yes or No	Quasi-objective	Waves 1–9
Could not pay the mortgage or rent on time			
Asked for financial help from friends or family			
Financial deprivation			
Pawned or sold something			
Went without meals	<i>Binary</i> : Yes or No	Quasi-objective	Waves 1–9
Was unable to heat home			
Asked for help from welfare or community organisations			
Current self-assessed health	<i>Ordinal</i> : Excellent, Very good, Good, Fair, Poor	Subjective	Waves 1–10
SF-36 score			
Physical functioning			
General health			
Vitality	<i>Continuous</i> : 0 to 100 scale	Quasi-objective	Waves 1–10
Social functioning			
Role-emotional			
Mental health			

Wellbeing variable	Measurement	Degree of objectivity	Data availability
Neighbourhood liveability Frequency of traffic noise Frequency of noise from airplanes, trains or industry Frequency of homes and gardens in bad condition Frequency of rubbish and litter lying around Frequency of vandalism and deliberate damage to property Frequency of burglary and theft	<i>Ordinal:</i> Never happens, Very rare, Not common, Fairly common, Very common	Quasi-objective	Waves 1–4, 6, 8, 10
Neighbourhood community participation Frequency of neighbours helping each other out Frequency of neighbours doing things together Frequency of people being hostile and aggressive	<i>Ordinal:</i> Never happens, Very rare, Not common, Fairly common, Very common	Quasi-objective	Waves 1–4, 6, 8, 10
Neighbourhood socio-economic status SEIFA decile of index of relative socio-economic advantage/disadvantage SEIFA decile of index of relative socio-economic disadvantage SEIFA decile of index of economic resources SEIFA decile of index of education and occupation	<i>Ordinal:</i> Lowest to highest decile	Objective	Waves 1–10

Source: 2001–10 Household, Income and Labour Dynamics in Australia survey

4 RESULTS

This Chapter presents the main findings of our analysis. We start by reporting on housing stress outcomes using the HILDA data and then use these outcomes to assess the link between housing stress and various measures of household wellbeing. We are looking for evidence that housing stress provides a meaningful measure of various elements of household wellbeing including financial, health and neighbourhood wellbeing indicators. If households in housing stress have consistently lower measures of household wellbeing, we can conclude that housing stress does indeed have a negative impact on household wellbeing. If, however, there is little or no relationship between housing stress and household wellbeing, then policy-makers need to be aware that housing stress is not a reliable measure of negative household wellbeing outcomes and rising housing stress does not necessarily mean that households are experiencing declining wellbeing outcomes.

4.1 Housing stress: key indicators from the HILDA data

4.1.1 *Housing stress by income bands*

Yates' 2007 study on housing affordability and financial stress reported 15 per cent of all households paying more than 30 per cent of their income in housing costs in 2003–04. Table 2 below reports similar analysis based on the HILDA data. In 2001, 11 per cent of all households (including outright owners & public housing tenants) paid more than 30 per cent of their gross income in housing costs. By 2003, this had risen slightly to 13 per cent, 2 per cent lower than the Yates figure for the same year. This figure peaked at 17 per cent in 2008, before falling back to 14 per cent in 2009, largely due to interest rate cuts, but rose again in 2010 to 16 per cent as interest rates moved upwards. When the traditional definition of housing stress is applied, the proportion of all households in housing stress is around 7 per cent, and this remains more or less unchanged throughout the ten-year period. This analysis suggests that over the last decade increasing housing cost burdens have been mainly restricted to higher income groups.

As shown in Table 3, it is clear that those in the lower income groups are still much more likely to be in housing stress than those in higher income groups in each year. However, the proportion of households that pay more than 30 per cent of income in housing costs in the bottom 10, 20 and 30 per cent of the income distribution has remained relatively stable over the last decade. On the other hand, there has been a noticeable increase in incidence of housing stress in the higher income groups. From a social policy point of view, this trend raises some questions regarding the appropriateness of traditional housing cost:income based measures as indicators of 'stress'. It also raises questions about the broadness of the measure; particularly treating those in the bottom 10 per cent of the income range the same as those in the 40 per cent band. If lower income groups are not experiencing rising levels of stress how are they coping given house prices have risen much faster than incomes over the study period? A possible hypothesis could include lower income groups being increasingly excluded from purchasing or are managing their housing cost burdens by moving into lower quality housing or locations that are further and further away from places of employment and essential services. We explore these issues later on in this Chapter.

Table 2: Average housing cost:income ratio and incidence of housing stress, per cent, 2001–10

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Mean housing cost:income ratio	13	13	14	13	14	15	15	15	14	15
Median housing cost:income ratio	10	10	11	10	11	12	12	13	12	13
Incidence of housing stress; 30 per cent rule	11	12	13	12	13	15	15	17	14	16
Incidence of housing stress; 30:40 rule	6	7	7	6	6	7	7	7	6	7

Source: Authors' calculations from the 2001–10 Household, Income and Labour Dynamics in Australia survey.

Table 3: Percentage of households paying more than 30 per cent of income in housing costs, by income band, 2001–10

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Outside bottom 40%	9	9	10	10	12	13	14	15	13	14
Bottom 40%	15	17	17	16	15	17	18	19	17	19
Bottom 30%	17	18	18	17	16	18	19	19	17	18
Bottom 20%	18	20	19	19	18	19	19	19	18	20
Bottom 10%	25	30	26	28	21	23	22	24	25	27

Source: Authors' calculations from the 2001–10 Household, Income and Labour Dynamics in Australia survey.

Note: The table includes all households such as outright owners and public housing tenants which reduces the overall proportion considered to be in stress.

4.1.2 Housing stress by tenure

When assessing figures relating to all households, it is important to consider the structure of the housing market. The 2006 census reports 32.6 per cent of all households as being outright owners. Consequently their mortgage costs should be zero. This will have a significant impact on overall housing cost burdens when taking into account all households. The analysis below, therefore, splits the sample into owner purchasers and private renters and excludes outright owners and public housing tenants. Owner purchasers account for 32.2 per cent of all households and the rental sector 27.2 per cent, of which around 15 per cent are public or social housing tenants and around a further 30 per cent listed as having an 'other' landlord type which could be, for example, an employer, in which case housing costs may be subsidised. This means that around 50 per cent of households will not be concerned with housing cost burdens having either paid off their mortgage, paying a fixed proportion of their income on housing costs or benefiting from subsidised rents. Consequently, housing stress only relates to households with specific tenure structures so overall numbers in stress tend to look low when taking into account all households.

Table 4 below describes average housing cost:income ratios and incidences of housing stress for owner purchasers and private renters. Owner purchasers have seen their housing cost burden rise slightly from an average of 19 per cent to 22 per cent in 2009, with a peak of 23 per cent in 2008. Changes in average cost burdens are partly due to increased mortgage interest rates, but the rise does not reflect the growth in house prices occurring during that period. As reported in Table 4, across all capital cities from 2002–10, the ABS house price index almost doubled from 79–150.

Table 4: Average housing cost:income ratios, incidence of housing stress and housing and income indicators by housing tenure, per cent, 2001–10

Owner purchasers	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Mean housing cost:income ratio	19	19	19	20	20	22	22	23	21	22
Median housing cost:income ratio	18	17	17	19	19	20	20	22	19	21
Incidence of housing stress; 30 per cent rule	18	18	20	22	23	26	26	29	22	25
Incidence of housing stress; 30:40 rule	7	8	7	7	7	8	9	9	7	8
Private renters										
Mean housing cost:income ratio	23	23	24	21	22	23	22	23	23	24
Median housing cost:income ratio	20	20	20	17	19	19	19	20	19	20
Incidence of housing stress; 30 per cent rule	20	21	22	16	19	20	20	21	22	24
Incidence of housing stress; 30:40 rule	13	15	15	13	13	13	13	13	13	15
National housing and income indicators										
Mortgage interest rate (%)	6.8	6.4	6.6	7.1	7.3	7.6	8.2	8.9	6.0	7.2
HPI– established homes	n.a.	78.8	92.0	100.0	101.9	109.3	120.3	129.9	129.1	149.8
CPI–Rent component	131.4	134.5	137.1	140.5	143.7	148.3	156.4	168.6	179.9	187.7
Mean weekly equivalised disposable income (\$)	605	n.a.	620	674	n.a.	738	n.a.	859	n.a.	848

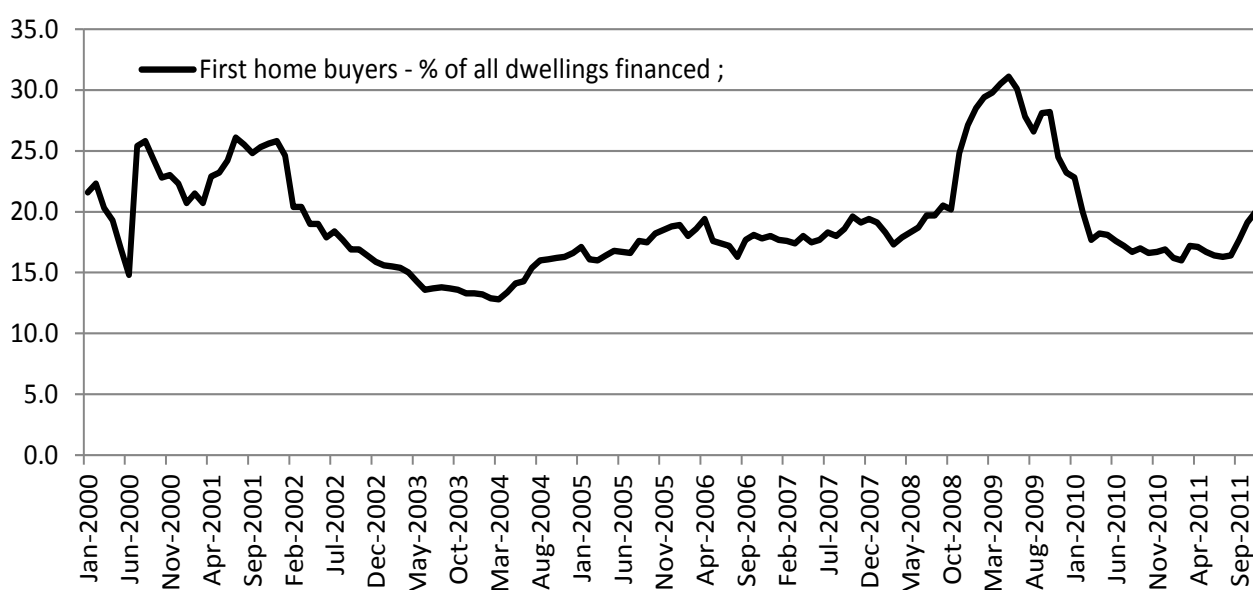
Source: Authors' calculations from the 2001–10 Household, Income and Labour Dynamics in Australia survey and Australian Bureau of Statistics (2011b) June quarter capital city House Price Index, Australian Bureau of Statistics (2011a) Consumer Price Index and Australian Bureau of Statistics (2011c) income data.

Households paying lower cost burdens over time (mortgage interest payments fall over time, see Table 5 below) have, up to 2009 at least, cancelled out those paying higher rates. Table 4 above provides evidence showing a big increase in the number of owner purchasers of all incomes paying above the 30 per cent benchmark in housing costs. The number of owner purchasers paying above 30 per cent rose from 18 per cent in 2001 to 29 per cent in 2008, falling back to 22 per cent following the interest rate cuts designed to stimulate the economy, before rising to 25 per cent after interest rates were raised again in 2010. The rising cost burdens are a function of interest rates but also the house price rises of the last decade, meaning that first time buyers, and upgraders, were forced to take on higher and higher housing cost burdens to enter the market. The proportion of households taking on higher cost burdens will eventually lead to a trend upwards in average costs. As shown in Table 5 below, owner purchasers who bought in the three years up to 2002 paid on average \$12 687 in mortgage costs in 2002, but those who purchased their home in the three years up to 2010 were paying \$26 000 in 2010. These figures show mortgage costs have doubled and housing cost burdens have risen from 24 to 29 per cent. If the

trend continues, the average housing cost burden will soon be well above 30 per cent for new purchasers.

In Australia, first home buyers make up, on average, around 20 per cent of all house purchases (ABS 2011d). Figure 1 below shows volatile first time buyer activity from 2000–11, largely due to rising house prices and government policies to stimulate demand, notably the first home owners grant boost. The average loan size of first home buyers and non-first home buyers has grown by 210 per cent since January 2000 (ABS 2011d). First home buyers now borrow, on average, \$282 000 and non-first home buyers \$298 000. Increased borrowing has led directly to the growth in the proportion of all owner purchaser households paying above 30 per cent of their income on mortgage costs. The proportion will continue to grow as first home buyers enter the market and will be exacerbated by an increase in interest rates.

Figure 1: First home buyer activity (per cent of all dwellings financed)



Source: Australian Bureau of Statistics (2011d), *Housing Finance Commitments*, Cat. 5609.

The proportion of owner purchaser households paying above 30 per cent of income in housing costs, and who were in the bottom 40 per cent of the income distribution, was 7 per cent in 2001, rising to a peak of 9 per cent in 2008. Comparing the incidence of housing stress under the 30 per cent rule and the 30:40 rule (Table 4), house price rises seem to have had less of an impact on owner purchaser cost burdens for low-income households. This may be because fewer low-income households have actually been able to enter home ownership as price rises have taken ownership out of their reach. This would be particularly the case for those households in the bottom 20 per cent of income earners. The housing (mortgage) stress measure is therefore problematic in that it only relates to those who have managed to achieve home ownership.

Steady housing cost burdens do not mean there is no growth in the number of households experiencing the impacts of declining housing affordability. It simply means that households that have managed to enter home ownership have experienced little growth in cost burdens. Using housing stress as a single measure of housing affordability would therefore show hardly any decline in affordability during this time despite house price increases of over 100 per cent in many states and mortgage loans increasing by 200 per cent. There may have been no decline in

affordability as measured by housing stress, but there is evidence of a decline in housing accessibility (Hulse et al. 2010; Flood & Baker 2010). Households may have been forced into the private rental sector or those that did enter home ownership may have been forced to locate to lower cost areas to keep down housing costs. The cost location trade-off is an outcome of declining affordability and is not something the housing stress measure can quantify. This is a discussion we return to later in the report.

Table 5: Housing cost estimates for owner purchasers in 2002, 2006 and 2010, by number of years since home was purchased^a

No. of years since home purchase	Mean annual mortgage payments			Mean housing cost income ratio		
	2002	2006	2010	2002	2006	2010
0–3	12,687	20,296	25,889	24	29	29
4–6	10,833	16,176	21,838	21	24	25
7–10	8,995	13,096	18,830	17	19	22
11–15	7,146	10,550	14,110	14	16	17
16–20	4,898	8,729	13,185	9	14	15
20–25	2,262	8,068	9,998	5	12	13
>25	1,741	4,228	6,191	3	8	7

Source: Authors' calculations from the 2002, 2006 and 2010 Household, Income and Labour Dynamics in Australia surveys.

Note: a. Data limitations preclude the calculation of years since home purchase in other years.

For private renters, cost:income ratios has remained almost unchanged over the study period (see Table 4 above). This is largely due to the fact that incomes kept pace with rent increases during the last decade. According to the ABS (2011c), average weekly equivalised disposable household incomes rose by 40 per cent from \$605 in 2000–01 to \$848 in 2009–10. The rent component of the Consumer Price Index (CPI) rose by a similar proportion over the same period. In 2001, 20 per cent of households in rental accommodation spent over 30 per cent of the income on rental costs. This figure rose to 24 per cent in 2010 but hovered below 22 per cent for the majority of the period. Those on low incomes paying over 30 per cent made up 13 per cent of all private renters in 2001 and once again there was little variation over the study period. Overall, the table suggests that typical households are paying well below the 30 per cent housing stress benchmark; although there was a jump in 2010 with incidences of stress reaching their highest level across the study period. This is not to say that rent rises in certain states since 2010, e.g. WA will not raise rent burdens significantly for many households or push even the bottom end of the private rental market almost completely out of reach of those on low incomes.

4.1.3 Housing stress by region

Over the last decade, house prices and rents have risen steeply in most capital cities in Australia. These are reflected in the ABS capital city HPI and rent CPI movements, which indicates that from 2002–10 house prices of established homes rose by 44 per cent in Sydney and more than 100 per cent in other capital cities. Indeed, in Perth, Hobart and Canberra, house prices spiked by 170 per cent. It is therefore surprising that the housing stress measure, based on the 30:40 rule, shows nowhere near the increase in housing stress one would expect to have occurred given such sharp increases in housing cost indices. Given the variation in house price and rental growth across states coupled with differing levels of employment and wage growth

we would expect some variations in the levels of housing stress. Even in Western Australia, where both house price and rent increases have generally been more acute than in other states over the study period, the proportion of households recorded as being in housing stress remained steady at around 7 per cent (Table 6 below). The 2010 data presents evidence that cost burdens are starting to rise with significant jumps in Queensland and South Australia. Regional variations are modest with Queensland having the highest incidences of stress and the ACT the lowest, but generally, levels of stress are consistently low across all states when taking into account all households. Further analysis was conducted to examine variations in the level of housing stress between urban, regional and rural areas, but no patterns emerged.

Table 6: Incidence of housing stress based on the 30:40 rule and housing indicators by housing tenure, per cent, 2001–10

State/ capital city	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Incidence of housing stress–30:40 rule (%)										
NSW	6	7	7	6	6	7	7	8	6	7
Victoria	5	7	6	7	5	7	7	7	6	6
Queensland	6	6	7	7	7	7	8	8	8	10
SA	6	6	7	4	6	5	7	6	5	9
WA	7	7	6	5	5	6	7	7	6	7
Tasmania	6	4	5	7	7	6	6	6	10	6
NT	a	a	a	a	a	a	a	a	a	a
ACT	4	4	9	5	6	6	1	5	5	2
HPI–Established houses										
Sydney	n.a.	81.6	93.7	97.7	94.2	94.3	98.2	101.1	100.3	117.3
Melbourne	n.a.	84.3	94.9	99.4	103.4	110.0	125.1	143.2	144.3	177.2
Brisbane	n.a.	64.5	83.1	103.8	105.5	110.9	128.1	146.1	142.2	154.3
Adelaide	n.a.	73.3	90.5	102.4	107.8	113.8	126.9	147.0	149.0	162.8
Perth	n.a.	77.2	90.2	104.9	122.5	169.6	192.1	190.8	185.3	208.3
Hobart	n.a.	57.6	79.7	107.8	114.5	124.6	135.4	143.1	145.0	156.2
Darwin	n.a.	81.6	91.3	103.0	122.6	150.3	166.3	177.7	197.5	223.6
Canberra	n.a.	70.7	90.9	100.3	100.0	107.0	118.5	126.7	126.4	146.6
CPI–Rent component										
Sydney	138.6	142.1	142.6	145.8	147.8	150.8	157.1	168.3	180.2	188.9
Melbourne	132.4	135.9	138.2	140.4	142.5	144.7	150.6	159.9	169.6	176.6
Brisbane	116.0	118.8	122.9	128.5	134.1	142.4	151.8	165.9	179.4	186.0
Adelaide	126.7	130.5	135.3	139.4	143.3	148.4	154.3	161.9	170.8	178.0
Perth	116.6	118.9	120.5	123.6	126.4	132.3	145.0	163.1	178.2	184.5
Hobart	118.4	121.3	125.0	131.3	135.6	142.5	150.4	156.9	165.2	171.1
Darwin	122.9	123.2	124.5	126.9	130.9	136.7	147.7	160.6	181.7	196.8
Canberra	124.5	131.6	138.1	148.3	152.7	157.1	165.6	177.8	189.8	197.5

Source: Authors' calculations from the 2001–10 Household, Income and Labour Dynamics in Australia survey and Australian Bureau of Statistics (2011b) June quarter capital city House Price Index, Australian Bureau of Statistics (2011a) Consumer Price Index and Australian Bureau of Statistics (2011c) income data.

Note: a. Due to small samples from the Northern Territory, the estimates for this territory have been excluded as they are statistically unreliable.

4.1.4 Housing stress across the life cycle

The housing tenure of a household is strongly related to life cycle stages. The traditional housing career of a household is a linear one, from renting in early adulthood, moving to home purchase and mortgages during a period of family formation, and owning a home outright in older age such that low incomes in retirement are matched by low housing costs. The estimates of housing stress in Table 7 below reflect this phenomenon; incidences of housing stress are lowest among the oldest age group, who enjoy much higher rates of outright home ownership than younger cohorts.

The figures on the proportion of outright owners and owner purchasers within each age band over the period 2001–10 highlights two key trends. First, the proportion of outright owners within each age band has declined over the decade. This is especially noticeable within the two older age groups; the 35–54 years cohort experienced a decline in outright home ownership rate of 9 percentage points and the 55+ group 11 percentage points. The proportion of owner purchasers has increased within each age band. This is especially concerning for the oldest age group, whereby the proportion of owner purchasers has almost doubled during the last decade, suggesting that growing numbers are entering retirement with mortgage burdens against the primary home. The housing stress measure tends to mask structural changes in the market. Taking simply the proportion of each age group in stress suggests little change across the study period; however, significant policy implications arise in connection with a mortgage burdened elderly population.

Table 7: Incidence of housing stress based on the 30:40 rule and housing indicators, by housing tenure, per cent, 2001–10

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Incidence of housing stress–30:40 rule (%)										
<35 years	10	12	11	10	10	10	11	10	8	11
35–54 years	6	6	7	5	6	7	7	8	7	7
55+ years	3	4	3	4	4	3	3	5	4	5
Proportion of outright owners										
<35 years	7	7	6	6	6	5	5	5	5	5
35–54 years	27	24	21	22	20	19	19	18	18	18
55+ years	72	70	69	69	67	66	65	65	63	61
Proportion of owner purchasers										
<35 years	33	34	35	33	34	34	34	37	36	37
35–54 years	48	50	51	51	52	53	53	52	53	53
55+ years	10	11	13	13	15	15	16	17	18	19

Source: Authors' calculations from the 2001–10 Household, Income and Labour Dynamics in Australia survey.

4.2 The relationship between housing stress and wellbeing

The analysis presented above suggests that housing cost burdens and levels of housing stress have not deteriorated over the period 2001–10 when in fact, the position for typical households has improved, particularly if a household is a long term owner purchaser with no desire to ‘trade up’. These findings are consistent with other AHURI research (Hulse et al. 2010; Burke et al. 2011; Berry et al. 2010). A general analysis using housing cost burdens and measures of housing stress is not consistent with anecdotal evidence of declining housing affordability, possibly because the affordability issues are related more to access to housing (deposit and household formation) and general cost of living rather than specifically mortgage or rental payments. In this Section we look more closely at the relationship between the traditional measure of housing stress and household wellbeing.

In order to assess whether housing stress is an accurate reflection of the impacts of housing affordability on household wellbeing, we explore the links between the housing stress measure based on the 30:40 rule and variables describing wellbeing, including financial stress, health and neighbourhood quality, via three pieces of statistical analysis.

First, we compare the wellbeing outcomes of those households in housing stress and compare them to those households not in housing stress. Our hypothesis is that in order for the 30:40 rule to have some validity in reflecting the ‘experience’ of housing stress, households in housing stress should exhibit lower levels of wellbeing than those not in housing stress. This is achieved via usual descriptive approaches such as comparison of means across the two groups using housing stress as well as both subjective and quasi-objective wellbeing indicators from the latest year of the survey.³ However, a descriptive analysis would at most show whether there is a correlation between housing stress and various wellbeing indicators. It would not allow us to quantify the magnitude of this correlation and any correlation uncovered via descriptive analysis might also reflect the influences of confounding factors that affect both housing stress and wellbeing, such as stage in the life cycle.

Hence, our second empirical exercise involves the use of regression modelling to examine the extent to which there remains a statistical link between housing stress status and various aspects of wellbeing after controlling for the influences of other factors. Here, we exploit all available waves of the HILDA survey by pooling together observations across waves to create a pooled dataset on which we are able to apply regression functions where the outcome variable is a wellbeing indicator regressed on a binary housing stress indicator, as defined by the 30:40 rule, as well as a series of other explanatory variables that act as controls. Our focus here will be on reporting regression findings based on indicators which are quasi-objective and therefore less likely to be influenced by differences in unobservable characteristics such as personality traits.

As detailed in Chapter 3, the range of quasi-objective wellbeing indicators can be binary or semi-continuous in nature. The nature of the regression specification will therefore depend on the measurement of the wellbeing outcome variable. For binary wellbeing variables, such as cash flow or financial deprivation variables, the outcome variable would take on a value of 1 if a household is experiencing a cash flow or financial deprivation problem, such as inability to pay the mortgage or rent on time, and 0 if it is not experiencing the problem. Here, we apply the following logistic regression specification:

³ The latest year of the survey would be 2010, except in the case of the analysis of cash flow problems and financial deprivation, where the latest year for which the necessary variables are available is 2009.

$$Pr(W_{it}) = f(HS_{it}, X_{it}, Y_{it})$$

where the probability of a household i experiencing a wellbeing outcome W at time t is a function of the household's housing stress status HS and characteristics X at time t , as well as the year. The coefficient of the HS variable can be reported in the form of an odds ratio. An odds ratio of greater than 1 indicates that housing stress increases the probability of exhibiting the wellbeing outcome W . The reverse is true for a ratio below 1. For example, if the relevant wellbeing indicator is inability to pay the mortgage or rent on time, then an odds ratio of 1.25 indicates a position in housing stress that increases the probability of not being able to pay the mortgage or rent on time by 25 per cent relative to being outside housing stress. On the other hand, an odds ratio of 0.8 would indicate that being in housing stress decreases the probability of exhibiting a wellbeing outcome by 20 per cent. The use of logistic regressions has been commonly employed in recent housing affordability studies such as Yates (2007) and Wood and Ong (2009).

We treat ordinal wellbeing variables as being continuous in order to employ a simple regression specification that has the advantage of being easy to interpret. Several existing studies have offered evidence that a linear model generates quantitatively similar results to an ordinal model (e.g. Frey & Stutzer 2002; Dockery et al. 2010). An example of a continuous wellbeing variable is the SF-36 health measure. Here, we apply the following linear regression specification:

$$W_{it} = f(HS_{it}, X_{it}, Y_{it})$$

where the wellbeing score W of household i at time t is a linear function of the household's housing stress status HS and characteristics X at time t , as well as the year. The coefficient of the HS variable does not have to be converted into another form in the case of linear regressions; a positive (negative) coefficient indicates that being in housing stress increases (decreases) the wellbeing score W in question. For example, if the relevant wellbeing indicator is the SF-36 social functioning measure, then a housing stress coefficient of 2 indicates that being in housing stress improves the SF-36 social functioning score by 2 points. On the other hand, a coefficient of -2 would indicate that the score is lowered by 2 points as a result of being in housing stress.

We go further by employing a third empirical exercise whereby we restrict our sample to households in housing stress only. The data remains pooled across all available waves; however, the sample now comprises households in housing stress in time t , and our primary concern is whether or not a movement out of housing stress between t and $t+1$ would be linked to an improvement in wellbeing between t and $t+1$. This approach has the added advantage of being even more robust than the previous approach as it tracks changes in each household's wellbeing outcome as a result of a change in housing stress status.

For a binary wellbeing outcome, such as inability to pay utility bills on time, an improvement in wellbeing would be noted if a household reported that it was not able to pay utility bills on time at t but was able to do so in the year leading up to $t+1$. For a continuous wellbeing indicator, such as the SF-36 mental health measure, an improvement would be denoted by an increase in the SF-36 score between t and $t+1$. The outcome variable thus takes on the value of 1 if an improvement has been observed between two adjacent waves, and 0 otherwise, regardless of whether it has been constructed from an underlying binary or semi-continuous wellbeing indicator. Hence, the following logistic regression specification now applies:

$$Pr(\Delta W_{it,t+1}) = f(OHS_{it,t+1}, X_{it}, Y_{it})$$

where the probability of a household (i) experiencing an improvement (Δ) in wellbeing outcome (W) between t and $t+1$ is a function of a movement out of housing stress (OHS) by the household between t and $t+1$ and characteristics (X) at time t , as well as the year. The coefficient of the OHS variable can again be reported in the form of an odds ratio. An odds ratio of greater (less) than 1 indicates that a movement out of housing stress increases (decreases) the probability of a household experiencing an improvement in the wellbeing outcome W .

X represents a vector of control variables representing the household's characteristics, including household type, household gross income, housing tenure, location, as well as key characteristics of the household reference person, i.e. age, gender, labour force status. These variables follow closely the household characteristics accounted for in Yates' (2007) financial stress modelling exercise. Moreover, various studies on subjective wellbeing have found that subjective wellbeing can vary systematically by age and/or gender (e.g. Frey & Stutzer, 2003; Long 2005). A more detailed description control variable measurement is presented in Appendix 3.

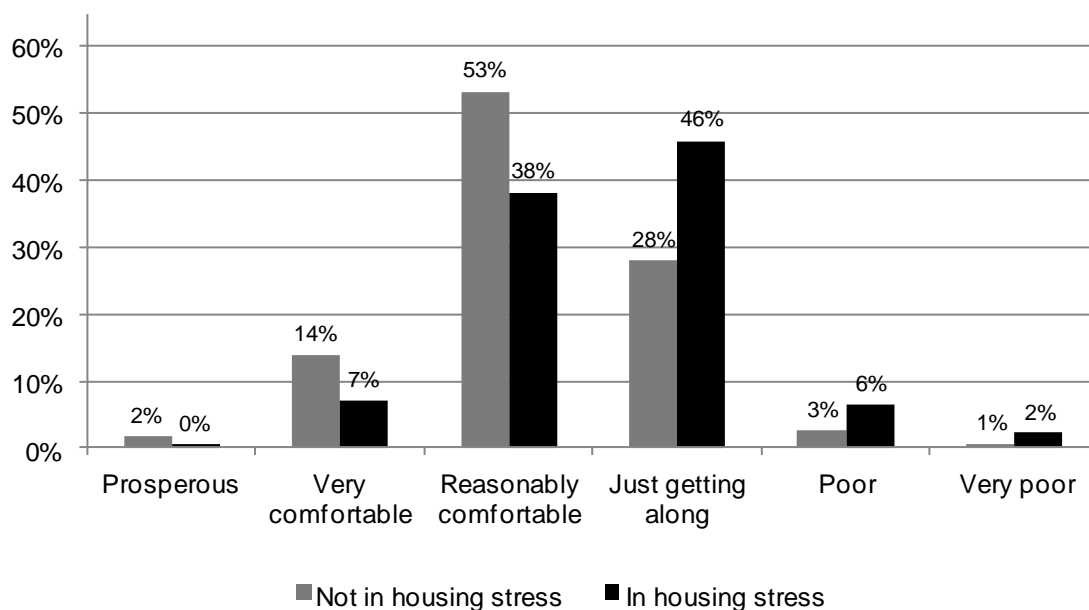
4.2.1 Financial wellbeing

We start by analysing the relationship between housing stress and financial wellbeing. If the traditional housing stress measure is to be used as the key indicator of changing housing affordability there should at least be a strong relationship between housing cost burdens and the financial wellbeing of low–moderate-income households. We would expect households in housing stress to be in a poorer financial position than those outside stress. Using the HILDA data on individuals' perceived prosperity level given their current needs and financial responsibilities, we are able to compare the financial satisfaction of the head of the household with the household's housing position within or outside housing stress. Figure 2 below describes the distribution of perceived prosperity levels ranging from prosperous on the left to very poor on the right by housing stress position. Although subjective household satisfaction measures are problematic (but becoming more widely accepted as described in Chapter 2) the figures below do provide some evidence that there is a link between housing stress and a household's experience of financial prosperity or financial stress.

Households in housing stress are more likely to report that they are 'just getting along', 'poor' or 'very poor'. On the other hand, households not in housing stress are more likely to perceive themselves as being 'comfortable' or 'prosperous'. However, if housing stress is regarded as a negative measure of a household's financial position we wouldn't expect 45 per cent of households in housing stress to regard themselves as financially 'reasonably comfortable' or 'very comfortable'. This supports the proposition that a significant proportion of low–moderate-income households can sustain housing cost burdens in excess of 30 per cent of their income and still be financially comfortable. This suggests that the 30 per cent benchmark is outdated. The measure is too broad in the sense that everyone in the bottom 40 per cent of income earners paying over 30 per cent in housing costs is automatically considered in housing stress and that this is always a negative outcome. Many households may have made the choice to spend over 30 per cent of their income in order to consume housing appropriate for their needs securing non-financial benefits from a position in housing stress while not, in fact, considering themselves to be in a position of financial stress. Other households may have taken on a short term position of stress for later perceived financial benefits so would consider their overall financial position comfortable. We return to investigate the validity of these hypotheses in the next Chapter discussing the disconnect between housing stress and wellbeing.

Figure 2 below does not suggest that being in housing stress automatically indicates a position of financial stress. What it does suggest is that many households consider themselves 'on the edge' of financial problems. 'Just getting along' was the most frequent rating of financial prosperity in housing stress households compared to 'reasonably comfortable' for non-stressed households. The housing stress measure based on the 30:40 rule could be regarded more correctly as an indicator of household risk. These findings echo those of Hulse et al. (2010) who stated that housing stress is less of an indicator of financial stress and more of an indicator of the potential risks of falling into hardship. The crucial factor to note is that a position of housing stress does not always equate to a position of financial stress.

Figure 2: Perceived prosperity given current needs and financial responsibility, by housing stress status based on the 30:40 rule, 2010, per cent



Source: Authors' calculations from the 2010 Household, Income and Labour Dynamics in Australia survey.

The HILDA survey also contains some more objective measures of financial stress, which we have termed quasi-objective measures. These are more reliable as they rely less on householder perceptions of their financial position. These variables are similar to those in the Hulse et al. (2010) study, which used the ABS HES to determine the percentage of households with indicators of financial crisis for 2003–04. The study found that the proportion of low households in financial crisis was much lower than the numbers suggested within traditional housing stress measures, implying that there is a disconnect between housing stress and financial stress.

The analysis presented in Table 8 below examines the proportion of households with a financial stress indicator by housing stress status. We use Bray's (2001) and Breunig and Cobb-Clark's (2005) typology to divide the range of indicators into two groups, i.e. cash flow problems and financial deprivation.

Table 8 shows that in 2009, households in housing stress are more likely to have a cash flow problem when compared to households not in stress. Forty per cent of those in housing stress have at least one cash flow problem indicator; the figure is only 16 per cent for non-stressed households. When it comes to financial deprivation, only a minority of households in housing stress reported an issue. At least one financial deprivation indicator was reported by 23 per cent, three times the proportion

of non-stressed households with at least one financial deprivation indicator. There is a clear link between housing stress and financial stress when comparing the frequency of occurrences of both types of stress, but what is also worth noting is that the majority of those in housing stress did not report a financial stress indicator in 2009. Therefore, equating housing stress with financial stress would be somewhat inaccurate. Policy-makers and the media tend to report those in housing stress as being in some kind of financial difficulty, but this is clearly not the case and paying above 30 per cent of income on housing costs while being in the bottom 40 per cent of the income distribution is manageable for many on low incomes. It should also be noted that there are households not in housing stress that experience financial stresses.

Table 8: Financial stress indicator, by housing stress status based on the 30:40 rule, 2009, per cent by column

Financial stress indicator	Not in housing stress	In housing stress
Cash flow problems		
Could not pay the mortgage or rent on time	6	13
Could not pay electricity, gas or telephone bills on time	11	25
Asked for financial help from friends or family	10	30
Had at least one cash flow problem	16	40
Financial deprivation		
Pawned or sold something	3	10
Went without meals	3	12
Was unable to heat home	2	8
Asked for help from welfare or community organisations	3	10
Had at least one financial deprivation problem	8	23

Source: Authors' calculations from the 2009 Household, Income and Labour Dynamics in Australia survey.

Note: 2009 is the latest year for which cash flow and financial deprivation variables are available in the Household, Income and Labour Dynamics in Australia survey.

Table 9 below reports findings from the regression analysis designed to unpack the links between housing stress status and financial stress outcomes, after controlling for other factors. Each financial stress indicator in Table 9 takes on the value of 1 if a household reports experiencing the stress measure and 0 otherwise. There are eight financial indicators listed in the table, each representing an outcome indicator in one of eight logistic regressions. The odds ratio attached to the housing stress status variable in each regression is reported in the table below.⁴ The odds ratios are all greater than 1, indicating that a position of housing stress is linked to financial stress with respect to all eight outcome indicators. However, this link is only statistically significant at the 5 per cent level with respect to four outcome indicators. Being in housing stress increases the probability of experiencing at least one cash flow problem by 12 per cent; similarly, the probability of suffering from at least one

⁴ Due to space constraints and in order to focus attention on the key variable of housing, i.e. housing stress status, the odds ratios attached to other explanatory variables have been excluded from our reporting of the regression results in this Section. However, the full set of odds ratios is available from the authors upon request.

financial deprivation problem is higher by 11 per cent when in housing stress relative to not being in housing stress. Unsurprisingly, the relationship between housing stress status and inability to pay the mortgage or rent on time is the strongest among all estimates reported in the table; being in housing stress increases the probability of being unable to pay the mortgage or rent on time by 22 per cent relative to being out of housing stress and this relationship is statistically significant at the 1 per cent level.

Our findings indicate that it would be erroneous to assume that traditional housing stress measures such as the 30:40 rule would be broadly indicative of being in financial stress. It is arguable that we should not expect any statistically significant relationship between housing stress and aspects of financial stress that are not directly housing related, e.g. being forced to pawn or sell an asset due to a shortage of money. However, even if we were to restrict attention to a household's ability to meet housing-related costs on time, the housing stress measure can only claim to account for a 22 per cent rise in a household's inability to meet their mortgage or rent payments on time. Furthermore, it is noteworthy that housing stress status has no statistically significant impact on a household's ability to meet other housing-related commitments, such as utility bills and home heating.

Table 9: Is there a statistical link between housing stress status and financial stress?^a

Outcome variable^b	Odds of experiencing a financial stress outcome when in housing stress relative to being out of housing stress^c
Cash flow problems	
Could not pay the mortgage or rent on time	1.219***
Could not pay electricity, gas or telephone bills on time	1.020
Asked for financial help from friends or family	1.091*
Had at least one cash flow problem	1.119***
Financial deprivation	
Pawned or sold something	1.060
Went without meals	1.148**
Was unable to heat home	1.080
Asked for help from welfare or community organisations	1.081
Had at least one financial deprivation problem	1.111**

Source: Authors' calculations using the 2001–10 Household, Income and Labour Dynamics in Australia survey.

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

Notes:

- The sample comprises 54 050 cases pooled across the 2001–09 waves. Cash flow problem and financial deprivation indicators are not available for 2010.
- In each model, the dependent variable has a value of 1 if a household has experienced a financial stress problem and 0 otherwise. For example, in the model whereby the dependent variable is 'Could not pay the mortgage or rent on time', the dependent variable takes on the value of 1 if a household reports that it is unable to pay the mortgage or rent on time', and 0 otherwise.
- All models are found to be statistically significant at the 1% level based on the model Chi² statistics.

It is interesting to note from Table 9 that all the financial stress indicators that represent households being forced to turn to external sources to address money shortages, i.e. having to ask for financial help from friends or family, borrowing from

welfare or community organisations, and sale of assets, appear to have, at most, statistically weak links to housing stress status. This casts doubt on the robustness of the estimates in Table 9 because outcomes may be linked to householders' personality traits. For example, varying preferences of households with respect to relying on external sources to meet financial needs may bias outcomes, but these are unobservable and therefore not controlled for in the regression analysis. We therefore turn to a more robust form of regression analysis, reported in Table 10 below, whereby we investigate whether a movement out of housing stress results in an improvement in that household's financial outcome. A striking finding is that there are no statistically significant relationships at the 1 or 5 per cent level between a movement out of housing stress and an improvement in financial wellbeing. This again casts doubts on the use of the 30:40 rule in making judgments about the financial position of a household. If a household's financial wellbeing is not improved by a movement out of housing stress this suggests the measure does not reflect their financial position. In this case the measure may be too broad and any stronger relationship within lower income groups diluted by the inclusion of higher income households, i.e. towards the top of the low–moderate-income band. Once again, policy designed to lift households out of housing stress may not have the wellbeing impact expected. A narrower measure e.g. a 30:20 rule, might show a much stronger relationship.

Table 10: Is there a statistical link between a movement out of housing stress and an improvement in financial wellbeing?^a

Outcome variable^b	Odds of experiencing an improvement in financial wellbeing when moving out of housing stress^c
Improvement in cash flow	
Improved ability to pay the mortgage or rent on time	1.014
Improved ability to pay electricity, gas or telephone bills on time	0.938
Improved ability to manage money shortage without having to ask for financial help from friends or family	1.124
Overall improvement in cash flow	1.085
Improvement in financial deprivation	
Pawned or sold something	0.667*
Went without meals	0.826
Was unable to heat home	0.653*
Asked for help from welfare or community organisations	1.258
Had at least one financial deprivation problem	2.116

Source: Authors' calculations using the 2001–09 Household, Income and Labour Dynamics in Australia survey.

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

Notes:

- The sample comprises 1 876 cases pooled across the 2001–09 waves. Cash flow problem and financial deprivation indicators are not available for 2010.
- In each model, the dependent variable has a value of 1 if a respondent has experienced an improvement in financial wellbeing, and zero otherwise. For example, in the model whereby the dependent variable is 'Improved ability to pay the mortgage or rent on time', the dependent variable

takes on the value of 1 if a household reported that it was unable to pay the mortgage or rent on time at t but was able to meet these commitments at $t+1$, and zero otherwise.

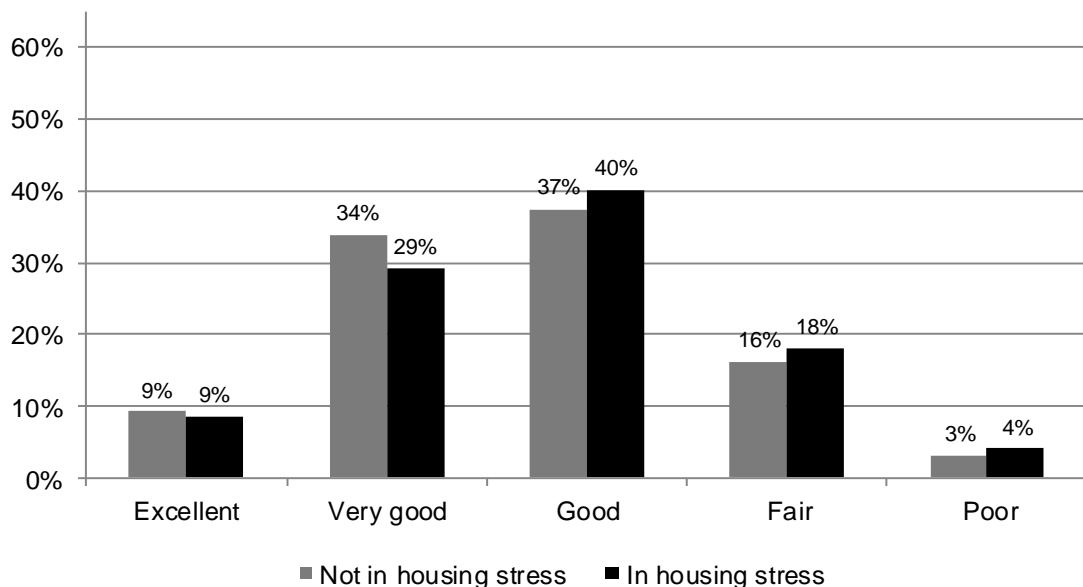
- c. All models are found to be statistically significant at either the 1% or 5% based on the model χ^2 statistics.

4.2.2 Health

Next, we turn our attention to the link between housing stress and another aspect of wellbeing: health. As discussed in the literature review, there is a strong relationship between housing and health. The stress caused to a household in danger of losing their house has significant health implications. The analysis below uses the HILDA survey to examine the link between households within and outside housing stress and their health outcomes, the hypothesis being those households suffering from housing stress would have worse health outcomes as a result. We are mindful of the fact that there exists a range of causal links between housing, income, employment status and health which means it is impossible to identify whether it is the housing stress element affecting health outcomes. However, the way in which housing stress is used to label households as being in a set of dire circumstances should mean there is some relationship between housing stress and health if the traditional measure is indeed a reliable indicator of housing stress.

Figure 3 below describes a very weak link between housing stress and subjective self-assessed health. Indeed, excellent health is reported by households in both groups. Similar proportions of households in and out of housing stress (40% & 37% respectively) report being in good health. The SF-36 measures are only slightly lower in most health categories for those in housing stress (Table 11). This reinforces the inferences drawn from self-reported health responses that the correlation between housing stress and ill health is weak at best. This biggest difference in SF-36 health scores between the two groups can be observed in the area of role-emotional health, which could partly be attributed to the emotional stresses of struggling to meet housing costs. Narrowing the definition of stress could potentially identify stronger links.

Figure 3: Self-reported health outcomes, by housing stress status based on the 30:40 rule, 2010, per cent



Source: Authors' calculations from the 2010 Household, Income and Labour Dynamics in Australia survey.

Table 11: Mean SF-36 health outcomes, by housing stress status based on the 30:40 rule, 2010, value on a scale of 0–100

SF-36 measure	Not in housing stress	In housing stress
SF-36 physical functioning	82	81
SF-36 general health	67	65
SF-36 vitality	60	56
SF-36 social functioning	82	75
SF-36 role-emotional	83	73
SF-36 mental health	75	70

Source: Authors' calculations from the 2009 Household, Income and Labour Dynamics in Australia survey.

Table 12 below replicates earlier regression analysis designed to uncover the links between housing stress status and health outcomes (as measured by the quasi-objective SF-36 scores) after controlling for other confounding factors. This time, a linear specification is applied as the SF-36 measure is continuous. There are six score categories listed in Table 12, each representing a health outcome measure in one of six linear regressions. The coefficient attached to the housing stress status variable in each regression is reported in the table below.⁵ The coefficients are all negative, indicating that being in housing stress is associated with lower SF-36 health scores with respect to all six outcome categories. Surprisingly and contrary to expectations formed from the earlier descriptive analysis, with the exception of vitality, the negative associations between housing stress and SF-36 health scores are highly statistically significant, although it is also important to note that the magnitude of the coefficients are small when compared to average SF-36 scores. For example, being in housing stress is associated with a 1.67 point reduction in the role-emotional score, which is equivalent to only a 2 per cent reduction when measured as a proportion of the population average SF-36 role-emotional score of 82.

Table 12: Is there a statistical link between housing stress status and health?^a

Outcome variable ^b	Change in SF-36 health score when in housing stress ^c
SF-36 physical functioning	-1.175***
SF-36 general health	-0.696**
SF-36 vitality	-0.332
SF-36 social functioning	-1.845***
SF-36 role-emotional	-1.676***
SF-36 mental health	-0.973***

* Source: Authors' calculations using the 2001–10 Household, Income and Labour Dynamics in Australia survey.

** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

Notes:

- The sample comprises 59 036 cases pooled across the 2001–10 waves.
- The outcome variable is a continuous SF-36 score measured on a scale of 0–100.
- The models are found to be statistically significant at the 1% level based on the model F statistics.

⁵ As before, the coefficients attached to other explanatory variables have been excluded from our reporting of the regression results in this Section. However, the full set of coefficients is available from the authors upon request.

We turn to what is arguably a more robust form of regression analysis, reported in Table 13 below, whereby we investigate whether a movement out of housing stress results in an improvement in household health. In contrast to the previous model, there are no statistically significant relationships. This implies policy designed to lift households above the benchmark set by the 30:40 rule would have no significant positive impact on the health of the households. Once again, focusing the stress measure on lower income groups or households in inappropriate housing may uncover much stronger links.

Table 13: Is there a statistical link between a movement out of housing stress status and an improvement in health?^a

Outcome variable^b	Odds of experiencing an improvement in SF-36 health score when moving out of housing stress
Improved SF-36 physical functioning	1.055
Improved SF-36 general health	n.s.
Improved SF-36 vitality	n.s.
Improved SF-36 social functioning	1.114
Improved SF-36 role-emotional	1.189
Improved SF-36 mental health	n.s.

Source: Authors' calculations using the 2001–10 Household, Income and Labour Dynamics in Australia survey.

Notes:

- a. The sample comprises 2,077 cases pooled across the 2001–10 waves. In each model, the dependent variable has a value of 1 if a respondent has experienced an improvement in health, and 0 otherwise. For example, in the model whereby the dependent variable is 'Improved SF-36 role-emotional', the dependent variable takes on the value of 1 if a household reported a higher SF-36 role-emotional score at $t+1$ than at t , and 0 otherwise.
- b. Only models found to be statistically significant at either the 1% or 5% level based on the model χ^2 statistics are reported.

4.2.3 Neighbourhood quality

Neighbourhood quality is a key facet of housing affordability. We propose that there is a two-fold hypothesis regarding the links between housing stress and neighbourhood quality. First, households in housing stress may be in financial stress and therefore forced to live in poor quality neighbourhoods. Second, there are those who may choose to take on a higher housing cost burden and therefore be in housing stress in order to access the benefits of residing in higher quality neighbourhoods. There are therefore two types of links between housing stress and neighbourhood quality that are contrasting in nature. Table 14 below describes the HILDA variables relating to neighbourhood quality which include measures of community participation. HILDA survey respondents are asked whether each of the events listed in Table 14 'never happens', are 'very rare', 'not common', 'fairly common', or 'very common'. For ease of interpretation, this variable is collapsed into two categories: infrequent (never happens, very rare, not common) and frequent (fairly common, very common). Table 14 shows some minor differences between the neighbourhood outcomes of households within and outside housing stress. Those in stress are more likely to report noise issues and appear to experience lower levels of community participation, but otherwise there are few distinctions between the two groups.

Table 14 Neighbourhood liveability and community participation, by housing stress status based on the 30:40 rule, 2010, per cent by column

Common occurrences of the following events in the neighbourhood	Not in housing stress	In housing stress
Traffic noise	29	37
Airplane, train or industry noise	22	26
Homes and gardens in bad condition	13	15
Rubbish and litter lying around	12	12
Vandalism and deliberate damage to property	12	15
Burglary and theft	12	13
Community participation		
Neighbours helping each other out	59	51
Neighbours doing things together	33	29
People being hostile and aggressive	7	12

Source: Authors' calculations from the 2010 Household, Income and Labour Dynamics in Australia survey.

Table 15 below provides some evidence that households are spending more on fuel costs and are becoming less satisfied within their house and neighbourhood. This could be a result of households being forced to move further away from places of employment so are incurring additional commuting costs. A falling proportion of households are highly satisfied with their house and neighbourhood which could indicate that households are making quality trade-offs to keep housing costs low. Further research is needed to explore these contentions in more detail.

Table 15: Expenditure and neighbourhood satisfaction

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Mean expenditure on necessities (\$) ^a										
Groceries						9,174	9,486	9,711	9,300	9,382
Utilities						1,655	1,618	1,689	1,548	1,534
Motor vehicle fuel						1,726	1,821	1,997	1,891	1,982
Health care						2,247	2,212	2,307	2,399	2,248
Clothing						1,415	1,385	1,392	1,311	1,336
Per cent highly satisfied with housing related aspects of life ^b										
The home in which you live	68	67	68	68	67	65	65	66	66	65
The neighbourhood in which you live	70	68	71	70	67	67	68	67	66	65

Source: Authors' calculations from the 2001–10 Household, Income and Labour Dynamics in Australia survey.

Notes:

- a. Mean expenditure on good *g* has been inflated to 2010 dollars using the Consumer Price Index for good *g*.

- b. Household reference persons are defined as being highly satisfied if they report that their satisfaction rating is at least 8 out of a scale of 0–10.

Table 16 below describes a clear association between housing stress status and the socio-economic status of neighbourhoods as represented by the Socio-Economic Indexes For Areas (SEIFA) deciles. The table shows how households in housing stress are far more likely to be located in areas of lower socio-economic status. The analysis suggests that households in stress are more likely to be located in areas of relative socio-economic disadvantage lacking economic resources, education and occupation amenities. Households in housing stress are clustered in the disadvantaged areas, perhaps forced into areas lacking the quality services and amenities desired by households. In this respect there is a link between housing costs and household wellbeing with low-income households forced into low socio economic status areas with many under housing stress even despite lower rents and prices in these areas.

However, once again the problems associated with housing stress as a proxy for affordability outcomes are clear. Low-income households are still able to consume housing in those areas regarded as the most desirable, i.e. those of the highest social economic status, and a proportion of these households are in stress. Low-income households in these locations may be households that bought into the area a number of years ago and have seen the area improve around them. They may also report a low-income but have generated significant wealth in the past enabling them to purchase in such an area. Whatever the case, it is likely that such households will have accrued significant capital gains in their houses and, although classified as being in housing stress under the 30:40 rule, are in fact relatively wealthy households without a housing affordability issue. The broad nature of the 30:40 rule includes asset wealthy households within the definition of stress.

Table 16: Neighbourhood SEIFA decile, by housing stress status based on the 30:40 rule, 2010, per cent by column

Decile	Relative socio-economic advantage/disadvantage		Relative socio-economic disadvantage		Economic resources		Education and occupation	
	Not in housing stress	In housing stress	Not in housing stress	In housing stress	Not in housing stress	In housing stress	Not in housing stress	In housing stress
Lowest	9	11	9	13	9	10	9	10
2 nd	10	11	10	11	10	11	11	12
3 rd	10	15	11	13	10	13	10	13
4 th	9	12	8	12	10	13	9	12
5 th	10	11	9	12	10	11	9	13
6 th	9	7	11	9	10	13	10	7
7 th	11	8	12	8	11	8	10	7
8 th	11	11	10	9	10	8	11	10
9 th	10	7	11	8	11	6	11	6
Highest	11	6	9	5	10	6	10	9
Total	100	100	100	100	100	100	100	100

Source: Authors' calculations from the 2009 Household, Income and Labour Dynamics in Australia survey.

Logistic (linear) regressions are used to measure the statistical links between housing stress status, neighbourhood quality and neighbourhood SEIFA decile in Tables 17 and 18 below. A common theme that runs through both sets of regression results is that there are no statistically significant relationships between housing stress status and neighbourhood quality, the exception being a weak link detected between housing stress and people in the community frequently being hostile to one another. Narrowing the housing stress definition may identify a stronger relationship.

Table 17: Is there a statistical link between housing stress and neighbourhood liveability or community participation?^a

Outcome variable^b	Odds of experiencing a frequent neighbourhood occurrence when in housing stress relative to being out of housing stress^c
Neighbourhood liveability	
Traffic noise frequently heard	0.973
Airplane, train or industry noise frequently heard	1.012
Homes and gardens frequently in bad condition	0.977
Rubbish and litter frequently lying around	1.003
Frequent vandalism and deliberate damage to property	0.994
Frequent burglary and theft	0.915
Community participation	
Neighbours frequently helping each other out	0.955
Neighbours frequently doing things together	1.089
People frequently being hostile and aggressive	1.163*

Source: Authors' calculations using the 2001–04, 2006, 2008 and 2010 Household, Income and Labour Dynamics in Australia surveys.

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

Notes:

- The sample comprises 35 461 cases pooled across the 2001–04, 2006, 2008 and 2010 waves. Neighbourhood liveability and community participation variables are not available for 2005, 2007 and 2009.
- In each model, the dependent variable has a value of 1 if a household has experienced frequent occurrence of a neighbourhood liveability issue or indicator of community participation, and 0 otherwise. For example, in the model whereby the dependent variable is 'Traffic noise frequently heard', the dependent variable takes on the value of 1 if a household reports that traffic noise is a frequent occurrence in its neighbourhood, and 0 otherwise.
- All models are found to be statistically significant based on the model Chi² statistics.

Table 18: Is there a statistical link between housing stress and neighbourhood socio-economic status?^a

Outcome variable^b	Change in SEIFA decile when in housing stress relative to being out of housing stress^c
SEIFA decile of relative socio-economic advantage/disadvantage	-0.012
SEIFA decile of relative socio-economic disadvantage	-0.044
SEIFA decile of economic resources	0.005

SEIFA decile of education and occupation -0.026

Source: Authors' calculations using the 2001–10 Household, Income and Labour Dynamics in Australia survey.

Notes:

- a. The sample comprises 69 325 cases pooled across the 2001–10 waves.
- b. Each dependent variable is measured on a scale of 1–10.
- c. All models are found to be statistically significant based on the model F statistics.

Next, we use regression analysis to identify if households escaping housing stress between t and $t+1$ have seen improvements in neighbourhood quality over the same time period. Here the sample is restricted to those who moved between t and $t+1$, as an improvement in neighbourhood quality could only occur in conjunction with a change of location. This regression analysis focuses on changes in neighbourhood socio-economic status as measured by differences in the SEIFA deciles between time periods.⁶ Once again, no statistically significant relationships are found between a movement out of housing stress and an improvement in neighbourhood quality. This is not surprising as a neighbourhood quality improvement would usually be associated with an increase in housing costs as more expensive housing is consumed. A movement into a lower quality neighbourhood may pull a household out of stress but result in a decline in other housing-related outcomes.

Table 19: Is there a statistical link between a movement out of housing stress and an improvement in neighbourhood socio-economic status?^a

Outcome variable ^b	Odds of a rise in SEIFA decile when moving out of housing stress ^c
Moved into an area with a higher SEIFA decile of relative socio-economic advantage/disadvantage	1.042
Moved into an area with a higher in SEIFA decile of relative socio-economic disadvantage	1.276
Moved into an area with a higher in SEIFA decile of economic resources	1.181
Moved into an area with a higher in SEIFA decile of education and occupation	1.152

Source: Authors' calculations using the 2001–10 Household, Income and Labour Dynamics in Australia survey.

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

Notes:

- a. The sample comprises 837 cases pooled across the 2001–10 waves.
- b. Each dependent variable is measured on a scale of 1–10.
- c. All models are found to be statistically significant based on the model Chi²-statistics.

4.2.4 Summing up

The analysis presented above has implications for the way housing stress is currently used to support arguments around housing affordability. Housing stress, as measured according to the 30:40 rule, does not necessarily equal financial stress with only a small proportion of households in housing stress suffering from financial stress. Housing stress is a serious issue for households when the costs of housing

⁶ The neighbourhood liveability and community participation indicators are not available in consecutive waves after 2004. Hence, it is not possible to conduct a regression analysis on these variables that require observations in adjacent waves of the survey.

are preventing essential expenditure on food and heating, for example. In such a situation, the household would be forced to consider a change in housing circumstances; through a move to cheaper rental accommodation or a move out of home ownership. Sometimes this is not possible without a household moving out of their current location or downsizing to a house which is not appropriate to their needs; lacking the required number of bedrooms for example. Housing stress in itself does not identify households that are in danger of losing their home. The measure classifies households choosing to pay more than 30 per cent of their income in housing costs that consider themselves in a very comfortable financial position as equal to those households suffering financial deprivation. In policy terms, this is a very wide range of households labelled identically but with very different circumstances. Sections 4.3 and 4.4 identify why there is disconnect between housing stress and household wellbeing and also what can be done to make the measure more meaningful in policy terms.

4.3 Why is there disconnect between the housing stress measure and household wellbeing?

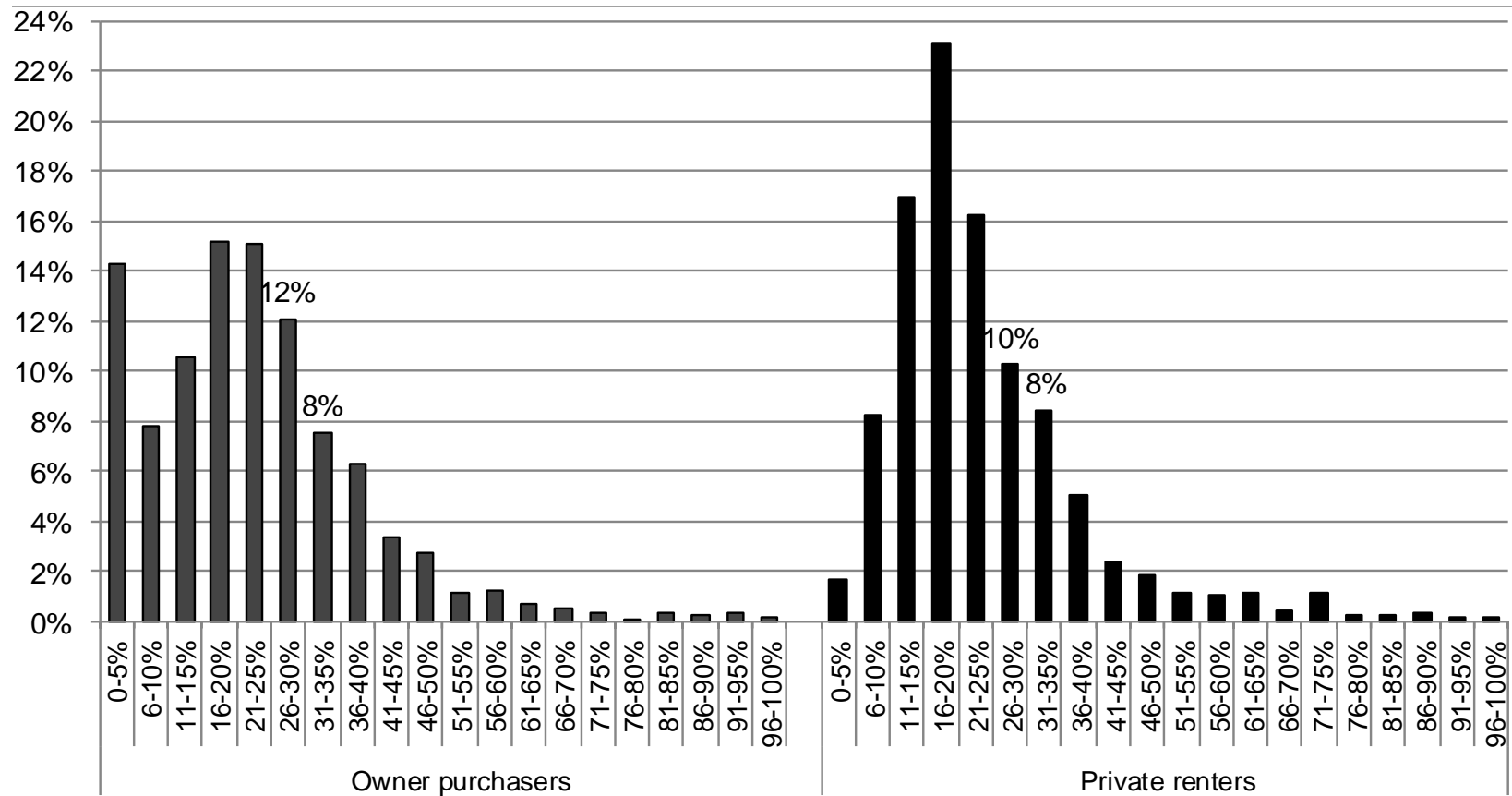
The measure of housing stress was originally designed to measure a household's housing cost burden. It has since been adopted as the go-to measure of housing affordability but, as discussed above, housing affordability is much broader than simply housing costs measured through mortgage and rental payments. Housing affordability encompasses not only the direct costs in terms of mortgage and rent payments but also the impact of maintenance costs, rates, insurance, commuting costs as well as wider outcomes such as housing quality, appropriateness and neighbourhood factors. As such, housing affordability outcomes are linked to household wellbeing. Housing stress is related to household wellbeing through financial wellbeing, as demonstrated in the preceding Section, but that link is weak at best. There are no consistent relationships between housing stress, health and neighbourhood outcomes. If housing stress is to continue to be used within policy debates we need to identify why there is disconnect between housing stress, financial wellbeing and the broader facets of household wellbeing. Chapter 5 discusses what can be done to improve the measure if it is to be retained.

4.3.1 An arbitrary benchmark

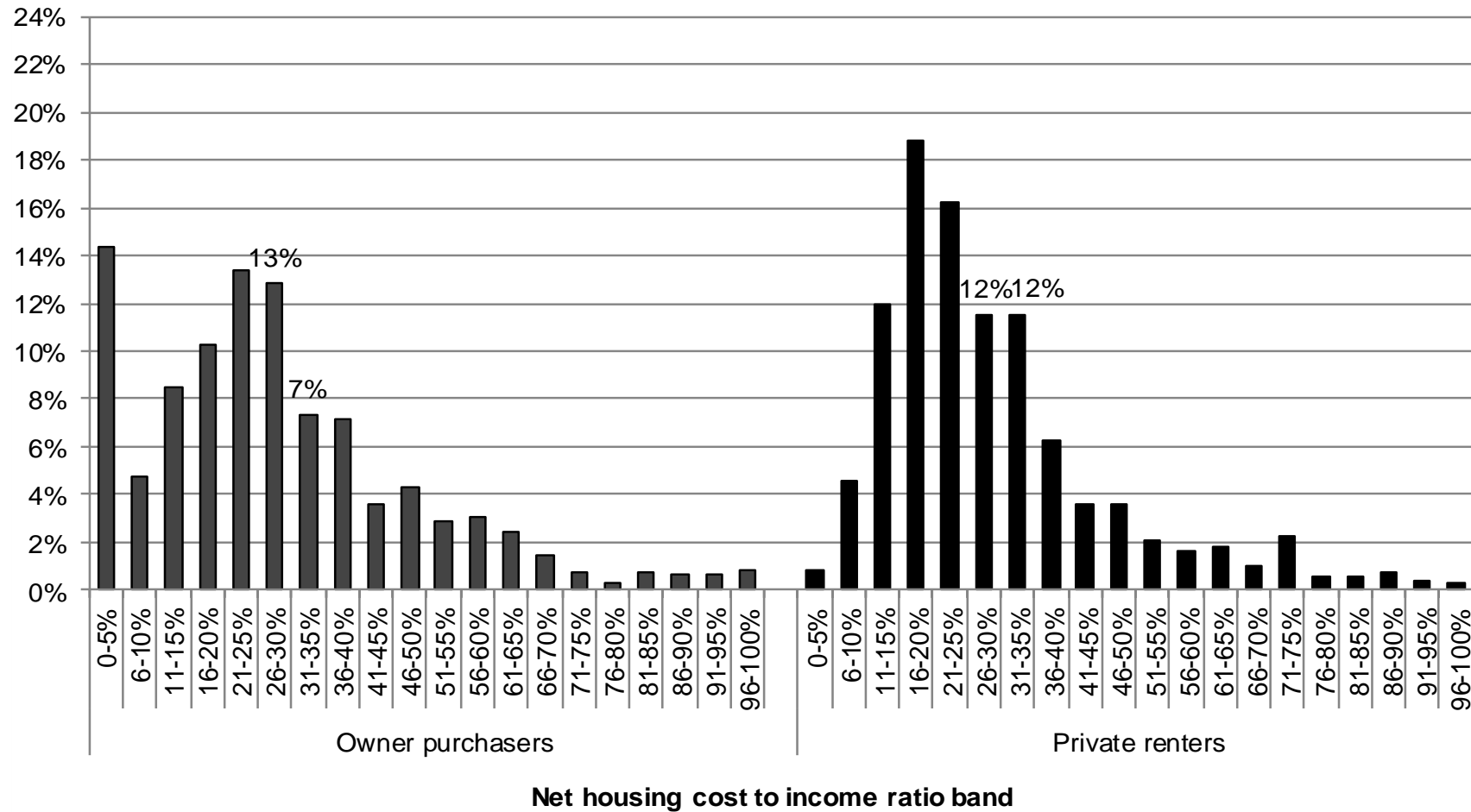
Figure 4 below graphically represents the distribution of net housing costs collapsed into 10 bands. The first figure describes the proportion of all owner purchasers within each cost band. The vast majority of households are located in the bottom three bands with 11–20 per cent being the most common. The proportion of households located in cost bands above 30 per cent drop off rapidly. For private renters, over half of households are paying between 11 and 25 per cent of their income in housing costs. Only around one quarter bear a housing cost burden in excess of 30 per cent.

Figure 4: Percentage of households in each net housing cost:income ratio band, by housing tenure, 2010

All households



Households in the bottom 40 per cent of the income distribution



Source: Authors' calculations from the 2010 Household, Income and Labour Dynamics in Australia survey.

When we narrow the sample to low and moderate-income earners (Figure 4b), the pattern is very similar for those in the private rental sector. However, a greater proportion of owner purchasers are located in the cost bands above 30 per cent. For those lower income earners, the proportion of households within the bands either side of the housing stress benchmark are much more evenly spread in comparison to all households. A small change in housing costs through an interest rate rise, for example, could push large numbers of households into stress. Conversely, a series of interest rate cuts could lift large numbers of households out of stress. As shown in Figure 4, around 20 per cent of households in both tenures are on the edge of the 30 per cent benchmark. Households could be moving into and out of stress in line with interest rates. However, a \$100 per month mortgage payment cut may not make a material difference to the financial wellbeing of a moderate-income household paying 31 per cent of their income in housing costs. Conversely, low-income households in the upper bands of housing stress will remain in housing stress following interest rate cuts; however a \$100 per month saving in mortgage payments may make a significant difference to the wellbeing of that household.

The arbitrary 30 per cent cut off ignores the variable financial positions of households within and outside of stress. Low-income households paying 20 per cent of their income in housing costs may experience similar financial pressures to a moderate-income household paying 45 per cent, but one household is in stress and one is not. The moderate-income household paying 45 per cent may have made a short term decision to pay a high cost burden to consume housing in a particular location and that cost burden is likely to fall over time as household income rises and the mortgage is repaid. A low-income private rental household paying 30 per cent of their income in housing costs may not see that burden fall over time if rents are rising faster or at the same rate as incomes.

For some households, housing stress may be a choice causing no hardship and therefore be meaningless. For others it may be an indicator of financial risk; the possibility of falling into financial hardship, and for the lowest income households it may be a major contributor to financial deprivation. The arbitrary 30 per cent benchmark is problematic. Work on the residual method assessing affordability has shown how households on moderate-incomes with specific structures, such as lone person or no children, can comfortably afford to pay more than 30 per cent in housing costs (Burke et al. 2011). However, it may be a fair reflection for low-income households with children. The 'one rate fits all' approach does not work because it fails to address the different circumstances of households, including levels of other debt commitments, for example, even if incomes are equivalised.

4.3.2 Trade-offs

The 30 per cent benchmark also raises the question of trade-offs. To what extent do households choose to pay over 30 per cent in order to consume housing appropriate to their needs but, at the same time, sacrificing other expenditure? If households do make a choice to spend over 30 per cent when they had an alternative option of consuming a cheaper property elsewhere, by sacrificing a certain level of amenity for example, should they still be regarded as being in housing stress or should housing stress simply classify those households forced into such a position by a lack of alternative housing options? This brings us back to the link between housing stress and housing affordability. Compromising on housing appropriateness, quality or neighbourhood amenities in order to avoid a position of housing stress would mean a household had a negative affordability outcome, if not necessarily a housing stress or financial wellbeing problem.

Table 20 below is based on employed persons spent time travelling to work each week. The data shows that those in housing stress typically spend less time travelling to work, suggesting that households are paying higher mortgage/rents in order to live in places that reduce their hours of commute and commuting costs. It could also be argued that households are moving a significant distance from their workplace (a commute greater than 4 hours) in order to access affordable accommodation but by doing so are incurring higher transport costs, particularly if they drive, as a result.

Table 20: Number of hours spent travelling to places of paid employment in a typical week, by housing stress status based on the 30:40 rule, 2010

Number of hours	Distribution (% by column)	
	Not in housing stress	In housing stress
<2	33	40
2–4	18	19
4–6	22	20
6–8	7	8
8–10	13	8
10–12	3	2
12+	5	4
Total	100	100
Median	4 hrs	3 hrs

Source: Authors' calculations from the 2010 Household, Income and Labour Dynamics in Australia survey.

The work by Hulse et al. (2010) highlights the difficulties faced by new purchasers, particularly those with families who are being forced to move to the urban fringes to access affordable and appropriate housing. The housing stress data presented here shows little increase in the proportion of low-income households in housing stress. Superficial analysis of that figure would suggest the proportion of households with a housing affordability issue has remained stable over the last ten years. However, if households are moving further and further out of the city to access affordable and appropriate accommodation this would not be reflected in rising housing stress figures. Such movements would place additional cost pressures on households through travel to work costs or a lack of quality amenities in the local area. While housing stress may not have increased, more and more households may be affected by wider housing affordability issues, i.e. being forced to locate in an area with inadequate infrastructure.

Table 21 below shows that the median travelling time required to get to and from places of work has increased from 3.75 hours in 2002 to 5 hours in 2010 for new owner purchasers, defined as those who bought within the three years leading up to 2002 and the three years leading up to 2010 respectively. The proportion of new owner purchasers who spend less than 2 hours per week travelling to and from work has declined from 35 per cent in 2002 to 29 per cent in 2010. On the other hand, the proportion spending more than 6 hours travelling to and from work each week has risen from 38 per cent to 55 per cent between 2002 and 2010. Increased congestion is part of the explanation, but the table does provide evidence pointing to new purchasers locating further away from employment opportunities. This is certainly an affordability outcome not addresses by housing stress measures.

Table 21: Number of hours spent travelling to places of paid employment in a typical week by new purchasers in 2002, 2006 and 2010

Number of hours	Distribution of hours spent travelling to and from work (% by column)		
	2002	2006	2010
<2	35	36	29
2–4	20	17	16
4–6	22	24	24
6–8	23	23	31
8–10	9	12	14
10–12	2	1	3
12+	4	3	7
Total	100	100	100
Median hours spent travelling to and from work	3.75	4	5

Source: Authors' calculations from the 2002, 2006 and 2010 Household, Income and Labour Dynamics in Australia survey.

Table 22 below provides further evidence relating to the importance of a full assessment of housing affordability. Public housing tenants are, by definition, excluded from the housing stress measure because they pay 25 per cent of their income in housing costs. Using housing stress as the indicator of housing affordability excludes any affordability issues faced by public housing tenants. Table 22 describes how public housing tends to be located in areas of greatest socio-economic disadvantage, fewest economic resources and poorest education and occupation opportunities. Public housing tenants may not be in housing stress but their housing quality and location may lead to negative wellbeing outcomes.

Table 22: Distribution of public housing stock across SEIFA deciles, 2010

	Relative socio-economic advantage/disadvantage	Relative socio-economic disadvantage	Economic resources	Education and occupation
Lowest	37	41	34	24
2	12	17	15	14
3	7	12	10	18
4	15	8	7	11
5	4	7	14	9
6	4	6	5	4
7	11	3	4	4
8	4	2	3	10
9	3	3	2	3
Highest	4	1	5	4
Total	100	100	100	100

Source: Authors' calculations from the 2009 Household, Income and Labour Dynamics in Australia survey.

Households outside housing stress may be achieving low housing cost burdens by choosing to reside in areas that have limited access to employment opportunities. Social infrastructure might be limited, providing households with below average educational opportunities for their children or low quality health services. Some households within 'affordable housing' may be living in a dwelling that is inappropriate for their needs or perhaps located a significant distance from family or the household's original community. These concentrations of disadvantage may provide affordable accommodation but present other problems in terms of housing inappropriate for needs. Households in such accommodation may be the ones suffering the greatest financial pressures from rising utility bills, transport costs or the need for child care if forced to locate away from family. Affordable housing costs may hide general wellbeing issues caused by the accommodation. Overcrowding, especially problematic within Indigenous households, is another facet of affordability that must be taken into account when assessing a policy response. Once again, a simple housing stress figure will exclude such households from the stress-based evidence base.

Table 23 below presents data from the HILDA survey on public housing location quality households in comparison to other housing tenures, which support the argument above. While it appears that public housing households have greater ease of access to public transport than other housing tenures, they have greater difficulty accessing frequently used services. Importantly, the proportion of public housing households that find living space or the number of bedrooms to be inadequate is twice the proportion of other housing tenures. In general, public housing households appear to enjoy less comfort and are less likely to have their housing needs met but are not considered to be in housing stress.

Table 23: Quality of location and housing of public housing tenants compared to other housing tenures, 2002^a, per cent

Quality of location and housing	Public housing	Other housing tenures	All
Distance from public transport			
Less or much less than adequate	11	18	18
Adequate	47	44	45
More or much more than adequate	42	38	38
Access to services normally used			
Less or much less than adequate	12	11	11
Adequate	59	53	53
More or much more than adequate	30	37	36
Living space			
Less or much less than adequate	23	11	12
Adequate	63	50	51
More or much more than adequate	14	38	37
Number of bedrooms			
Less or much less than adequate	20	10	11
Adequate	66	55	55
More or much more than adequate	14	35	34

Comfort			
Less or much less than adequate	14	7	7
Adequate	70	49	50
More or much more than adequate	16	45	43
Housing needs in general			
Less or much less than adequate	16	6	6
Adequate	66	52	53
More or much more than adequate	19	42	41

Source: Authors' calculations from the 2002 Household, Income and Labour Dynamics in Australia survey.

Note: a. This is the latest wave for which the quality of location and housing variables listed in this table are available.

4.3.3 Access to housing

The psychological benefits of home ownership are well reported; stability, control, etc. (Saunders 1990; see Hulse & Saugeres 2008 for a review) and households that cannot afford to enter home ownership are unable to access these benefits even though they may not be regarded as being in housing stress within their rental accommodation. Again this is part of the wider issue of housing affordability.

Table 24 below presents data on the views on home purchase from a special youth module within the 2004 HILDA survey and, in particular, the chances of being able to enter ownership. Only a third of young people aged under 30 are 'not at all worried' about their ability to purchase a home by their desired age. The majority hold concerns about their ability to afford to purchase and, when combined with the 75 per cent of young people that have yet to start to save for a deposit, the concern seems well placed. Given the survey took place in 2004, before significant price rises in many states, we would expect views expressed today to be even more pessimistic.

The lack of a deposit is a barrier preventing home ownership for many existing households and households yet to form. The deposit issue is crucial in any debate on housing affordability. However, when housing stress is used as a proxy for affordability outcomes, the evidence presented fails to take into account barriers to future household formation or tenure transition. This is one of the major flaws of using housing stress indicators as a base for housing policy. With high levels of population growth expected throughout the country in the coming decades, the ability of individuals to form new households should be a pressing policy concern at all levels of government. Before policy can address the issue, there needs to be reliable data on the extent to which potential households are prevented from forming due to a lack of affordable options. Table 25 below presents evidence to suggest independent adults are leaving home later in life, which will be a choice for many but forced on others. The recent AHURI Essay by Liu and Easthope (2012) presents evidence that multi-generational households are becoming more common and household sizes rising as a result. The issue of young people being unable to leave home is an important one and such constraints are integral to discussions about housing affordability but ignored by housing stress measures. In fact, a proportion of multi-generational homes are unlikely to be in a position of housing stress as they often contain more than one working adult, but there is still an affordability issue for any member of the household who is unable to leave due to a lack of accommodation options.

Table 24: Young people and home ownership, 2004

Indicators of ability to afford home purchase	<20 years	20–24 years	25–29 years	All
Whether worried about ability to purchase property by desired age				
Very worried	8%	11%	20%	11%
Somewhat worried	59%	54%	52%	55%
Not at all worried	33%	36%	29%	33%
Whether begun saving for home deposit yet? (those who plan to purchase a home)				
Yes	11%	32%	39%	24%
No	89%	68%	61%	76%
Amount of home deposit saved (those who have started saving)				
Mean	\$4,703	\$8,472	\$12,470	\$9,026
Median	\$2,000	\$4,000	\$5,000	\$4,000

Source: Authors' calculations from the 2004 Household, Income and Labour Dynamics in Australia survey.

Table 25: Percentage of independent adults who only left their parental home at 25 years old or later, 2010

Birth cohort	Age band	Males (%)	Females (%)	All (%)
1976–1980	30–34 yrs	17	14	15
1971–1975	35–39 yrs	16	11	13
1966–1970	40–44 yrs	12	8	10
1961–1965	45–49 yrs	14	8	11
1955–1960	50–54 yrs	15	8	11
1951–1955	55–59 yrs	11	7	9
1946–1950	60–64 yrs	14	5	9
Pre-1946	65 yrs +	17	9	13

Source: Authors' calculations from the 2010 Household, Income and Labour Dynamics in Australia survey.

4.3.4 Choice versus constraint

In previous Sections, we have contended that the 30 per cent housing stress benchmark, and even the more restrictive 30:40 rule, does not distinguish between those who fall into housing stress as a result of income constraints and those who choose to take on a higher cost burden in order to enjoy higher quality housing. In this Section, we attempt to empirically test this hypothesis via the following approach.

We take a sample of households that are not in housing stress at time t pooled across all ten waves of the HILDA survey and who moved between t and $t+1$. Using this targeted sample, we are able to empirically investigate whether or not a movement into housing stress between t and $t+1$ is accompanied by a move into a higher quality neighbourhood as represented by the SEIFA deciles.

If a movement into housing stress is accompanied by an improvement in neighbourhood socio-economic status, we are able to infer that movers are choosing to take on higher housing cost burdens in order to enjoy the benefits of improvements in housing outcomes. To test this, we apply the following logistic regression specification:

$$Pr(\Delta Sit, t+1) = f(IHSit, t+1, Xit, Yit)$$

where the probability of a household (*i*) experiencing an improvement (Δ) in neighbourhood socio-economic status (*S*) between *t* and *t*+1 is a function of a movement into housing stress (*HIS*) by the household between *t* and *t*+1 and characteristics (*X*) at time *t*, as well as the year. An odds ratio of greater than 1 indicates that a movement into housing stress is associated with an increased probability of a mover household experiencing an improvement in neighbourhood socio-economic status.

If, however, a movement into housing stress is accompanied by a deterioration in neighbourhood socio-economic status, this would imply that households are falling into housing stress due to constraints forcing them to trade down into lower quality housing. To test this, we apply the following logistic regression specification:

$$Pr(\nabla Sit, t+1) = f(IHSit, t+1, Xit, Yit)$$

where the probability of a household *i* experiencing a deterioration (∇) in neighbourhood socio-economic status (*S*) between *t* and *t*+1 is a function of a movement into housing stress (*HIS*) by the household between *t* and *t*+1 and characteristics (*X*) at time *t*, as well as the year. An odds ratio of greater than 1 indicates that a movement into housing stress is associated with an increased probability of a mover household experiencing a deterioration in neighbourhood socio-economic status.

The model findings are presented in Tables 26 and 27 below. Table 26 shows that a movement into housing stress is associated with a 40–50 per cent increase in the probability of achieving a higher quality housing environment through improved neighbourhood socio-economic status. On the other hand, a movement into housing stress is not statistically linked to a deterioration in neighbourhood socio-economic status, as shown in Table 27. The findings clearly support the hypothesis that many households are choosing to take up higher housing costs in return for an improvement in neighbourhood conditions. To what extent such choice pushes a household into financial stress is an area in need of further research.

Table 26: Is there a statistical link between a movement into housing stress and a move into a neighbourhood with higher socio-economic status?^a

Outcome variable ^b	Odds of moving into an area with a higher SEIFA decile while moving into housing stress ^c
Moved into an area with a higher SEIFA decile of relative socio-economic advantage/disadvantage	1.417**
Moved into an area with a higher in SEIFA decile of relative socio-economic disadvantage	1.513***
Moved into an area with a higher in SEIFA decile of economic resources	1.494***
Moved into an area with a higher in SEIFA decile of education and occupation	1.504***

Source: Authors' calculations from the 2001–09 Household, Income and Labour Dynamics in Australia survey.

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

Notes:

- The sample comprises 6,047 cases pooled across the 2001–10 waves.
- In each model, the dependent variable has a value of 1 if a respondent has experienced an improvement in neighbourhood socio-economic status between t and $t+1$, and 0 otherwise.
- All models are found to be statistically significant based on the model Chi²-statistics.

Table 27: Is there a statistical link between a movement into housing stress and a move into a neighbourhood with lower socio-economic status?^a

Outcome variable ^c	Odds of moving into an area with a lower SEIFA decile while moving into housing stress ^c
Moved into an area with a lower SEIFA decile of relative socio-economic advantage/disadvantage	1.078
Moved into an area with a lower SEIFA decile of relative socio-economic disadvantage	0.967
Moved into an area with a lower SEIFA decile of economic resources	0.901
Moved into an area with a lower SEIFA decile of education and occupation	1.045

Source: Authors' calculations from the 2001–09 Household, Income and Labour Dynamics in Australia survey.

Notes:

- The sample comprises 6 047 cases pooled across the 2001–10 waves.
- In each model, the dependent variable has a value of 1 if a respondent has experienced a deterioration in neighbourhood socio-economic status between t and $t+1$, and 0 otherwise.
- All models are found to be statistically significant based on the model Chi²-statistics.

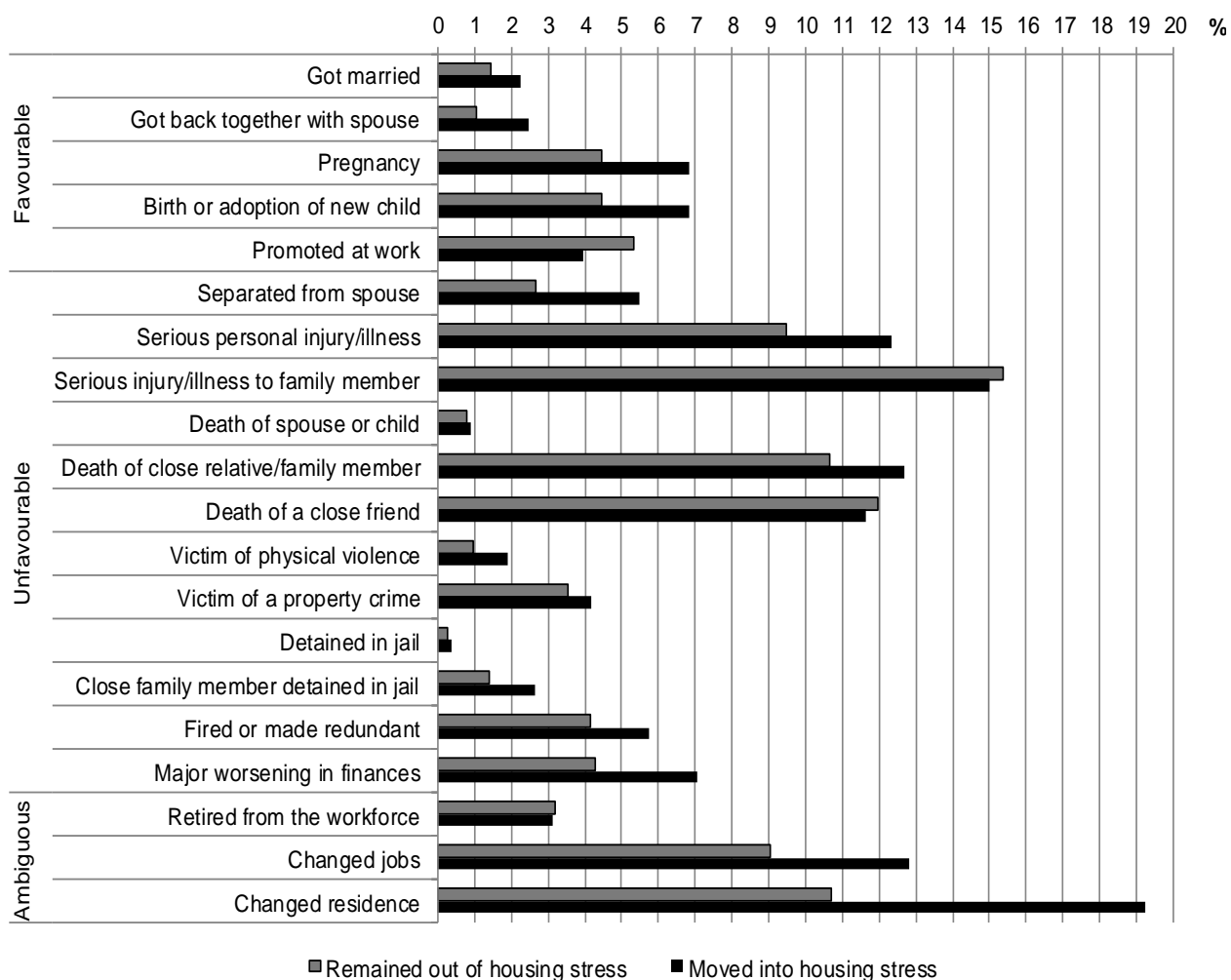
We further mine the HILDA survey to distinguish between choice and constraint using the survey's major life events modules. As before, we take a sample of households that are not in housing stress at time t pooled across all ten waves of the HILDA survey, though this time we include both movers and non-movers. Using this sample, we investigate the types of events that precede movements into housing stress by $t+1$. If favourable life events tend to precede movements into housing stress, it would indicate that households are prompted by positive events to make a choice to take on a higher housing cost burden. On the other hand, if unfavourable life events tend to precede movements into housing stress, we can infer that households are falling into housing stress due to constraints.

Figure 5 below lists the major life events that can precede a movement into housing stress. These are broadly divided into three groups; events that tend to be favourable, unfavourable, and others that are ambiguous due to lack of more detailed information. The figure allows us to compare the propensity of each major life event occurring among households who move into housing stress versus those who remain out of housing stress from 2009–10. It is notable that a promotion at work raises income relative to housing costs, and therefore those who move into housing stress are less likely to have benefited from a promotion than those who remain out of housing stress. However, it is also clear that many favourable life events that are associated with family formation and expansion can precede movements into housing stress as households take on higher housing cost burdens to accommodate the needs of a growing family. So, for example, the probability of the birth or adoption of a child occurring before a move into housing stress is around 7 per cent; the

probability of this same event occurring among those who remain out of housing stress is lower at around 4 per cent.

On the other hand, negative events can also cause households to fall into housing stress, as evidenced by the higher probability of negative events occurring among those moving into housing stress, for example, separation from one’s spouse or redundancy. Clearly, the factors underlying moves into housing stress need to be investigated before one presumes that all moves into housing stress are evidence of financial constraints. It is very clear from Figure 5 that households changing residences are much more likely to move into housing stress than out of it. This would suggest some degree of choice unless the move is precipitated by a negative event such as marriage breakup. That movement into stress may well be to secure a dwelling appropriate for housing needs. Much more detail is required to analyse individual circumstances to determine whether a move into stress is by choice or forced and has positive or negative benefits; what is certain is that households have very different circumstances and a single housing stress measure does not adequately address the wide variety of outcomes resulting from housing affordability.

Figure 5: Propensity of a major life event occurring among households that move into housing stress versus households that remain outside housing stress, 2009–10



Source: Authors’ calculations from the 2009–10 Household, Income and Labour Dynamics in Australia survey.

5 IMPROVING THE MEASUREMENT OF HOUSING STRESS

Housing stress, if calculated using a consistent methodology, provides policy-makers with a useful tool to assess how housing cost burdens have changed over time. It can also provide comparisons of the proportion of households paying above a pre-determined benchmark level of housing costs. However, its application is limited to households that have already been formed. There is some merit in using the 30 per cent benchmark to assess housing accessibility in certain circumstances but the residual method provides a more realistic tool. Housing stress effectively excludes analysis of public housing tenants, and outright owners and individuals wishing to form households but are unable to do so. Policy-makers may use increasing numbers in housing stress to draw conclusions about these other groups but there is no conceptual basis to do so.

The measure is commonly used to define housing affordability and provide the evidence base for policy justifications or affordable housing targets. However, the supply of affordable housing is designed to accommodate all manner of households and not just those with existing affordability problems, as evidenced by housing stress. Affordable housing targets also need to take into account household structure so dwellings can accommodate those household types most in need; families, lone persons, etc. As shown in this report, the broad nature of the housing stress measure prevents such conclusions being drawn because it is impossible to determine if the increase in households in stress is due to choice or constraint; quantify the position of households prevented from forming due to deposit or rent/payment constraints, or assess the appropriateness of housing or location. More importantly, the measure does not address the wider facets of housing affordability such as the outcomes of a decision to take on a certain cost burden, including the appropriateness of the housing; dislocation from an existing community; the other costs associated with consumption, and the quality of the neighbourhood in terms of access to employment and social infrastructure.

Rather than discard such a widely used and reported measure, what could be done to improve it and perhaps target it more specifically to those households where housing stress has a material impact on wellbeing? It is outside the scope of this project to develop an improved measure of housing stress, however, this Section provides a discussion on possible ways of modifying the measure so it is more policy-relevant.

5.1 Differentiating between medium-level and high-level housing stress

The analysis presented above describes a weak relationship between housing stress and financial wellbeing. If housing stress is to be applied as an accurate indicator of the financial stresses placed on a household, then it must be modified. Defining households as simply within or outside stress provides no quantification of degrees of housing stress and the associated financial implications. The financial pressures on households of similar income and structure will be very different if one has a housing cost burden of 30 per cent and one of 50 per cent, but both are classified equally. Similarly, the financial pressures on a household in the lowest income band paying 29 per cent of their income on housing costs compared to a household at the top of the 40 percentile income band paying 31 per cent are again, very different, yet the first is not considered to be in housing stress even though housing costs may be causing intense financial pressure. This suggests a need for a variety of different

housing cost benchmarks for different income groups reflecting varying positions of financial stress, where housing costs are a key contributor.

Alternative rules aligning more closely with financial stress measures could be considered for owner purchasers and private renters. Table 28 below examines how incidences of cash flow and financial deprivation change in comparison to the original 30:40 benchmark when variable housing stress bands are introduced. In the table, using the 30:40 rule, 14 per cent of households not in stress have a cash flow problem. The figure for in stress households is 18 per cent higher at 32 per cent. Using this 18 per cent difference as a benchmark, we can analyse whether splitting the bottom 40 per cent of households by income and housing cost burden provides a stronger relationship between housing costs and financial stress. The table identifies scenarios that achieve a better alignment with financial stress indicators than the 30:40 rule (all those not shaded in grey).

Assuming cash flow problems are indicators of medium-level stress:

- For owner purchasers, broadly speaking an income benchmark of 20 per cent and housing cost burden set at 15 per cent provides a much stronger relationship between housing stress and medium-level financial stress. This shows the financial pressures placed on the bottom income earners and how even low housing costs contribute to these pressures.
- For private renters, there are stronger relationships when restricting the measure to the 30 per cent of income earners.

Assuming financial deprivation is an indicator of high-level stress:

- For owner purchasers, the relationships are stronger in the bottom 30 per cent of income earners. When those in the 40 per cent bracket are included the relationship is weakened.
- For private renters, the relationships are stronger in the bottom 30 per cent of income earners, but this relationship breaks down at housing cost burdens above 35 per cent suggesting a greater degree of choice.

Generally, the inclusion of the 40 per cent income band weakens the relationship between housing stress and financial wellbeing. The 30 per cent cost benchmark could also be reduced for those on the lowest incomes because otherwise it excludes households in financial stress paying below this benchmark level. Extreme financial stress is, unsurprisingly, more closely related to income bands than levels of housing cost burdens, probably because housing costs have traditionally been a residual. Restricting housing stress measures to include only the bottom 30 per cent of income earners would be a start in making the measure more reflective of financial stress and therefore household wellbeing. That is not to say that those in the 40 per cent income band are outside financial stress, the table shows many households have an issue. For owner purchasers, increasing the cost benchmark level from 30 per cent to 50 per cent would provide a better indicator of financial stress as incidences of medium level financial stress are greater in the higher income bands. For high level stress, there are no scenarios that would improve the weak relationship between the 40 per cent income band and financial stress probably because the distribution is based on individual circumstances, including choice, rather than a lack of income across all households.

Table 28: Incidence of financial stress, by housing stress status under alternative binary rules, per cent, 2009

(a) Medium-level stress, cash flow problems

Housing cost burden	Income groups								
	Bottom 20%			Bottom 30%			Bottom 40%		
	Not in HS	In HS	% pt difference	Not in HS	In HS	% pt difference	Not in HS	In HS	% pt difference
Owner purchasers									
15%	14%	52%	38%	14%	32%	18%	13%	32%	19%
20%	14%	46%	32%	14%	32%	18%	13%	31%	18%
25%	15%	44%	29%	15%	29%	15%	14%	31%	17%
30%	15%	44%	29%	15%	31%	16%	14%	32%	18%
35%	15%	42%	27%	15%	35%	21%	14%	37%	23%
40%	15%	43%	28%	15%	34%	19%	14%	40%	26%
45%	15%	38%	23%	15%	35%	20%	15%	39%	25%
50%	15%	35%	20%	15%	30%	15%	15%	38%	23%
Private renters									
15%	31%	47%	16%	29%	48%	19%	29%	43%	14%
20%	32%	49%	17%	30%	49%	19%	30%	45%	14%
25%	32%	52%	20%	31%	52%	21%	31%	48%	17%
30%	32%	53%	21%	32%	53%	22%	32%	48%	16%
35%	33%	53%	20%	32%	56%	24%	32%	49%	17%
40%	33%	54%	21%	32%	57%	24%	33%	48%	16%
45%	33%	50%	17%	33%	56%	24%	33%	47%	15%
50%	33%	51%	18%	33%	54%	21%	33%	45%	12%

(b) High-level stress, financial deprivation

Housing cost burden	Income groups								
	Bottom 20%			Bottom 30%			Bottom 40%		
	Not in HS	In HS	% pt difference	Not in HS	In HS	% pt difference	Not in HS	In HS	% pt difference
Owner purchasers									
15%	6%	18%	12%	6%	12%	7%	5%	10%	5%

20%	6%	18%	12%	6%	14%	8%	6%	10%	5%
25%	6%	16%	10%	6%	12%	6%	6%	10%	5%
30%	6%	18%	12%	6%	13%	8%	6%	11%	5%
35%	6%	20%	14%	6%	16%	11%	6%	12%	7%
40%	6%	13%	7%	6%	13%	8%	6%	10%	4%
45%	6%	12%	6%	6%	15%	10%	6%	11%	5%
50%	6%	13%	7%	6%	15%	9%	6%	10%	4%
Private renters									
15%	13%	33%	20%	12%	31%	19%	12%	26%	14%
20%	14%	37%	23%	13%	33%	20%	13%	28%	15%
25%	14%	41%	27%	13%	37%	23%	14%	30%	16%
30%	15%	39%	24%	14%	36%	22%	14%	31%	17%
35%	16%	34%	18%	15%	32%	17%	15%	28%	13%
40%	16%	27%	11%	16%	26%	10%	16%	23%	7%
45%	16%	22%	6%	16%	23%	7%	16%	20%	4%
50%	16%	21%	5%	16%	19%	2%	16%	16%	0%

Source: Authors' calculations from the 2009 Household, Income and Labour Dynamics in Australia Survey

5.2 Duration of housing stress

One could also take 'time' into account by adopting a measure that takes into account duration of housing stress. Table 29 below is based on a sample of household reference persons in 2009, also observed in every year before 2009. A housing tenure breakdown has not been done here because housing tenure changes over time. The table shows how households that have been in housing stress for longer than a single year are more likely to have cash flow or financial deprivation problems. Households may drop in and out of stress regularly due to interest rate payments, rent increases or income changes. A situation of temporary stress may not have serious wellbeing implications for a household and may be taken on by choice.

The cash flow problems drop with a housing stress duration of three years plus but this may be because they have moved into a more serious position of financial deprivation. When examining the health implications of stress duration, the findings are significant. There are clear health implications associated with longer durations in stress with large reductions in health wellbeing when households have been in stress for three years or more. This evidence would suggest that there is merit in focusing the housing stress measure on households that have been in stress for three years or more to provide a better indication of the long term impact of housing cost burdens. If

the numbers in long-term stress are growing over time, there are serious wellbeing implications that would require a policy intervention.

Table 29: Wellbeing outcomes, by duration of housing stress status, 2009

Financial stress (%)

Indicator	Not in HS	In HS		
		1 yr	2 yrs	3 yrs+
Cash flow problems	13%	38%	55%	44%
Financial deprivation	6%	29%	28%	33%

Health (mean SF-36 measure)

Indicator	Not in HS	In HS		
		1 yr	2 yrs	3 yrs+
Physical functioning	81	71	73	55
General health	67	60	66	52
Vitality	61	58	54	46
Social functioning	82	74	70	57
Role-emotional	83	70	70	51
Mental health	76	69	67	63

Source: Authors' calculations from the 2009 Household, Income and Labour Dynamics in Australia survey.

5.3 Identifying choice versus constraint

One of the major flaws of the 30:40 rule is the difference between households being forced into a position of housing stress and those that take on higher cost burdens by choice, a decision often resulting in wellbeing benefits through improved housing and location quality. This is an issue in need of detailed research as there are obvious policy implications. If more and more new households are being forced into housing stress because they have no other options available to them, and this is particularly relevant in the private rental sector, they are being pushed into a position of financial stress. Unless a household is in a position where their income is likely to grow faster than their housing costs over time, it would be very difficult for such a household to ever escape housing stress. Households may be forced to take on inappropriate housing in terms of quality or location to keep their cost burdens low and such a decision may have wellbeing implications.

Owner purchaser households on higher incomes have a greater choice. Many may sacrifice location to keep housing costs down although may incur higher costs in other areas such as commuting costs. Others may choose to pay higher cost burdens to locate in more desirable locations. In either case, mortgage payments decrease over time and incomes would normally increase, reducing the housing cost burden and eventually lifting the household out of stress, although there may be short term changes due to interest rate fluctuations. The lending criteria of banks, particularly post GFC, has restricted the housing cost burdens that low-income households are able to take on, thus reducing the element of choice. This may prevent new households from entering a position of housing stress if the lender believes there is a chance of default in the short term. Such lending decisions, and more stringent deposit requirements, add to housing affordability issues as they restrict the

availability of dwellings to newly-formed households, forcing households into cheaper accommodation options or into the private rented sector, further increasing competition and rents.

In order to improve the measure of housing stress within the owner purchaser sector, it would be necessary to remove those households that have made a decision to take on cost burdens over 40 per cent because of the perceived future, largely financial, benefits of such a decision. Such households would need to be differentiated from those households taking on burdens above 40 per cent to ensure an appropriate accommodation option in a suitable location. The question then becomes what is an appropriate accommodation option for a household with a given level of income? Household standards could be adopted as they are in other countries. For example, if a newly-formed household consisting of a married couple without children have a choice between a three-bedroom or four-bedroom house in the same suburb, with the former option leading to a cost burden of 28 per cent and the latter 35 per cent, should such a household be excluded from housing stress measures if they chose the more expensive option? This is a complex question because they may have chosen the four-bedroom house for a variety of reasons including the desire to remain in the accommodation should they choose to have a family, which would save on future costs through stamp duty, etc. Consider another example. A lone person household purchases a one-bedroom apartment in a central location which accounts for 35 per cent of income in rental payments. There were alternative options available in the same complex which would have accounted for 28 per cent of income, but without the same views. This lone person household is regarded as being in housing stress due to the decision to rent a room with a view. Should such a household be regarded as being in housing stress? There are many similar examples which raise difficult questions about classifying households as simply being within or outside stress because this classification often boils down to individual circumstances and choices. The broad nature of the measure is its major flaw.

A broad brush solution could be to use a bedroom-based standard and exclude from the measure those households that have chosen to purchase a much larger dwelling which has pushed them into housing stress. Although the problems with such an approach are highlighted above, it would largely concentrate the measure on those forced into housing stress through consuming appropriate accommodation for their needs. There is also the issue of location which is even more complex e.g. households choosing to take on high cost burdens to be close to their preferred school. The issues discussed above highlight the problems with the housing stress measure and how it cannot capture the individual nature of housing decisions within a binary classification of households.

5.4 Removing households with high net worth

Households may be in a situation of housing stress but also have high household wealth. This could be for a variety of reasons such as low declared income from self-employment or significant savings accrued in a variety of ways such as inheritance. However, the most common store of wealth is in housing equity (Wood et al. 2010). A moderate-income household may have paid \$200 000 for their house in 2002 with a housing cost burden of 40 per cent. They are still paying off the mortgage with the cost burden now at 30 per cent, but the house is currently worth \$500 000. If they have not re-mortgaged they have housing equity of \$300 000. Although regarded as being in housing stress, it is difficult to argue that the household is in a position of financial stress given their large safety net available on the sale of the house. A similar household may have re-mortgaged, releasing some of this equity for renovations or personal expenditure keeping their mortgage repayments high, but

that household has realised some of the wealth benefits of their house price growth. Other households may have used their equity to trade up to a much larger house, meaning they are still paying perhaps 40 per cent of their income in housing costs but have made the decision to use their equity to improve their housing quality.

The HILDA data could be used to filter out households with high levels of net worth (asset less debt) which may improve the relationship between housing stress and household wellbeing. The mean and median net worth of households in 2010 are \$687 714 and \$406 550 respectively. Similarly in 2006, mean household net worth was \$604 106, significantly higher than the median of \$325 250. This disparity between the mean and median indicates that there are certain households with extremely high net worth in the distribution. We test for whether the housing stress measure becomes a more accurate reflection of financial stress when we incorporate net worth benchmarks into the housing stress measure. In the table below, the 30:40:50 rule is a housing stress measure that classifies a household as being in housing stress if the household pays more than 30 per cent of income in housing costs, and is in the bottom 40 per cent of the income distribution, and has net worth below the median or 50th percentile in the net worth distribution. Imposing net worth restrictions appear to make the housing stress measure more targeted. For example, Table 30 shows the 30:40:40 rule to be a more accurate indicator of financial stress than the 30:40 rule.

Table 30: Financial stress, by housing stress status under alternative rules that take into account housing cost burden, income and net worth, 2009

Housing stress rule	Not in housing stress	In housing stress	Difference
Per cent with cash flow problems			
30:40	17	47	30
30:40:60	17	49	32
30:40:55	17	49	32
30:40:50	17	49	32
30:40:45	17	50	33
30:40:40	17	52	35
% suffering from financial deprivation			
30:40	7	23	16
30:40:60	7	25	17
30:40:55	7	25	18
30:40:50	7	26	18
30:40:45	8	26	19
30:40:40	7	27	20

Source: Authors' calculations from the 2006 Household, Income and Labour Dynamics in Australia survey.

6 HOUSING NEED ANALYSIS AS AN ALTERNATIVE TO HOUSING STRESS

Policy-makers require a reliable tool for assessing housing affordability and its consequences. This is a tool which would enable them to quantify the demand for affordable housing of all tenures to plan and fund appropriate accommodation options for all income groups and household types. A tool should also allow an assessment of those households in danger of falling out of home ownership because they cannot meet their mortgage costs or are likely to be forced to move out of an area because they can no longer meet rising private rental costs. A tool should help determine whether policy intervention is necessary for vulnerable households. Housing stress does not achieve these aims and nor was it designed to do so. However, local housing market assessments and housing needs studies can provide policy-makers with the information required to make informed housing (and planning) decisions including planning for affordable housing delivery. In their recent AHURI report, Wiesel et al. (2012, p.12) wrote:

Undertaking local housing market and housing needs studies should be a critical activity informing development planning...however...this practice is not widespread in Australia.

The recent Community Development and Justice Standing Committee report for the Parliament of Western Australia (Community Development & Justice Standing Committee 2011) recommended that:

The Minister for Local Government requires all local governments to complete a needs analysis by December 2012 to determine the appropriate level of social and affordable housing that would allow their residents to remain connected to their community.

Local housing market assessments incorporating estimates of housing need have been an integral part of planning and housing strategies in the UK and other countries. Both the Scottish and English governments produced detailed guidance on how to prepare a housing market and housing needs assessment (Department of Communities & Local Government 2007a, 2007b; Scottish Government 2008). Housing market assessments are now the primary tool used by government to assess housing markets, moving away from direct assessments of individual household need. The key problem is actually defining and conceptualising housing need. Seelig et al. (2008) produced an AHURI Positioning Paper discussing the need to reconceptualise housing need in Australia. However, a Final Report which promised a huge leap ahead for housing need in this country failed to materialise. They stated:

Much Australian housing research that purports to identify or enumerate housing needs does not explicitly define 'need' and its concerns, nor examine how identified needs have actually been determined. Consequently, the term 'housing need' has been used in a number of housing policy contexts, but often to mean quite different things. ... both the importance and centrality of the concept, but also the mystery and ambiguity that surrounds it ... it remains the case that the concept of 'housing need' is both contested in theoretical terms, and is applied in a variety of ways in policy and practice. (Seelig et al. 2008)

A detailed discussion of housing market and need assessments is outside the scope of this report and we recommend a detailed research project developing a robust

definition of need and using Australian Bureau of Statistics data to deliver a housing market and basic housing need assessment analysis tool that could support local and state governments in establishing an evidence base to underpin their housing and planning strategies.

A comprehensive report on housing need by Newhaven Research (2010) for the Scottish Government discussed some the key issues surrounding housing need and critically analyses the existing guidance. The report discusses the four standards required to determine if a housing need exists. These are:

- housing quality, including fitness for purpose
- housing cost
- location
- time.

The concept of housing need is much more closely aligned with that of housing affordability and household wellbeing, being concerned with housing quality and appropriateness outcomes as well as costs. Studies quantifying housing need help to define affordable housing targets by tenure. Quantifying housing need is essentially a simple equation adding the number of households in future need to those households in existing need. Conceptually, the difficulties surround defining need and unpicking the difference between demand (underlying or effective) and aspirations. Importantly, need studies take into account the flow of new housing supply, particularly affordable housing supply, to calculate the proportion of need that will be met annually. Housing targets can then be set to meet the gap between predicted supply and that required to meet need.

The basic approach to a housing needs framework is set out below. The problem with existing measures of housing stress in their current form is that they don't really apply to any of the categories listed in Table 31 below. However, measures of chronic housing stress, i.e. identifying the number of households at the greatest risk of mortgage default or eviction, could be used to calculate the annual number of households falling into need.

Table 31: Summary of the Scottish housing needs framework (adapted from Newhaven 2010)

Households in existing need (households in inappropriate housing plus households unable to form plus homeless)
less
existing stock available to meet existing housing need
equals
net current need
divided by
figure representing the proportion of current need that can be met annually (Holmans & Monk 2010)
equals
annual quota of housing in current need
plus
annual number of new households in need

plus
annual number of existing households falling into need (evidence through chronic levels of housing stress likely to fall out of home ownership or likely to be evicted from private rental accommodation)
minus
affordable housing supply (dwellings of all tenures)
equals
estimate of net annual housing need

In England, housing needs studies were traditionally undertaken through large scale primary data collection consisting of surveys of households within a defined housing market (Fordham et al. 1998). Guidance issued by the Department of Communities and Local Government in 2007 (DCLG 2007a & 2007b) defined a move away from costly primary data collection to the use of secondary data to inform strategic housing market assessments, part of which determined housing need. The guidance set out the secondary data sources available to inform a housing needs study and examples are shown in Table 32 below. The table describes the steps in the housing need Section of the housing market assessment guidance, which also includes an analysis of the current and future housing market. These assessments inform planning and housing policies of the local authority, or partnership of local authorities, commissioning the study.

Table 32: Stages of a housing needs study with sources of data (adapted from DCLG 2007)

	Housing need element	Suggested data sources (UK)
Stage 1	Current housing need (gross backlog)	Homeless agencies data, census, survey of English housing, local housing registers, RSL transfer lists, etc.
Stage 2	Future housing need (gross annual estimate)	Census, survey of English housing, entry level rents, house prices, mortgage lenders, tenant surveys
Stage 3	Affordable housing supply	Local authority and RSL transfer lists, local authority records, HSSA data, RSL and local authority data on sales of shared equity schemes, development programs of affordable housing providers, etc.
Stage 4	Housing requirements of households in need	Turnover rates, tenant surveys, housing register, housing benefit records, etc.
Stage 5	Bringing the evidence together	

There are examples of housing needs studies being undertaken in Australia (e.g. Gold Coast City Council & the Department of Local Government, Planning, Sport & Recreation 2007). The Department of Family and Community Services within Housing NSW have developed guidance and a toolkit for undertaking housing market assessments. They also provide guidance on consistent housing needs analysis including a list of data sources, which compliments their *Affordable housing national leading practice guide and toolkit* published in 2008 (Gurran 2008).

Work has been undertaken in this area but there is no consistent national definition or guidance for local authorities to adopt. This is an area in need of further research and the brief review above should prompt research interest.

Assessments of housing need have formed the basis of affordable housing policy in the UK and other countries for many years, informing affordable and market housing targets within local authority areas. Although now termed housing market assessments and relying on secondary rather than primary data collection in the UK, such reports attempt to quantify the number of households in need of certain types of accommodation within a defined spatial boundary. This provides a much better policy tool when setting housing targets, market and affordable, in comparison to a broad assessment of the housing cost position of existing households and ratios based on median prices and incomes. Such assessments would help local and state governments to identify local area affordable housing targets which would be a first step in delivering the affordable housing supply necessary to tackle the negative outcomes of housing affordability and improve household wellbeing for those on low–moderate incomes.

7 CONCLUSIONS AND POLICY IMPLICATIONS

This report examined the relationships between housing stress, housing affordability and household wellbeing through analysis of HILDA survey data. We argued that housing stress is too narrow a measure of housing affordability and fails to assess the outcomes of affordability constrained decisions to consume housing. Housing affordability encompasses the positive and negative financial and non-financial outcomes of a household's decision to consume housing and any assessment of affordability must include more than simple cost:income ratios. For example, a household may take on high housing cost burdens to consume housing that delivers many non-financial benefits such as a quality dwelling in a location within a household's existing community. That household suffers housing stress, by definition, but not necessarily financial stress and there are other wellbeing benefits. Conversely, a household minimising housing costs burdens may suffer from negative housing-related outcomes as a result e.g. from poor quality housing in a disadvantaged neighbourhood. Housing affordability is defined by a household's expenditure on housing but it also reflects the outcomes of that consumption decision. It also reflects the inability of a household to consume appropriate housing e.g. a household is unable to form because they cannot save the necessary deposit to enter home ownership or cannot afford private market rents.

Calculations of housing stress using the HILDA data showed little change in the proportion of households in stress over the study period 2001–10. This is at odds with house price rises well in excess of incomes and mortgage loans for first time buyers and existing owners doubling over the study period. There is evidence that housing cost burdens are rising for moderate-income earners and analysis of new purchasers suggests that they are having to make trade-offs in terms of location in order to access preferred housing tenures. Little change in levels of housing stress masks the problems caused by housing affordability faced by new households e.g. saving the necessary deposit or being able to afford to buy or rent within their existing community and/or within a neighbourhood that provides the necessary amenities. Housing stress does not measure the wider facets of housing affordability and it is therefore questionable how useful it is in policy terms. Basing policy on the housing stress results presented in this report would necessitate no action. However, we are certainly not suggesting that there is no housing affordability issue; on the contrary we believe new households face major affordability constraints, simply the existing housing stress measure does not adequately assess the extent of the problem, and in any ways masks it. Indeed, movements out of housing stress are not associated with improvements in household wellbeing and many positive life events are linked to movements into stress as households choose to spend more than 30 per cent of their income to consume the housing of their choice.

Housing stress was originally defined to denote the negative impacts of housing cost burdens on households. It is now widely used as a term that classifies households as being in financial stress as a result of paying above a set benchmark, 30 per cent, of their income in housing costs. As we have shown in this report, the actual measure is far too broad incorporating households that have taken on high housing cost burdens by choice to enjoy the wellbeing benefits of quality housing, with many considering themselves to be financially 'comfortable'. The measure also excludes households paying below 30 per cent but may still have housing induced wellbeing constraints as a result of their choice to consume lower cost housing. By combining low and moderate-income households and applying the standard 30 per cent benchmark, the link between housing stress and financial wellbeing is diluted. Many low–moderate-income households paying above 30 per cent consider themselves to be in a

comfortable financial position while there are households paying below 30 per cent in financial stress. By narrowing the measure to the bottom 30 per cent of income earners and varying the benchmark, it is possible to improve the relationship between housing stress and measures of financial stress, both medium and chronic.

This report has argued that housing affordability is a concept that stretches beyond simply the financial to incorporate other housing-related outcomes that are directly related to household wellbeing. For example, there are links identified in academic literature between quality housing and health outcomes. Using the traditional housing stress measure, we failed to identify any clear links between housing stress and health outcomes. However, when we narrowed the housing stress measure to identify only those households that had been in housing stress for three years or more, a relationship emerged. A household that has been in stress for a considerable duration with little chance of escaping shows evidence of poorer health outcomes. If housing policy is designed to improve household wellbeing, the evidence base should include a measure that identifies those households that would most benefit from policy intervention.

Duration in stress is an important issue e.g. a small change in interest rates may push a household briefly into housing stress, by definition, but it may make very little material difference to household wellbeing. Conversely, it may make a big difference to a very low-income household paying 29 per cent of their income in housing costs. If housing stress is to reflect household wellbeing outcomes, it needs to be modified to exclude households that are financially comfortable being in such a position. Varying classifications of housing stress would help, such as mild and chronic, combined with duration, so policy-makers could track changes to each group over time to record whether there have been serious declines in financial wellbeing as a result of falling affordability. Removing households with high levels of wealth, often in the form of housing equity, would also improve the relevance of the measure.

Even with modifications, the traditional housing stress measure does not provide policy-makers with the evidence base they need to develop housing policy aimed at improving household wellbeing. Existing policy tools designed to improve housing affordability are limited. In the past, demand side subsidies such as the first home owners grant and first home savers accounts have been used to help households into home ownership. Commonwealth Rent Assistance has been used to aid those on low incomes in the private rental market. This is helping households access largely existing housing rather than providing a supply of new housing for those on low-moderate incomes. Supply side policies have largely been limited to the NRAS (National Rental Affordability Scheme) program and stimulus package expenditure on new social housing, but such funding has largely dried up. It is now down to regeneration agencies, state and local government to secure affordable housing directly or through partnerships/negotiation with the private sector.

We have demonstrated that housing stress is an inadequate measure upon which to base housing policy decisions. In one sense it is too broad as it incorporates many households that are not suffering the negative consequences associated with the measure. On the other hand, it is too narrow because it excludes certain groups and only addresses the negative financial outcomes of housing affordability and not the much wider implications of a household's housing consumption choice. Policy-makers need to be more concerned with addressing the needs of future households rather than the housing costs of those already within the owner purchasing sector. With mortgage default rates very low by international standards, particular focus should be on the affordability of the bottom end of the private rental sector and measures to increase the supply of affordable rental stock. Affordability indicators

such as the residual method can help quantify an affordable rent but the traditional stress measure has limited relevance within policy development.

Affordability can only be improved through a significant reduction in market rents and prices, direct housing subsidies to households or, more realistically, through large scale new housing supply. Housing affordability prevents new household formation so policy must address this issue by overcoming existing housing supply barriers and quantifying the supply needed to deliver diverse and affordable housing for low–moderate-income groups. A strong evidence base is required to set specific local area affordable housing targets to meet the housing needs of low–moderate-income earners in their local housing markets. We recommend a move towards housing market and housing needs assessments, which include modelling the demand for various types of affordable housing, to provide a reliable evidence base for setting housing supply targets to address the negative outcomes of declining affordability. Specific targets would help all levels of government, in partnership with the private and not-for-profit sector, develop strategies and policies to deliver the housing required to meet the requirements of a growing population.

7.1 Further Research

Throughout this report we identify areas that would benefit from additional research. The table below summarises those considered most important.

Table 33: Future research suggestions

Application of housing market and housing needs assessment in Australia	Although there has been some work on conceptualising housing need and some authorities have undertaken housing market and need assessments, future research should develop a toolkit based on 2011 ABS census data that could be used to deliver robust studies providing the necessary empirical evidence base for market and affordable housing supply targets.
Duration in housing stress	It would be worth exploring further the wellbeing impact of periods of long term housing stress on households. Do extended periods in stress increase the chances of a range of negative wellbeing outcomes?
Choice versus constraint; quality and location trade-offs.	Further work is required is assessing the question of choice versus constraint. This could be in the form of a qualitative study examining household decisions which could also incorporate an analysis of trade-offs many households may have made when taking the decision to consume their chosen dwelling.
High-income households hiding affordability issues for other members of the household	To what extent do households outside of stress contain members that have affordability issues, e.g. are downpayment constrained and cannot form a household of their own? This would apply to young adults for example. A study examining these issues would provide a better understanding of the factors preventing household formation.
Affordability issues for outright owners	Some outright owners may be on very low incomes and may experience affordability issues resulting from the consumption of housing through maintenance costs or utility bills for example. Research could explore the extent of this issue and potential policy responses.
Composite affordability indicator	Development of a measure incorporating modified housing stress measures, deposit constraints, affordable housing supply and general housing consumption costs to track housing affordability and accessibility for different groups and different tenures.

APPENDIX

Table A1: Indicators of cash flow and financial deprivation problems, by income and housing tenure, region and age band, 2001 and 2009

	Moderate to high income		Low income	
	2001	2009	2001	2009
% with cash flow problems				
Owner purchasers	21	13	43	28
Private renters	44	26	58	45
New South Wales	20	11	31	24
Victoria	21	12	32	24
Queensland	28	17	37	28
South Australia	20	13	33	31
Western Australia	23	13	37	24
Tasmania	26	18	31	32
Northern Territory	a	a	a	a
Australian Capital Territory	17	13	24	20
<35 years	37	20	63	50
35–54 years	21	14	47	36
55+ years	8	6	13	12
% with cash flow problems				
Owner purchasers	7	5	19	12
Private renters	18	10	41	26
New South Wales	7	4	19	13
Victoria	8	6	18	12
Queensland	11	8	24	15
South Australia	7	3	23	16
Western Australia	10	6	26	16
Tasmania	9	4	30	25
Northern Territory	a	a	a	a
Australian Capital Territory	6	1	19	4
<35 years	13	7	40	24
35–54 years	8	6	30	21
55+ years	3	3	9	7

Source: Authors' calculations from the 2001 and 2009 Household, Income and Labour Dynamics in Australia survey.

Note:

a. Due to small samples from the Northern Territory, the estimates for this territory have been excluded as they are statistically unreliable.

Table A2: Indicators of debt reliance and satisfaction with housing-related aspects of life, by income and housing tenure, region and age band, 2001 and 2010

	Moderate to high income		Low income	
	2001	2010	2001	2010
% own a credit card that is used monthly				
Owner purchaser	78	82	56	71
Private renter	57	67	28	36
New South Wales	69	78	37	46
Victoria	71	74	44	54
Queensland	64	73	37	50
South Australia	66	73	33	42
Western Australia	70	79	42	55
Tasmania	63	69	27	28
Northern Territory	a	a	a	a
Australian Capital Territory	89	83	59	45
<35 years	65	66	31	37
35–54 years	72	81	46	55
55+ years	67	75	37	49
% highly satisfied with home				
Owner purchaser	71	68	67	63
Private renter	45	47	51	49
New South Wales	66	66	72	66
Victoria	68	64	70	67
Queensland	65	64	67	67
South Australia	68	65	70	64
Western Australia	64	60	70	64
Tasmania	71	55	65	66
Northern Territory	a	a	a	a
Australian Capital Territory	63	64	62	49
<35 years	56	56	50	49
35–54 years	67	60	59	54
55+ years	79	78	84	79
% highly satisfied with neighbourhood				
Owner purchaser	72	68	66	66
Private renter	61	60	61	55
New South Wales	71	65	70	63
Victoria	73	67	72	67
Queensland	70	67	69	65
South Australia	71	66	67	60

Western Australia	67	65	64	64
Tasmania	72	68	66	61
Northern Territory	a	a	a	a
Australian Capital Territory	73	64	63	44
<35 years	65	61	59	55
35–54 years	70	65	63	59
55+ years	82	72	77	70

Source: Authors' calculations from the 2001–10 Household, Income and Labour Dynamics in Australia survey.

Note: Due to small samples from the Northern Territory, the estimates for this territory have been excluded as they are statistically unreliable.

Table A3: Definitions and measurement of explanatory variables in the regression models

Variables	Definition	Measurement
Housing stress		
Housing stress status <i>HS</i>	1 if household was in housing stress in wave t , 0 otherwise	Binary
Moved out of housing stress <i>OHS</i>	1 if household moved out of housing stress between waves t and $t+1$, 0 otherwise	Binary
Moved into housing stress <i>IHS</i>	1 if household moved into housing stress between waves t and $t+1$, 0 otherwise	Binary
Year^a		
2001 (omitted)	1 if response from wave 1, 0 otherwise	Binary
2002	1 if response from wave 2, 0 otherwise	Binary
2003	1 if response from wave 3, 0 otherwise	Binary
2004	1 if response from wave 4, 0 otherwise	Binary
2005	1 if response from wave 5, 0 otherwise	Binary
2006	1 if response from wave 6, 0 otherwise	Binary
2007	1 if response from wave 7, 0 otherwise	Binary
2008	1 if response from wave 8, 0 otherwise	Binary
2009	1 if response from wave 9, 0 otherwise	Binary
2010	1 if response from wave 10, 0 otherwise	Binary
Household type		
Couple with no children (omitted)	1 if household comprises a couple with no children, 0 otherwise	Binary
Couple with dependent children	1 if household comprises a couple with children aged under 15 or dependent students aged under 25, 0 otherwise	Binary
Couple with non-dependent children	1 if household comprises a couple with non-dependent children, 0 otherwise	Binary
Lone parent with dependent children	1 if household comprises a lone parent with children aged under 15 or dependent students aged under 25,	Binary

Variables	Definition	Measurement
	0 otherwise	
Lone parent with non-dependent children	1 if household comprises a lone parent with non-dependent children, 0 otherwise	Binary
Lone person	1 if household comprises a single person, 0 otherwise	Binary
Group and multi-family households	1 if household comprises a group of unrelated people living together or multiple families, 0 otherwise	Binary
Household gross income	Gross household financial year income / \$1,000	Continuous
Housing tenure		
Outright owner	1 if household owns the home outright, 0 otherwise	Binary
Owner purchaser (omitted)	1 if household owns the home with an outstanding mortgage balance, 0 otherwise	Binary
Private renter	1 if household rents the home from a private landlord, 0 otherwise	Binary
Public renter	1 if household rents the home from a state or territory housing authority, 0 otherwise	Binary
Rent free	1 if household lives in the home rent free, 0 otherwise	Binary
Region^b		
Major city (omitted)	1 if household lives in a major city, 0 otherwise	Binary
Inner regional	1 if household lives in an inner regional area, 0 otherwise	Binary
Outer regional	1 if household lives in an outer regional area, 0 otherwise	Binary
Remote or very remote	1 if household lives in a remote or very remote area, 0 otherwise	Binary
State / territory		
New South Wales (omitted)	1 if household lives in New South Wales, 0 otherwise	Binary
Victoria	1 if household lives in Victoria, 0 otherwise	Binary
Queensland	1 if household lives in Queensland, 0 otherwise	Binary
South Australia	1 if household lives in South Australia, 0 otherwise	Binary
Western Australia	1 if household lives in Western Australia, 0 otherwise	Binary
Tasmania	1 if household lives in Tasmania, 0 otherwise	Binary
Northern Territory	1 if household lives in Northern Territory, 0 otherwise	Binary
Australian Capital Territory	1 if household lives in Australian Capital Territory, 0 otherwise	Binary
Age		
<25 years (omitted)	1 if household reference person is aged under 25 years, 0 otherwise	Binary
25–34 years	1 if household reference person is aged 25–34 years, 0 otherwise	Binary

35–44 years	1 if household reference person is aged 35–44 years, 0 otherwise	Binary
45–54 years	1 if household reference person is aged under 45–54 years, 0 otherwise	Binary
55–64 years	1 if household reference person is aged under 55–64 years, 0 otherwise	Binary
65–74 years	1 if household reference person is aged under 65–74 years, 0 otherwise	Binary
>74 years	1 if household reference person is aged over 74 years, 0 otherwise	Binary
Gender		
Female	1 if household reference person is female, 0 otherwise	Binary

Labour force status		
Employed full-time (omitted)	1 if household reference person is employed full-time, 0 otherwise	Binary
Employed part-time	1 if household reference person is employed part-time, 0 otherwise	Binary
Unemployed	1 if household reference person is unemployed, 0 otherwise	Binary
Not in the labour force	1 if household reference person is not in the labour force, 0 otherwise	Binary

Note:

- a. In regressions that require matching of data from adjacent waves t and $t+1$, the 2001 year variable is used to represent matched responses from waves 1 and 2, the 2002 year variable is used to represent matched responses from waves 2 and 3 and so on. In these regressions, the 2010 year variable is not required as the 2008 year variable is used to represent matched responses from waves 9 and 10.
- b. The regions are based on the Accessibility/Remoteness Index of Australia (ARIA) scores from the 2001 Census. The ARIA index categorises non-continuous geographical areas with each state or territory into areas that share common remoteness characteristics, Australian Bureau of Statistics, 2001.

REFERENCES

- ABS (2012), Household Expenditure Survey and Survey of Income and Housing, User Guide, Australia 2009–10, Cat. No. 6503.0, ABS, Canberra.
- Acevedo-Garcia, D, Osyup, Tz L, Werbel, R E, Meara, E R, Culter, D M & Berkman, LF 2004, 'Does housing mobility policy improve health?', *Housing Policy Debate*, 15, vol. 1, pp. 49–98.
- Argyle, M & Martin, M 1991, 'The psychological causes of happiness' in F Strack, M Argyle & N Schwarz (eds), *Subjective well-being: An interdisciplinary approach*, Pergamon Press, Great Britain, pp. 77–100.
- Australian Bureau of Statistics (ABS) 2011a, Consumer price index, Time Series Workbook, cat. No. 6401.0, ABS, Canberra; 2011b, House price indexes: Eight capital cities, cat. no. 6416.0, ABS, Canberra; 2011c, Household income and income distribution, Australia, 2009–10, Detailed Tables, cat. no. 6523.0, ABS, Canberra; 2011d, Housing finance, Australia, cat. no. 5609 ABS, Canberra; 2003, Socio-economic indexes for areas, Australia, 2001, Census of population and housing, Information Paper, ABS, Canberra; 2001, Australian standard geographical classification, cat. no. 1216.0, ABS, Canberra; 1997, Survey of income and housing costs, Australia: User Guide, cat. no. 6553.0, ABS, Canberra; 1995, Standards for statistics on the family, cat. no. 1286.0. ABS, Canberra.
- Baillie, RS & Wayte, KJ 2006, 'Housing and health in Indigenous communities: Key issues for housing and health improvement in remote Aboriginal and Torres Strait Islander communities', *Australian Journal of Rural Health*, vol.14, pp. 178–183.
- Baker, E & Tually, S 2008, 'Women, health and housing assistance: Implications in an emerging era of housing provision', *Australian Journal of Social Issues*, vol. 43, no.1, pp. 123–138.
- Berry, M, Dalton, T & Nelson, A 2009, Mortgage default in Australia: Nature, causes and social and economic impacts, Positioning Paper No. 114, Australian Housing and Urban Research Institute, Melbourne.
- Berry, M, Dalton, T & Nelson, A 2010, Mortgage default in Australia: Nature, causes and social and economic impacts, Final Report No. 145, Australian Housing and Urban Research Institute, Melbourne.
- Boehm, TP & Schlottman, AM 1999, 'Does home ownership by parents have an economic impact on their children?', *Journal of Housing Economics*, vol. 8, no. 3, pp. 217–232.
- Bogdon, AS & Can, A 1997, 'Indicators of local housing affordability: Comparative and spatial approaches', *Real Estate Economics*, vol. 25, no. 1, pp. 43–80.
- Bratt, RG 2002, 'Housing and family well-being', *Housing Studies*, vol. 17, no. 1, pp. 13–26.
- Bray, JR 2001, Hardship in Australia: An analysis of financial stress indicators in 1998–99 Australian Bureau of Statistics Household Expenditure Survey, Occasional Paper no. 4, Department of Family and Community Services, Canberra.
- Breunig, R & Cobb-Clark, D 2005, 'Understanding the factors associated with financial stress in Australian households', *Australian Social Policy*, pp. 13–64.

- Brickman, P, Coates, D & Janoff-Bulman, R 1978, 'Lottery winners and accident victims: Is happiness relative?', *Journal of Personality and Social Psychology*, no. 36, pp. 917–927.
- Bronfenbrenner, U 1979, *The ecology of human development: Experiments by nature and design*, Harvard University Press, Cambridge, Massachusetts.
- Buddelmeyer, H & Verick, S 2008, 'Understanding the drivers of poverty dynamics in Australian households', *Economic Record*, vol. 84, no. 266, pp. 310–321.
- Burke, T, Pinnegar, S, Phibbs, P, Neske, C, Gabriel, M, Ralston, L & Ruming, K 2007, *Experiencing the housing affordability problem: Blocked aspirations, trade-offs and financial hardships*, National Research Venture 3, Research Paper No. 9, Australian Housing and Urban Research Institute, Melbourne.
- Burke, T, Pinnegar, S, Phibbs, P, Neske, C, Gabriel, M, Ralston, L & Ruming, K 2007, *Experiencing the housing affordability problem: Blocked aspirations, trade-offs and financial hardships*, National Research Venture 3, Research Paper No. 9, Australian Housing and Urban Research Institute, Melbourne.
- Burke, T, Stone, M & Ralston, L 2011, *The residual income method: A new lens on housing affordability and market behaviour*, Final Report No. 176, Australian Housing and Urban Research Institute, Melbourne.
- Campbell, HL & McFadden JR 2006, 'Healthy living: Housing affordability and its impact on family health', *Journal of Family and Consumer Sciences*, vol. 98, no. 4, pp. 49–51.
- Chandler, MJ, Lalonde, CE, Sokol, BW & Hallett, D 2003, 'Personal persistence, identity development, and suicide: A study of native and non-native North American adolescents', *Monographs of the Society for Research in Child Development*, vol. 68, no. 2.
- Clark, AE & Oswald, AJ 1994, 'Unhappiness and unemployment', *Economic Journal*, vol. 104, pp. 648–59.
- Community Development and Justice Development Committee (2011), *A fading dream – affordable housing in Western Australia*, Report No. 8, Legislative Assembly, Parliament of Western Australia, Perth, Available: [http://www.parliament.wa.gov.au/publications/tailedpapers.nsf/displaypaper/3814179aece076b49f1350494825793d002fffc3/\\$file/4179.pdf](http://www.parliament.wa.gov.au/publications/tailedpapers.nsf/displaypaper/3814179aece076b49f1350494825793d002fffc3/$file/4179.pdf)
- Cummins, RA, Eckersley, R, Pallant, J, Van Vugt, J & Misajon, R 2003, 'Developing a national index of subjective wellbeing: The Australian unity wellbeing index', *Social Indicators Research*, vol. 64, pp. 159–190.
- Demographia 2012, 8th annual Demographia international housing affordability survey, Demographia, <http://www.demographia.com/dhi.pdf>
- Department of Communities and Local Government 2007a, *Strategic housing market assessments: Practice guidance version 2*, Department for Communities and Local Government, London.
- 2007b, *Strategic housing market assessments: Annexes*, Department for Communities and Local Government, London.
- Desjardins, R 2008, 'Researching the links between education and well-being', *European Journal of Education*, vol. 43, no. 1, pp. 23–35.
- Diener, E & Gonzalez, E 2011, 'The validity of life satisfaction measures', *SINET: Social Indicators Network News*, no. 108, pp. 1–5.

- Dockery, AM 2011, 'Housing and Wellbeing of Children', *Parity*, vol. 24, no. 2, pp. 8–9.
- Dockery, AM 2010, Education and happiness in the school-to-work transition, National Centre for Vocational Education Research, Adelaide.
- Dockery, AM & Milsom, N 2006, Who cares about housing anyway?, National Housing Conference, 26–28 October 2005, Perth.
- Dockery, AM, Feeny, S, Hulse, K, Ong, R, Saugeres, L, Spong, H, Whelan, S & Wood, G 2008, Housing assistance and economic participation, National Research Venture 1 Final Research Paper, Australian Housing and Urban Research Institute, Melbourne.
- Dockery, AM, Kendall, G, Li, J, Mahendran, A, Ong, R & Strazdins, L 2010, Housing and children's development and wellbeing: A scoping study, Final Report No. 149, Australian Housing and Urban Research Institute, Melbourne.
- Dockery, AM, Seymour, R & Ong, R 2010, 'Life on the minimum wage: An empirical investigation', *Australian Journal of Labour Economics*, vol. 13, no. 1, pp.1–26.
- Dunn, JR 2002, 'Housing and inequalities in health: A study of socioeconomic dimensions of housing and self-reported health from a survey of Vancouver residents', *Journal of Epidemiology and Community Health*, vol. 56, pp. 671–681.
- Easterlin, RA 2001, 'Income and happiness: Towards a unified theory', *The Economic Journal*, vol. 111, no. 473, pp. 465–484.
- Ellen, I & Turner, M 1997, 'Does neighbourhood matter? Assessing recent evidence', *Housing Policy Debate*, vol. 8, no. 4, pp. 833–866.
- Engeland, J, Figueroa, R, Rea, W & Yuen, J 2008, The dynamics of housing affordability, Income Research Paper Series, Statistics Canada, Ottawa.
- Evans, G 2003, 'The built environment and mental health', *Journal of Urban Health*, vol. 80, no. 4, pp. 536–555.
- Evans, GW, Wells, NM, Chan, E & Saltzman, H 2000, 'Housing and mental health', *Journal of Consulting and Clinical Psychology*, vol. 68, pp. 526–530.
- Feeny, S., Ong, R., Spong, H. and Wood, G. (2011 forthcoming), The impact of housing assistance on the employment outcomes of labour market programme participants, *Urban Studies*, paper accepted for publication on 10 March.
- Fertig, AR & Reingold, DA 2007, 'Public housing, health and health behaviors: Is there a connection?', *Journal of Policy Analysis and Management*, vol. 26, no. 4, pp. 831–859.
- Flood, J and Baker, E 2010, Housing implications of social, spatial and structural change, AHURI, Melbourne.
- Flood, J (2012) Housing Stress; Fix or discard. Proceedings of the 6th Australasian Housing Researchers Conference, University of Adelaide.
- Fordham, R, Finlay, S, Gardner, J, Macmillan, A, Muldoon, C, Taylor, G & Welch, G 1998, Housing need and the need for housing, Ashgate, Aldershot.
- Frey, BS 2008, Happiness: A revolution in economics, MIT Press, Cambridge, Massachusetts.

- Frey, BS & Stutzer, A 2003, 'Maximising happiness?', *German Economic Review*, vol. 1, no. 2, pp. 145–167.
- 2002, 'What can economists learn from happiness research?', *Journal of Economic Literature*, vol. 40, no. 2, pp. 402–435.
- Gabriel, M, Jacobs, K, Arthurson, K & Burke, T 2005, Conceptualising and measuring the housing affordability problem, Research Paper 1, National Research Venture 3: Housing affordability for lower income Australians, Australian Housing and Urban Research Institute, Melbourne.
- Glatzer, W 1991, 'Quality of life in advanced industrialized countries: The case of West Germany', in F Strack, M Argyle & N Schwarz (eds), *Subjective well-being: An interdisciplinary approach*, pp 261-279, Pergamon Press, Great Britain.
- Gold Coast City Council and the Department of Local Government, Planning, Sport and Recreation 2007, *Housing needs assessment for the Gold Coast*, Available: http://www.goldcoast.qld.gov.au/attachment/publications/housing_needs_assessment_0407.pdf
- Gronda, H & Costello, L 2011, *Beyond the current NAHA: What next for national housing policy?*, Conference Discussion Paper, AHURI Research Synthesis Service, Australian Housing and Urban Research Institute, Melbourne.
- Gurran, N 2008, *Affordable housing national leading practice guide and toolkit* <http://www.housing.nsw.gov.au/NR/rdonlyres/D3B288EA-6BDA-49C3-AA4E-E96CD35CDF49/0/AHNationalGuideandKitv2.pdf>
- Henman, P & Jones, A 2012, *Exploring the use of residual measures of housing affordability in Australia: Methodologies and concepts*, Final Report No. 180, Australian Housing and Urban Research Institute, Melbourne.
- Henry, K, Harmer, J, Piggott, J, Ridout, H & Smith, G 2009, *Australia's future tax system, Report to the Treasurer*, Available: <http://www.taxreview.treasury.gov.au>
- Holmans, A & Monk, S 2010, *Housing need and demand in Wales 2006 to 2026*, Welsh Assembly Government Social Research 03/2010, <http://wales.gov.uk/docs/desh/research/100707housingdemandandneedfullen.pdf>
- Hulchanski J D 1995, 'The concept of housing affordability, six contemporary uses of the housing expenditure-to-income ratio', *Housing Studies*, vol. 10 no. 4, p. 475.
- Hulse, K and Saugeres, L 2008, *Housing insecurity and precarious living: An Australian exploration*, Final Report No. 124, Australian Housing and Urban Research Institute, Melbourne.
- Hulse, K, Burke, T, Ralston, L & Stone, W 2010, *The benefits and risks of home ownership for low–moderate-income households*, Final Report No. 154, Australian Housing and Urban Research Institute, Melbourne.
- Jones, C, Watkins, CA & Watkins, D 2011, 'Measuring local affordability: Variations between housing market areas', *International Journal of Housing Markets and Analysis*, vol. 4, no. 4, pp. 341–356.

- Kahneman, D 1999, 'Objective happiness' in D Kahneman, E Diener & N Schwarz (eds), *Well-being: The foundations of hedonic psychology*, Russell Sage Foundation, New York, pp. 3–25.
- Kahneman, D, Diener, E & Schwarz, N (eds) 1999, *Well-being: The foundations of hedonic psychology*, Russell Sage Foundation, New York.
- Karmel R 1998, *Housing assistance: Reports on measurement and data issues*, Australian Housing and Urban Research Institute, Welfare Division Working Papers No. 17, Canberra.
- Kearns, RA, Smith, CJ & Abbott, MW 1992. 'The stress of incipient homelessness', *Housing Studies*, vol. 7, no. 4, pp. 280–298.
- King A 1994, *Towards indicators of housing stress*, Department of Housing and Regional Development, Housing and Social Policy Group, Monograph series No. 2, AGPS, Canberra.
- Krieger, J & Higgins, DL 2002, 'Housing and health: Time again for public health action', *American Journal of Public Health*, vol. 92, no. 5, pp. 758–768.
- Landt J and Bray R (1997) *Alternative approaches to measuring rental housing affordability in Australia*. Canberra: NATSEM (STINMOD technical paper No. 6)
- Layard, R 2003, 'Happiness: Has social science a clue?', Lecture 1, Lionel Robbins Memorial Lecture, 2002/3, London School of Economics, March.
- Leishman, C & Rowley, S 2012, 'Affordable housing' in DF Clapham, AV Clarke & K Gibb (eds), *The Sage handbook of housing*, Sage, London.
- Liu E & Easthope, H 2012, *Multi-generation households in Australian cities*, Final Report No.181, Australian Housing and Urban Research Institute, Melbourne.
- Long, A 2005, 'Happily ever after? A study of job satisfaction in Australia', *Economic Record*, vol. 81, no. 225, pp. 303–321.
- MacLennan, D & Williams, P 1990, *Affordable housing in Britain and America*, Joseph Rowntree Foundation, York.
- Marks, GN & Sedgwick, ST 2008, 'Is there a housing crisis? The incidence and persistence of housing stress 2001–2006', *The Australian Economic Review*, vol. 41, no. 2, pp. 215–221.
- McCarthy, P, Byrne, D & Harrison, S & Keithley, J 1985, 'Respiratory conditions: Effect of housing and other factors'. *Journal Epidemiological Community Health*, vol. 39, pp. 15–19.
- Michalos, AC 2007, *Education, happiness and wellbeing*, paper written for the International Conference on 'Is happiness measurable and what do those measures mean for public policy?', University of Rome, April.
- Nazaroff, WW & Singer, BC 2004, 'Inhalation of hazardous air pollutants from environmental tobacco smoke in US residences', *Journal of Exposure Analysis and Environmental Epidemiology*, Supplement 1, vol. 14, pp. S71–S77.
- Nepal, B, Tanton, R & Harding, A 2010, 'Measuring housing stress: How much do definitions matter?', *Urban Policy and Research*, vol. 28 no. 2, pp. 211–224.
- Newhaven Research (2010) *Wagging the dog: Accessing housing need*. Chartered Institute of Housing Scotland. Available at <http://www.cih.org/resources/PDF/Scotland%20Policy%20Pdfs/Wagging-the-dog-Mar11.pdf>

- OECD (n.d.), What are Equivalence Scales?, available at <http://www.oecd.org/dataoecd/61/52/35411111.pdf>, accessed 24 June 2011.
- Rich, RC, Edelstein, M, Hallman WK & Wandersman, AH 1995, 'Citizen participation and empowerment: The case of local environmental hazards', *American Journal of Community Psychology*, vol. 23, pp. 657–76.
- Robinson, E & Adams, R 2008. 'Housing stress and mental health and wellbeing of families', *AFRC Briefing: Australian Family Relationships Clearing House*, vol. 12, pp. 1–8.
- Rowley, S, Ong, R & McMurray, C 2011, Do traditional measures of housing stress accurately reflect household financial wellbeing?, *Australasian Housing Researchers Conference, Auckland, 17–19 November 2010*.
- Sandel, M & Wright, RJ 2006, 'Child health series: When home is where the stress is: Expanding the dimensions of housing that influence asthma morbidity', *Arch Dis Child*, vol. 91, pp. 942–948.
- Sarason, S 1974, 'Psychological sense of community: Prospects for a community psychology', Jossey Bass, San Francisco, CA.
- Saunders, P 1990, *A nation of homeowners*. Unwin Hyman, London.
- Saunders, P, Chalmers, J, McHugh, M, Murray, C, Bittman, M & Bradbury, B. 1998, *Development of Indicative Budget Standards for Australia*, Research Paper no. 74, Department of Social Security, Canberra, Available: http://www.fahcsia.gov.au/about/publicationsarticles/research/dss/Policy_Research_Series/Documents/policyresearchpaper74.pdf
- Scottish Government 2008a, *Housing need and demand assessment guidance*, Edinburgh at <http://www.scotland.gov.uk/Topics/Built-Environment/Housing/supply-demand/guidance/guidance-info>
- Seelig, T, Milligan, V, Phibbs, P & Thompson, A 2008, *Reconceptualising housing need in the context of 21st century Australian housing policy*, Positioning Paper No.110, Australian Housing and Urban Research Institute, Melbourne.
- Smith, S 2009, *AHURI research agenda: Looking forward*, Australian Housing and Urban Research Institute, Melbourne.
- Social Housing Task Force 2009, *More than a roof and four walls*, WA Department of Housing, Perth.
- Soos, P 2011, *Bubbling over: The end of Australia's \$2 trillion housing party*, Available: <http://www.prosper.org.au/wp-content/uploads/2011/07/PhilipSoosBubblingOver1.pdf>
- Stone, ME 2006, 'What is housing affordability? The case for the residual income approach', *Housing Policy Debate*, vol. 17 no. 1, pp. 151–84.
- Stone, M, Burke, T & Ralston, L 2011, *The residual income approach to housing affordability: The theory and the practice*, Positioning Paper No. 139, Australian Housing and Urban Research Institute, Melbourne.
- Strack, F, Argyle, M & Schwarz, N (eds) 1991, *Subjective well-being: An interdisciplinary approach*, Pergamon Press, Great Britain.
- Veenhoven, R 1991, 'Questions on happiness: classical topics, modern answers, blind spots' in F Strack, M Argyle & N Schwarz (eds), *Subjective well-being: An interdisciplinary approach*, Pergamon Press, Great Britain, pp. 7–26.

- van Praag, BMS, Frijters, P & Ferrer-i-Carbonell, A 2003 '[The anatomy of subjective well-being](#)', [Journal of Economic Behavior & Organization](#), vol. 51 no. 1, pp. 29-49.
- Waite, G & Henman, P 2006, 'Applying budget standards to assess housing affordability' in S Darby, P Flatau & I Hafekost (eds), *Building for diversity*, Department of Housing and Works, Perth.
- Waite, G, Henman, P, Banks, C & Curtis, C 2010, 'The dynamics of financial hardship and housing need: A longitudinal analysis using budget standards' in B Randolph, T Burke, K Hulse & V Milligan (eds), *Refereed papers presented at the 4th Australasian Housing Researchers Conference*, City Futures Research Centre, University of New South Wales, Sydney.
- Ware, JE (n.d.), SF-35® health survey update at <http://www.sf-36.org/tools/SF36.shtml>
- Whitehead, CME, Monk, S, Holmans, A, Clarke, A & Markkanen, S 2009, *Measuring housing affordability: A review of data sources*, Cambridge Centre for Housing and Planning Research for National Housing and Planning Advice Unit.
- Wiesel I, Davison, G, Milligan, V, Phibbs, P, Judd, B & Zanardo, M 2012, *Developing sustainable affordable housing: a project level analysis*, Final Report No.183, Australian Housing and Urban Research Institute, Melbourne.
- Wong YL & Piliavin, I 2001, 'Stressors, resources, and distress among homeless persons: A longitudinal analysis', *Soc Sci Med*, vol. 52, pp. 1029–1042.
- Wood, G, Colic-Peisker, V, Ong, R, Bailey, N & Berry, M 2010, *Housing needs of asset-poor older Australians: Other countries' policy initiatives and their implications for Australia*, Positioning Paper No. 133, Australian Housing and Urban Research Institute, Melbourne.
- Wood, G. and Ong, R. (2009), *The dynamics of housing affordability: Movements in and out of housing affordability stress 2001-2006*, Final Report No. 133, Australian Housing and Urban Research Institute, Melbourne.
- Yates, J 2007, *Housing affordability and financial stress*, NRV3 Research paper 6, Australian Housing and Urban Research Institute, Melbourne.
- Yates, J & Gabriel, M 2006, *Housing affordability in Australia*, NRV3 Research Paper No. 3, Australian Housing and Urban Research Institute, Melbourne.

AHURI Research Centres

AHURI Queensland Research Centre

AHURI RMIT Research Centre

AHURI Southern Research Centre

AHURI Swinburne-Monash Research Centre

AHURI UNSW-UWS Research Centre

AHURI Western Australia Research Centre

Australian Housing and Urban Research Institute

Level 1, 114 Flinders Street, Melbourne Victoria 3000

Phone +61 3 9660 2300 Fax +61 3 9663 5488

Email information@ahuri.edu.au Web www.ahuri.edu.au