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The Residual Income Approach to Housing Affordability: The Theory and the Practice

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Positioning Paper

The residual income approach to housing affordability: the theory and the practice

authored by

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for the

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EXECUTIVE SUMMARY

Introduction

The residual income approach to housing affordability is one that looks at what different household types can afford to spend on housing after taking into account the other necessary expenditures of living. It is an alternative to benchmark measures of affordability as used in social housing rent setting in Australia (the 25% rule) or assessing the overall affordability in the wider housing market (the 30/40 rule) as commonly used by a range of housing affordability researchers in Australia.

This Positioning Paper does two things. Part A provides an overview, using existing literature, of the various semantic, substantive and definitional issues around the notion of affordability, leading to an argument in support of the soundness of the residual income approach. This overview is set in the historical contexts of discussions about affordability measures in the US, UK and Australia.

Part B is methodological; it shows for various household types and income ranges, both for home purchase and rental, how the residual income method can be operationalised and its potential policy applications. This is still work in progress and there may be minor refinements to the method by the time of the production of the Final Report. However, we are confident that the method is sufficiently robust at this point to indicate its substantial potential as a problem identification and policy tool.

As a literature review, Part A of this Positioning Paper may be seen as contributing to the broad knowledge base of those interested in affordability research, but does not have an explicit policy focus. Those with just a concern for policy alone could extract the key information from the executive summary and then move to Part B.

Part A begins with two frameworks for understanding the key direction and debates in the literature. The first is in terms of the semantic and substantive arguments about the term 'housing affordability' and the second with those around the actual measurement of the relationship between housing costs and income, notably the two broad and computational approaches 'ratios' and 'difference', which are the formal foundations of measurement. This executive summary focuses on these two frameworks emerging from a synthesis of the literature rather than on the literature itself.

Framing analysis of affordability measurement

The first way of framing analysis about housing affordability measurement is in terms of the substantive arguments about 'housing affordability'. These can be categorised as:

- Conceptual rigour v. practical policy implications.
- Housing affordability v. 'affordable housing'.
- Housing affordability v. 'affordable rents' in social housing.
- Housing affordability v. affordable living.
- Housing affordability v. housing standards.
- A normative standard of affordability v. empirical analysis of housing costs in relation to incomes.

Conceptual rigour v. practical policy implications

This section of the paper draws attention to the conflict between the conceptual clarity of the affordability standard and the practical policy implications such as recognition of potential perverse incentives (if used for rent setting), fiscal constraints, broad economic and social goals, and political interests. The section discusses the various literatures which had tried to reconcile these demands.

Housing affordability v. 'affordable housing'

Throughout much of the world, affordability is often expressed in terms of 'affordable housing'. Yet affordability (and lack of affordability) is *not* an inherent characteristic of a housing unit—it is a *relationship* between housing and people. For some people, all housing is affordable, no matter how expensive; for others, no housing is affordable unless it is free. 'Affordable' housing only can have meaning (and utility) if three essential questions are answered:

1. Affordable to whom?
2. On what standard of affordability?
3. For how long?

In light of the discussion on housing standards, one might also add the question: Meeting what physical standard? One of the ways of giving greater precision to the term has been the emergence of the affordable housing concept which can relate the affordable price or rent more closely to the income of specific income groups.

Housing affordability v. 'affordable rents' in social housing

Even though social housing (public & non-profit) does not or cannot generate profit for its owners, it nonetheless needs to generate sufficient income from residents and other sources to be able to cover adequately much or all of the costs of operations and, depending upon the financing scheme, repayment of capital costs for construction and any subsequent modernisation. This raises the question of to what degree household rents purportedly designed for housing affordability are actually affordable rents.

Housing affordability v. affordable living

A household in an outer urban or regional area may have an affordable dwelling but not affordable living, as standard affordability measures do not recognise the trade-offs between cheap or affordable housing and the commuting costs associated with residence in such locations. As Australian cities become more polarised, this issue will become more problematic, although the limited work to date has been done in the US (Brookings Institution 2006; Center for Housing Policy 2006). The measurement issue here is determining the degree to which this is a problem, as many outer urban home purchasers and renters live and work in the same area. For these, commuting costs are not high at all.

Housing affordability v. housing standards

This debate recognises that affordability cannot be divorced from housing deprivation and housing standards. If a household is achieving 'affordability', but only by virtue of living in overcrowded conditions, with insecure tenure or in unsafe or inaccessible locations, is that real affordability? While each of these other forms of deprivation is logically distinct from lack of affordability, in reality most households who experience one or more of these do so because they cannot afford satisfactory dwellings and residential environments. Others argue that households may have their standards set too high and, if experiencing an affordability problem, it is their choice. The

choice/constraint debate relating to standards has been a major undercurrent of housing affordability for many decades. Australia's popular acceptance of the 30/40 rule acknowledges this debate in that it assumes any household above the 40th decile that has put themselves in a position where their housing costs are in excess of 30 per cent of their income has done so out of choice.

A normative standard of affordability v. empirical analysis of housing costs in relation to incomes

Historically, one way of measuring affordability has been to calculate the mean or median ratio of shelter expenditures (mortgages & rents) to income, using various household expenditure surveys to derive the relevant figures. It has then been assumed that because households on average actually spend such a fraction of their incomes on shelter, ipso facto this percentage is justified as a standard of what is reasonable to spend.

But is a description of reality an appropriate basis for a standard? Should there be a normative concept, an affordability standard with some independent logical or theoretical basis, against which households' actual circumstances can be measured? A standard based on what households actually do is tautological.

Diverse and incompatible definitions of housing affordability

This section of Part A deals less with detailed conceptualisation and principles than with the actual measurement of the relationship between housing costs and income. The two broad computational approaches—'ratios' and 'difference'—are the formal foundations of the prevailing affordability paradigm and its principal challenger respectively. In practice, there appears to be a greater variety of approaches to defining housing affordability:

- *Categorical*: a statement of ability or inability of households to pay for market housing, but without a measurement foundation.
- *Relative*: changes over time in the relationship between housing costs and household incomes.
- *Subjective*: whatever individual households are willing or choose to spend.
- *Family budget*: monetary standards based on aggregate housing expenditure patterns.
- *Ratio*: maximum acceptable housing cost/income ratios.
- *Residual*: normative standards of a minimum income required to meet non-housing needs at a basic level after paying for housing.

Tautological/categorical

Categorical, and arguably tautological, statements about affordability but not grounded in any reference point are not unusual. For example, affordability is 'people's ability to secure housing, to rent or to buy, based on their ability to pay either the rent or the mortgage'. Or households with an affordability problem are those 'who cannot meet the market cost of buying or renting housing from their own resources, i.e. those whose housing costs have to be subsidised'. While hinting at the causes of an affordability problem, i.e. an income-cost relationship, such statements are problematic—they imply a definition of affordability but fail to provide any real measure of what it means.

Relative

The relative approach, widely used by the mortgage lending and real estate industries to assess the affordability of the residential sales market, is based upon prototypical housing costs, primarily for potential homebuyers. The derived indicators enable two or more points in time to be compared as to whether, on average, dwellings for sale have become relatively more or less affordable, typically either in relation to median income or in constant dollars.

The relative approach may thus serve a useful descriptive purpose, but provides no independent normative standard and uses no distributional data for assessing how many and which kinds of households can and cannot afford which properties that are for sale. Nor does it provide any basis for assessing ongoing affordability stresses. Furthermore, the median multiple measure is particularly problematical because it takes no account of purchasing and financing terms that are decisive in determining the affordability of dwellings of any given price.

Subjective

The third approach rests on the assumption of *homo economicus*: since households are presumably rational utility-maximisers, every household is by definition paying just what it can afford for housing. Some may be living in undesirable conditions, some may have low incomes that give them few choices, but they make the choice that is best for them within their constraints. Thus, from this perspective, housing affordability per se has no generalisable meaning; it is neither rationally possible nor socially desirable to establish a normative standard of affordability other than individual choice. The notion negates the need to measure affordability as it is seen as a subjective concept that is different for all households. However, this does not advance the policy debate very far.

Family budget

The fourth approach to conceptualising housing affordability has based affordability standards on a combination of normative judgements and summary measures of what households in the aggregate actually spend. This is the basis for the budget standards approach and, at one step removed, the residual income method which is the subject matter of this study.

Although every household has its own unique conditions of life, there are historically and socially determined notions of what constitutes a minimum adequate or decent standard of living. They represent norms around which a range of variations can be recognised and about which there certainly may be some philosophical debate. One manifestation of this method is the poverty line as a minimum entitlement as to the quantity and/or quality of essential goods and services a household could consume. The budget standard is another manifestation of this approach and involves specification of a 'market basket' of essential items. For housing, food and most other items, data from consumer expenditure surveys, expert opinion and, in some cases, opinion surveys and focus groups are used to establish a minimal standard of type, quantity and quality, in a given social context at a given time (the physical standard will of course vary by household type, and this qualifier applies to all of the following). The physical standard for each item is then priced, and the prices summed to yield a total (after-tax) minimal budget. How housing is treated in this process is a source of considerable debate, with the general conclusion that the budget standard methodology may be able to specify a reasonably precise physical standard for housing, but it cannot establish a precise *monetary* standard.

Ratio

As an indicator for expressing the relationship between housing costs and incomes, the ratio measure has the longest history and widest recognition for assessing affordability. Normatively, this approach recognises that what many households pay for housing in relation to their income is the result of difficult choices among limited and often unsatisfactory alternatives. It asserts that if a household pays more for housing than a certain percentage or fraction of its income, then it will not have enough income left for other necessities. It usually specifies an explicit ratio of housing cost to income as a standard against which households' actual circumstances can be measured. Yet, despite its widespread recognition and acceptance, there is no theoretical or logical foundation for the concept and the particular ratio or ratios that are used, and moreover it is problematic as it tends to accept the same standard irrespective of household type and their different consumption standards. As discussed in more detail in Part A, these logical flaws in the ratio approach led inexorably to the residual income concept of affordability.

Residual income

The residual income approach to affordability recognises that because of housing's distinctive physical attributes in comparison with other necessities, its cost makes the largest and least flexible claim on after-tax income for most households, i.e. that non-housing expenditures are limited by how much income is left after paying for housing. This means that a household has a housing affordability problem if it cannot meet its non-housing needs at some minimum level of adequacy after paying for housing. The appropriate *indicator* of the tension between housing costs and incomes is thus the difference between them—the residual income after paying for housing—rather than the ratio. For reasons discussed in Part A, it is a method which addresses many of the conceptual and methodological flaws of other methods. However, as Part A reveals, the literature not only strengthens the argument for the residual income approach, it also helps to illuminate some of the practical tasks in operationalising such a standard.

Operationalising the residual income model

Recognising the serious shortcomings of the familiar and widely used ratio approach, this paper outlines a residual income method which can differentiate potential affordability outcomes for various household types across a range of incomes, both for home purchase and rental. We operationalise an ownership and rental model with the key features of:

- Different indicators for purchase and rental.
- Affordability measures for a broad range of incomes.
- Affordability for a sample of household types: a single person household and a couple with two children.
- Affordability based upon two residual income non-housing standards.
- User-set parameters to test market conditions as well as indexed over time.
- Multiple indicators of affordability for different uses, e.g. price points, assessing spatial constraints in the housing markets, understanding market dynamics.

In the Final Report these features will be expanded to more household types and for a broader range of applications, e.g. rent setting in social housing.

There are three major practical issues that have to be dealt with in translating the residual income logic into an operational affordability standard. These are: first, how to specify the monetary level of a minimum standard of adequacy for non-shelter items

other than taxes, second, how to scale this standard for various types of households, and third, how to deal with personal taxes and benefits to create a disposable income appropriate for each household type.

For this study, the 'low cost' and 'modest but adequate' indicative budgets developed by the Social Policy Research Centre (SPRC) at the University of New South Wales (Saunders et al. 1998) have been used to devise and apply operational residual income affordability scales.

The second practical issue involves translating a specified *qualitative* standard of adequacy for non-housing items into *quantitative* monetary amounts that differ by household size and type. Again, as detailed low cost budgets have been derived by the SPRC for 20 household types and modest but adequate budgets for 26 types, this data base has been used, but only for two household types: single persons and couples with two children. The Final Report will provide details on more household types.

Having dealt with the problem of expenditures, the next methodological challenge for any income group is the matter of taxes and benefits. The ratio approach has always manifested a great deal of confusion and inconsistency as to whether the standard should be based upon gross household income or disposable income. By contrast, the residual income approach is unambiguous: because the non-housing standard provided by the indicative budgets is a consumption standard, it is a household's *disposable* income that faces the tension between housing and non-housing necessities. Thus, for each income level and household type the appropriate tax and Income Support payments, including in the case of rents, rent assistance, has to be factored in.

What is left when relevant expenditure (whether low cost or modest) is deducted from the relevant income for each household type is the amount that can be spent on housing without having an affordability problem. Because of the very different methodology of the residual approach compared to the ratio method, it is likely to produce very different affordability outcomes for different household types, which potentially has important policy implications.

Part B applies the model for both purchasers and renters to different housing market or policy issues. First, there is a big difference in purchasing affordability for the two household types. Compared to a family on the same income, a single person willing to live on the modest but adequate budget standard can afford to pay much more per week on housing expenditures than indicated by the 30 per cent of income benchmark method. This means that a single income household on a reasonable income has more ability to enter the home purchase market. The additional living expenses of households with children constrain their ability to borrow and therefore afford housing even in lower price areas. This analysis is consistent with the findings of Hulse et al. (2010) who, in their research on changes in low-moderate income home purchasing patterns, noted a sharp decline in the number of low-moderate income purchasers who are households with children and a very big increase in the proportion who are single person, single income households, with these changes being much greater than those explainable by demographic change alone. In short, the model is more nuanced to household type and their affordability problems.

Second and relatedly, the model provides an explanation of how some low-moderate income homebuyers are able to afford the high prices of recent years, particularly if they are first-time purchasers who do not have more than a minimum deposit. For some household types, e.g. single persons above an income of \$30 000, there is greater capacity to afford these prices than the benchmark model would suggest. The

household might be living modestly to achieve the latter loan size but, provided that there were no other issues which affected their expenditures (e.g. maintenance payments to children of a previous marriage), they could afford the repayments if this is how they set their priorities. This greater capacity to borrow explains why dwelling prices which look non-affordable on the benchmark method are actually affordable. The model provides a better understanding of housing market dynamics.

Third, the analysis also suggests the notion of price points for affordable housing for low-moderate income purchasers. Thus, for any household type and income level it is possible to specify what may be the appropriate price or rent points to aim at to avoid an affordability problem. This could be a useful guideline for the National Rental Affordability Scheme or other affordable housing.

Fourth, the model can be used to get some understanding of the spatial patterning of the housing market. Part B applies the mortgage capacity for a given household type using the residual income model to the Valuer General's unit record sales data for Melbourne. By this method it is possible to determine where different households for any given income can afford to purchase. Applied to Residential Tenancies Bond Authority data, the same method shows how much rental property is affordable for different households. In short, it enables a better understanding of what is happening in the market spatially and reveals that low-moderate income households can still purchase or rent, but their choices are highly spatially constrained.

This Positioning Paper is not comprehensive in the applications the model can be put to, but it suggests the broad directions. The Final Report will look at more household types as well as include new applications, e.g. relevance for social housing rent setting and comparing Australia's affordability performance with international housing markets. But even at this point, the paper illustrates (a) that the work requires a level of methodological detail not hitherto undertaken in equivalent studies in Australia or internationally and (b) the model's potential usefulness in providing a critical framework for thinking about affordability and for new policy debate.

PART A: LITERATURE REVIEW

1 INTRODUCTION—LITERATURE REVIEW

This Positioning Paper seeks to provide a greater understanding of the residual income approach to measuring housing affordability. It does so in two ways. Part A provides an overview, using existing literature, of the various semantic, substantive and definitional issues around the notion of affordability, leading to an argument in support of the soundness of the residual income approach. This overview is set in the historical contexts of discussions about affordability measures in the US, UK, Australia and several other countries. This part of the paper can be seen as a complement to the associated AHURI paper by Gabriel et al. (2005) which overviewed affordability measures used or contested in the Australian context but only gave fleeting attention to the residual income measure. This part is detailed and at times complex, but is important reading if we are to understand that affordability measurement and its policy applications are grounded in contestation and debate. For readers who want to get just an overview of the issues, the executive summary may be sufficient reading.

Part B is methodological; it shows for various household types and income ranges, both for home purchase and rental, how the residual income method can be operationalised and its potential policy applications. This is still work in progress and there may be minor refinements to the method by the time of the production of the Final Report. However, we are confident that the method is sufficiently robust at this point to indicate its substantial potential as a problem identification and policy tool.

Housing affordability has been an enduring concern for consumers and governments for over a century but, in the face of rising house prices and rents in recent decades, has taken on even greater visibility. But what is housing affordability? Most fundamentally, it is an expression of the social and material experiences of households, in relation to their individual housing situations. Affordability expresses the challenge each faces in balancing the cost of their actual or potential housing, on the one hand, and their non-housing expenditures, on the other, within the constraints of their income.

Public policy and the interpretation of individual experiences are mediated through generalised analytical indicators and normative standards of housing affordability that transcend unique individual experience; the personal trouble of a household is transformed into a social problem, with the individual experience often lost in this process. Generalised indicators and standards make it possible to arrive at conclusions—potentially contentious, to be sure—about the overall extent of affordability problems and needs, as well as their distribution socially and geographically. They also provide an important foundation stone for the (at least somewhat rational) formulation, implementation and evaluation of policies and practices that deal with affordability.

In much of the developed world, especially in the English-speaking countries, there is widespread use and acceptance of the ratio of housing cost to income as the appropriate *indicator* of affordability and of the simple ‘rule of thumb’ ratio *standard* (25% of income until the early 1980s, 30% since then) for assessing housing affordability problems as well as for determining eligibility and payment levels, explicitly for publicly subsidised rental housing and somewhat more loosely for other rental and ownership programs and financing. The ratio paradigm persists despite considerable critical discussion that began in the US in the late 1960s and early 1970s,

in the UK in the early 1990s, and in Australia in the late 1990s, in presenting and applying an alternative residual income approach.

This paper begins with an overview of various issues around the meaning of housing affordability, leading to an argument in support of the conceptual soundness of the residual income model. The residual income concept is then set into the historical context of US, UK and Australian debates about affordability measures. In the US, during the late 1960s and first half of the 1970s, there was a considerable body of literature devoted to arguments in support of a residual income alternative to the conventional ratio approach, culminating in operational models and applications to measuring affordability problems, but apparently with no practical impact on housing policies. Thereafter, the arguments and applications were carried forward, largely by a single researcher, until the past decade when some renewed interest emerged. In the UK, in the early 1990s, there began insightful discussion among research and advocacy communities about the need for greater clarity about the meaning of housing affordability and the relative merits of various conceptual approaches, with particular attention to the residual income model, which was placed on a strong theoretical foundation. Until several years ago, this work seems to have unfolded independently, unaware of the work that had been done in the US. In Australia, active interest in the residual income approach began in the late 1990s, informed by both the US and UK literature. While not providing further theoretical or conceptual advances, in recent years Australian analysts have made important methodological contributions and practical policy proposals, placing Australia in the forefront of residual income work. Finally, it should be noted that some analysts in continental Europe and Asia have recently also begun applying the approach.

2 THE LOGIC OF HOUSING AFFORDABILITY

2.1 Semantic and substantive issues about the term 'housing affordability'

One finds several types of tensions in the literature on housing affordability, including, but not necessarily limited to, the following:

- Conceptual rigour v. practical policy implications.
- Housing affordability v. 'affordable housing'.
- Housing affordability v. 'affordable rents' in social housing.
- Housing affordability v. housing standards.
- A normative standard of affordability v. empirical analysis of housing costs in relation to incomes.

2.1.1 *Conceptual rigour v. practical policy implications*

Housing policy inevitably is shaped by factors other than conceptual clarity of the affordability standard, e.g. potential perverse incentives, fiscal constraints, broad economic and social goals, and political interests. Design of affordability indicators on the other hand requires rigorous and sound conceptualisation, including some notion of an affordability standard as well as the consideration of methodological issues, such as data availability quality and appropriateness. Reconciling these demands is not easy.

Hulchanski (1995) clarified the different policy and research uses of an affordability measure. While limiting his discussion to the ratio standard, he has made a valuable contribution and become widely cited for identifying and critically examining six ways in which housing cost to income ratios have been used:

1. Description of household expenditures.
2. Analysis of trends and comparison of different household types.
3. Administration of public housing by defining eligibility criteria and subsidy levels in rent-geared-to-income housing.
4. Definition of housing need for public policy purposes.
5. Prediction of the ability of a household to pay the rent or mortgage.
6. As part of the selection criteria in the decision to rent or provide a mortgage.

Hulchanski has divided this list into two categories and presented sophisticated arguments about their validity and utility that he summarises as follows:

The first three uses—description, analysis and administration—can be considered quite valid and helpful when used properly by housing researchers and administrators. 'Used properly' means that the research methods and the statistical analysis techniques are properly carried out, i.e. no significant methodological errors are made. This leads to valid and reliable descriptive and analytic statements about the housing expenditures of the different types of households being studied. This type of description and analysis of household expenditure patterns can also be helpful in defining administrative rules about eligibility for means-tested housing programmes ...

The improper and inappropriate use of housing expenditure-to-income ratios, leading to invalid and unreliable results, is due to a variety of theoretical and

conceptual errors. Uses four, five and six—definition, prediction, and selection—are all invalid uses for they fail to measure what they claim to be measuring, even if the research methods and the statistical analysis techniques are properly carried out. In short the conceptual and methodological problems in the housing cost to income ratio method, i.e. the benchmark method, preclude its use for these policy purposes.

Strikingly, though, and despite quoting a critique of the ratio approach in a paper by Stone (1990) that advanced the residual income approach, Hulchanski makes no explicit mention at all of the residual income concept, let alone putting it forward as a possible alternative for definition, prediction and selection.

2.1.2 *Housing affordability v. 'affordable housing'*

Throughout much of the world, affordability is often expressed in terms of 'affordable housing'. Yet affordability (and lack of affordability) is *not* an inherent characteristic of a housing unit—it is a *relationship* between housing and people. For some people, all housing is affordable, no matter how expensive; for others, no housing is affordable unless it is free. 'Affordable' housing only can have meaning (and utility) if three essential questions are answered:

1. Affordable to whom?
2. On what standard of affordability?
3. For how long?

In light of the discussion in the section below on housing standards, one might also add the question: Meeting what physical standard?

In the US, before the 1980s, subsidised housing (private and public) was referred to as 'low income housing' and 'low and moderate income housing', with explicit definitions of 'low income' and 'moderate income'. Although such terms and definitions are still used in determining eligibility under various housing policies and programs in the US,¹ in the 1980s the term 'affordable housing' came into vogue as part of the retreat from public responsibility for the plight of the poor and as affordability challenges moved up the income distribution ladder. The term has since achieved international stature, yet in most contexts still lacks precise and consistent definition. It typically encompasses not only social housing and low income housing, but also financially assisted housing for middle income households who find it difficult to purchase in the private speculative market. Growing interest in the concept of affordable housing as more than just a social housing one by the development and building industry has, at least in Australia, required greater specification of the concept and to this purpose there has been some discussion of price points. These are the 'affordable' prices or rents for different household income levels, but identifying such price points still requires making certain methodological assumptions of the type addressed in this paper. In Australia the policy environment, notably the National Rental Affordability Scheme (NRAS), has also widened the use of the affordable housing term as such. NRAS-funded housing has now been labelled 'affordable housing'. However, a far more accurate and appropriate term for NRAS and other types of 'affordable housing' would be 'below-market housing'. This term properly

¹ The term 'moderate income' is one for which there is no longer a precise definition for national policy in the US, although some state governments do have explicit definitions. But 'low income', 'very low income' and 'extremely low income' are defined by federal statutes and regulations. Each year the Department of Housing and Urban Development publishes the income limits for each of these definitions, adjusted for household size, for every geographical area of the US. See Stone (1994) for a critique.

denotes identifiable segments of the housing stock, without making any unjustifiable general claim of affordability.

2.1.3 Housing affordability v. 'affordable rents' in social housing

While this particular confusion may seem to be rather like the previous one, it has its own specific character and issues. Even though social housing (public & non-profit) does not or cannot generate profit for its owners, it nonetheless needs to generate sufficient income from residents and other sources to be able to cover adequately much or all of the costs of operations and, depending upon the financing scheme, repayment of capital costs for construction and any subsequent modernisation.

In Australia, the commonly used 25 per cent household rent in social housing is called an affordable rent, while the UK central government in a recent rent restructuring process created an expectation that social landlords (both councils & housing associations) establish 'affordable rents', but also harmonise difference across providers and set rents that reflect the attributes of the property (DETR 2000; Reeves 2005). However, declaring a goal or obligation to set 'affordable rents' or calling a rent affordable as in the Australian context will not necessarily either assure that they are truly affordable to low-income households or yield sufficient rental income for the housing to be economically viable or both.

2.1.4 Housing affordability v. affordable living

As cities increasingly gentrify and the cheapest housing is to be found on the urban fringe or in regional towns, there is a growing concern that standard affordability measures do not recognise the trade-offs between cheap or affordable housing and the commuting or travel costs associated with residence in such locations. A household in such a location may have an affordable dwelling but not affordable living. As Australian cities become more polarised (Baum & Gleeson 2010; Hulse et al. 2010), this issue will become more problematic. The limited work to date has been done in the US (Brookings Institution 2006; Center for Housing Policy 2006) although, by default, research on key worker housing (Randolph et al. 2007) confronts this issue as one of the reasons occupational shortages exist in inner city locations is the costs of transport for workers unable to afford inner city housing. The measurement issue here is determining the degree to which this is a problem, as many outer urban home purchasers and renters live and work in the same area. For these, commuting costs are not high at all.

2.1.5 Housing affordability v. housing standards

Housing deprivation can take a variety of forms, of which lack of affordability is only one. Households may live in housing that fails to meet physical standards of 'decency', in overcrowded conditions, with insecure tenure or in unsafe or inaccessible locations. While each of these other forms of deprivation is logically distinct from lack of affordability, in reality most households who experience one or more of these do so because they cannot afford satisfactory dwellings and residential environments.

If other forms of housing deprivation are largely due to the affordability squeeze, in measuring the extent of affordability problems how should we account for those households who seem *not* to have an affordability problem (as measured on some standard of affordability), yet *do* experience one or more other forms of housing deprivation? Simply put, if the cost of obtaining satisfactory dwellings and residential environments within the same housing market area exceeds what such households could afford, then they reasonably should be considered to have an affordability problem, even though this is not revealed by application of an economic affordability standard. Only if such a household could afford adequate housing—and if such

housing actually is available—might they reasonably be considered to be living in inadequate housing by choice. Although housing deprivation is complex and can take various forms, standards for most forms of deprivation are fairly well established; hence the measurement of deprivation and its relationship to affordability is, in principle, reasonably tractable.

On the other hand, can it not be argued that those households who *do* appear to have an affordability problem, yet are ‘over-housed’, might not have an affordability problem if they were not over-housed? This question is the obverse of the one in the previous paragraph and could in principle be answered by a similar analytical technique. The difficulty, of course, is: What is a reasonable, broadly acceptable operational definition of over-housed? Although the relationship between the number of people in a household and the number of bedrooms (or total number of rooms) is widely used as an operational definition, this tends to be simplistic. For example, a modern garden apartment consisting of two tiny bedrooms, a small living room and a minuscule kitchen could easily have less than half the usable space of a once-luxurious Victorian flat with one large bedroom, a good sized living room and dining room, and an eat-in kitchen. Is it reasonable to consider a widow living in the former to be over-housed because the flat has two bedrooms, but not in the latter because it has one bedroom? Of greater subtlety, and as significant for assessing affordability: Should households be considered over-housed if they have rooms for anticipated additional children, for overnight visits from family and friends, for study or hobbies, or for home-based business or employment? And, more importantly, can we assume it is choice driving the over-consumption? As various studies on the changes in the rental stock over time have shown (e.g. Yates & Wulff 2000; Wulff et al. 2001), much of the lowest cost stock is occupied by higher income earners, forcing lower income earners to accept what they can get. Thus, the number of households who appear to have an affordability problem, but would not have such a problem were they not ‘over-housed’, is likely to be considerably lower based on application of some flexible standard rather than a simplistic person/bedroom (or person/room) definition.

In sum, housing affordability is not really separable from housing standards. An analysis of the extent and distribution of affordability problems that takes into account other forms of housing deprivation would increase the number, while adjustment for over-housing would decrease the number of households determined to have a ‘true’ affordability problem. Because of these offsetting tendencies, and the difficulties of definition, ideally housing affordability studies should be iterative, i.e. applying an economic affordability standard in the first instance, while exploring ways of enhancing the precision of the analysis to account for under-housing and over-housing.

Lerman and Reeder (1987) and Thalmann (1999, 2003) have developed and applied such ‘quality-based’ measures which classify a household as having an affordability problem, not on the basis of their actual housing cost in relation to income, but what it would cost to obtain housing of a basic physical standard within a given local housing market. Lerman and Reeder developed their model using the ratio standard; Thalmann used a ratio standard in his first paper (1999), but a residual income standard in the later paper (2003). Both limited their analyses to renters because of the difficulty in consistently defining and measuring homeowner occupancy costs.

Focusing on rental housing units in the US that pass certain physical standards of adequacy, Lerman and Reeder determine statistically the *minimum* hedonic rent for units of each size (number of bedrooms) within a given census region and city population size, which they have called the ‘minimally adequate’ rent. They then determine the appropriate housing unit size for a household of a given size based on

Section 8 regulations, referring to the minimally adequate rent for such a household as the 'predicted rent'. On this basis, if the predicted rent for a given household type is no more than 30 per cent of their income, then—according to Lerman and Reeder's logic—the household does not have an affordability problem, even if their actual rent exceeds 30 per cent of income. From their perspective, a household in the latter circumstance has, as they put it, 'a strong taste for housing', i.e. is choosing to spend more than 30 per cent.

The weakness in this assertion is that, while it may be true for some relatively high income households, it is not necessarily true for all or even most households, especially those of low income. Some households paying over 30 per cent of income might be quite willing to move into minimally adequate units to reduce their housing costs, but those units may not in fact be available: they are likely to be occupied already as illustrated by the Australian research referred to above, they may be in inaccessible or undesirable locations, they may be effectively off limits to some people because of discrimination, or relocation costs may be high economically and/or socially. Hence, this model, which regards as 'misclassified' all households who are determined to have a 'conventional' affordability problem but not a 'quality-based' affordability problem, tends to exaggerate the magnitude of such misclassification.

When it is all boiled down, the assumption that sits behind this study is that there can be no subjective and normative-based minimum housing shelter standard of affordability. There can be a minimum standard of occupancy, such as the Canadian occupancy standard, and there can be minimum conditions standards as defined through planning and building regulations, but there can be no affordability standard. Affordability measurement has to be household type specific and emerges as a residual of other expenditures.

2.1.6 A normative standard of affordability v. empirical analysis of housing costs in relation to incomes

Studies of consumer expenditures have been carried out in Europe and North America since the late 19th century, yielding considerable information about how households have spent their incomes for housing and other items (e.g. Feins & Lane 1981; Stone 1993; Pelletiere 2008). One way of summarising the data on housing costs has been to calculate the mean or median ratio of shelter expenditures to income. It has then been assumed that because households on average actually spend such a fraction of their incomes on shelter, ipso facto this percentage is justified as a standard of what is reasonable to spend.² Rapkin (1957, p.8) rather whimsically noted this confusion when he wrote:

No discussion of the rent-income ratio can begin without a reference to the familiar belief that one month's rent should approximate one week's salary. It has never been quite clear to me whether this statement purports to be a statistical observation or whether it is a 'folkloristic' exhortation to husbandry.

Baer (1976) made a useful contribution by explicitly distinguishing between an *indicator*, which measures empirically the relationship between, say, housing costs and incomes, and a *standard*, which specifies normatively the appropriate value or values that an indicator should take or not exceed. As he stated with regard to housing affordability (p.383):

Given the variety of circumstances facing different households, rules of thumb about the percentage of income to be devoted to housing can be extremely

² The same confusion could, in principle, arise with residual incomes rather than ratios. It just happens that the ratio indicator has for the most part been unquestioned.

misleading in individual cases and therefore in aggregate data as well. Although generally recognized, the dilemma has largely defied attempts to establish appropriate housing standards.

To illuminate the issue further: Feins and Lane (1981) and Yip (1995), for example, carried out very extensive empirical work on the relationship of housing expenditures to incomes in the US and England respectively. In both instances, they recognised explicitly the distinction between indicators and standards. Yet they, as well as Baer (1976, p.384), ultimately used empirical findings on expenditures as the basis for their normative standards. To be sure, all of these authors rejected the notion of a single normative standard for all household types. Nonetheless, their proposed standards were derived from actual expenditure patterns of various subsets of the population.

In reality, what most households actually pay for housing is not what they realistically can 'afford': many pay more, while some pay less, whether measured in money or as a percentage of income. Who pays more and who pays less than they realistically can afford is of course not random, but correlated with economic and social circumstances. As a normative concept, an affordability *standard* must have some independent logical or theoretical basis, against which households' actual circumstances can be measured. Otherwise the standard is tautological, or arbitrary, or affordability is purely subjective.

2.2 Diverse and incompatible definitions of housing affordability

Mathematically, the relationship between housing costs and incomes can be computed as a ratio or a difference. These two computational approaches are the formal foundations of the prevailing affordability paradigm and its principal challenger respectively. In practice, there appears to be a greater variety of approaches to defining housing affordability:

- *Categorical*: a statement of ability or inability of households to pay for market housing, but without a measurement foundation.
- *Relative*: changes over time in the relationship between housing costs and household incomes.
- *Subjective*: whatever individual households are willing or choose to spend.
- *Family budget*: monetary standards based on aggregate housing expenditure patterns.
- *Ratio*: maximum acceptable housing cost/income ratios.
- *Residual*: normative standards of a minimum income required to meet non-housing needs at a basic level after paying for housing.

2.2.1 Categorical

Categorical statements about affordability that are not grounded in any reference point are not unusual. For example, affordability is 'people's ability to secure housing, to rent or to buy, based on their ability to pay either the rent or the mortgage'. Or households with an affordability problem are those 'who cannot meet the market cost of buying or renting housing from their own resources, i.e. those whose housing costs have to be subsidised'.³ While hinting at the causes of an affordability problem, i.e. an

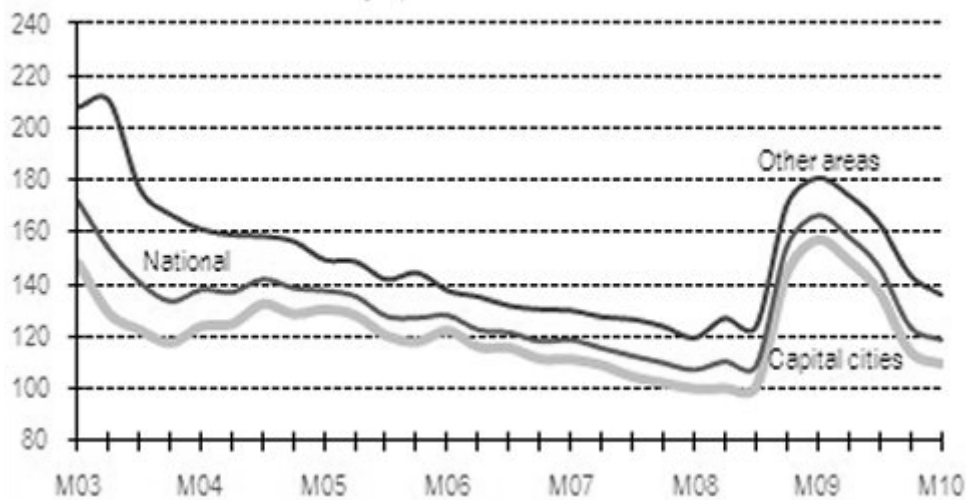
³ These two statements appeared several years ago on the public record in the UK. The authors shall nonetheless remain anonymous to avoid embarrassing them. While they might claim that the statements are taken out of context, the contexts do not dispel their essentially tautological character.

income-cost relationship, such statements are problematic—they imply a definition of affordability, but fail to provide any real measure of what it means.

2.2.2 Relative

The relative approach, widely used by the mortgage lending and real estate industries to assess the affordability of the residential sales market, is based upon prototypical housing costs, primarily for potential homebuyers. The derived indicators enable two or more points in time to be compared as to whether, on average, dwellings for sale have become relatively more or less affordable, typically either in relation to median income or in constant dollars. The technical sophistication of such affordability measures does vary, with considerable discussion as to the most appropriate definitions of housing cost and income to use in constructing the measure, as well as the implications of different cost and income definitions (e.g. Weicher 1977; Linneman & Megbolugbe 1992; Pannell & Williams 1994). The most widely used Australian version is the Housing Industry Association/Commonwealth Bank of Australia Housing Affordability Index (see Figure 1 below). There is no absolute measure or standard such as 30 per cent, but rather the affordability story is told by comparing the present with the past, with a lower index indicating lower affordability. This measure is in effect an application of the ratio approach.

Figure 1: HIA/CBA Housing Affordability Index, May 2010



Source: HIA Commonwealth Bank affordability report

The HIA/CBA approach computes the ratio of household disposable income as reported by the Australian Bureau of Statistics to the income needed to qualify for a mortgage on a median dwelling, as calculated from a census of all dwellings financed by the Commonwealth Bank and assuming a 20 per cent down payment and the prevailing interest rate for a 25-year mortgage loan. The percentage of income to mortgage ratio for March 1985 (17.3%) was multiplied by 100 to yield an index number (117.3) and this time period has become the reference to measure affordability subsequently.

The most widely cited relative measures in the US are those of the National Association of Realtors (NAR) and the Joint Center for Housing Studies. The NAR (2005) approach computes the ratio of 'the median family income as reported by the US Bureau of the Census' to the income needed to qualify for a mortgage on 'the national median-priced existing single-family home as calculated by NAR ... assuming a 20 per cent down payment' and the prevailing interest rate for 30-year mortgage

loans. The ratio is multiplied by 100 to yield an index number, such that 'a value of 100 means that a family with the median income has exactly enough income to qualify for a mortgage on a median-priced home'. An index below 100 implies that a median income family has insufficient income to qualify for a median-priced existing single-family home, while a higher index implies more than sufficient income to qualify. 'Qualification', though, assumes a conventional ratio standard: 'the monthly P&I payment cannot exceed 25 per cent of a [sic] the median family monthly income'. That is, the NAR measure is really an application of the ratio approach, not a conceptually distinct approach.⁴

The Joint Center, by contrast, computes a set of indicators without reference to any normative standard. For homebuyers, they compute the before-tax and after-tax monthly mortgage payment on the median-priced existing single-family home (from NAR), assuming 'a 30-year mortgage with 10 per cent down' (Joint Center 2004, p.31, Table A-1). They also compute median contract rent and median gross rents. These amounts are presented in constant dollars for each year, thereby providing a true relative measure of prototypical housing costs. Their affordability indicators are all ratio measures: the prototypical homebuyer costs as a percentage of median homeowner income, and prototypical renter costs as a percentage of median renter income.

Another variation on the relative approach is the median multiple measure, widely used by the real estate and lending industries in many countries and across countries (Demographia 2010). The indicator computes the ratio of the median price of for-sale houses in a given market area to median annual household income as the indicator of affordability for that market. The computed indicators are then compared across markets at various geographical scales. Normatively, an indicator of 3.0 or less is defined as 'affordable', with higher thresholds defined as 'moderately', 'seriously' and 'severely' unaffordable (Demographia 2010, p.9).

The relative approaches may thus serve a useful descriptive purpose, but provide no independent normative standard and use no distributional data for assessing how many and which kinds of households can and cannot afford which properties that are for sale. Nor do they provide any basis for assessing possible affordability stresses of owner-occupiers in their current dwellings, although the Joint Center's renter ratios do provide broad-gauged indicators of renter stress. Furthermore, the median multiple measure is particularly problematical because it takes no account of purchasing and financing terms that are decisive in determining the affordability of houses of any given price.

2.2.3 Subjective

The third approach rests on the assumption of *homo economicus*: since households are presumably rational utility-maximisers, every household is by definition paying just what it can afford for housing. Some may be living in undesirable conditions, some may have low incomes that give them few choices, but they make the choice that is best for them within their constraints. Thus, from this perspective, housing affordability per se has no generalisable meaning; it is neither rationally possible nor socially desirable to establish a normative standard of affordability other than individual choice. As a memorandum on 'affordable housing' submitted to a UK Parliamentary Select Committee bluntly stated (UK Parliament 2002; Memorandum AFH 20, p.2): 'The concept of affordability, of whatever commodity, is essentially subjective.'

⁴ Treskon and Pelletiere (2004) have similarly analysed renter affordability, using median gross rent, median renter income and the 30 per cent of income ratio standard.

More sophisticated versions of this perspective do recognise that the degree of financial flexibility does increase with income. Kempson, for example, has argued (1993, pp.26–7):

... people differ in the way they allocate their money. Some choose to spend more on their housing and cut back on other expenditure; while others keep their housing costs low in order to spend more on other things. The higher the income the less need there is for such choices.

Linneman and Megbolugbe (1992 p.388) expressed this perspective particularly pointedly. Although they acknowledged a ‘real’ affordability problem among low income households, while claiming that it is ‘primarily a problem of income inadequacy’, they asserted, in response to widespread anguish about the cost of achieving homeownership (p.388), that housing affordability is ‘an issue manufactured by middle-class and affluent young adults with ever growing expectations’.

While no-one could disagree that higher income households have considerable discretion about how to allocate their resources between housing and other items, and hence for them affordability may be quite subjective, households at the lower end of the income distribution are not simply choosing freely between housing and other needs. Rather, housing costs tend to make the first claim on disposable income, so that such households have little discretion in what they can spend on non-housing items.

Thus, it is reasonable to argue that ‘subjectivity’ of affordability is not only *not* universal, it is not even a continuum that increases with income. Instead, there is a threshold above which affordability may become increasingly subjective. The important questions are then: what is that threshold or transition zone below which affordability is not subjective, and how to define and measure objective affordability below that threshold. These questions are not addressed within this perspective.

2.2.4 Family budget

The fourth approach to conceptualising housing affordability has based affordability standards on a combination of normative judgements and summary measures of what households in the aggregate actually spend. In practice, this has formed the basis for the ratio approach. It has also provided the basis for the budget standards approach of a standardised monetary amount for housing. Since the latter can be understood as a purely income-based standard of affordability, it deserves attention here as a distinct approach.

Although every household has its own unique conditions of life, there do exist historically and socially-determined notions of what constitutes a minimum, adequate, or decent standard of living. They represent norms around which a range of variations can be recognised and about which there certainly may be some philosophical debate. While the experience of ‘poverty’ is recognised as more than just the inability to secure a socially-determined minimum quantity and/or quality of essential goods and services, measurable material deprivation is certainly a central element in poverty. Furthermore, in societies where most basic goods and services are commodities, it is possible, at least in principle, to determine the monetary cost of achieving such a basic material level. This budget standards approach to poverty and income adequacy has a long and honourable history (e.g. Expert Committee on Family Budget Revisions 1980; Bradshaw et al. 1987; Oldfield & Yu 1993; Ruggles 1990; Bradshaw 1993; Citro & Michael 1995; Parker 1998; Saunders et al. 1998; Bernstein et al. 2000; Bradshaw & Sainsbury 2000; Pelletiere 2008).

The budget standards approach involves specification of a 'market basket' of essential items. For housing, food and most other items, data from consumer expenditure surveys, expert opinion and, in some cases, opinion surveys and focus groups are used to establish a minimal standard of type, quantity and quality, in a given social context at a given time (the physical standard will of course vary by household type, and this qualifier applies to all of the following). The physical standard for each item is then priced, and the prices summed to yield a total (after-tax) minimal budget.

If the budget amounts for housing specified in the standard budgets really do represent the amount of income needed for essentially *any* household of a given type to obtain socially defined minimally adequate *housing*, then housing affordability has no independent meaning: in principle, any household with an income no less than the total budget should be able to meet all of its basic needs, including housing, at the physical quantity and quality represented by the budget standard.

There are, however, conceptual problems in the treatment of housing costs in the budget standards methodology due to their inherent nature and variability. While the budget standard methodology is well conceptualised and operationalised for other items, *it is flawed with regard to housing*. The issue is revealed by contrasting the budget standard approach and implications for food with that of housing.

Given the nature of food items—low price variance and high supply elasticity—essentially any household could, in principle, meet the physical food standard with the amount represented by the specific monetary standard, at least within a particular geographical region. Housing, by contrast, is highly heterogeneous. Because it is bulky, durable and tied to land, it shows high price variance and low elasticity of supply, even within a given market area. How then to price the minimum standard for housing? If prices are determined for a sample of housing units meeting the minimum physical standard, the price distribution has a large variance. Which point on the distribution should then be selected for the monetary standard for housing?

If a very low cost is selected (say, the midpoint of the lowest third of the distribution of rents for private market housing, as was the standard in the US Bureau of Labor Statistics lower standard budgets), then most households, despite their best efforts, will not be able to obtain physically adequate housing at the monetary standard—unless perchance there were to be an extraordinarily large supply of physically adequate housing priced barely above this cost threshold. That is, most would need income above the total specified by the monetary budget standard in order to meet the minimum physical standard. If, on the other hand, the monetary standard for housing were to be set closer to the midpoint of the price distribution, such as the 40th percentile of rents for physically standard units, which is the definition of 'fair market rent' computed by the US Department of Housing and Urban Development (2002) and used in recent US budget standards (e.g. Bernstein et al. 2000), then some households are able to spend less than the monetary standard for housing and hence need less income than the total budget, through no virtue of their own, while others would have to spend more, though not as many as with a lower point on the distribution.

In sum, housing is unique; the budget standard methodology may be able to specify a reasonably precise *physical* standard for housing, but it cannot establish a precise *monetary* standard.⁵ Furthermore, in terms of policy, this means that housing

⁵ While difficult, it is not impossible to specify what constitutes a unit that is minimally adequate physically, and it would be possible to determine the hedonic price of these minimal physical characteristics. However, because housing is tied to location, which of course cannot be standardised, actual dwelling unit prices—reflecting local demand and supply conditions—will show large variance, even controlling for physical characteristics. Furthermore, because housing is so heterogeneous with

affordability problems cannot be explained as just income problems. General and standardised Income Support alone would be neither efficient nor equitable for solving housing affordability problems.⁶

2.2.5 Ratio

As an indicator for expressing the relationship between housing costs and incomes, the ratio measure has the longest history and widest recognition for assessing affordability. Normatively, this approach recognises that what many households pay for housing in relation to their income is the result of difficult choices among limited and often unsatisfactory alternatives. It asserts that if a household pays more for housing than a certain percentage or fraction of its income, then it will not have enough left for other necessities. It usually specifies an explicit ratio of housing cost to income as a standard against which households' actual circumstances can be measured. Yet, despite its widespread recognition and acceptance, there is no theoretical or logical foundation for the concept and the particular ratio or ratios that are used.

How can one account for the existence and persistence of the fixed ratio or percentage of income affordability concept? Apart from its mathematical simplicity, the rationale for the conventional standard, and the rationalisation for raising the acceptable level in the US from 25 per cent to 30 per cent in the 1980s, and in Australia and other countries since then, has been built upon interpretations of empirical studies of what households actually spend for housing. Because ratios are pure numbers, they can be compared across time and space and thus are susceptible to being reified as universal and lawful. Such 'laws' then become legitimated as appropriate indicators and the basis for normative standards.

Even most of those who have rejected the notion of a single ratio *standard* have accepted uncritically the ratio *indicator*. Feins and Lane, for example (1981, p.7), after discussing the distinction between indicators and standards, have asserted: 'When we apply these terms to the issues of housing affordability, we find that the ratio of shelter expenditures to household income is the appropriate indicator' (see also Pedone 1988, p.9; Yip 1995, Chapter 7; for a critique of such alleged 'lawfulness', see Chaplin et al. 1994, pp.13–14).

However, once the ratio measure is accepted as *the* appropriate indicator, ipso facto, the standard must be a ratio or a set of ratios. Yet the notion that a household can adequately meet its non-shelter needs if it has at least a certain percentage of income left after paying for housing implies either that the lower the income of a household, the lower the amount of money it requires for non-shelter needs, with no minimum whatsoever, or that the normative ratio must diminish with income, all the way to zero below certain incomes. Furthermore, since a housing affordability standard is intended to measure whether housing costs make an undue claim on household income in

respect to age, amenities, space and condition, it is unlikely that most households would ever be able to obtain housing at the price hedonically determined for a unit that is minimally adequate physically, despite their best efforts.

Thus, as suggested in the earlier section on housing standards, in assessing housing need on an individual basis, a household's actual affordability situation could, in principle, be tempered by considering whether units meeting a minimal physical standard actually are available, as well as the monetary and non-monetary costs of moving, in order to determine whether or not their affordability problem is 'by choice'. Obviously, this is very different from assessing the relationship between what a household actually pays for consumption of food and other non-housing items in relation to normative payment standards for these items. There are very good reasons for singling out housing for special status.

⁶ For a similar argument, see Thalmann (2003, p.300).

relation to other needs, basing such a standard on what people actually pay provides no way of assessing whether they are in fact able to achieve some minimum standard for non-shelter necessities. These logical flaws in the ratio approach led inexorably to the residual income concept of affordability.

2.2.6 *Residual income*

The residual income approach recognises that because of housing's distinctive physical attributes in comparison with other necessities, its cost makes the largest and least flexible claim on after-tax income for most households, i.e. that non-housing expenditures are limited by how much income is left after paying for housing. This means that a household has a housing affordability problem if it cannot meet its non-housing needs at some minimum level of adequacy after paying for housing. The appropriate *indicator* of the tension between housing costs and incomes is thus the difference between them—the residual income after paying for housing—rather than the ratio. That is, as Hulchanski (1995) has argued, the ratio is not a valid indicator of housing need and the ability to pay for housing, although it still could be useful as one indicator of actual housing expenditures in relation to incomes.

What are the implications of this logic for the amount and fraction of income that households realistically can afford, i.e. for an affordability *standard*? Consider, for example, two households with comparable disposable incomes. Suppose that one consists of a single person, while the other is a couple with three children. Obviously the larger household would have to spend substantially more for its non-shelter necessities than would the small household in order to achieve a comparable material quality of life. This implies that the larger household can afford to spend *less* for housing than can the small household of the same income. Now compare two households of the same size and composition, but different after-tax incomes. Both would need to spend about the same amount to achieve a comparable standard of living for non-shelter items. The higher income household could thus afford to spend more for housing, in percentage of income as well as in monetary terms.

Generalising from these examples: Since the non-housing expenses of small households are, on average, less than those of large households, to achieve a comparable basic standard of living, smaller households can reasonably devote a higher percentage of income to housing than can larger households with the same income. Since low income and higher income households of the same size and type require about the same amount of money to meet their non-housing needs at a comparable basic standard of living, those with lower incomes can afford to devote a smaller percentage of income for housing than otherwise similar higher income households can afford. In this way, the residual income standard emerges as a sliding scale of housing affordability—with the maximum affordable monetary amount and fraction of income varying with household size, type and income. Indeed, it implies that some households can afford nothing for housing, while others can afford more than any established ratio.

Operationalising a residual income standard involves use of a socially-defined standard of adequacy for non-housing items. Thus, while the residual income logic has broad validity, a particular residual income standard is not universal, but socially grounded in space and time. Issues involved in selecting such a standard for non-housing necessities will be taken up below as part of the review of the debates about affordability standards in the US, UK and Australia. This literature not only strengthens the argument for the residual income approach, it also helps to illuminate some of the practical tasks in operationalising such a standard.

3 DEBATES ABOUT AFFORDABILITY STANDARDS

Prior to the late 1960s in the US, the late 1980s in the UK and the late 1990s in Australia, leading housing experts accepted without question the ratio of housing costs to incomes as the appropriate affordability indicator, challenging only the notion of a single ratio as an appropriate normative standard (e.g. Rapkin 1957; Donnison 1967, pp.65–8, pp.255–6). In Australia, the ‘after-housing poverty’ notion was first articulated in the mid-1970s (Commission of Inquiry into Poverty 1975), although its implications as a critique of and alternative to the ratio approach were little recognised and appreciated for the next two decades.

In the US, initial interest was followed by nearly a decade of considerable intellectual ferment and great progress in reconceptualising affordability in terms of residual incomes, after which interest diminished until quite recently. In the UK, since about 1990, there has been even richer debate, adding important theoretical foundation to the argument for the superiority of the residual income approach, but apparently with no recognition of work done in the US. By the same token, the UK literature seems not to have become familiar to most US readers. In Australia, discussion began in the late 1990s, drawing on some of the literature from both the US and the UK, with many academics becoming quite conversant with the issues and debates, but with penetration of the residual income approach into the policy arenas being quite recent and heretofore modest. Over the past decade, researchers in other parts of the world have begun incorporating the residual income approach into research and policy analyses. It is therefore worth reviewing the literature in the interest of promoting deeper understanding and further development of the residual income paradigm and its practical application.

3.1 US debates about affordability standards

In the 1960s and early 1970s, concern with poverty and urban problems in the US included considerable discussion of housing affordability concepts. A number of housing analysts looked at housing affordability in relation to income adequacy and living standards, not merely as a matter of housing costs; and they began questioning the conventional ratio approach to affordability.

The late Cushing Dolbeare (1966, p.12) appears to have been one of the first to go beyond recognition of the inadequacy of the ratio standard, especially for the poor, and suggest an alternative. In a limited circulation pamphlet, she offered an alternative as part of a proposal for ‘housing grants for the very poor’:

The subsidy might cover the difference between the amount the family could afford for shelter after meeting other basic needs and the cost of shelter—the ‘residual’ approach.

The compelling argument in favor of the residual approach is that it covers, if necessary, the full amount needed for housing, thus assuring that the recipient is able to meet as many ... other basic needs—food, clothing, medical care, etc.—as possible.

The proposed non-shelter standard in this residual income approach was an amount equal to the federal Poverty Threshold for a household of a given size, minus an estimated typical shelter cost for low-income households of that size (p.33).

The issue emerged in the US policy arena under the auspices of the President’s Committee on Urban Housing, one of the commissions established in the wake of the urban riots of the mid-1960s. In its 1968 report the committee asked, ‘When does a

family need a subsidy?' and went on to declare (pp.41–2): 'Determination of a proper proportion of a family's income for housing requires some difficult value judgments ... The staff concluded that no flat percentage can be equitable for all.' Several of its consultants went a little further in conceptualising how a variable standard might be developed, but most then retreated to the simpler, conventional ratio standard (G.E. TEMPO 1968, p.15; Robert Gladstone and Associates 1968, pp.56–7). Another consultant did examine the differential effect of household size on housing affordability and, in doing so, used the concept of a 'minimum adequate' budget that varies with household size. Not surprisingly, he found that smaller households with incomes at the minimum budget level could obtain and afford shelter at higher rent/income ratios than could larger households (von Furstenberg 1968, p.107).

Over the next few years, some elements of a consensus seemed to be emerging about an appropriate approach, until the issue was submerged by the economic crises of the 1970s. In 1971, a committee of the US congress published reports on housing affordability standards that it had requested from a number of experts. Three of the papers argued explicitly and strongly for using a residual income approach in analysis of housing needs and subsidy formulas for federal housing programs (Frieden 1971; Newman 1971; Lowry 1971). Both Newman and Lowry suggested that Bureau of Labor Statistics (BLS) normative family budgets should be used to set the standard for non-housing expenses.

In the mid-1970s, a big step forward was taken when two research projects independently operationalised the residual income approach using the non-housing components of the BLS lower budgets and applied this standard to estimate the extent of housing affordability problems (Grigsby & Rosenberg 1975, p.78, for Baltimore; Stone 1975, p.23, for the US).⁷ Grigsby and Rosenberg first summarised the truism about housing costs (p.47): 'with minor exceptions housing costs cannot be deferred or reduced by low income families, whereas other expenditures can be and are. As a result, households suffer from inadequate diet, clothing, and medical care, just to keep a roof over their heads.' They then proceeded to advance the logic of residual incomes and the use of budget standards to operationalise a residual income standard (p.47):

If it is accepted that the problem is one of housing cost as well as income, a measurable objective with respect to what is an excessive expenditure relative to income must be established ... One possible measurable objective, then, could be derived by matching family income against the total cost of an acceptable living standard, for example, in one of the family budgets of the Bureau of Labor Statistics. The family's housing expenditures should not be so great as to leave it with insufficient money to acquire the non-housing necessities in any budget that is deemed appropriate.

Applying the operational standard to Baltimore, they found that in 1969 nearly one-third of all households were 'bearing housing costs which may be considered excessive relative to income' (p.78).

In his paper, Stone introduced the term 'shelter poverty' to characterise households for whom the squeeze between income and housing cost leaves them unable to meet their non-shelter needs at the Bureau of Labor Statistics (BLS) lower budget standard. He asserted (p.146):

Quite apart from variations in individual situations, it is apparent that in general the lower the income of a family the smaller the proportion of income they can

⁷ In both cases, the residual income discussion was a small part of a much larger analysis.

afford for housing. While the limitation of the conventional standard has been recognised, even officially, until now there has been no attempt to determine how much working-class families realistically can afford for housing and establish a standard which varies with income.

He then provided an overview of his methodology (p.146):

The standard budgets computed periodically by the Bureau of Labor Statistics (BLS) provide a basis for determining how much households of a given income and household size can, on average, afford for housing. The 'lower budget' in this series defines the level of expenditures necessary for a minimum adequate standard of living. The maximum amount a family can afford for shelter and still meet its other needs can thus be determined by subtracting from income the sum of all *non-shelter* consumption expenditures in the BLS lower budget plus personal taxes corresponding to that level of income [emphasis in original].

After illustrating the operationalisation of this methodology, Stone presented a summary of the application to 1970 US census data, concluding that 26 per cent of all households, including 34 per cent of renters and 21 per cent of homeowners, were shelter poor in that year (pp.147–8).

Over the next two and a half decades, Stone continued to advance the arguments for the residual income approach and to update and apply the shelter poverty standard to housing problems and in the US as a whole (1983, 1990, 1993, 1994), as well as in Massachusetts (1989; Stone et al. 2000). While the 1983 and 1990 papers presented successively greater explication of the logic, methodology, results and potential policy implications and applications, his 1993 book provided by far the most comprehensive presentation of all four of these dimensions of the residual income approach (see e.g. Chapter 2 and appendices).

Stone found that persistently about a third of US households have been shelter poor, with the incidence rising several percentage points above this level in recessions and falling several points below it in the best of times. By contrast, on the ratio standard, the incidence has risen monotonically since the 1970s: in the early 1970s, on the 25 per cent of income standard, the incidence was about a third of households; by the 1990s, it was about a third of households on the 30 per cent of income standard, and much more on the 25 per cent standard. Although there has been very considerable overlap between the households with affordability problems on the shelter poverty and ratio standards, Stone has found that the residual income approach reveals a lower incidence among small households and a higher incidence among large households, raising questions about the distribution of need and the allocation of housing subsidies.

In their extensive monograph on housing affordability, Feins and Lane (1981) fully acknowledged the inadequacy of the single ratio standard, and proposed new standards 'that are sensitive to income levels of renter households as well as to household size, age, and geographic location' (p.58). They also proposed using the BLS budgets as the basis for their new standards, but argued that:

... expectations about what lower-income and intermediate-income households are able to spend for shelter could be based on the *proportion* of the BLS budgets that are allocated for housing, and that this *proportion* could vary for households of different types and in different locales, as it does in the BLS budgets (p.59) [emphasis added].

That is, despite pushing the boundaries, they were ultimately unable to transcend the ratio paradigm, showing no awareness of the previous work that had been done on

the residual income approach, other than passing reference to work by Stone, which they dismissed because they misread and misstated his central premise. They erroneously presumed that because he devised a normative standard for non-shelter items, he was arguing 'that the budget's designated costs for items other than shelter should be covered first, with only the residual income being allocated to rent' (p.67). Stone was actually arguing that housing costs make the first claim on income, with residual income *after-housing costs* being insufficient to meet non-shelter needs if it is less than the BLS budget for non-shelter items.

During the 1980s and 1990s several others broached the residual income argument, but with little impact on prevailing thought, let alone policy. For example, a 1980 report growing out of the Experimental Housing Allowance Demand Study proposed a residual income affordability standard, but suggested that the non-shelter standard be set at three-quarters of the federal poverty standard—a level considerably lower than the BLS lower budget non-shelter level. After making the proposal, however, the author proceeded to use the traditional 25 per cent of income standard in his analysis (Budding 1980).

In the late 1980s, there was again a brief discussion in the US about the inadequacies of the ratio approach that brought the issue closer to the policy arena, although again only temporarily (National Housing Task Force 1988; Leonard et al. 1989). The Housing Task Force criticised the use of the fixed ratio payment standard for housing subsidies, arguing for a 'flexible' definition that was at least implicitly a residual income approach and paraphrasing the language in Stone's 1983 paper as follows:

Applying a single rent-to-income standard across the board to poverty-level households can produce serious inequities. A single person living alone, with an income toward the upper end of the eligible range, clearly can afford to pay a higher proportion of income for rent than a large family with children and income at the lower end of the scale. Current law recognises this by providing adjustments for minor children, but more should be done.

Accordingly, the Task Force recommends that Congress consider requiring a sliding scale of tenant payments based upon family size and income. Larger families with lower incomes would pay a smaller proportion of income; small, relatively better-off households would pay a large proportion (p.44).

Leonard et al. restated the arguments against the ratio approach and in favour of the residual income logic (pp.69–72). They operationalised a residual income standard based on the BLS lower budget non-housing components, following the same logic developed earlier by Stone and by Grigsby and Rosenberg.

Combs et al. (1995) compared three measures of housing affordability: a ratio standard based on spending over 30 per cent of income for housing; a residual income standard they call 'housing poverty' based on an after-housing non-shelter standard set at 70 per cent of the poverty level; and what they call 'housing burden', which combines aspects of the other two. The latter defines a household as housing burdened if it both spends over 30 per cent of income for housing *and* has an after-housing residual income of less than 70 per cent of the poverty level. This measure thus does *not* consider a household to be housing burdened if it is spending less than 30 per cent for housing but has a residual income equal to less than 70 per cent of the poverty level. Not surprisingly, they found that the incidence of affordability problems became successively lower in going from the first to the second to the third of their measures. While their housing burden concept may help to focus attention on the income side of the issue, it is not apparent that it does so more effectively than a pure residual income approach, and it lacks a sound theoretical and conceptual basis.

Bogdon and Can (1997), in a paper on the measurement of local housing affordability problems, compared various approaches, including the ratio measure and the shelter poverty residual income approach, as well as several others that are actually adaptations of the ratio measure. Ultimately, though, they adopted the ratio measure and its variations for convenience.

The last ten years have witnessed a substantial increase in the quantity and depth of discussion and awareness of the residual income approach in the US. First of all, the widely read *State of the Nation's Housing*, prepared and published annually by the Joint Center for Housing Studies of Harvard University, first took note and used the term 'residual income' in their 2003 report (p.26 & Figure 25). Their approach has been descriptive and empirical; reporting how much residual income households in each quintile of income would have available to cover non-housing expenses if they were paying either 30 per cent or 50 per cent of income for housing. Each subsequent year's report has continued to provide a few illustrations of residual incomes in this way. To be sure, the ratio standard has continued to be the point of reference, and there is no discussion of a normative standard against which to measure residual incomes. Nonetheless, the notion of 'residual income' as relevant for assessing affordability has reached a far wider audience than previously.

In an important paper, Kutty (2005) forcefully restated the case for the residual income approach, alluding especially to the work of Stone. Most notably, she has operationalised a residual income standard with the non-housing standard set at two-thirds of the federal poverty threshold and applied it to compute what she calls 'housing induced poverty'. As she acknowledges, her choice of a non-shelter standard is lower than the BLS lower budget standard used by Stone and others.

A Joint Center report (Belsky et al. 2005) on measuring rental affordability mentioned the residual income approach, citing both Stone and Kutty. However, the analytical work in the paper used the ratio approach, while also noting problems with uncritical reliance on the approach.

In addition, during this period, Stone published his greatest concentration of papers on the residual income approach (2004, 2006a, 2006b, 2006c, 2006d). While the first four of these largely present application of his shelter poverty approach to assess housing needs and problems, the last of these papers (2006d) and a paper by Pelletiere (2008) are the most comprehensive recent syntheses in the US literature on the theoretical and conceptual issues involved in defining and measuring housing affordability. Stone's paper brings together the early conceptual work done in the US with the more recent theoretical work done in the UK (discussed in the next section) to provide the most compelling argument for the residual income approach. He also addresses the practical issues in operationalising the approach.

Pelletiere devotes more attention to the budget standards literature and to reforming rent policy in light of the critiques of the rigid ratio approach and insights of the residual income approach. Nonetheless, with respect to policy reform, he concludes in some dismay (p.19):

Today, most administering agencies continue to see rent reform as rent simplification, and a means to encourage greater employment and self-sufficiency among program participants. Both serve the goal of reducing program costs ...

With the discussion of rent and subsidy determination stuck defending the status quo, and with little current empirical data to test the impact of alternatives on current and future recipients and program finances, no policy space exists to consider alternatives.

This has left the residual income approach sidelined in policy discussions, largely because it has little to offer in the context of the current debate. Any system that determines rents and subsidies based on residual income, whether it is determined on an individual budget basis or by assigning households to specific categories, is not likely to be less complicated than the current system of income adjustments, though it is perhaps no more complicated. Also ... on its own, the residual income approach does not provide an intuitive response to those motivated by incentives for work on the one hand and disincentives for fraud on the other.

Finally, while the current policy deadlock does not preclude the use of more precise residual income and more normative quantity based budgeting results as standards of affordability, the lack of a policy mandating the use of such standards is a barrier to the creation of a special purpose data set and a consensus quantity based budget and in general a barrier to their broad acceptance.

In sum, the US has the longest and most developed set of work on the residual income approach, but this approach has not entered substantially into the policy environment.

3.2 UK debates about affordability standards

In the late 1980s, concern about rising housing costs across all sectors of housing in the UK—social rented, private rented and owner-occupied—opened up discussion and debate about the meaning of housing affordability (see Malpass & Murie 1999, p.162, for a summary of the context). Since then, there has developed extensive exploration of the issue by members of the academic, professional and advocacy communities, but apparently reluctance by the government to adopt an appropriate workable definition for use in assessing housing need and making policy.

The literature on housing affordability concepts that emerged in the UK since about 1990 seems to fall into three categories (although some studies combine more than one of these). These are, first, conceptual and theoretical explorations, second, examinations of the implications of various affordability standards for Housing Benefit formulas and rent setting in social housing, and third, a tiny number of studies of the extent and distribution of housing affordability problems based on one or more of the standards. Until very recently, this literature has shown essentially no awareness of the US discussions summarised above, and those papers that have looked at the US just refer to the ratio standard enshrined in official policy. Similarly, in the US, there has been lack of awareness of the rich discussion about affordability that has taken place over the past two decades in the UK.

Maclennan and Williams are often quoted as having offered one of the earliest UK statements on the meaning of housing affordability (1990, p.9):

‘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. A number of judgements and assumptions are usually made in putting the concept into practice, and, in broad terms, affordability is assessed by the ratio of a chosen definition of housing costs to a selected measure of household income in some given time period.

The first sentence is certainly beyond dispute as a general statement of what is meant by ‘affordability’. The second is a fairly accurate statement of conventional policy and practice, certainly in the US, if not the UK. Note, though, that they stated that

'affordability *is assessed* by the ratio' [emphasis added], not 'affordability is *usually* assessed' or 'affordability is *conventionally* assessed'. Throughout their paper, and at that time, there was not yet in the UK an explicit challenge to the ratio approach to defining and measuring affordability. It is ironic that the paper was presented at a conference on 'Affordable Housing in the US and UK', but it illustrates the point made in the preceding paragraph: even a full reading of their paper reveals that references to affordability measures in the US have been limited to the ratio standard.

Nonetheless, Maclennan and Williams expressed some dismay at the failure of government in the UK to advance a definition, and they argued for work to be done towards such a definition (pp.8–9):

However, as the term has been given no explicit meaning by government in Britain the notion of 'affordability' in Britain is less than clear.

Though ill-defined and perhaps meaningless in the current British policy debate, affordability does, nevertheless, carry significant meaning and not just at a purely semantic level. Implicit in the term, even in its current usage, are a wide range of assumptions whose implications are central to housing policy debate in both countries. It is only by probing these assumptions and examining existing usages that a new meaning can be constructed.

Five years later, again within the context of a conference on housing policy in the UK and North America, Maclennan summarised the state of affairs in the UK (1995, p.684): 'There has been a long and imprecise debate in the UK, and, unlike the governments in Canada and the United States, the UK government has been unwilling to specify appropriate ratios (*or better, residual incomes—that is, net equivalent income minus housing costs*)' [emphasis added]. While he was apparently still critical of the government's failure to specify an affordability standard, his reference to and preference for the residual income approach suggests that a debate had been underway, and that in the five years since his earlier paper with Williams this debate had not been as 'imprecise' as he lamented. What had happened in the intervening five years to put the residual income approach onto the agenda and, at least for one UK expert, in the preferred place?

1990 seems to have marked a watershed in the UK for conceptualising housing affordability. On the one hand, a study of housing association rent setting by Ferguson and Wilcox (1990) only considered the percentage of income (ratio) approach, largely based on the empirical/normative confusion discussed earlier (pp.14–16), but did recognise that there are problems with using a single percentage for all household types (pp.27–8). Similarly, the National Federation of Housing Associations (1990) uncritically accepted the ratio concept and used empirical averages to set a normative standard. Bramley, in an unpublished paper (1990), offered a broad definition of affordability that appeared to move in the direction of a residual income approach, but then apparently actually used a ratio standard in his research (as noted in Hancock, 1993, p.129, p.133).

On the other hand, two reports by Brownill et al., growing out of a Joseph Rowntree Foundation project on housing affordability in London, provided deeper criticism of the ratio approach. More significantly, they made an argument for the logic of the residual income approach, in terms quite similar to the logic underlying the shelter poverty concept in the US (Brownill et al. 1990; Sharp et al. 1990, Chapter 2). Specifically, they presented survey data on residual incomes after housing costs of council tenants receiving and not receiving Housing Benefit (Brownill et al. 1990, p.30), and they argued (pp.47–9) that:

The relation between housing costs and income is the crux of the affordability debate. This ... has been characterised by a search for a definitive ratio of costs to income as a measure of affordability. For example, rent levels of 20 per cent of net income have been widely canvassed as 'affordable'. Our analysis calls into question such simple assessments on two counts.

First, there are many other housing costs which should be taken into consideration. Secondly, no single ratio could apply over time to people on varied incomes, in different types of household and tenure. After all, 20 per cent of a low income leaves a lot less to spend on other essential items than 20 per cent of a high income. A more useful approach is to consider what income is necessary to meet basic needs for different types of households. It is the amount of money left after housing costs have been met that is crucial in determining whether the costs of housing are really affordable.

Their work was thus a significant step forward, but the authors did not then suggest a normative standard for a minimally adequate residual income or a direction for establishing such a standard.

Subsequent to the work of Bramley and Brownill there were a growing number of UK studies largely driven by social housing rent setting considerations rather than broader housing affordability issues that recognised the potential importance of a residual model for policy purposes, but did not undertake any substantive empirical research (Hancock 1993; Kearns 1992; Gibbs 1992; Randolph 1992, 1993). However, Hancock and Randolph both proposed operationalising a residual income method for rent setting whereby a normative standard of some percentage above Housing Benefit level (120% Randolph, 140% Hancock) for relevant household types should be set as the affordable rent. In 1993, the Scottish Federation of Housing Associations adopted a policy that combined a ratio with a residual income standard (SFHA 1993, quoted in SFHA 1999, p.4):

A rent is affordable only if:

- No working household is obliged to pay more than 25 per cent of net income (including Housing Benefit) on rent.
- No working household is left with less than 140 per cent of the appropriate Income Support amount.

This formula implies that any working household with net income of less than or equal to 140 per cent of the Income Support level would pay zero rent. Households with incomes above 140 per cent of Income Support presumably would have pound for pound applied to rent, i.e. a taper of 100 per cent, up to the income at which rent was equal to 25 per cent of net income; this works out to be 187 per cent of Income Support ($140/[1-0.25]$). Households with incomes above this level would face a taper of 25 per cent, i.e. for every £4 of income above this level, rent would be £1 higher, with the other £3 available for other purposes at the households' discretion. While this mixed formula had no theoretical justification, it was sophisticated and extremely generous. It recognised the fundamental logic of residual income and the appropriateness, at least for working families, of a normative standard for non-shelter items higher than the Income Support standard. The 100 per cent taper over a portion of the range might arguably be a disincentive for households to increase their incomes, but the limited range of this severe taper and the very generous taper above it might have more than offset such a disincentive.⁸

⁸ It is not known whether this formula was ever implemented and, if so, whether its impact was evaluated. Following a later re-examination (SFHA, 1999), the federation abandoned advocacy of this formula in

There were papers in this period that grounded analysis in the wider affordability problems in the UK. Bramley, for example, focused in detail on the scope and causes of 'An Affordability Crisis in British Housing', but began with an overview of affordability definitions. He expressed intellectual support for the residual income approach, but concern about its relationship to the definition of poverty (1994, p.104):

It seems to both the author and others that the most coherent normative concept of affordability is one that links normative judgements about housing needs/standards with judgements about minimum income requirements for non-housing consumption. This implies that housing affordability is closely bound up with the definition of a poverty line, and that the key ratios are likely to be expressed in terms of residual income (after housing costs) relative to that line. In general, there is less consensus about poverty line definition than about basic housing standards, and normative need-type statements lose much of their force if they do not reflect consensus.

His caveat may be justified, but is diminished by ambiguity about the type of poverty line definition that is relevant for a residual income approach to affordability. One could argue that one of the principal reasons why there is less consensus about a poverty line definition is because such definitions usually include housing costs as an essential component, even though it is not possible to arrive at an appropriate minimum housing cost to include, as discussed above with regard to the budget standards methodology. If there were to be a clearer focus on defining a 'poverty' standard for non-shelter items, it would not be surprising if there were greater consensus than about poverty as conventionally conceived.

While he summarised such problems, unfortunately he did not then attempt to specify 'critical thresholds' or to fine-tune either the ratio or residual income standards on the basis of the data.

Chaplin et al. (1994) examined affordability definitions and measures, with particular attention to the ratio and residual income approaches. Although they present critiques of each approach, they affirmed that the ratio approach cannot stand up to careful scrutiny. Thus, throughout the paper they repeatedly acknowledge the basic logic of the residual income approach, for example (p.6): 'This would hardly be a useful basis for a normative standard under either a residual income or ratio definition.'⁹ However, they then move on to develop a statistically complex measure of affordability that would still leave unresolved what represented a normative standard to judge affordability even adapted to a residual method.

The most comprehensive UK examination of housing affordability has been Yip's 1995 DPhil thesis from the University of York, *Housing Affordability in England*, which apparently and unfortunately has not resulted in any published work. This study well explained the ratio, residual income and behavioural approaches to affordability, carried out extensive analyses of housing expenditure patterns, and computed the incidence of affordability problems on various standards using data from the Family Expenditure Survey. His approach to residual income used two alternative standards: the first was 140 per cent of Income Support level as the normative standard for non-shelter items, the same standard that Karen Hancock had used as the most generous definition in her Glasgow study; the second was 50 per cent of national average

favour of a vaguer approach that resolves the tension between true affordability and the need for adequate rental income in favour of the latter.

⁹ Note also that while the narrative explanation of their method is clear, there are errors in the mathematical formulas.

income before housing cost (p.138).¹⁰ His latter approach represents the only example heretofore of a residual income standard independent of the benefits systems.

Yip's thesis was an empirical *tour de force*, making use of sophisticated statistical methods to extract as much insight as one could imagine from Family Expenditure Survey data. He did not, however, make any conceptual advances. Furthermore, while his use of 50 per cent of national average income was a creative alternative for specifying the non-shelter standard in the residual income approach, he did not consider drawing upon the budget standards work of Jonathan Bradshaw and the Family Budget Unit even though he did mention this in passing. Also, he expressed a preference for the ratio over the residual income approach, basing his position on two arguments that have been shown above to be weak at best: that the ratio approach is supported by empirical 'laws' and that the residual income approach is too closely bound up with the concept of poverty (Yip 1995, p.134).

Since 1995, the UK literature on affordability concepts has, for the most part, shown familiarity with the debates and cited some of the preceding sources, but been focused on policy issues, particularly rent setting in social housing and Housing Benefit reform (Freeman et al. 1999; Wilcox 1999). The papers by academics and policy research centres have all acknowledged the conceptual weaknesses of the ratio approach and recognised the logical superiority of residual income, but none has been able to untie the Gordian knot binding the operationalisation of residual income to the existing standards embedded within Income Support and Housing Benefit policies. Thus, no further conceptual work has been done. Nor, until several years ago, had the knot been cut in such a way that it allowed for the development of a more sophisticated operational model of the residual income approach.

A methodological breakthrough finally came when Stone (2006e) proposed and operationalised a residual income standard for the UK not tied to the poverty standard, or the Income Support or Housing Benefit systems. His model was based on indicative budgets, following upon the approach that he, as well as Grigsby and Rosenberg, had first developed in the US in the mid-1970s.

Stone has explained the methodological approach as follows (p.459):

Operationalising the shelter poverty scale involves use of a conservative, socially defined minimum standard of adequacy for non-shelter necessities, scaled for differences in household size and type. It takes into account the actual cost of a standardised, basic 'market basket' of non-shelter necessities in determining the maximum amount of money households can afford to spend for housing and still have enough left to pay for this basic market basket of non-shelter necessities. Thus, while the logic of shelter poverty has broad validity, a particular shelter poverty scale is not universal; it is socially grounded in space and time.

The practical challenge in translating the shelter poverty concept into an operational affordability scale is how to specify the monetary level of a minimum standard of adequacy for non-shelter items.

From a review of the UK history and experience with quantity-based normative budgets, Stone concluded (p.460) that:

¹⁰ Applying the two standards to Family Expenditure Survey data, Yip found that 29 per cent had an affordability problem based on the former standard, 28 per cent on the latter, with essentially the same group of households (97 per cent classified the same on the two standards (p.145)).

... the budget standards approach, especially that of Bradshaw and his colleagues in the Family Budget Unit (FBU), is directly relevant (Bradshaw et al. 1987; Bradshaw 1993; Bradshaw & Sainsbury 2000).

The 'low cost' budget, originally computed by Yu (1993), and since refined and updated as the 'low cost but acceptable' (LCA) budget by Parker and her colleagues at the FBU (Family Budget Unit 2002a, 2002b, 2004a, 2004b; Parker 1998; Parker et al. 2001a, 2001b, 2002), provides the ingredients for an appropriate residual income (i.e. nonshelter) standard needed to operationalise the shelter poverty affordability model for the UK.

The methodology is presented in detail and then applied to generate an operational residual income standard for several types of households (p.467):

A shelter poverty scale has been computed for a set of prototypical household types: non-elderly two-adult households with zero to three children; non-elderly one-adult households with zero to three children; and elderly singles and couples. All of the non-elderly households are assumed to have employed adults so that the non-shelter standard includes job-related costs, most especially childcare, albeit at a conservative level.

Stone concludes (p.467): 'quite clearly there is no single percentage of income, nor even a small set of percentages, that can approximate what households of various types and incomes can realistically afford'. He does suggest some of the potential implications of the approach for assessing housing problems and needs, alluding to his detailed work on housing affordability in the US, but did not carry out any such analyses for the UK.

There does not appear to have been any subsequent published work on the residual income approach and its application to housing in the UK.

3.3 Australian debates about affordability standards

The Commission of Inquiry into Poverty (1975), known as the 'Henderson Commission' after its chairman, introduced to Australia the notion of 'after-housing poverty'. In doing so, it recognised that housing costs tend to make the first claim on household incomes and also show enormous variation, in contrast with the basic cost of other necessities, associated with differences in tenure and location. While this might have provided a logical entree into Australia for the residual income approach to measuring housing affordability, more than two decades had to pass before the residual income approach began to receive serious and explicit attention. Since then, it has been quite extensively explored and debated, although it has not had any demonstrable impact on policy.

There is major conceptual difficulty with using the Henderson after-housing poverty measure as a normative standard for non-shelter items in a residual income housing affordability standard: it was arrived at by using the ratio affordability concept. Specifically, the commission assumed that a family with an after-tax income at the before-housing poverty threshold needed 23 per cent of that income for housing (Bradbury et al. 1987, p.97). That is, the standard for non-housing necessities did not have an independent theoretical or empirical basis. This is the same weakness encountered in the work of several US researchers who used a fraction of the poverty level, discussed above.

Furthermore, the Henderson Report was focused on income inadequacy, and regarded even after-housing poverty as essentially an income problem, not housing affordability. As Burke has put it (1998, p.179):

The Henderson Report lacked any conceptual analysis of the housing system and housing markets and failed therefore to comprehend and build upon the fact that there are systemic problems in the Australian housing system.

Nonetheless, in the following two decades, two projects in Australia explicitly looked at the impacts of housing in after-housing poverty. First was the work of Bradbury, Rossiter and Vipond (1986, 1987). Their 1986 paper was focused specifically on the elderly, arguing that after-housing poverty was a more realistic measure than before-housing poverty for this population because of dramatic differences in housing costs by tenure. Their empirical work demonstrated that among owner-occupiers after-housing poverty was thus much lower than before-housing, while among private sector renters just the opposite.

In their 1987 paper, 'Housing and Poverty in Australia', these authors emphasised that the extraordinary character of housing gives it 'a special place in the analysis of social inequality' (p.95). Their empirical analysis of before-housing and after-housing poverty found that the incidence was very nearly the same on both measures, but 'despite the similarity of these estimates, the populations in the two types of poverty are not the same' (p.97). From analysis of the differences, they concluded (p.100):

The data ... show the significant role played by housing outlays in alleviating and in imposing poverty in Australia. The key distinction is housing tenure. Many low-income owner occupiers are saved from poverty by their low housing outlays. On the other hand, about an equal number of families who live in private rental accommodation or who are buying their own homes are forced into poverty by their high housing costs relative to their incomes. Public sector housing plays a minor role in alleviating poverty.

In the mid-1990s, important work in advancing the residual income method was made by King (1996) in a paper which reaffirmed the problems of the ratio method and put the case for a residual method, but in the absence of a budget standard his case was still built around the poverty line. Burke (1998), building on data provided by King, used an after-housing poverty measure to get an overview of the scale of after-housing poverty in Australia. Landt and Bray (1997) promoted a similar approach but focused on rental housing affordability, but like all the authors to this period were handicapped by the absence of a budget standard.

Probably the most important work in this era was a second major housing research project using the Henderson after-housing measure. Carried out under the auspices of the Australian Institute of Health and Welfare (AIHW), this focused particularly on measurement and data issues for housing assistance policy (Karmel 1998a, 1998b, 1998c). Most particularly, the study contrasted the fixed-ratio affordability standard put forward in the 1991 National Housing Strategy (NHS) with an AIHW-developed sliding scale of affordability. The differences are several and significant (Karmel 1998a, pp.5–7):

First, the AIHW 1995 measure identifies low income families using family specific cut-offs related to income and housing needs as determined by their composition and location, while the NHS measure uses a relative income approach with families being classified as 'low income' depending upon their position in the income distribution. Secondly, the principle that housing costs of such families should not prevent such households from meeting basic non-housing needs is incorporated in the AIHW measure but not that of NHS. Thirdly, in the AIHW approach the percentage of income a family on low income can reasonably be expected to spend on housing without experiencing housing need increases as income increases—the NHS measure uses a fixed

proportion across all income levels. Finally, the AIHW measure allows for variation of basic housing costs and general living expenses between families, depending upon such factors as their size, composition and where they live, while the NHS measure does not capture these variations.

This is, of course, essentially the argument for the residual income approach. Karmel explicitly mentions this (1998a, pp.10–11), but does distinguish it from the AIHW sliding scale. The latter establishes a housing affordability standard as a percentage of household net income that increases linearly from zero at income equal to the Henderson after-poverty threshold up to 30 per cent at some 'low income benchmark', which could be the Henderson before-housing poverty level. It is thus not a true residual income standard, and does still have some arbitrary aspects, albeit much less than the fixed ratio standard. On the other hand, it does avoid having to specify a monetary normative standard for non-housing costs.

Furthermore, in operationalising the AIHW scale and applying it empirically, Karmel (1998b, 1998c) has refined the Henderson before-housing standard to take into account regional variation in housing costs, and both standards to take into account differences in household size and composition. Several other authors, in papers on housing affordability and income adequacy in Australia, have also made adjustments and refinements to the Henderson standards (Bourassa 1996; Chotikapanich et al. 2003; Siminski & Saunders 2004; Kazakevitch & Borrowman 2009). None of these authors, though, pushed beyond the Henderson approach towards a residual income housing affordability standard based upon an alternative framework for a normative non-housing standard, i.e. budget standards.

The basis for formulating such normative non-housing standards for Australia was provided with the *Development of Indicative Budget Standards for Australia* by the Budget Standards Unit (BSU) of the Social Policy Research Centre (SPRC) at the University of New South Wales (Saunders et al. 1998). Drawing theoretically and methodologically upon the extensive history of such work in the UK and US, but pushing beyond it, they formulated normative budgets as the sum of cost standards (as of February 1997) for nine separate categories of consumption. Two budget standards were established: 'modest but adequate' and 'low cost'. The 'modest but adequate' standard was similar to the US Bureau of Labor Statistics (BLS) 'intermediate' budget, which at early points had been called 'modest but adequate'. The 'low cost' budget was similar to the BLS 'lower' budget and the UK Family Budget Unit (FBU) 'low cost but acceptable' budgets mentioned earlier that have been used to operationalise residual income affordability standards for the US and UK.

One of the notable advances of the Australian indicative budgets over the work in the US and UK is that the modest but adequate standard was computed for 26 household types and the lower standard for 20 household types, differing by size, composition and tenure. This level of detail obviated the need for contentious equivalency scales that plagued the US and UK standards and the Henderson poverty standard in Australia.

Consistent with comments earlier in this paper, the discussion of the housing budget in the SPRC report is insightful and relevant to the issue of the use of the budget standards for residual income affordability. It is noted that variation in tenure, housing quality, and location (Saunders et al. 1998, p.113):

make it very difficult to establish a single housing standard for use in the BSU budgets. The dilemma underlying this difficulty reflects the nature of the Australian housing market, which is characterised by its *variety* when what is

ideally required for budget standards purposes is a single *representative* figure—in relation to both quality and cost [emphasis in original].

The project made efforts to address these issues, but acknowledged that ‘the solution is not ideal’, and offered the following strong caveat (p.114):

In light of these problems, a strong case can be made for treating the housing component of the budget standards separately from the remaining components. This should be kept firmly in mind when using the overall BSU budgets inclusive of housing [emphasis in original].

Thus, the residual income affordability work using the non-housing portion of the indicative budgets is quite consistent with the position articulated by the authors of the budget standards.

With the dawn of the 21st century, a whole new era began in the definition and measurement of housing affordability in Australia, driven by substantive and policy concern about the issue, and facilitated by growing awareness of work done in the US and UK and the availability of the SPRC budget standards. Much of this work has been sponsored by AHURI.

Seelig (1999) was the first to explore the potential use of budget standards, but his substantial paper was not generally available, being an in-house document of the Queensland Department of Housing. It used both the poverty line and budget standard and modelled it to Department of Family and Community Services social security payment rates for a number of household types and for application to Queensland and five regional rental housing markets. In the residual income analysis part of the report, whereby the study measured the residual rent affordability for certain household types, a rent for each type had to be created rather than using the SPRC rent which was based on outer suburban Sydney. This was based on the Queensland Department of Housing’s assessment of the notional rent for the relevant household, a rent which tended to be lower than median market rents. These rents were also adjusted for rent assistance. This method enabled a measure of the percentage of households on the specific benefits nominated who were experiencing a housing affordability problem. The SPRC and poverty line were both used to produce a residual income measure, with the SPRC method showing more households in a severe affordability situation. This was a very rich and potentially important study, but its significance was reduced somewhat by it being a government report with little visibility and with a focus on Queensland alone.

Burke and Ralston (2003) produced the first paper that made explicit use of budget standards to assess affordability in Australia as a whole. *Analysis of expenditure patterns and levels of indebtedness of public and private rental households, 1975 to 1999*, assessed and compared affordability based on the traditional ratio approach and on residual income approaches using both the Henderson after-housing model and a budget standards model. Before presenting their findings, they provided a brief discussion on ‘measuring housing affordability’ that compared these approaches. In doing so, though, they refer to the ratio standard as ‘shelter first’ and residual income models as ‘non-shelter first’.

Their distinction is erroneous. In stating (p.7) that ‘an alternative approach to affordability is to assume that other expenditure items have first claim on the budget, and housing costs should be the residual’, they have confused the mathematical procedure for computing a residual income standard with the conceptual logic and behavioural reality. The ratio approach and the residual income approach *both* assert that because housing costs behaviourally tend to make the first claim on disposable income, a household has an affordability problem if, after paying for housing, it has

insufficient residual income to meet its non-shelter needs at some normative level of adequacy.

The difference between the two approaches is how they define the normative level of adequacy for non-shelter items. The ratio approach defines it as a fraction of income: traditionally 75 per cent, more recently 70 per cent, has been defined as the minimum share of income that must be available after housing costs in order to avoid hardship in meeting non-shelter needs. That is, it is presumed that irrespective of the level of income and household composition, non-shelter needs can be met adequately if this share of income is left after paying for housing. By contrast, the residual income approach defines the normative level of adequacy for non-shelter items as a monetary amount that is independent of income but very dependent upon household composition and the non-housing cost of living as a function of time and place.

In order to determine the maximum amount that a household can afford for housing without compromising its non-shelter needs, the residual income model subtracts from disposable income the appropriate non-shelter monetary standard. This procedure does not determine 'how much is *available* for rent', as Burke and Ralston assert (p.7); rather it determines how much is *affordable* for rent. If the amount the household actually pays for rent, as the first claim on its disposable income, exceeds this affordable amount, then the residual income *available for non-shelter needs is inadequate*. This conceptual error has been addressed in the operationalising of the concept in a later part of this paper.

The paper describes the SPRC indicative budget standards and explains how they have used the budget standards for their empirical work (pp.9–10). They have used the low cost budget standard, but consistent with the SPRC caveats about the housing component and consistent with the residual income logic, declared (p.10): 'In the analysis used in this study, actual private and public rents from the 1998–99 HES were substituted for these surrogate values.'

At a later point, they explain this methodology in fuller detail, after presenting some of their extensive empirical findings, including disposable incomes after housing costs (i.e. residual incomes), without comparison to a normative standard. Their approach was not to establish a residual income affordability standard as a function of income and household type and assess actual housing costs of households in the HES against this standard, as Stone has done for the US. Rather, they derived revised budget standards for private and public renters of various household types by subtracting from the SPRC total budget for that type of household, the housing component of that SPRC budget and then adding the HES mean rent for households of that type who are below the budget standard, all adjusted to years other than 1997–98 by changes in the CPI (pp.20–1).

Having applied these revised budget standards to the disposable incomes of private and public renters in the HES, they estimated the number and percentage of private and public renter households with housing need on the 25 per cent and 30 per cent ratio standards, the after-housing poverty and the revised budget standard approaches. The findings led them to a very powerful conclusion (p.22):

When we look at the budget standard, it is clear that percentage benchmarks do not allow for an adequate standard of living. Despite rent rebates and, in the case of many private tenants, rent assistance, the amount of housing subsidy is insufficient to prevent a sizable proportion falling below the minimum budget standard ... It has become almost an orthodoxy of belief in Australia that, once provided public housing, a tenant, by virtue of the rebate, is able to live at a satisfactory, albeit basic, level. These findings challenge that

belief. Achieving affordability, when this is based on a rent first market derived notion, is not a sufficient goal. Affordability should mean having sufficient to live after paying housing costs, rather than how we currently conceive of it, i.e. having costs below some rent to income benchmark.

Thus, after some initial difficulties in explication, Burke and Ralston arrived at a sound understanding of the residual income approach, how it can be operationalised with budget standards, and its implications for measuring and understanding the extent of housing needs in Australia. Building on their work, McNelis (2006) used a very similar methodology to model the impact of a residual income rent on different types of public housing households.

The purpose of the modelling exercise was to assess whether public housing households had sufficient income to meet a minimum standard of living. It was assumed that rents would be at least able to cover operating and asset utilisation costs. The general results of McNelis' research indicated that most households require an income higher than their current Centrelink entitlements in order to meet a minimum standard of living. If rents were set as a proportion of income based on the budget standard, they would range from a low of 15 per cent for a 'couple plus four children' household (occupying a four-bedroom dwelling) to 33 per cent for a 'single aged' household. One objective of this study is to explore further and to widen the research opened up by McNelis.

Somewhat later than both Burke and Ralston's and McNelis' papers, AHURI launched a National Research Venture 3 (NRV3)—'Housing Affordability for Lower Income Australians'. The project has been one of the most comprehensive explorations of housing affordability, certainly in Australia and possibly in any country, yielding eleven research papers as well as a Final Report. Nonetheless, for the most part, the papers have accepted and used the ratio standard of affordability. Two have explored various affordability concepts, including the residual income approach (Gabriel et al. 2005; Yates & Gabriel 2006), and hence are most relevant for this review. Yet even they are reluctant to venture far from the prevailing paradigm, as revealed at the outset (Gabriel et al. 2005, p.v):

The paper provides a rationale for continued use of the 30/40 affordability rule (that is housing costs below 30% for the bottom 40% of the [unequalised] income distribution) both because it provides continuity with traditionally used measures and because it is simple to apply and easy to understand. However, a case is also made for providing additional complementary measures that are more responsive to household needs and capacity to pay.

There is considerable irony in this statement in view of the acknowledgement that the ratio standard is not as responsive to household needs and capacity to pay as other measures.

Building upon much of the affordability literature from the US, UK and Canada, the bulk of the paper by Gabriel et al. is devoted to the issues involved in measuring affordability, including the conceptual foundations of the ratio and residual income approaches, the advantages and disadvantages of each, possible modifications of each, as well as technical issues involved in operationalising and applying the measures. The paper does not produce an operational residual income standard and does not assess the extent and distribution of affordability problems in Australia on various measures.

While the paper does not break new ground conceptually, it does provide the most comprehensive discussion of the basic issues in the Australian context. With regard to residual income measures in particular, it draws attention to the use of the Henderson

poverty line and budget standards, citing the work on the former by Bradbury et al. (1986, 1987) and Karmel (1998a), and on the latter by Burke and Ralston (2003), both of which were discussed above. In their Technical Appendix, Gabriel et al. compare potential measures of non-housing expenditures that could be used for residual income standards for an array of household types (pp.48–50): the low cost budget standard, modest but adequate budget standard, average household expenditures from the HES and the Henderson poverty line. Apart from the expectedly large differences among household types, the comparison reveals (pp.49–50):

The low cost budget standard (excluding housing) varies from 25 per cent to almost 50 per cent more than the poverty line for households with head not in the workforce. The modest but adequate budget standard (excluding housing) varies from 50 per cent above to almost double the poverty line for households with a head in the workforce. The modest but adequate standard (excluding housing) varies from being half of the HES data for equivalent households to 25 per cent higher.

Rather than then making the case for one or another of these measures, or suggesting comparative analysis of the sensitivity of empirically determined affordability problems to the choice, they remain frustratingly noncommittal (p.50): ‘The conclusion that can be drawn is that it is unlikely that it will be possible to get agreement on what is the most appropriate measure to use.’

Yates and Gabriel (2006) provide detailed empirical data on the extent and distribution of housing affordability problems in Australia from the 2002–03 Survey of Income and Housing. They have primarily used the 30/40 ratio standard of ‘housing stress’ (adjusted for equivalised incomes) for their detailed analysis, but have also computed the number of moderate income and higher income households paying at least 30 per cent of income for housing, and most notably have also estimated the extent and distribution of affordability problems on residual income approaches based on both the low cost budget standard and the after-housing poverty line (pp.35–40). Their aggregate results are as follows (p.viii, p.ix):

Based on a low cost budget standard estimate of non-housing needs:

- 1.4 million lower income households have insufficient income after meeting their housing needs to maintain a frugal standard of living.
- These represent 44 per cent of all lower income households (compared with the 28% estimate derived from a 30/40 rule).

Based on an after-housing poverty line estimate of non-housing needs:

- 947 000 lower income households, representing 31 per cent of all lower income households, have insufficient income to meet their non-housing needs.

They have computed and compared the numbers in, and incidence of, housing stress using both the two residual income as well as the 30/40 measures for a number of demographic, tenure and geographic variables (Table 3.6, p.38). This work is thus the most extensive done on the extent and distribution of housing affordability stress for Australia as a whole based upon the residual income approach.

Independent of the AHURI papers under National Research Venture 3, in recent years there have two strands of affordability analysis explicitly devoted to the residual income approach operationalised for the most part with budget standards. One strand has focused on affordability for low income households in private rental housing (Waite & Henman 2006; Waite et al. 2009). The other has considered home purchase

affordability for moderate as well as lower income households (Smith 2009; Stone et al. 2010). Both strands are very attentive to the policy relevance of their approach.

After summarising the limitations of the ratio standard, introducing the SPRC budget standards and summarising the advantages and disadvantages of the residual income approach by Gabriel et al. (2005), Waite and Henman emphasise (2006, pp.198–9): ‘The two aspects of budget standards which we see as particularly important in measuring housing affordability relate to equivalence scales and geographical sensitivity.’

Adapting and updating the SPRC budget standards, Waite and Henman have constructed budget standards for 66 household types for each of 30 Queensland geographical divisions. They then consider two approaches to assess the effects of housing (p.201):

The first is to calculate a budget standard which includes a normative assessment of housing costs and compare household disposable income with that ‘before housing’ budget standard. In that case, a household is regarded as being ‘before housing poor (or stressed) if their household disposable income is less than the budget standard for their household situation. The second approach is to compare a household’s living standard after paying their housing costs. In this instance, a household is regarded as ‘after housing poor’ (or stressed) if their household disposable income after paying rent is less than the relevant budget standard without housing costs.

There are several good reasons for using ‘after housing’ measures, which implicitly equate budget standards housing costs as actual housing costs. Local housing markets may be more or less diverse, both in price and in quality, and this diversity is ignored by using average prices. The presence or absence of a low cost sector within local rental markets will always be an important determinant of the capacity for low-income households to locate a home they can afford to rent.

Applying their standards to Queensland Centrelink recipients in private rental, they found that 63 per cent were below the low cost after-housing budget standard in 2002, compared with 34 per cent paying over 30 per cent of income for housing (p.205). Results are also presented for a set of consolidated household types (pp.202–5) and for each geographical division (pp.207–9). Their work is thus complementary to that of Yates and Gabriel (2006), providing much finer-grained social and geographical detail for Queensland, but none for the rest of Australia.

Waite et al. (2009) add the time dimension to their earlier residual income affordability analysis and extend it across the country, with budget standards derived for regional and remote areas as well as capital cities. Because they have used the Centrelink client dataset, they have been able to carry out longitudinal analysis to examine the ‘dynamics of financial hardship and housing need’ of households in their sample over a three-year period. The sophistication of analysis is unprecedented and has important policy implications (p.10):

This combination of longitudinal Centrelink data and budget standards has produced a surprisingly rich analytic tool. The resulting data model provides important new evidence on the duration and type of need experienced by various categories of low income renters, which in turn supports policy development around the timing and nature of government support needed by various groups.

By contrast, the affordability models developed by Smith (2009) and Stone et al. (2010) have been designed as tools to assess whether, and at what maximum price, households can afford to purchase homes in a more realistic way than conventionally used by the real estate industry and policy-makers.

Smith's model has several distinctive features. First, it is intended as a computer-based tool primarily for use by consumers (p.5):

The primary purpose of the model is to create greater awareness amongst home purchasers of the total potential costs involved in their purchase over a specified time frame. The model has been primarily developed for use by potential purchasers of a property so that they can carry out an independent and comprehensive evaluation of potential costs involved.

Second, it takes into account the total costs of purchasing and owning a property: capital/acquisition costs; pre-purchase costs, finance costs, and operational costs. Due to the limited amount of data that has been available on housing maintenance, repairs and improvements, Smith analysed over 500 property inspection reports to generate the cost inputs for the latter component of the model.

Third, it computes the after-housing residual income that would be available to a household if they were to purchase the property (p.5):

The affordability model is based on the 'Residual Affordability Measurement' technique which identifies the after-housing income of a purchaser. The concept of the model is that it will analyse the total potential costs of a purchase over a specified time frame and average that back to an average cost per week. This will then be compared to the purchaser's average net income per week over the same time period. The purchaser can then evaluate whether their 'residual' income per week (after allowance for their housing costs) is affordable for their individual circumstances and lifestyle.

While Smith assumes that the household itself would assess the sufficiency of this residual income, he also states (p.5): 'It will also have potential application by financial institutions, financial advisors, government housing authorities and other bodies involved in the provision of housing information/advice.' In such contexts, the approach presumably could be used with normative standards for residual income such as that provided by after-housing budget standards. His model is thus a very creative and potentially highly useful approach with application in a variety of arenas.

Stone et al. (2010) also developed a computer model for assessing affordability for home purchasers using the residual income approach. This was developed for the Victorian Department of Planning and Community Development (DPCD) for use in analysing housing markets, planning and policy development. As with Smith's model, despite its primary purpose, it offers the potential for use by others, including consumers and the real estate and finance industries, as well as being adaptable for renter affordability. This AHURI study is designed to take the model developed for the DPCD much further, extending it to more household types, to private and public rental as well as purchase, and to illustrate its potential for a range of policy purposes (see Part B).

The model assesses affordability based on both of the SPRC non-housing budget elements—low cost and modest but adequate—indexed for price changes since the budget standards were established. It computes affordability for four prototypical household types and for a broad range of gross annual incomes. Income taxes, as well as income-based tax benefits and credits, are computed, to produce disposable incomes. Subtracting the SPRC non-housing budget elements from disposable

income yields maximum affordable housing costs. Subtracting recurring housing costs other than mortgages (rates, insurance, maintenance and repairs) from maximum affordable housing costs yields maximum affordable mortgage payment. Based on user-set parameters for purchase and mortgage financing terms, the model then computes maximum affordable mortgage payment and maximum affordable purchase price—all as a function of gross income, household type and SPRC non-housing standard.

To illustrate the utility of the model for housing market analysis, Stone et al. (2010) have applied the affordability standards for 2009 to detailed 2008 Valuer General's property sales data for four rings of Greater Melbourne. This analysis is intended to demonstrate which geographical locations would be affordable to which types of households, at which levels of income, and under which mortgage conditions.

This work by Smith and by Stone et al. (2010) on affordability for prospective home purchasers thus represents a new and significant addition to the potential for the residual income approach. Their models demonstrate how the approach can provide a practical and workable tool for decision making by consumers, policy-makers and the housing industry. Moving beyond the theoretical and conceptual literature, it is complementary to the gradually increasing numbers of studies of housing needs and problems that include or emphasise findings from application of the residual approach.

3.4 Residual income studies in other countries

Over the past decade, awareness and application of the residual income concept of housing affordability has interested researchers and spread to several other parts of the world, most particularly China and continental Europe.

Two papers have used a residual income standard to examine affordability and rent setting policy in Hong Kong public housing (Hui 2001; Yip & Lau 2002). Hui draws primarily and explicitly upon the UK literature to critique the ratio approach and then construct in considerable detail the residual income approach from economic first principles, following Hancock (1993). Deriving an operational residual income standard for Hong Kong and applying it to a sample of public housing tenants, Hui concludes that existing rent policy based on the ratio standard leaves large numbers of tenants unable to meet their non-housing needs at a minimal level of adequacy. The conclusion and policy recommendation (p.49) is that the Hong Kong Housing Authority 'should seriously consider the economic concept of affordability and develop both housing and non-housing consumption yardsticks to improve its domestic housing policy'.

Yip and Lau (2002) have not recapitulated the theoretical arguments, instead focusing primarily on the details and contradictions of public housing rent setting policies in Hong Kong. Showing awareness of some of the residual income literature, they have computed the residual incomes of households on the Rent Assistance scheme, concluding that (p.14) 'the Rent Assistance scheme still cannot offer poor tenants any assurance of adequate resources for daily necessities'.

Concerned with the affordability implications of the promotion of home purchasing in the increasingly market-driven environment of Beijing, Yang and Shen (2008) have constructed a residual income model for a minimum budget a family would need to purchase a 'standard' unit (p.2):

Housing affordability is not a simple question of comparing house prices to family income. Affordability is a complicated concept that is difficult to define because it is influenced by the subjective values and differing social expectations of consumers. It is further challenged by the large disparities in

family income and in housing quality in urban areas. In this context, the traditional measure of affordability, which is the ratio of aggregate income to house price, might lead to measurement errors that distort the targets of public policy and the evaluation of performance in an effort to achieve those targets. In this study, we develop the 'residual income' concept of house affordability in Beijing. We identify a 'standard' unit with minimum required attributes, whose value is calculated using a hedonic price equation. We then estimate the minimum budget requirement that will allow a household to afford this standard unit, considering the cost of non-housing necessities and the costs of financing. Comparing actual average family income to the minimum required budget, we estimate housing affordability for moderate- to low-income families. Therefore, in our proposed model, housing affordability is defined not only in terms of family income. It is defined by an analysis of the multiple determinants of demand: income; borrowing ability; non-housing costs; and current housing wealth.

Thus, apart from limiting their model to a 'standard' housing unit and not including housing costs other than financing, there are some similarities to the work of Smith (2009) and of Stone et al. (2010) in Australia. They draw extensively and in detail upon the US and UK for the conceptual and some of the methodological foundations for their model, but go well beyond the extant literature in the methodological sophistication used to construct their 'standard' unit and their analysis of the Beijing housing market.

In Europe, Lux (2007) has proposed a 'quasi-normative' approach to establishing 'optimal' rent-income ratios in social housing in the Czech Republic. He has extensively cited the affordability literature, alluding to the residual income approach, and presented a sophisticated mathematical model that combines behavioural and normative elements. Nonetheless, he has been unable to transcend the traditional paradigm, concluding that (p.1120) 'the reference point on affordability should be the rent-income ratio between 13 per cent and 15 per cent'.

By contrast, Heylen and Haffner (2010) have explicitly formulated a budget standards residual income approach to affordability. Drawing upon the UK, US and Australian literature, they restate the logic and issues in the ratio and residual income approaches, and then present an operational residual standard based on the non-housing components of recently-developed low cost and modest cost budget standards for the Netherlands and Flanders.

They have applied the affordability standards to households of various tenures and household characteristics in the two regions, in comparison with the conventional 30 per cent of income standard. They find that the results on the residual income and ratio standards are not dramatically different in the aggregate, but by tenure they are. Most notably, they find that: (a) the situation of public renters is considerably worse than suggested by the ratio approach; and (b) both private and public renters appear relatively worse off under the residual income approach, and owner-occupiers relatively better off, than suggested by the conventional standard (p.10). They note that these findings certainly have 'quite some policy consequences' (p.17), but do not draw out this conclusion.

3.5 Conclusion

Over the past half century, the traditional 'rule of thumb' ratio concept of housing affordability has been subjected to growing criticism for its lack of theoretical and logical justification, and its distortion of the lived experience of households, with consequences, among others, for the equity and efficiency of housing policies based

upon this approach. Constructively, much of the criticism has been accompanied by the formulation of a competitive alternative—the residual income approach—which has been demonstrated to possess the theoretical and logical soundness missing from the ratio approach. Nonetheless, the ratio paradigm has remained dominant due to its familiarity and simplicity.

Some of the objections to the residual income approach on practical—as distinct from theoretical—grounds have begun to be overcome through increasingly widespread use and acceptance of the non-housing elements of indicative budget standards as a sound and robust source for operationalising the approach. As the principal methodological challenge has been met in this way, an expanding array of projects have been undertaken using the residual income standard, beginning to demonstrate its utility as a finely honed instrument for analysing housing problems and needs, assessing policy questions, and guiding decision making.

So far, this Positioning Paper has reported on the application of the residual income or budget standard method as an alternative way of understanding a range of problems relating to housing affordability. However, it has not provided any applications. The paper now outlines in preliminary form the method used in modelling the residual income for a range of household types and for both home purchase and private rental, and then illustrates the usefulness of the concept via applications to the Melbourne housing market. While there is some fine-tuning of the method, the early findings suggest that, for some household types, the 30/40 rule overstates their lack of affordability and, for others, understates it. The findings also help to explain how, despite Melbourne's high prices (median of around \$500 000), these are still affordable for many households and why single persons and childless couples are becoming large players in the purchase market and many families are being trapped in private rental.

PART B: APPLICATION OF THE MODEL

4 INTRODUCTION

As in other countries, a number of developments in Australia justify a new and more detailed examination of the implications of the residual income logic for understanding housing affordability problems and shaping policy and practice. First, the problems have well and truly reached up the income distribution ladder such that they are no longer limited to the lowest income tiers or to renters, compounded by greater diversity of household types with very disparate living costs which is not captured by benchmark measures. Second, the decline in the amount of public housing, growth of the community housing sector, and large numbers of rent subsidised households in private rental are raising questions about differential rent setting practices across the sectors, with obvious implications for horizontal equity of affordability. Third, the existing benchmark model appears limited in its ability to explain what is actually happening in the housing market. For example, it would suggest that prices have reached a level of affordability where there could not be any further growth, but in fact they keep growing. And from another perspective Berry et al. (2010) show that, even in the worst trough of the global financial crisis, mortgage default in Australia was very small at the same time as benchmark measures were indicating widespread financial stress.

From another perspective, the US post sub-prime housing crisis has raised questions about how best to assess housing risk, given all the evidence from the US— and there is some here—that banks themselves are no longer using a benchmark method but a non-transparent residual income model. Recent Australian affordability research (Yates 2007; Tanton et al. 2008; Hulse et al. 2010) indicates a substantial number of renting and purchasing households have housing costs well in excess of the 30 per cent benchmark, while a simple plugging in of data to any financial institution's mortgage calculator will reveal that they have clearly departed from any semblance of a benchmark method, although since the global financial crisis they have tightened their lending criteria. The Commonwealth Bank calculator as of May 2010 would, for example, lend to a household with \$50 000 income and no other debt a mortgage with repayments of \$19 764, which represents 39.5 per cent of income. The basis for this is unclear, but one suspects some form of residual income model.

As Part A has pointed out, the limitations with the benchmark method are not unique to Australia, and others are grappling with how best to make the method operational. We believe that this research is designed to take the method to a deeper level of analysis than has been the case anywhere else.

Recognising the serious shortcomings of the familiar and widely used ratio approach, the study outlines a residual income method that can differentiate potential affordability outcomes for various household types across a range of incomes, both for home purchase and rental. We operationalise an ownership and rental model with the key features of:

- Different indicators for rental, purchase and outright ownership.
- Multiple indicators of affordability for different uses.
- Affordability measures for a broad range of incomes.
- Affordability for four household types.
- Affordability based upon two residual income non-housing standards.

→ User-set parameters to test market conditions as well as indexed over time.

Note that, in a number of the examples, the residual income model is compared with a 30 per cent rule for all income ranges, not just for those below the 40th percentile, although we do identify the income point at which 40 per cent income cut-off occurs. The reason for extending the analysis is twofold: First, higher income groups (particularly with larger families) above this cut-off may also confront risk and severe constraints on choice because of affordability issues; and second, the model can also be used to get a better understanding of decision making in the housing market and submarkets. In the latter case, the drivers of market outcomes are more often higher income groups.

5 THE HOME PURCHASE MODEL: FEATURES

The home purchase and rental markets require separate models as they represent quite different sets of actors in terms of incomes, motivations and constraints and, to some extent, also have different stock (much more multi-unit accommodation for rental) and locational attributes. Perhaps more important in terms of methodology is that the housing cost and income measures and assumptions that sit behind these tenures but which are required to build the model are different. For example, a renter's income may be boosted by Commonwealth Rent Assistance (CRA), compared to a purchaser who gets no equivalent subsidy, while on the other hand there are ongoing costs for owners (rates, repairs etc.) that renters do not have. So let's start with home purchase. For each of the five broad features of the model, the following outlines the specific elements.

1. *Multiple indicators of affordability*: In this case, six applications of the model are developed and exemplified using Melbourne data. In most cases, the indicators will translate to Australia generally, but in some cases they are limited to those states or territories that have Valuer General's property sales statistics in unit record format.
 - Maximum affordable total (mortgage plus non-mortgage) housing cost (per year, per month, per week).
 - Maximum affordable mortgage payment (per year, per month, per week).
 - Maximum affordable mortgage loan.
 - Maximum affordable purchase price.
 - Minimum savings required to purchase at maximum affordable purchase price.
 - Share of houses sold in 2008 with affordable purchase prices.
2. *Affordability for a broad range of incomes*: The method allows for calculation of affordability indicators for a very large income spectrum, but in the case of home purchase the indicators start at \$30 000 as it is assumed that purchase is not affordable below this level.
 - \$1000 intervals of gross annual household income.
 - From \$30 000 to \$150 000.
3. *Affordability for four household types*: Necessarily the residual income model is household specific as that is one of its characteristic features, i.e. the ability to reveal that different household types have very different expenditures and therefore very different abilities to borrow. The numbers of types are many once permutations of marital status and number of children are taken into account. For the purpose of most of this study we concentrate on four indicative types, although at some points we do look at more than these:
 - Single adult, no children.
 - Couple, no children.
 - Couple with two children.
 - Single adult with one child.
4. *Affordability based upon two residual income non-housing standards*: The development of a residual income model of housing affordability requires indicative budget standards for different household types. Australia is fortunate to

have the two standards developed by the Social Policy Research Centre (SPRC) at the University of New South Wales (Saunders et al. 1998):

- Low cost budget non-housing elements indexed for price changes.
- Modest but adequate budget non-housing elements indexed for price changes.

It should be recognised that these budget standards are indicative and some elements have been questioned, notably child care costs and housing costs (DFaCs 2007). The housing estimates are not relevant for this study as they emerge as a residual from the other data, and the child care methodological issues are not so great as to change the expenditure estimates in a way that could invalidate the findings here. However, some minor adjustments will be made for child costs in the Final Report. There are also certain consumption items whose importance has changed over time (e.g. mobile phones, broadband) and these will be factored into the final analysis, along with a measure of debt which has also increased greatly since the SPRC study.

There is also the problem with the SPRC budget standard that it assumes expenditures are very similar across Australia. This would certainly be the case in capital cities and adjacent regional areas, but there are parts of Australia, e.g. remote areas or resource intensive areas (often one and the same), where many items by virtue of transport costs or high commercial rents are much higher. The model therefore cannot have applicability in such areas.

5. *User-set parameters to test market conditions as well as index over time:* The budget standards were developed in the late 1990s and therefore the parameters of any measures or indicators based on this standard have to be adapted for current circumstances. These include:
 - Month and year of affordability standard.
 - Appropriate CPI for selected month and year.
 - Non-mortgage recurring housing costs (rates, insurance, maintenance, repairs).
 - Mortgage loan-to-value ratio (equal to 1 minus the deposit ratio).
 - Mortgage loan term (years).
 - Mortgage interest rates.
 - Mortgage establishment costs (legal etc.).

6 OPERATIONALISING A HOME PURCHASE RESIDUAL INCOME STANDARD

There are three major practical issues that have to be dealt with in translating the residual income logic into an operational affordability standard: how to specify the monetary level of a minimum standard of adequacy for non-shelter items other than taxes; how to scale this standard for various types of households; and how to deal with personal taxes.

The well-established budget standards concepts and methodology have provided an appropriate basis for establishing a normative measure of an after-tax residual income. This takes into account the actual cost of a basic 'market basket' of necessities. By explicitly identifying and pricing the various elements in the basket, non-housing items can be extracted, so that their total cost is not an arbitrary percentage of the total budget.

The authors who have taken the budget standards approach in the US have used the non-shelter, non-tax components of Bureau of Labor Statistics 'lower budgets', updated using corresponding components of the CPI (Stone 1993, Appendix A). For the UK, the non-shelter components of the Family Budget Unit's 'Low cost but acceptable' budgets have been used (Stone 2006e). For Australia, the SPRC 'low cost' indicative budgets, which are conceptually and methodologically similar to the US and UK low cost budgets, have seen somewhat similar application in developing and applying a residual income affordability standard (Waite & Henman 2006; Yates & Gabriel 2006). Furthermore, the SPRC has also developed a somewhat higher 'modest but adequate' budget, following similar assumptions and giving it the same name as intermediate budgets developed much earlier in the US.

The availability of the two SPRC budget standards has been essential for this project, making it possible to devise and apply operational residual income affordability scales based on both the very conservative standard of living defined by the low cost budget and the more 'modest' standard defined by the modest but adequate budget.

The second practical issue involves translating a specified *qualitative* standard of adequacy for non-housing items into *quantitative* monetary amounts that differ by household size and type. For the US and UK, this has involved the use of equivalence scales because detailed standards budgets have been devised for only a few prototypical household types (Stone 1993, Appendix A; Stone 2006b). For Australia, this is not necessary, for the most part, because detailed low cost budgets have been derived for 20 household types and modest but adequate budgets for 26 types, the greater number for the latter reflecting a greater array of owner-occupier household types (Saunders et al. 1998).

Finally, there is the matter of taxes. The ratio approach has always manifested a great deal of confusion and inconsistency as to whether the standard should be based upon gross household income or disposable income. By contrast, the residual income approach is unambiguous: because the non-housing standard provided by the indicative budgets is a consumption standard, it is a household's *disposable* income that faces the tension between housing and non-housing necessities. This means that, to the extent that datasets and policy analysis are based upon gross household incomes, prototypical taxes and income-based government benefits need to be computed as a function of income as well as household type in order to determine disposable incomes and thus fully operationalise a residual income standard.

Appendix A outlines in detail the features of the model and its applications to two household types: a single person and a couple with two children. The following section examines some of the implications of the model using these two household types as case studies.

7 IMPLICATIONS OF THE HOME PURCHASE MODEL

One of the paradoxes of recent housing affordability data is that posed by the question: *If the home purchase affordability problem is so bad, how can low-moderate income households still afford to buy?* Using the residual income method discussed above, we were able to calculate the maximum weekly mortgage costs affordable for household incomes above \$30 000 per annum. Here we illustrate the findings for a single income household (Figure 2) and a couple with two children (Figure 3). Each of these figures show that the weekly mortgage affordable for all incomes between \$30 000 and \$150 000 and for two versions of the budget standard (modest and low) and two for the 30 per cent benchmarks (gross and disposable income). The reason for showing both gross and net income for comparative purposes is that Australian researchers have not yet settled on what should be the 'official' 30/40 practice in regard to tax treatment and both tend to be used. The 40th percentile is identified at the point of the vertical line.

Figure 2: Maximum affordable mortgage repayments using two types of budget standard and two measures of housing affordability, single person household

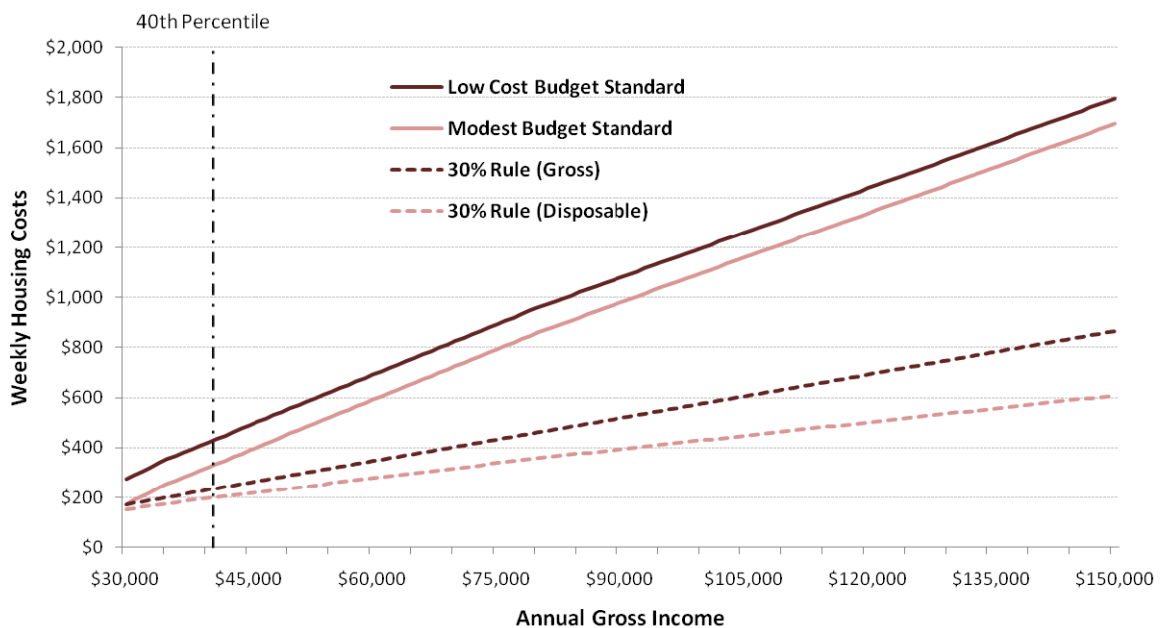
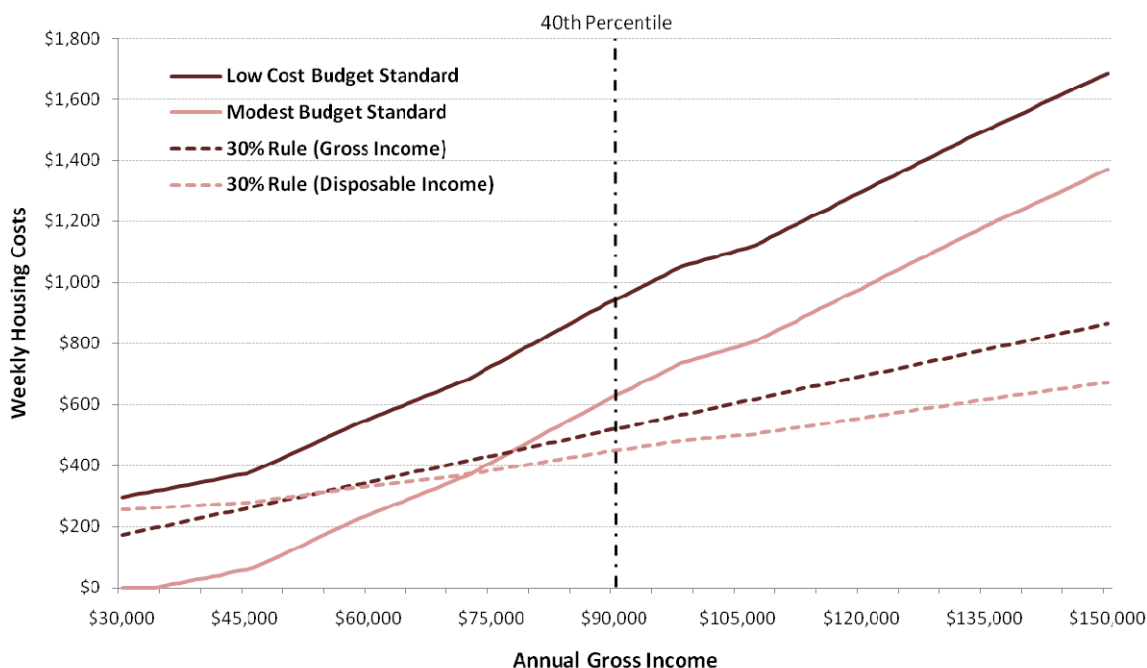


Figure 3: Maximum affordable mortgage repayments using two types of budget standard and two measures of housing affordability, couple with two children



Note: Details of the methodology employed in Figures 1 and 2 are set out in Appendix A.

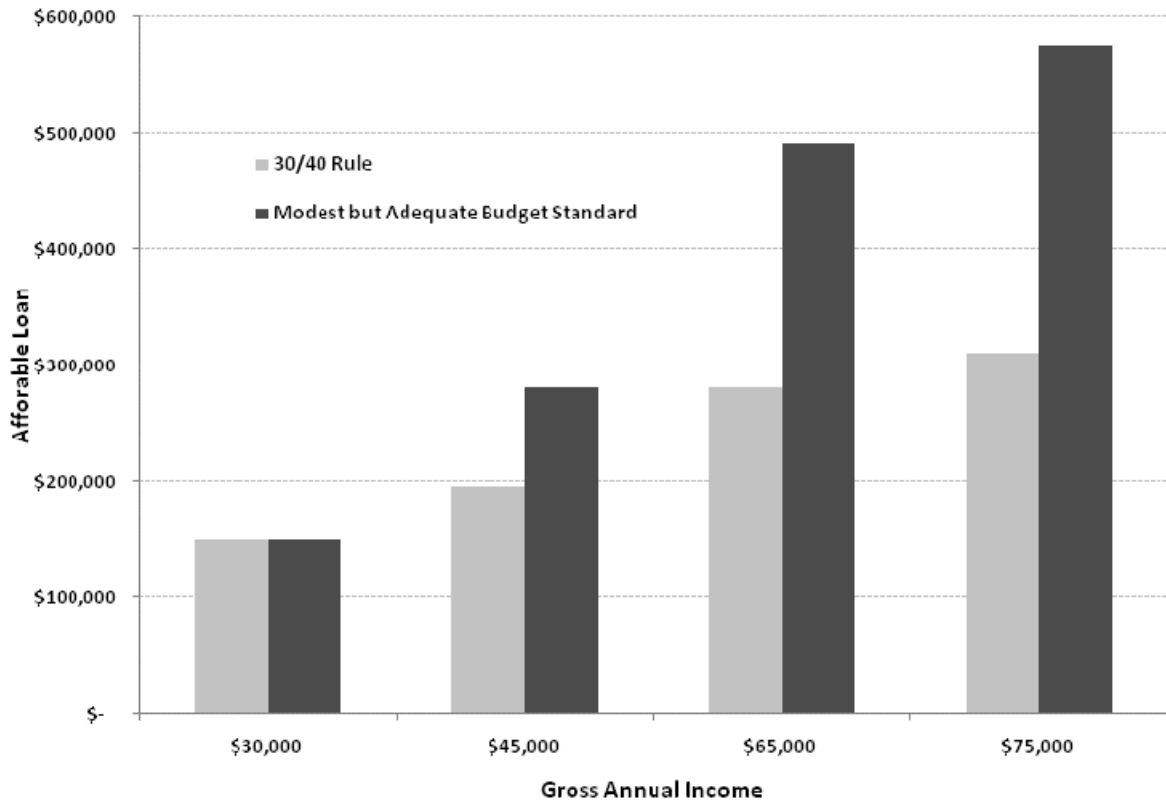
This analysis has three important implications. First, as illustrated in Figures 2 and 3 above, there is a big difference in purchasing affordability for the two household types. A single person willing to live on the modest but adequate budget standard can afford to pay much more per week on housing than using a maximum of 30 per cent of income benchmark, however measured. The situation is very different for the couple with two children, due to their higher non-housing expenditures. Up to the 40th percentile of household income for purchasers, using the modest but adequate budget standard illustrates that they can afford to pay less than if the 30 per cent of household income, however measured, was applied. In addition, when just using the residual method, the couple with two children on the same income as a single person, e.g. \$65 000, have much less mortgage capacity.

Second, many people have speculated on how some low-moderate income homebuyers are able to afford the high prices of recent years, particularly if they are first-time purchasers who do not have more than a minimum deposit. The residual income method, based on budget standards, offers an explanation. For a single person, single income household, there is little difference between the amount that they could borrow using the two measures. However, on an income of \$65 000 per annum, a single person would only be able to borrow \$255,000 if they are not to exceed 30 per cent of their income. Using the modest but adequate budget standard, they could afford to borrow up to \$455 000,¹¹ as illustrated in Figure 4 below. The household might be living modestly to achieve the latter loan size but, provided there were no other issues that affected their expenditures (e.g. maintenance payments to children of a previous marriage), they could afford the repayments if this is how they set their priorities. Of course, the more one moves up the income scale, the more that it could be argued that a modest budget standard is too modest for such groups and

¹¹ Assumptions are: 10 per cent deposit, mortgage repayable over 25 years, average interest rate 6 per cent.

they would spend more on other expenditure items. That is very likely the case, but what the budget standard does show is the maximum potential for dwelling purchase if a household was willing to make the expenditure sacrifices.

Figure 4: Comparison of affordable loans for single person, single income households on different levels of income, comparing two measures of housing affordability



Source: Amortisation data derived from Mortgage-X Mortgage Information Service, <<http://mortgage-x.com/calculators/amortization.htm>>.

Note: The 30 per cent is calculated on gross household income.

The situation is very different for the couple with two children (not illustrated). Up to the 40th percentile of household income for home purchasers (\$76 000 per annum), they can borrow less using the modest but adequate budget standard than using a simple 30 per cent of household income approach. For the same household income of \$65 000 per annum, they cannot afford to devote more than 17 per cent of their income to mortgage repayments and, using this measure, could only afford to borrow \$151 000 compared to \$277 000 using the 30 per cent of household income ratio. The additional living expenses of households with children constrain their ability to borrow and therefore to afford housing even in lower price areas. This analysis is consistent with the findings of Hulse et al. (2010, Chapter 5) who, in their research on changes in low-moderate income home purchasing patterns, noted a sharp decline in the number of low-moderate income purchasers who are households with children and a very big increase in the proportion who are single person, single income households, with these changes being much greater than those explainable by demographic change alone.

Many low-moderate purchasers have been able to afford the higher house prices of recent years as long as they are willing to forego a few luxuries and live to a modest

but adequate budget standard. If they are willing to forego a little more and live on the low cost budget standard, they can borrow even more.

Third, the analysis also suggests the notion of price points for affordable housing for low-moderate income purchasers. Table 1 below shows four different household types the affordable price point, i.e. that purchase price at which a property is affordable based on an income of \$50 000. The assumptions to construct the price points are in Appendix B. As the table shows, for a single person with a 20 per cent deposit, a \$50 000 income will buy them a \$266 000 dwelling using the moderate budget standard, but for a couple with two children only a dwelling of \$48 000 is affordable. In the context of metropolitan Australia, few dwellings would be affordable for the single person and none would be for the family. Pushing the income levels higher would change the price points, as would switching to a low cost budget standard. However, at this stage the objective is to illustrate the concept of the price point and its variation across household types. The Final Report will provide data for other income ranges and a template for calculating whatever combinations of income, interest rate and household type are desired.

Table 1: First home buyer price points for different household types, based on annual gross income of \$50 000 and 10 per cent and 20 per cent deposits

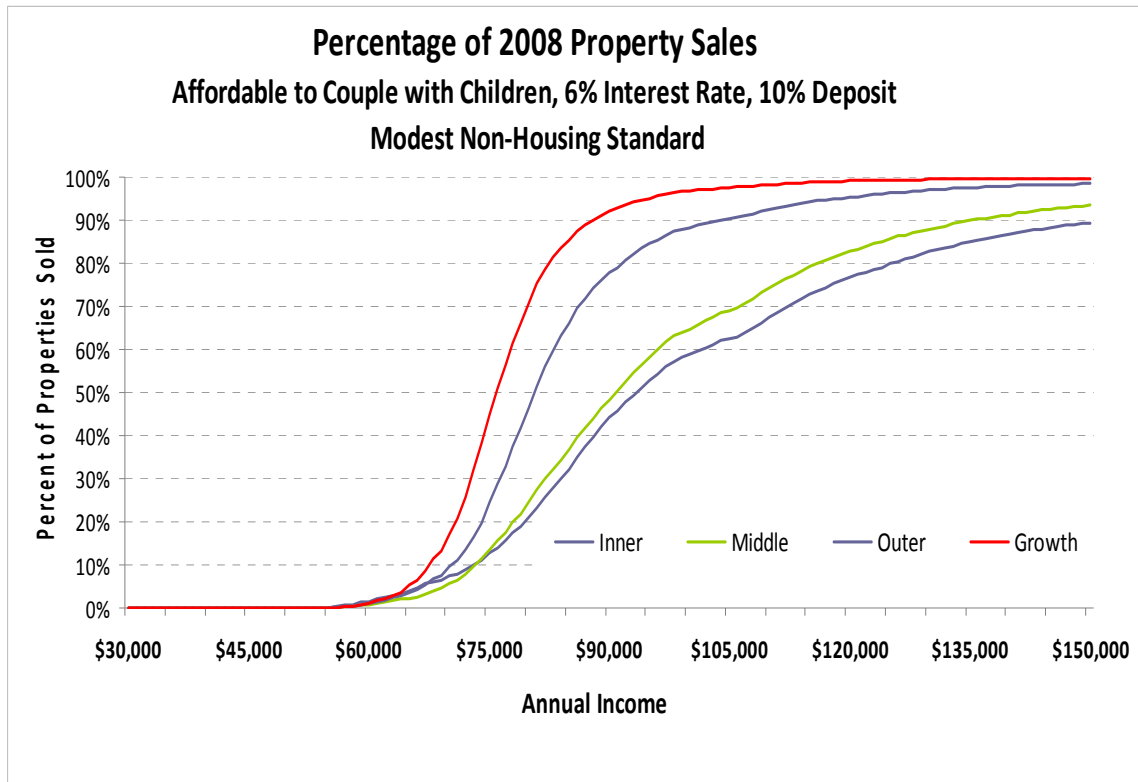
| | <i>Single person</i> | <i>Couple only</i> | <i>Sole parent with one child</i> | <i>Couple with two children</i> |
|-----------------------------|----------------------|--------------------|-----------------------------------|---------------------------------|
| Home purchase (deposit 10%) | | | | |
| Modest budget standard | \$266,598 | \$162,448 | \$228,636 | \$48,872 |
| Assumed savings | \$37,360 | \$21,737 | \$31,665 | \$6,810 |
| 30/40 rule gross | \$157,208 | \$157,208 | \$181,584 | \$187,590 |
| Assumed savings | \$20,951 | \$20,951 | \$24,608 | \$25,509 |
| 30/40 rule nett | \$122,425 | \$134,806 | \$147,981 | \$165,188 |
| Assumed savings | \$15,931 | \$17,591 | \$19,567 | \$22,148 |
| Home purchase (deposit 20%) | | | | |
| Modest budget standard | \$299,923 | \$182,754 | \$257,215 | \$54,981 |
| Assumed savings | \$72,351 | \$43,058 | \$61,674 | \$13,066 |
| 30/40 rule gross | \$176,859 | \$176,859 | \$204,282 | \$211,039 |
| Assumed savings | \$41,585 | \$41,585 | \$48,440 | \$50,130 |
| 30/40 rule nett | \$137,729 | \$151,656 | \$166,478 | \$185,836 |
| Assumed savings | \$31,802 | \$35,284 | \$38,990 | \$43,829 |

There is another reason why many low-moderate income households can afford to buy and the explanation has relevance to the spatial polarisation of Australian cities. By taking the residual income and associated mortgage capacity for a given household type and applying that model to the Victorian Valuer General's unit record sales data, it is possible to determine where households for any given income can purchase. Figure 5 below shows the percentage of Melbourne properties affordable to a couple with two children with a 10 per cent deposit and a 6 per cent interest rate and shows (a) the degree to which few properties are affordable anywhere below \$60 000 and (b) the differences between regions. The growth areas of Melbourne are almost universally affordable for this household type so long as they have around \$85 000 household income, while this income would get this household type a choice of less

than 30 per cent of the inner city. Such data enables a better understanding of what is happening in the market: low-moderate income households can still purchase, but only in very spatially constrained markets on the fringe of metropolitan Melbourne.

The ability to use the method for such submarket analysis is only as good as the availability of unit record property valuation data, and some states and territories would be more limited in their ability to apply the model by virtue of lack of data, e.g. South Australia, Tasmania and Western Australia.

Figure 5: Percentage of 2008 Melbourne properties affordable to couple with two children using the modest budget standard



Source: Victorian Valuer General's Property Sales Statistics 2008 and residual income calculations as documented in Appendix A.

8 THE RENTER MODEL

The construction of the renter model is broadly the same as for ownership but requires some rejigging in a number of aspects. Reviewing stages 1 to 12 of the ownership application of the model (see Appendix A), the ones that remain the same for rental are:

1. Non-housing consumption standards.
2. Indexing using appropriate consumer price indexes.
3. Income tax computations.
4. Income-based benefits and credits.

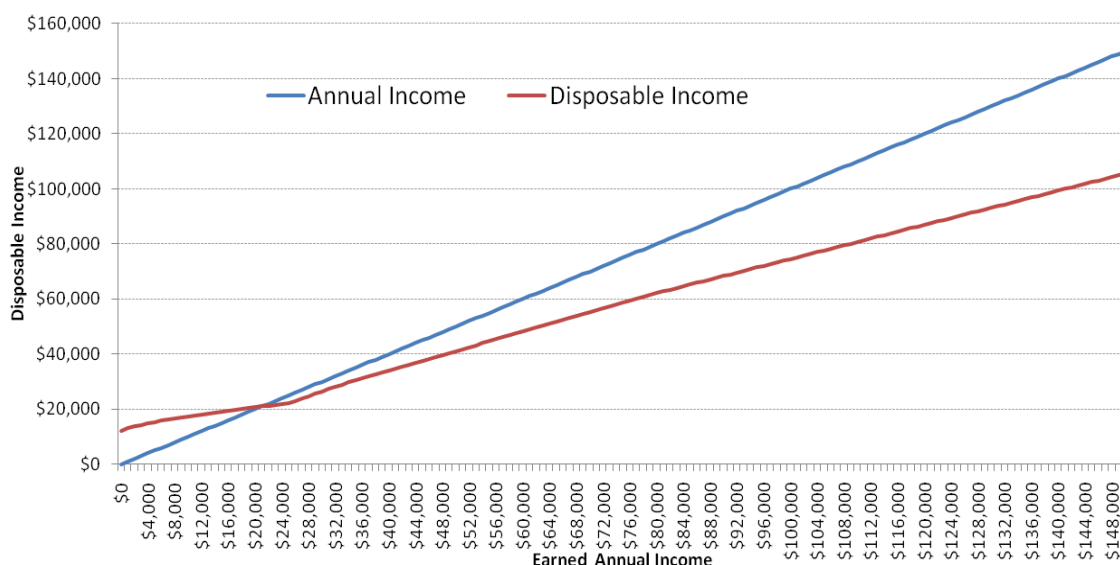
Areas that require change are as follows.

Income assumptions:

Unlike home purchase, no minimum income for computations is assumed, as rental is the only option for low income earners and therefore even the lowest income earners are assumed to be requiring accommodation in this sector. One of the issues in extending the income range down to zero is that Centrelink benefits and any credits become dominant in determining disposable income. Where most purchasers over \$30 000 have largely earned income with some credits such as family allowances, most renters under \$30 000 are dependent on some level of benefit.

This is simply illustrated in Figure 6 below, using the example of a single person household. Annual earned income starts at zero but actual disposable income is higher, representing the pension or disability benefit and the fact that no tax is paid on such income. Above some point, in this case around \$21 000, the disposable income becomes less than earned income as the cut-in and application of marginal tax rates reduces actual income as income rises.

Figure 6: Earned v disposable income, single person



Rent Assistance

Commonwealth Rent Assistance (CRA) is a non-taxable income supplement payment added on to the pension, allowance or benefit of eligible Income Support customers

who rent in the private rental market and in eligible community housing. It is paid at the rate of 75 cents for every dollar of rent above the specified threshold until the maximum rate is reached. Maximum rates and thresholds vary according to household type and number of children.

Methodologically, CRA can be treated in two ways. It can be treated as an income payment and added to a household's income as calculated in the homeownership model, i.e. the Disposable Income equals Gross Household Adult Income from Employment minus taxes plus tax benefits, credits *and* CRA. Thus, the 'Maximum Affordable Rent' equals Disposable Income minus the relevant budget standard.

Alternatively it can be seen as a supplement to the rent, which means that the disposable income remains that of Gross Household Adult Income from Employment minus taxes, but plus tax benefits and any credits. Thus the Maximum Affordable Rent equals disposable income minus the relevant budget standard *plus* CRA. In most cases the result will be same. For the purposes of this study, the latter method is used, because the former does not easily allow for establishing the amount of CRA that would be available to a particular household type.

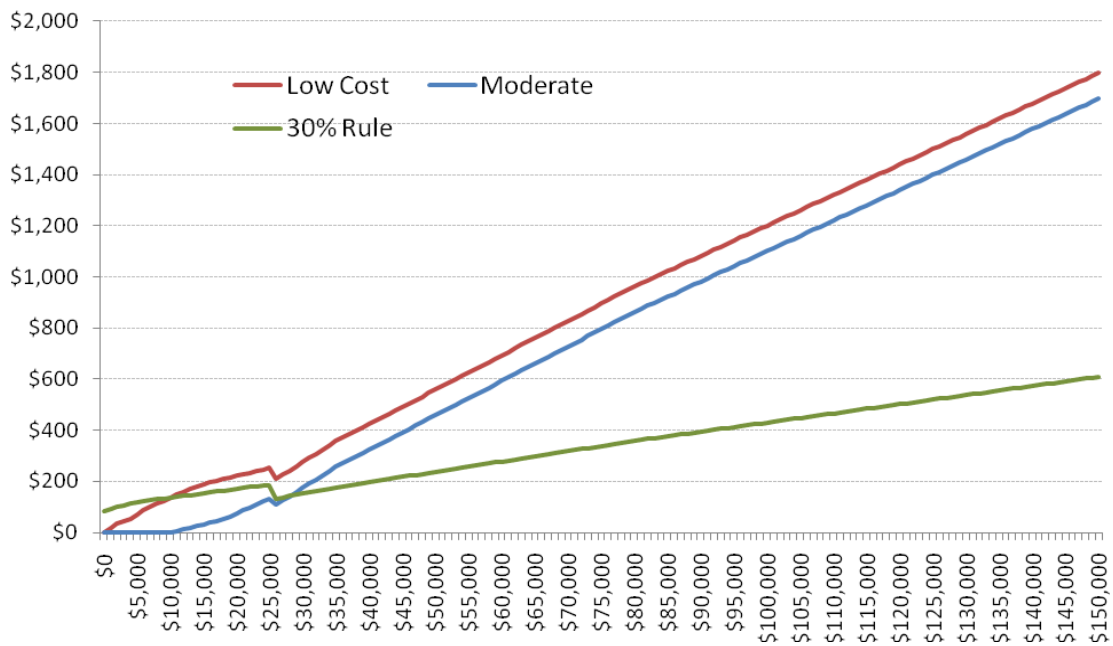
8.1 Rental examples and associated issues

The rental application of the model is indicative only as work is still continuing at this stage.

Using the disposable income and the CRA added to the budget standard, Figure 7 below shows, both for the low cost and modest budget standard and for comparative purposes the 30 per cent benchmark, what level of rent is affordable at each level of income.

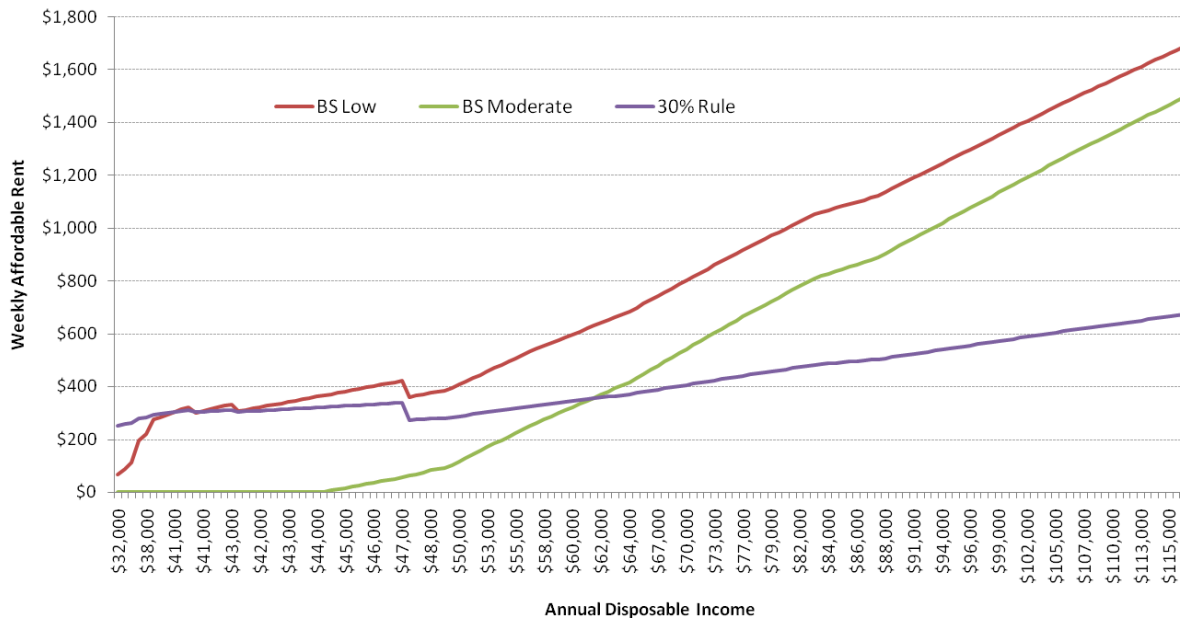
As with the ownership data, this data clearly reveals differences between the benchmark model and the budget standard model. First, for single renters, it would suggest that above some income level, i.e. \$25 000 to \$30 000 depending on which budget standard is used, they can afford more by way of rent than indicated by the budget standard, with the difference widening as incomes increase. By contrast, below some minimum level of income, the opposite holds true: the benchmark method overstates the degree of affordability. Second, and related to these differences, is that the budget standard method offers a better explanation of the rental market dynamics. One of the puzzles of recent years has been how rents have been able to increase to the degree that they have done, given the extent of income resistance that would be suggested by the benchmark method, i.e. the lack of affordability of rents should have acted as a drag on the rental market. That this has not been the case is suggested by the budget standard method which indicated an ability of any single person household over \$30 000 to pay more than we previously thought affordable.

Figure 7: Rental affordability using different affordability measures, single person



Turning to a couple with two children (Figure 8 below), the story in broad terms is the same, although much more visible. Note here that (a) the income level starts at \$32 000 as, factoring in all the benefits for a household of this type, that is the minimum income and (b) the annual disposable income between \$38 000 and \$43 000 is not linear as incomes actually drop back a bit when certain benefit tapers cut in. The affordable rent is much the same between \$38 000 and \$47 000 for the low cost budget standard and the 30 per cent benchmark. After the \$47 000 income point, this household type's ability to pay more rent without experiencing an affordability problem is much greater under the low cost budget standard than the benchmark one. However, if the modest budget standard is used, we see a major problem. Such are the demands of other expenses for this household type that below \$45 000 no rent is affordable, and any real capacity to afford rents is not achieved until the mid-\$50 000s.

Figure 8: Rental affordability using different affordability measures, couple with two children



Whether a rent is affordable is one housing issue. Whether there are any properties available to rent at an affordable level where a household wants to locate is another.

Victoria has a Residential Tenancies Bond Authority (RTBA) which holds all residential tenancy bonds for rental properties, including long-term caravans and rooming houses, houses and flats. The bonds are held in trust for landlords/agents and tenants, or owners and residents, giving all parties equal say on how bonds should be repaid when a rental agreement (also called a lease) ends. When a new lease is taken on, the landlord or agent provides the RTBA with the bond along with information including property type, number of bedrooms, rent and address. Confidentialised RTBA unit records thus enable us to calculate for each household type the percentage of appropriate dwelling units available for Melbourne using the low cost, modest budget standard and the 30/40 benchmark method. Table 2 below looks at a single person household and applies the Canadian occupancy standard, which has a single person occupying a one-bedroom dwelling. The table also shows boarding house data as this is potentially an option (but perhaps a worst outcome) for this household type. The post codes of the rental addresses have been amalgamated into inner, middle, and outer areas of Melbourne.

Table 2 shows the affordable rent for each income group and each method and the percentage of dwellings that were affordable and reveals a very different story when comparing residual income methods to the benchmark method. Taking a reasonably low income, e.g. \$35 000, and using the moderate budget standard (our preferred standard), 30 per cent are affordable overall and, in the middle ring, 47 per cent of properties are affordable. By contrast, for the same income, the 30/40 benchmark has only 3 per cent of properties affordable overall, and in the middle ring only 4 per cent. This is a very different affordability story. The \$30 000 income level is a telling one as, if one uses the modest budget standard, affordability drops away almost to the levels of the benchmark method, and below \$20 000 there is no rental property affordable on the low cost budget standard. Even if we were to use the low cost budget standard (not illustrated), below \$20 000 there is nothing affordable. Thus, for households such

as aged single pensioners with no other income sources, no amount of adjustment of expenditures could find such households an affordable dwelling.

Table 2: Single person: percentage of available one-bedroom rental properties by inner, middle and outer Melbourne municipalities, 1 January 2010 to 1 June 2010

| | | <i>Modest</i> | | | | | <i>30/40 rules</i> | | | | |
|----------|------------|---------------|-------|--------|-------|--------|--------------------|-------|--------|-------|--------|
| Gross | Disposable | Modest | Inner | Middle | Outer | Total | 30/40 | Inner | Middle | Outer | Total |
| \$12,000 | \$17,929 | \$12 | 0% | 0% | 0% | 0% | \$143 | 0% | 3% | 1% | 22% |
| \$15,000 | \$18,949 | \$32 | 0% | 0% | 0% | 0% | \$154 | 0% | 2% | 4% | 1% |
| \$20,000 | \$20,649 | \$75 | 0% | 0% | 0% | 0% | \$171 | 1% | 4% | 8% | 3% |
| \$25,000 | \$22,349 | \$132 | 0% | 1% | 2% | 1% | \$186 | 1% | 6% | 13% | 5% |
| \$30,000 | \$26,400 | \$175 | 1% | 5% | 9% | 3% | \$152 | 0% | 2% | 4% | 1% |
| \$35,000 | \$30,650 | \$257 | 17% | 47% | 35% | 30% | \$177 | 1% | 5% | 9% | 3% |
| \$40,000 | \$34,150 | \$324 | 46% | 72% | 72% | 59% | \$197 | 1% | 10% | 16% | 6% |
| \$45,000 | \$37,650 | \$391 | 74% | 85% | 92% | 80% | \$217 | 3% | 21% | 22% | 12% |
| \$50,000 | \$41,150 | \$459 | 88% | 91% | 97% | 90% | \$237 | 8% | 34% | 27% | 20% |
| \$55,000 | \$44,650 | \$526 | 92% | 94% | 99% | 94% | \$258 | 17% | 47% | 35% | 30% |
| \$60,000 | \$48,150 | \$593 | 95% | 96% | 99% | 96% | \$278 | 25% | 56% | 44% | 39% |
| | | | 7,713 | 5,404 | 2,061 | 15,178 | | 7,713 | 5,404 | 2,061 | 15,178 |

Table 3 below looks at the case study of a couple with two children, using the Canadian occupancy standard for appropriate room allocations which requires a three-bedroom dwelling for this household type. Here the story is slightly different. The modest budget standard method reveals less choice than the 30/40 benchmark. A couple with two children on \$50 000 have no available stock affordable on the modest budget standard, while the benchmark method suggests that there is 26 per cent affordable, of which the bulk is in the urban fringe. Above \$75 000 the position is reversed, with the modest budget standard showing that 83 per cent is affordable compared to 69 per cent of the benchmark method. Both highlight that it is predominantly outer urban areas where there is any real choice for income below \$70 000, but once an \$80 000 income is exceeded, choice in the inner area becomes much greater using the modest budget standard than the 30 per cent benchmark. The differences raise fundamental questions as to which is most appropriate for our understanding of the affordability constraints in Melbourne—or any other city where the method is applied—and the dynamics of the housing market. As with the home ownership model, the ability to undertake such spatial analysis is limited to cities with equivalent data to that of the RTBA. At the time of writing, as far as the authors know, only Queensland has comparable data.

Table 3: Couple with two children: Percentage of available three-bedroom rental properties by inner, middle and outer Melbourne municipalities, 1 January 2010 to 1 June 2010

| Annual income | Dis-posable income | Modest budget standard | | | | | 30/40% rules (based on disposable income) | | | | |
|------------------|--------------------|------------------------|-------|--------|--------|--------|---|-------|--------|--------|--------|
| | | Rent modest | Inner | Middle | Outer | Total | 30% rule | Inner | Middle | Outer | Total |
| \$32,000 | \$45,193 | \$15 | 0% | 0% | 0% | 0% | \$327 | 3% | 18% | 70% | 44% |
| \$40,000 | \$47,274 | \$55 | 0% | 0% | 0% | 0% | \$339 | 3% | 22% | 77% | 49% |
| \$45,000 | \$48,647 | \$87 | 0% | 0% | 0% | 0% | \$281 | 2% | 5% | 34% | 20% |
| \$50,000 | \$51,297 | \$143 | 0% | 0% | 0% | 0% | \$296 | 2% | 6% | 44% | 26% |
| \$55,000 | \$54,550 | \$210 | 1% | 1% | 1% | 1% | \$315 | 2% | 13% | 61% | 37% |
| \$60,000 | \$57,652 | \$275 | 2% | 3% | 27% | 15% | \$333 | 3% | 22% | 76% | 48% |
| \$65,000 | \$60,455 | \$334 | 3% | 22% | 76% | 48% | \$349 | 3% | 26% | 82% | 53% |
| \$70,000 | \$63,258 | \$393 | 6% | 52% | 96% | 71% | \$365 | 4% | 39% | 91% | 63% |
| \$75,000 | \$66,656 | \$463 | 16% | 76% | 99% | 83% | \$385 | 5% | 49% | 95% | 69% |
| \$80,000 | \$70,456 | \$541 | 31% | 88% | 100% | 89% | \$406 | 8% | 59% | 97% | 75% |
| \$85,000 | \$74,256 | \$619 | 51% | 94% | 100% | 93% | \$428 | 10% | 65% | 98% | 78% |
| \$90,000 | \$77,906 | \$694 | 69% | 97% | 100% | 96% | \$449 | 12% | 70% | 98% | 80% |
| Total Properties | | | 1,736 | 8,248 | 10,854 | 20,838 | | 1,736 | 8,248 | 10,854 | 20,838 |

As with first home purchasers, it is possible to use the residual income model to develop affordable price points for renters and this is shown in Table 4 below. Again, it shows for an equivalent income the marked affordability advantage of a single person over multiple person households. They have more choice of dwellings in the sense that a single person with \$50 000 income, on a modest budget standard (the affordable rent is \$453), can rent anything from a one-bedroom upwards. A couple with children have to look for a larger dwelling, e.g. three-bedroom, and consequently have much less capacity to afford such.

Table 4: Affordable rental price points for different household types, based on annual gross income of \$50 000

| | Single person | Couple only | Sole parent with one child | Couple with two children |
|-------------------------------|---------------|-------------|----------------------------|--------------------------|
| Renting | | | | |
| Modest budget standard | \$453.56 | \$295.34 | \$392.24 | \$129.08 |
| 30/40 rule gross | \$287.67 | \$287.67 | \$323.36 | \$332.15 |
| 30/40 rule nett | \$238.48 | \$254.88 | \$274.16 | \$299.35 |
| Office of Housing rent amount | \$239.55 | \$239.55 | \$249.05 | \$259.60 |

9 CONCLUSION

This Positioning Paper is not comprehensive in the applications the model can be put to, but it suggests the broad directions. The Final Report will expand on the existing applications by looking at more household types as well as include new applications including relevance for social housing rent setting and comparing Australia's affordability performance with international housing markets. But even at this point, the paper illustrates (a) that the work requires a level of methodological detail not hitherto undertaken in equivalent studies in Australia or internationally and (b) the model's potential usefulness in providing a critical framework for thinking about affordability and for new policy debate.

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APPENDIX A

Methodology

1. *Non-housing consumption standards:*

- SPRC low cost and modest but adequate budgets.
- Total budget minus housing.
- The budgets are national, not regional or local.
- However, since housing is the expenditure that varies most by location, while the aggregate of other expenditures varies little by location, use of the national total budget minus housing is a reasonable approximation for Victoria.

2. *Indexing using appropriate consumer price indexes:*

- Because SPRC budgets have separate components for housing and energy, but CPI 'Housing' includes utilities, it is necessary to utilise: ...
 - CPI 'All Items minus Housing and Financial Services' to index the budgets minus the Housing and Energy components.
 - CPI 'Utilities' to index budget's Energy component.
- Because CPI 'All Items minus Housing and Financial Services' is available only for Australia as a whole, not for Victoria or Melbourne, it is necessary to use the national CPI elements.
- As with the SPRC budgets, since housing is the expenditure that varies most by location, while the aggregate of other expenditures varies little by location, use of the national CPI 'All Items minus Housing and Financial Services' is reasonable.
- Add results of 'b' and 'c' to produce indexed normative budget standard (minimum adequate residual income) for Non-Housing Consumption including Utilities (home energy).

3. *Income assumptions:*

- \$30 000 is the minimum income for computations as it is assumed that ownership is not possible on a lower income unless subsidised. Any rental affordability measure, however, would have no lower income cut-off.
- Because of the \$30 000 income cut-off, household income is predominantly from employment, although at lower income levels households are eligible for certain income benefits and allowances.
- For two-adult households, 60 per cent of total income is assumed to be from adult male employment and 40 per cent from adult female employment. It is assumed that no other family members' income is relevant for loan eligibility.

4. *Income tax computations:*

- Income tax rates are based on personal tax rates for the 2009–10 financial year.
- Tax rates are based on withholding rates for pay-as-you-go and do not include amounts credited or debited for taxation financial reconciliation such as the Medicare levy or low income tax offset. The computations also exclude tax deductions that are household specific, such as those for length of tax year, higher education payments and the private health insurance offset. However, there are a number of income-based tax credits and benefits that are not household specific and can be included in the computations (see 5).

5. Income-based tax benefits and credits:

The value of the following benefits has been computed, with the specifics differing by household type as Table A1 below shows and the accompanying text explains further. Consistent with Australian Government policy, Newstart is based on disposable income while Family Tax Benefits are based on annual gross income.

Table A1: Relevant tax benefits and credits for sample household types

| <i>Household Type</i> | <i>Newstart</i> | <i>Family Tax Benefit Part A</i> | <i>Family Tax Benefit Part B</i> |
|-----------------------|-----------------|----------------------------------|----------------------------------|
| Single person | √ | X | X |
| Sole parent, 1 child | √ | √ | √ |
| Couple, no children | √ | X | X |
| Couple, 2 children | √ | √ | √ |

→ Sole person household:

Not eligible for Family Benefits, and the \$30 000 income cut-off means that no single persons are eligible for Newstart as it ceases at a disposable income of \$853.34 per fortnight for single persons. Lowering of the cut-off to, say, \$20 000, would require computation of Newstart for this household group.

→ Couple household:

Newstart allowance is paid up to an individual disposable income of \$779.17 per fortnight and reduces at a greater rate once one of the partners exceeds this amount. Once the combined incomes exceed \$45 000 the couple is no longer eligible for any Newstart allowance.

→ Sole parent household with child:

Minimum income level is too high to consider Newstart allowance, but Family Tax Benefit Payment of \$156.94 per fortnight is paid in full until income reaches \$44 165, thereafter decreasing on a sliding scale until the upper limit of \$99 000 is reached.

Family Tax Benefit Part B (FTBB) of \$93.10 per fortnight is paid up to primary earner's maximum annual income of \$150 000. Many sole parents will receive child support, but because this relates to individual circumstances it cannot be taken into account.

→ Couple household with two children:

This household type is eligible for Newstart up to \$45 000, above which the couple is no longer eligible for any Newstart allowance. Family Tax Benefit Part A of \$313.88 per fortnight is paid in full until combined income reaches \$44 165 and then decreases on a sliding scale until the upper limit of \$107 000.

Family Tax Benefit Part B (FTBB): The maximum payment of this benefit is \$93.10 per fortnight, and is based on the 'non-primary earner' if the primary earner's annual income is below \$150 000. As it is based on the income of the non-primary earner, FTBB is no longer paid once the couple's combined income reaches \$42 000.

6. Computation of Maximum Affordable Housing Cost:

- Disposable Income equals Gross Household Adult Income from Employment minus taxes plus tax benefits and credits.
- Maximum Affordable Housing Cost equals Disposable Income minus indexed normative budget standard (minimum adequate residual income) for Non-Housing Consumption including Utilities (home energy).

7. Computation of Maximum Affordable Mortgage Payment:

- Subtract assumed non-mortgage housing costs excluding utilities from Maximum Affordable Housing Cost.

8. Computation of Maximum Affordable Mortgage:

- Compute present value (PV) of stream of Maximum Affordable Mortgage Payments at assumed annual average interest rate over assumed term.

9. Computation of Maximum Affordable Purchase Price:

- Divide Maximum Affordable Purchase Price by assumed loan-to-value ratio (one minus deposit ratio).

10. Computation of Minimum Necessary Savings to Purchase:

- Necessary deposit equals assumed deposit ratio times Maximum Affordable Purchase Price.
- Compute stamp duty based on Maximum Affordable Purchase Price.
- Add non-variable fees (legal etc.) to results of 'a' plus 'b' to produce Minimum Necessary Savings.

11. Computation of Number and Percentage of Sold Homes Actually Affordable:

- Utilise Valuer General's sales price data for the most recent year, supplied by DPCD.
- Compute the number and percentage of homes sold for an amount less than or equal to the Maximum Affordable Purchase Price.

12. Produce Graphs:

- For each household type.
- For the full range of incomes.
- Based on low cost and modest but adequate non-housing standards.
- Of results of computations in Steps 6–11 above.

Illustrative home purchase examples

In order to demonstrate the utility of the Residual Income Home Purchaser Affordability Model, a few illustrative examples have been run, based upon the parameters specified in the following Table A2.

Table A2: User set parameters

| <i>Month and year</i> | <i>September 2009</i> |
|--|-----------------------|
| Consumer Price Index for selected month and year: | |
| All items excluding housing and financial and insurance services (CPI, Table 8, line 28) | 169.7 |
| Utilities (CPI, Table 7, line 69) | 221.2 |
| Loan term (years) | 25 |
| Interest rate | 6% |
| Additional housing costs per year | \$3000 |
| Deposit | 10% |
| Legal fees | \$1000 |

A comparison has been made with the mortgage interest rate changed to 9 per cent, keeping all other parameters unchanged. This variation provides a basic sensitivity analysis of changing interest rates on home purchaser affordability.

For the illustrative examples, and any cases for the same month and year, the non-housing consumption standards (minimum adequate residual income) would be unaltered by variations in the other parameters. The amounts of these standards for the four specified household types on the indexed SPRC low cost and modest but adequate budgets are as shown in Table A3.

Table A3: Indexed SPRC Budgets, non-housing consumption standard, September 2009

| | <i>Single</i> | | <i>Sole parent one child</i> | | <i>Couple</i> | | <i>Couple with two children</i> | |
|--------------------------------|---------------|----------|------------------------------|----------|---------------|----------|---------------------------------|----------|
| | Low cost | Modest | Low cost | Modest | Low cost | Modest | Low cost | Modest |
| Non-housing less energy | \$221 | \$320 | \$283 | \$492 | \$337 | \$524 | \$533 | \$829 |
| Energy | \$13 | \$15 | \$13 | \$21 | \$18 | \$21 | \$24 | \$28 |
| Total non-housing consumption: | | | | | | | | |
| Per week | \$235 | \$335 | \$297 | \$513 | \$355 | \$545 | \$558 | \$857 |
| Per year | \$12,200 | \$17,400 | \$15,400 | \$26,700 | \$18,400 | \$28,400 | \$29,000 | \$44,500 |

The numbers imply that a single person of a given disposable income living at the modest standard for non-housing items could afford \$100 a week less for housing than if they were living at the low cost standard for non-housing items.

For a sole parent with one child, the differential in the standard of adequacy for non-housing costs is much greater, \$216 a week, due to the considerably higher standard, and hence greater costs, in the modest budget associated with having a child. That is, for a given level of disposable income, at the modest non-housing standard they could afford \$216 a week less for housing than at the low cost standard.

For the couple household, the differential is \$190 a week. For a couple with two children, it is \$300 a week.

The differential affordability implications of the low cost versus modest non-housing standards only apply to a specific household type of a given *disposable* income. No

comparisons are possible based on gross incomes without taking into account the differential effects of taxes and income-based government tax credits and benefits, which are essential parts of the following, more detailed summaries. They are provided for two of the four proto-typical household types: a single person and a couple with two children.

In the following examples, 'gross income' means total annual household income from adult employment.

Single person

Maximum affordable total housing cost and mortgage payment

The maximum amount that a household of a given type and income can afford is independent of the loan characteristics, depending only upon the non-housing consumption standard and the magnitude of taxes and income-based government credits and benefits.

The results of this portion of the analysis for a single person household are summarised in Figures A1 through A3 below. The maximum affordable housing cost rises steadily with income, not only in dollars as would be expected for any affordability standard, but also as a percentage of income, revealing the folly of trying to set any single percentage of income or a few categorical percentages as an affordability standard.

Note that the percentage graphs tend to level off at high incomes. The reason is that at higher incomes, for each additional dollar of gross income, approximately 40 cents goes for taxes with the remaining 60 cents potentially available for additional housing cost.

In terms of mortgage affordability, assuming quite low non-mortgage costs of about \$250 a month, a single person with:

Gross income of \$35 000 a year could afford a monthly mortgage payment of:

- A little under \$1300 a month on the low cost standard.
- About \$850 on the modest standard.

Gross income of \$50 000 could afford a mortgage payment of:

- About \$2160 a month on the low cost standard.
- About \$1730 on the modest standard.

Figure A1: Maximum affordable housing cost, single person household

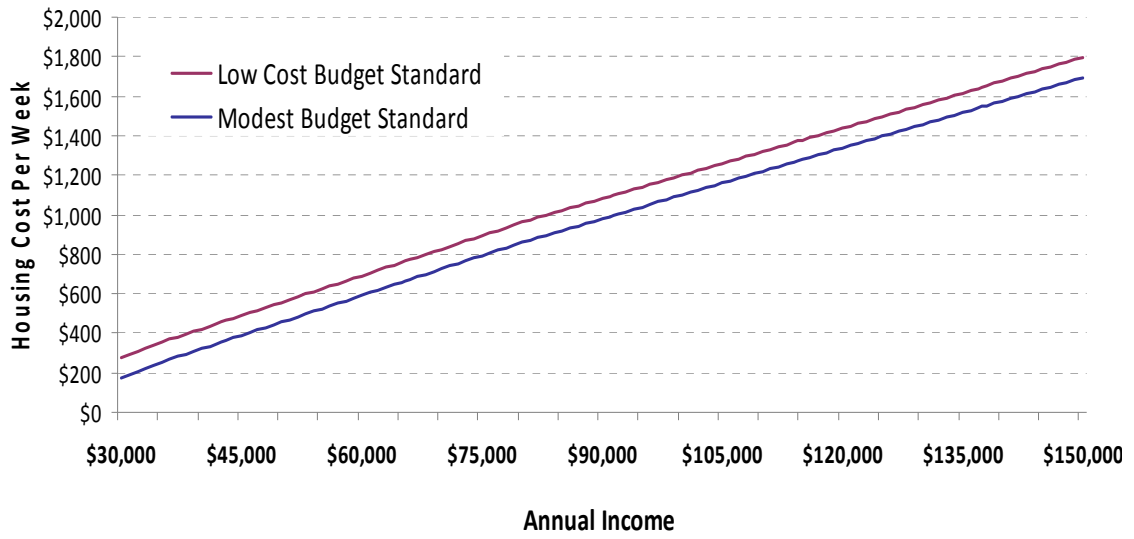


Figure A2: Maximum affordable debt service cost, single person household

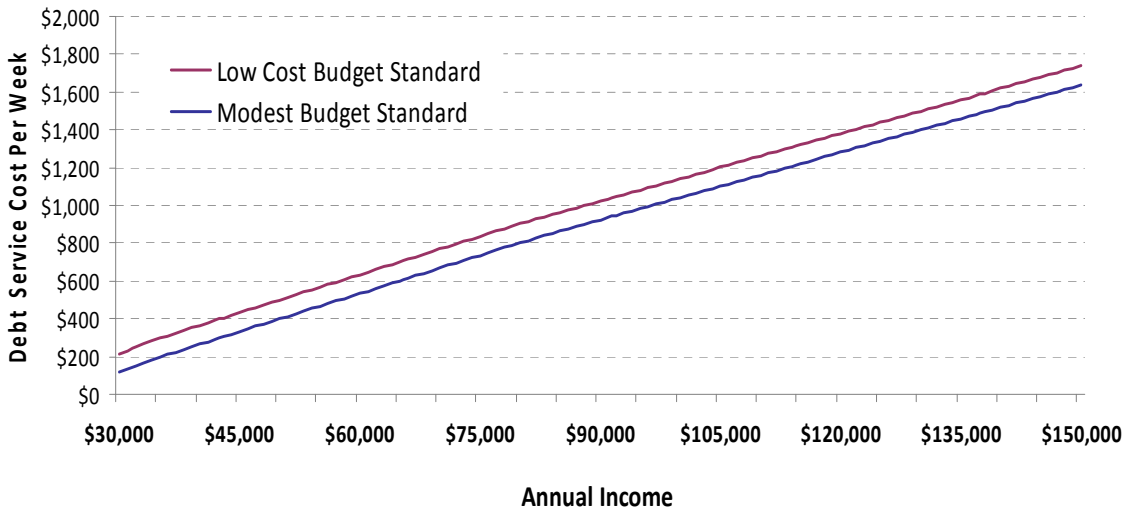
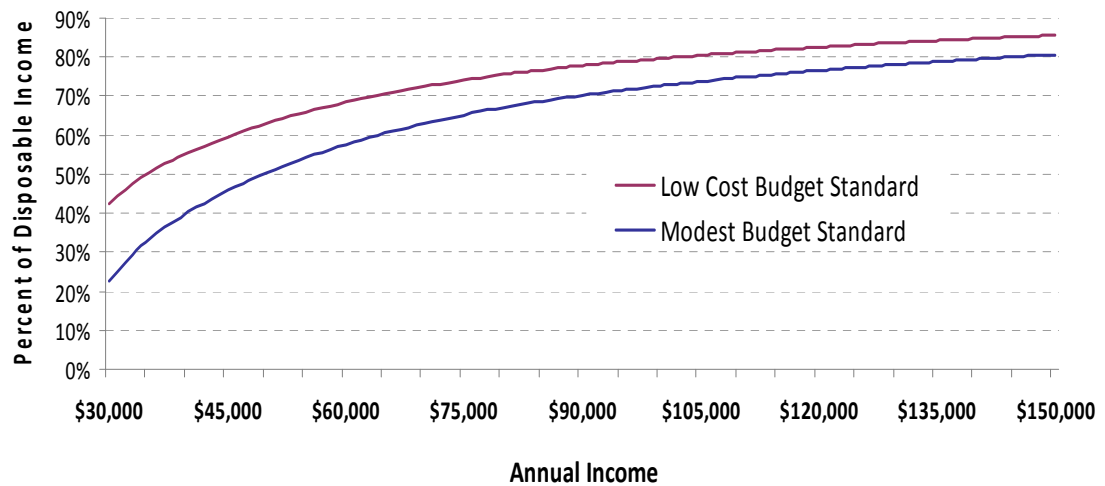


Figure A3: Maximum affordable debt service cost from disposable income, single person household



Purchase affordability with mortgage interest rate of 6 per cent

Figure A4 below shows the maximum affordable mortgage loan based on: (a) the maximum affordable mortgage payments, as just described; (b) assumed mortgage term of 25 years; (c) assumed average annual interest rate of 6 per cent.

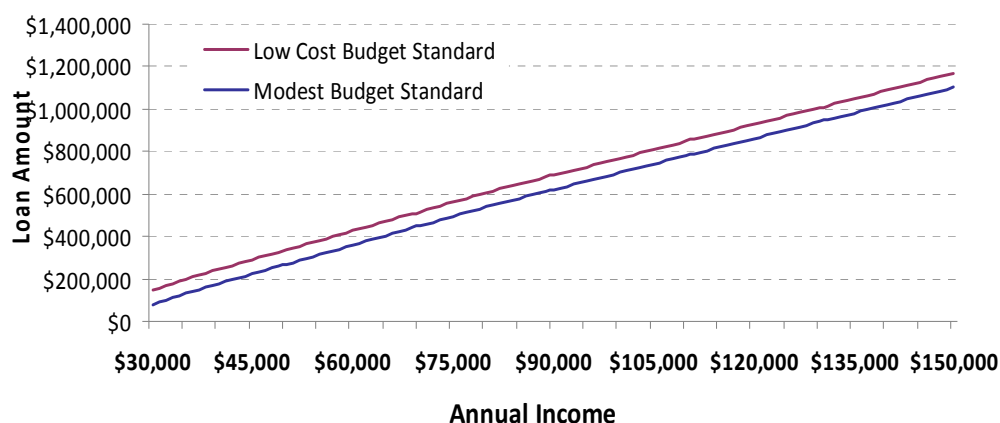
Gross income of \$35 000 a year could afford a loan of:

- \$200 000 on the low cost standard.
- \$133 000 on the modest standard.

Gross income of \$50 000 a year could afford a loan of:

- \$336 000 on the low cost standard.
- \$268 000 on the modest standard.

Figure A4: Maximum affordable mortgage loan, single person household



Note: 6 per cent interest rate.

Figure A5 below shows the maximum affordable purchase price based on: (a) the loan amount just presented; and (b) assumed loan-to-value ratio of 90 per cent (initial deposit of 10%).

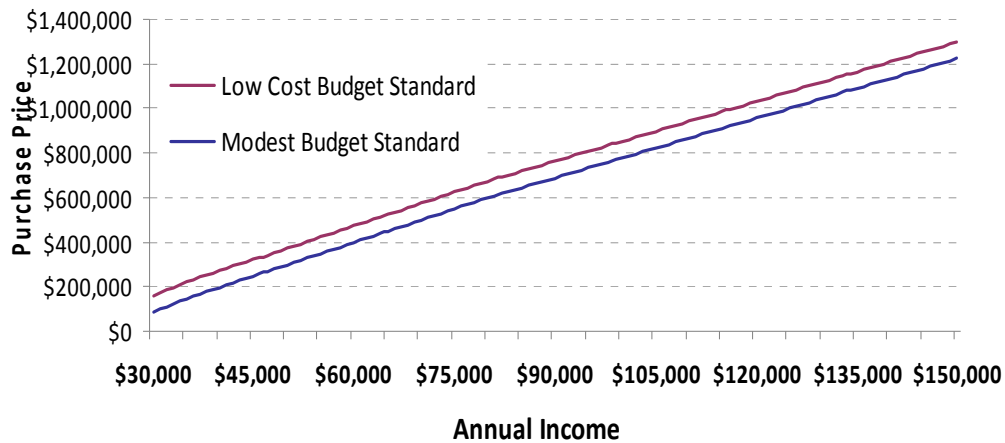
Gross income of \$35 000 could afford a price of:

- \$222 000 on the low cost standard.
- \$147 000 on the modest standard.

Gross income of \$50 000 could afford a price of:

- \$373 000 on the low cost standard.
- \$298 000 on the modest standard.

Figure A5: Maximum affordable purchase price, single person household



Note: 6 per cent interest rate and 10 per cent deposit.

Figure A6 below shows the minimum savings necessary to cover the initial costs of purchasing a house at the maximum affordable price, including: (a) the assumed deposit requirement; and (b) other initial costs, including stamp duty and legal costs.

Gross income of \$35 000 would need at least:

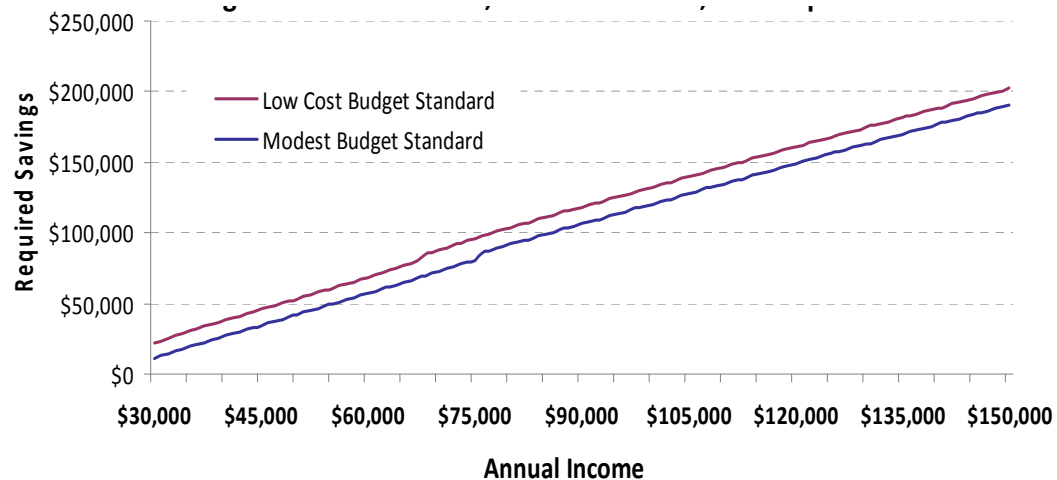
- \$30 700 on the low cost standard.
- \$19 500 on the modest standard.

Gross income of \$50 000 would need at least:

- \$53 300 on the low cost standard.
- \$42 100 on the modest standard.

The necessary minimum savings are lower on the modest budget non-housing standard because the maximum affordable purchase price is less than on the low cost standard.

Figure A6: Minimum necessary savings, single person household



Note: 6 per cent interest rate and 10 per cent deposit.

Purchase affordability with mortgage interest rate of 9 per cent

Figure A7 below shows with a gross income of \$35 000, the maximum affordable loan would be:

- \$153 000 on the low cost standard, \$47 000 less than if the interest rate was 6 per cent.
- \$102 000 on the modest standard, \$31 000 less than at 6 per cent interest.

The maximum affordable purchase price would be:

- \$170 000 on the low cost standard, \$52 000 less than at 6 per cent.
- \$113 000 on the modest standard, \$34 000 less than at 6 per cent.

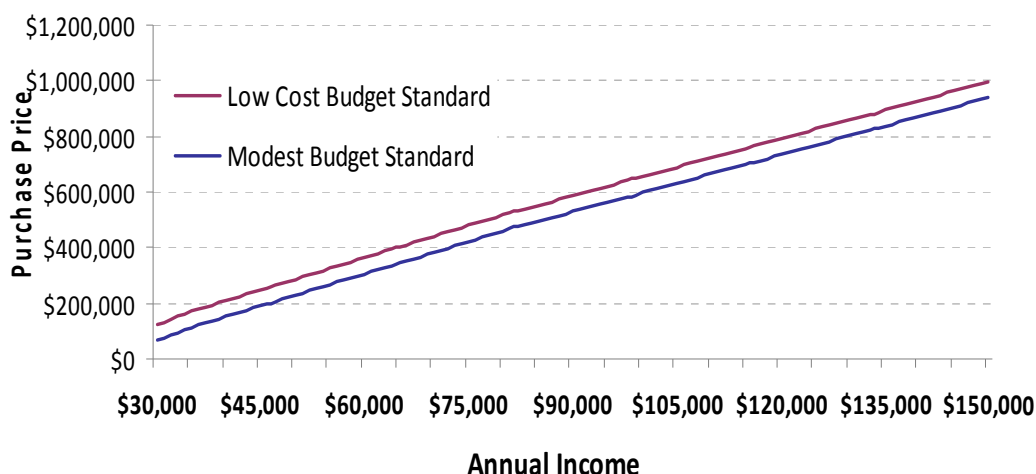
With a gross income of \$50 000, the maximum affordable loan would be:

- \$258 000 on the low cost standard, \$78 000 less than at 6 per cent.
- \$206 000 on the modest standard \$62 000 less than at 6 per cent.

The maximum affordable purchase price would be:

- \$286 000 on the low cost standard, \$87 000 than at 6 per cent.
- \$229 000 on the modest standard, \$59 000 less than at 6 per cent.

Figure A7: Maximum affordable purchase price, single person household



Note: 9 per cent interest rate and 10 per cent deposit.

Greater Melbourne affordable properties

The most recent comprehensive Valuer General's property sales price data is for 2008 (although 2009 data will be used in the Final Report). Figures A8 and A9 below show the percentage of 2008 property sales (houses and flats combined) affordable based on current residual income affordability for a single person household if financed with a mortgage interest rate of 6 per cent, deposit of 10 per cent.

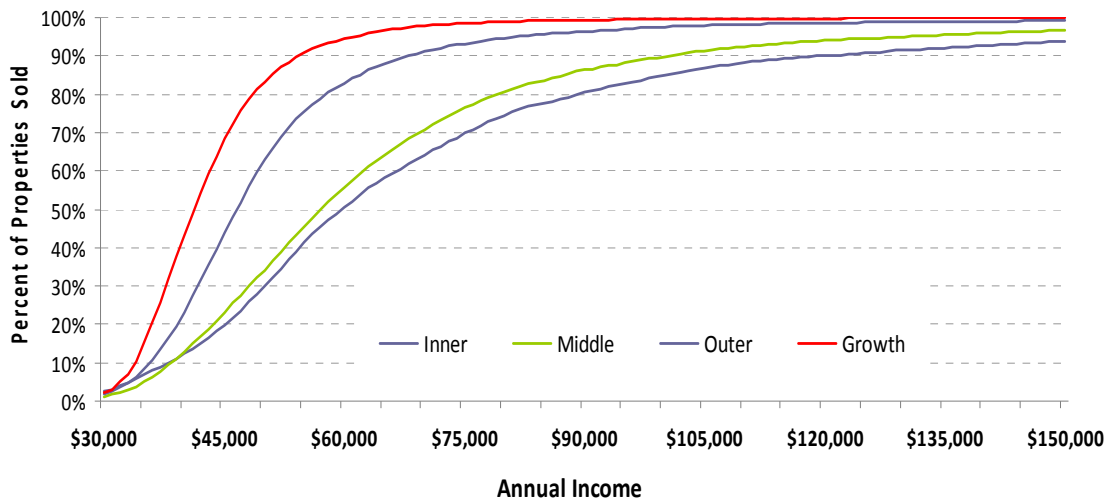
With a gross income of \$35 000 a year:

- On the low cost non-housing standard, fewer than 10 per cent of properties in Inner, Middle and Outer Melbourne were affordable, and just 15 per cent in so-called 'growth areas'.
- On the modest standard, no properties were affordable in any parts of Greater Melbourne.

With a gross income of \$50 000 a year:

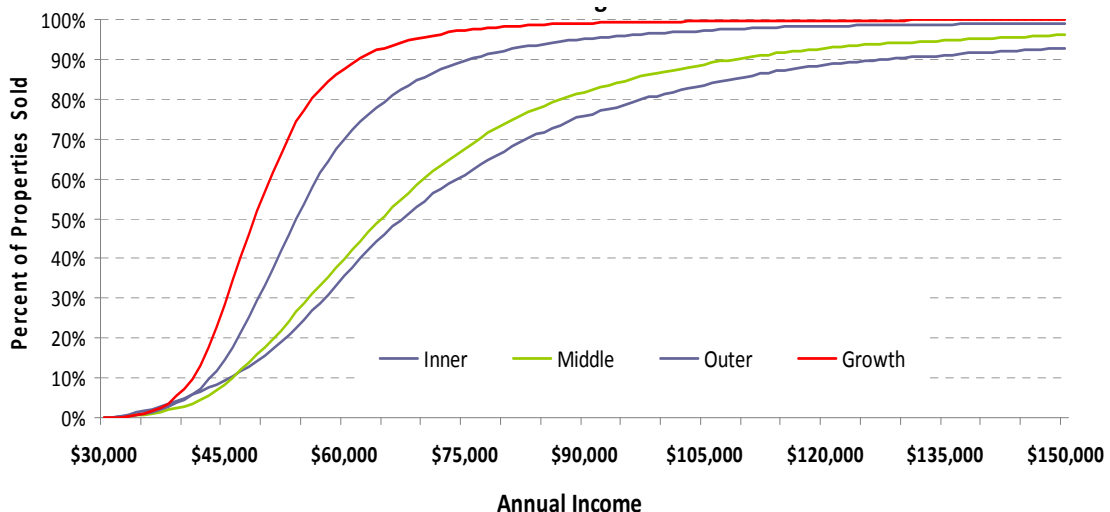
- On the low cost standard, about 30 per cent of properties in Inner and Middle Melbourne were affordable, about 60 per cent in Outer Melbourne, and about 80 per cent in growth areas.
- On the modest standard, fewer than 20 per cent of properties in Inner and Middle Melbourne were affordable, about a third of properties in Outer Melbourne, and a little under 60 per cent in growth areas.

Figure A8: Percentage of 2008 property sales affordable to single person household, low-cost housing standard



Note: 6 per cent interest rate and 10 per cent deposit.

Figure A9: Percentage of 2008 property sales affordable to single person household, modest non-housing standard



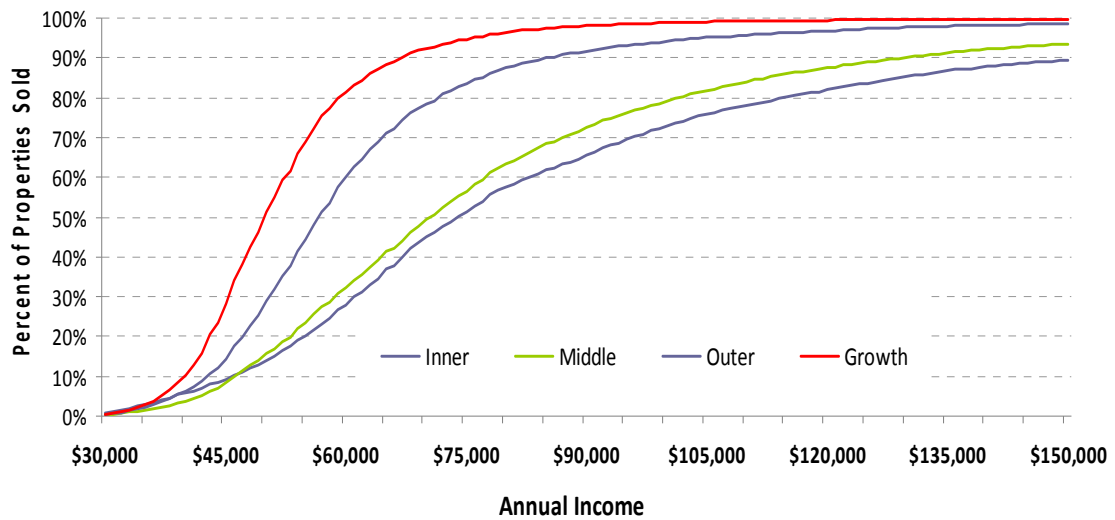
Note: 6 per cent interest rate and 10 per cent deposit.

If the interest rate was 9 per cent, the share of affordable properties would be far lower, as shown in Figures A10 and A11 below. With a gross income of \$35 000 a year, a single person could have afforded no properties in any part of Greater Melbourne, even on the low cost standard for non-housing items, let alone the modest standard.

With an income of \$50 000, on the low cost standard this household could have afforded about 15 per cent of properties in Inner and Middle Melbourne, i.e. only half the share they could have afforded at an interest rate of 6 per cent. In Outer Melbourne, just 30 per cent would have been affordable, and 50 per cent in growth areas; in both of these areas the share affordable was fully 30 percentage points lower than at the lower mortgage rate of 6 per cent.

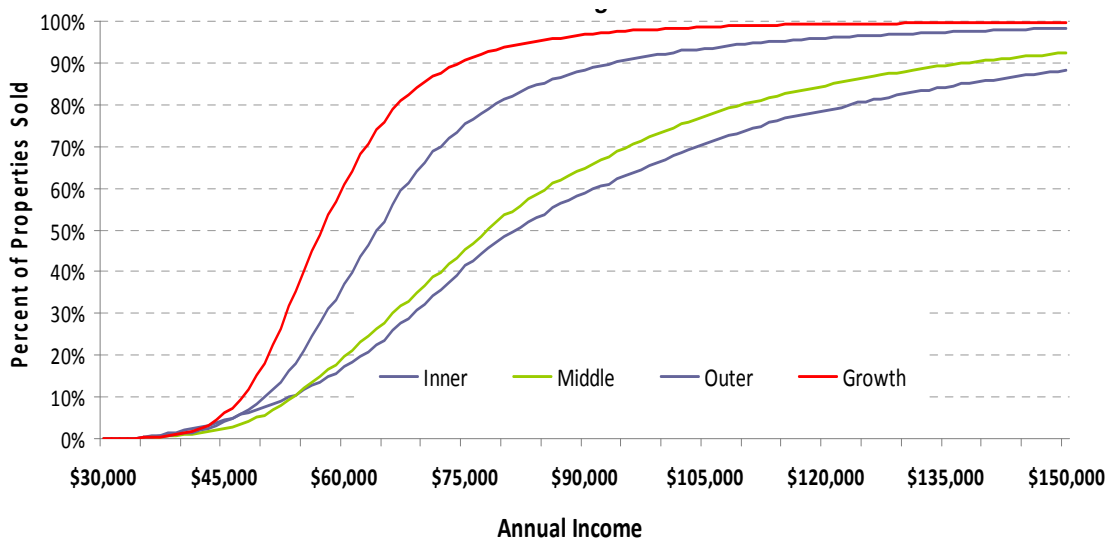
On the modest standard, an income of \$50 000 would have given this household access to fewer than 10 per cent of properties in Inner and Middle Melbourne, only about 10 per cent in Outer Melbourne, and fewer than 20 per cent even in growth areas.

Figure A10: Percentage of 2008 property sales affordable to single person household, low-cost non-housing standard



Note: 9 per cent interest rate and 10 per cent deposit.

Figure A11: Percentage of 2008 property sales affordable to single person household, modest non-housing standard



Note: 9 per cent interest rate and 10 per cent deposit

Couple with two children

Maximum affordable total housing cost and mortgage payment

The results of this portion of the analysis for a couple with two children are summarised in Figures A12 through A15 below.

In terms of mortgage affordability, assuming quite low non-mortgage costs of about \$250 a month, a couple with two children and with:

Gross income of \$50 000 a year could afford a monthly mortgage payment of:

- \$1600 a month on the low cost standard.
- \$316 on the modest standard.

Gross income of \$75 000 could afford a mortgage payment of:

- About \$2900 a month on the low cost standard.
- About \$1600 on the modest standard.

Figure A12: Maximum affordable housing cost, couple with two children

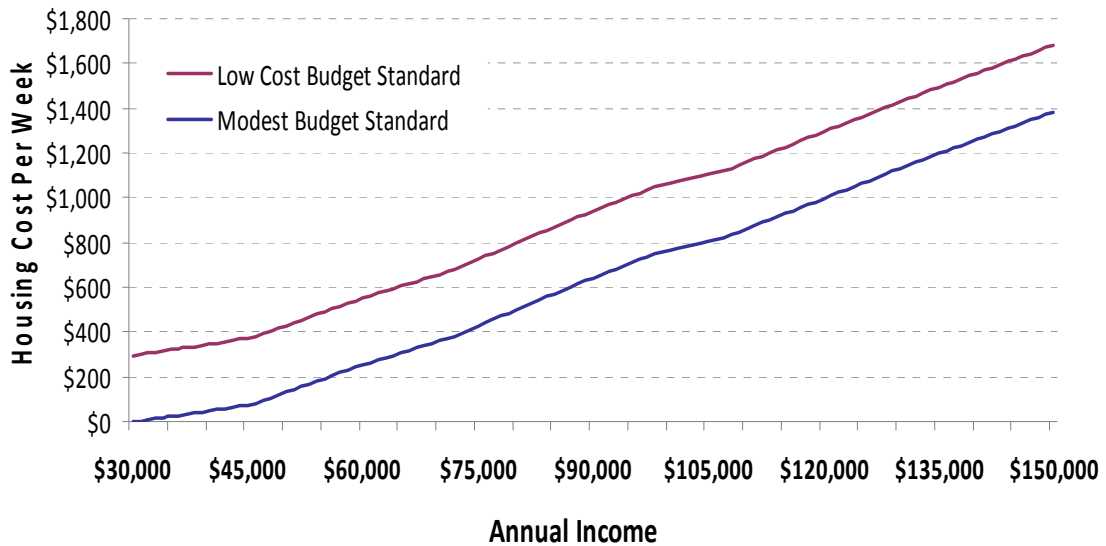


Figure A13: Maximum affordable housing cost from disposable income, couple with two children

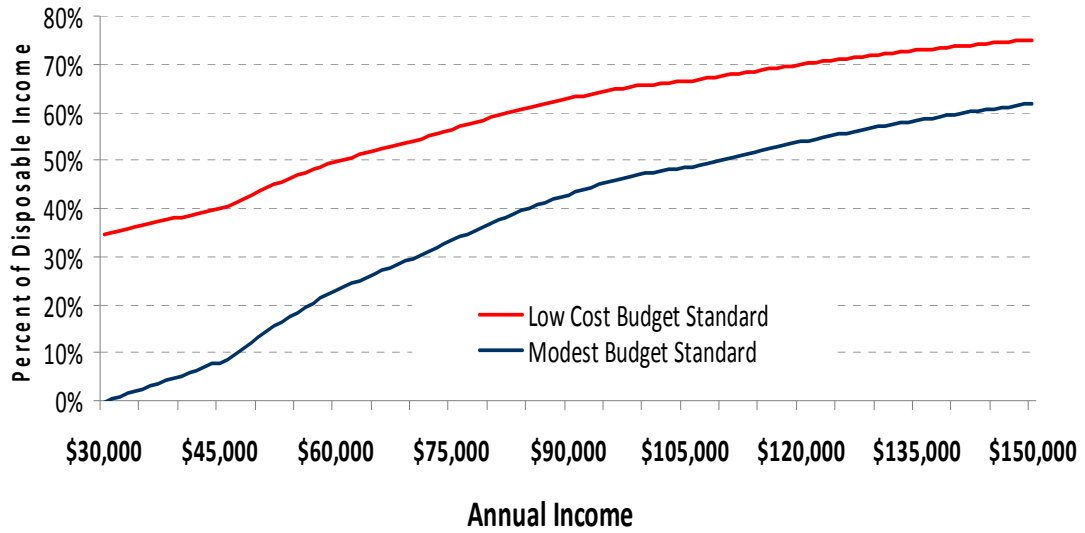


Figure A14: Maximum affordable debt service cost, couple with two children

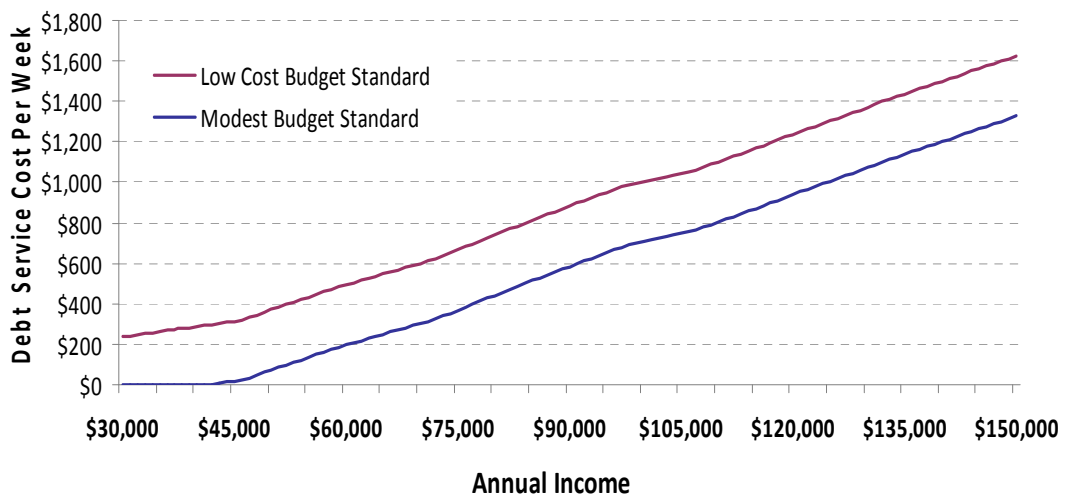
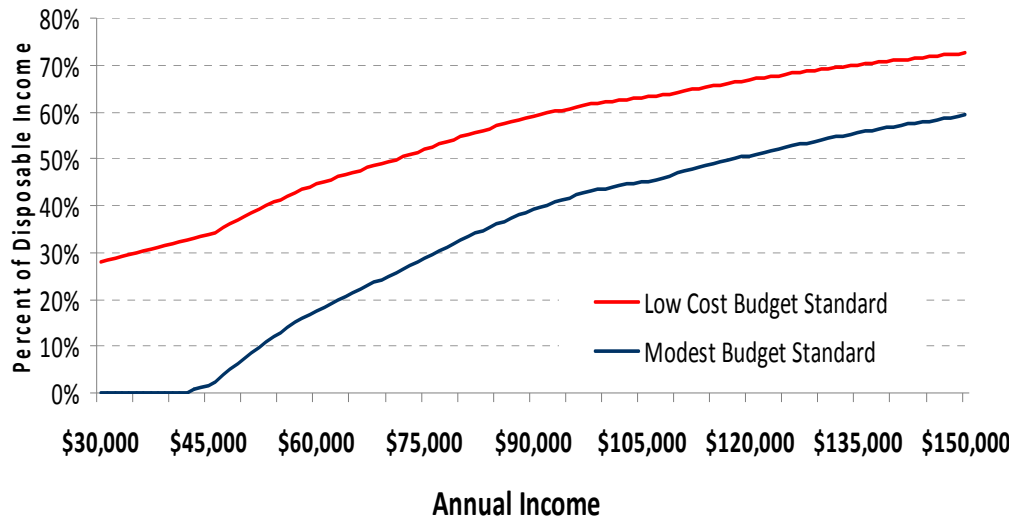


Figure A15: Maximum affordable debt service cost from disposable income, couple with two children



Purchase affordability with mortgage interest rate of 6 per cent

Figure A16 below shows the maximum affordable mortgage loan based on: (a) maximum affordable mortgage payments, as just described; (b) assumed mortgage term of 25 years; (c) assumed average annual interest rate of 6 per cent.

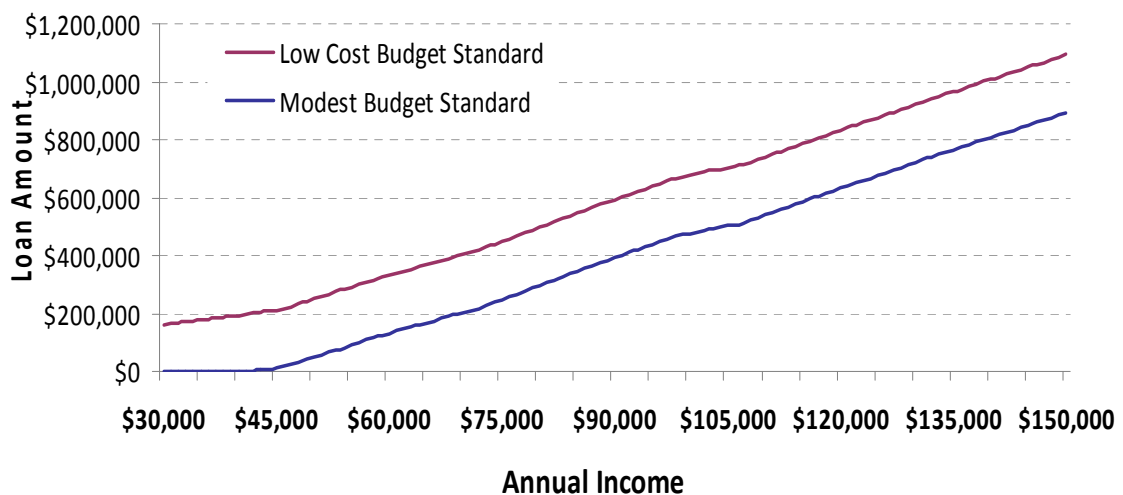
Gross income of \$50 000 a year could afford a loan of:

- \$250 000 on the low cost standard.
- \$49 000 on the modest standard.

Gross income of \$75 000 a year could afford a loan of:

- \$448 000 on the low cost standard.
- \$248 000 on the modest standard.

Figure A16: Maximum affordable mortgage loan, couple with two children



Note: 6 per cent interest rate

Figure A17 below shows the maximum affordable purchase price based on: (a) the loan amount just presented; and (b) assumed loan-to-value ratio of 90 per cent (initial deposit of 10%).

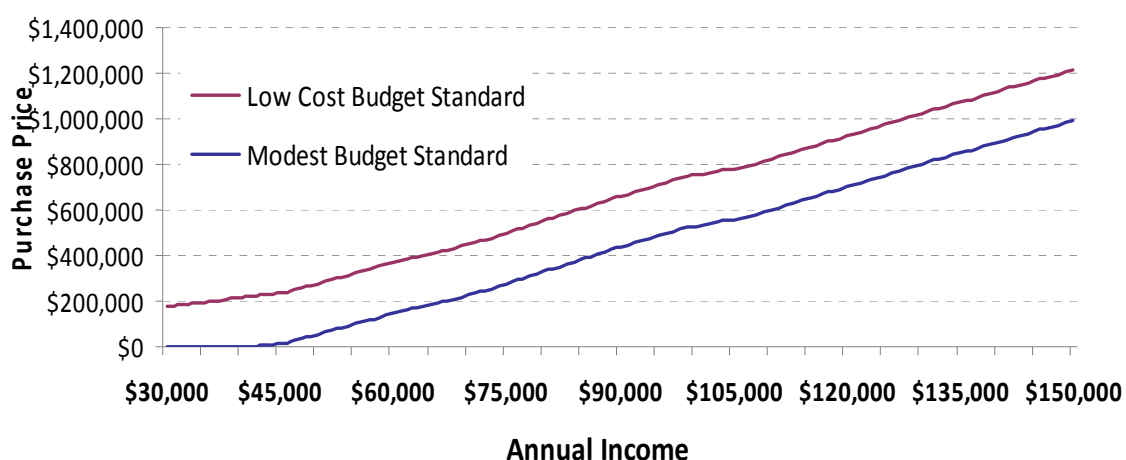
Gross income of \$50 000 could afford a price of:

- \$277 000 on the low cost standard.
- \$55 000 on the modest standard.

Gross income of \$75 000 could afford a price of:

- \$498 000 on the low cost standard.
- \$275 000 on the modest standard.

Figure A17: Maximum affordable purchase price, couple with two children



Note: 6 per cent interest rate and 10 per cent deposit.

Figure A18 below shows minimum savings necessary to cover the initial costs of purchasing a house at the maximum affordable price, including: (a) the assumed deposit requirement; and (b) other initial costs, including stamp duty and legal costs.

Gross income of \$50 000 would need at least:

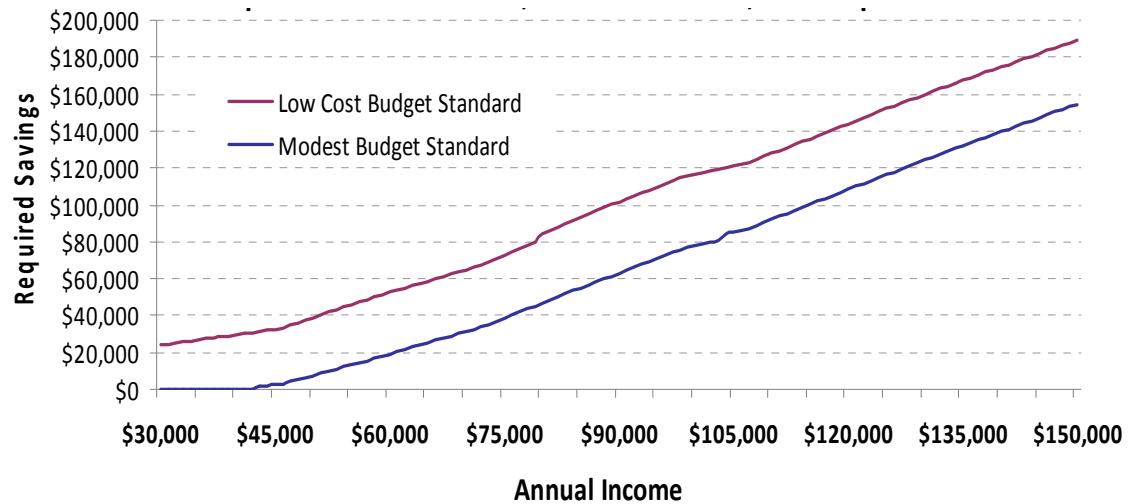
- \$39 000 on the low cost standard.
- \$7500 on the modest standard.

Gross income of \$75 000 would need at least:

- \$72 700 on the low cost standard.
- \$38 700 on the modest standard.

The necessary minimum savings are lower on the modest budget non-housing standard because the maximum affordable purchase price is less than on the low cost standard.

Figure A18: Minimum necessary savings, couple with two children



Note: 6 per cent interest rate and 10 per cent deposit.

Purchase affordability with mortgage interest rate of 9 per cent

With a gross income of \$50 000:

The maximum affordable loan would be:

- \$192 000 on the low cost standard, \$58,000 less than if the interest rate was 6 per cent.
- \$39 000 on the modest standard.

The maximum affordable purchase price would be:

- \$213 000 on the low cost standard, \$64 000 less than at the 6 per cent interest rate.
- \$42 000 on the modest standard.

With a gross income of \$75 000:

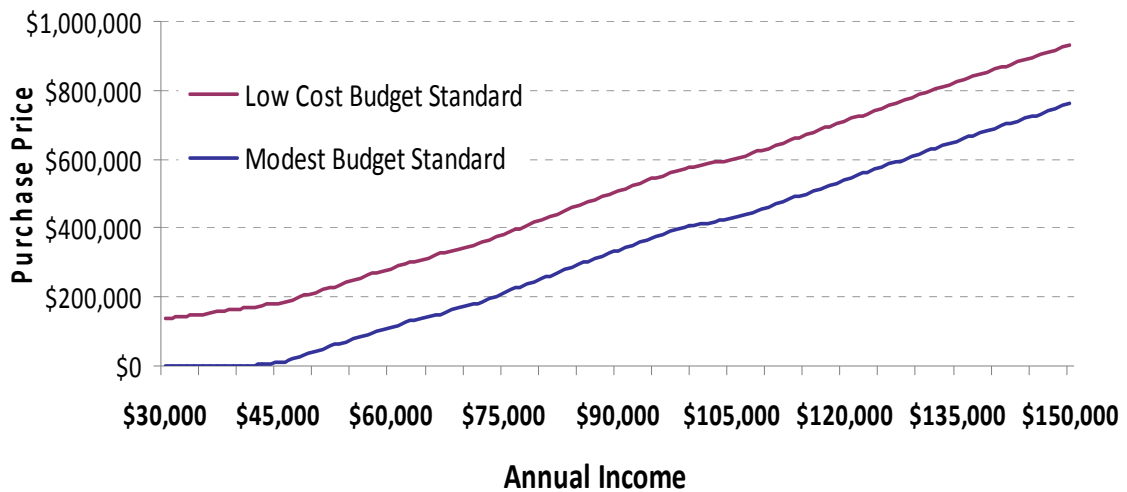
The maximum affordable loan would be:

- \$344 000 on the low cost standard, \$104 000 less than at the 6 per cent interest rate.
- \$190 000 on the modest standard, \$58 000 less than at 6 per cent.

The maximum affordable purchase price would be:

- \$382 000 on the low cost standard, \$116 000 less than at 6 per cent.
- \$211 000 on the modest standard, \$64 000 less than at 6 per cent.

Figure A 19: Maximum affordable purchase price, couple with two children



Note: 9 per cent interest rate and 10 per cent deposit.

Greater Melbourne affordable properties

Figures A20 and A21 below show the percentage of 2008 property sales (houses and flats combined) affordable based on current residual income affordability for a couple with two children aiming to purchase with a mortgage interest rate of 6 per cent, deposit of 10 per cent.

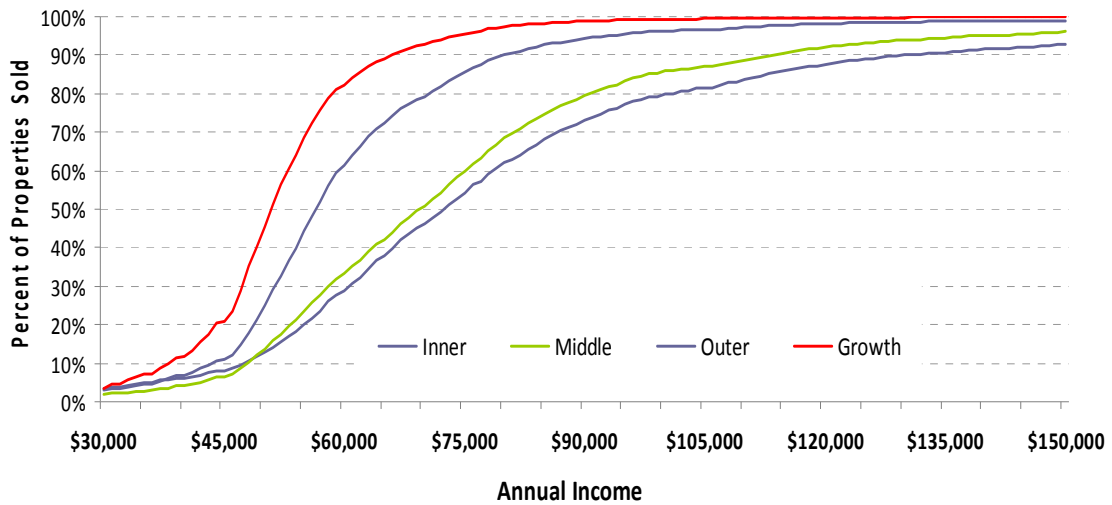
With a gross income of \$50 000 a year:

- On the low cost non-housing standard, fewer than 15 per cent of properties in Inner and Middle Melbourne, 25 per cent in Outer Melbourne, 46 per cent in growth areas were affordable.
- On the modest standard, no properties were affordable in any parts of Greater Melbourne.

With a gross income of \$75 000 a year:

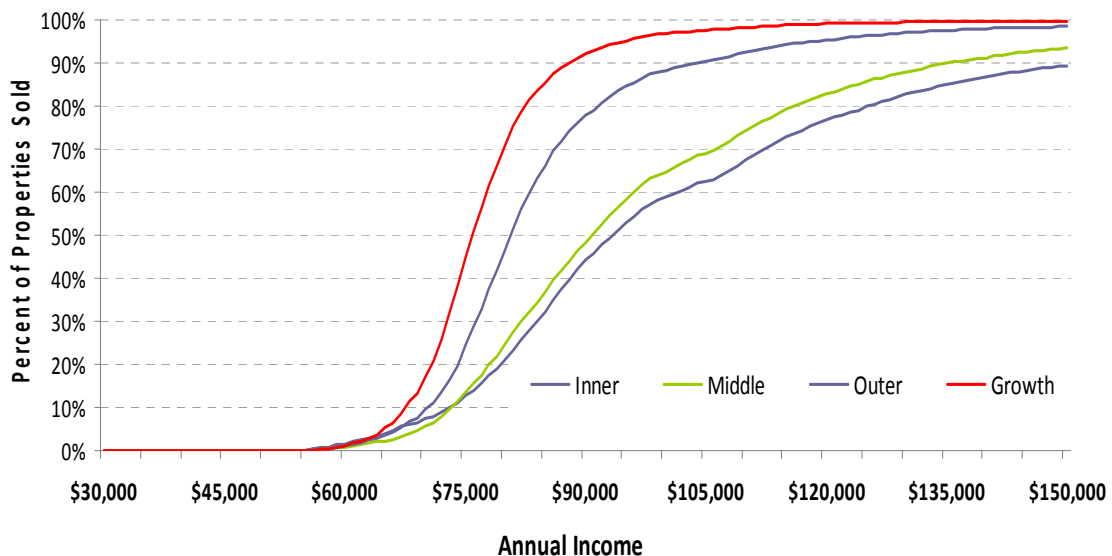
- On the low cost standard, about 54 per cent of properties in Inner, 60 per cent in Middle Melbourne, 86 per cent in Outer Melbourne, and nearly all in growth areas were affordable.
- On the modest standard, fewer than 15 per cent of properties in Inner and Middle Melbourne, 25 per cent in Outer Melbourne, and 45 per cent in growth areas were affordable.

Figure A20: Percentage of 2008 property sales affordable to couple with children, low-cost non-housing standard



Note: 6 per cent interest rate and 10 per cent deposit.

Figure A21: Percentage of 2008 property sales affordable to couple with children, modest non-housing standard



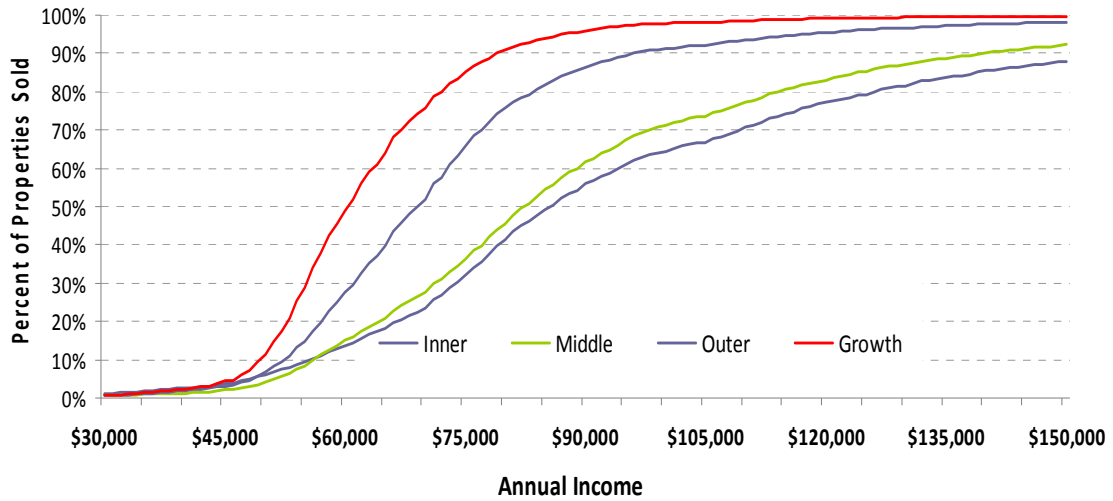
Note: 6 per cent interest rate and 10 per cent deposit.

If interest rates were 9 per cent, the share of affordable properties would be far lower, as shown in Figure A22 below. With a gross income of \$50 000 a year, a couple with two children could have afforded no more than 10 per cent of properties in any part of Greater Melbourne on the low cost standard for non-housing items, and none on the modest standard.

With an income of \$75 000, on the low cost standard, they could have afforded about 35 per cent of properties in Inner and Middle Melbourne. In Outer Melbourne, 66 per cent would have been affordable, and 85 per cent in growth areas. The share affordable in all areas was about 15 to 20 percentage points lower than if the mortgage rate was 6 per cent.

On the modest standard, an income of \$75 000 would have given them access to fewer than 7 per cent of properties in Inner, Middle and Outer Melbourne, and only 11 per cent in growth areas.

Figure A22: Percentage of 2008 property sales affordable to couple with children



Note: 9 per cent interest rate and 10 per cent deposit.

APPENDIX B

The assumptions required to construct home purchase price points are:

- Home purchase based on a 7 per cent interest rate and a 25-year loan.
- For a sole parent, the child's age is eight.
- For a couple, the children's ages are eight and ten.
- All adults are assumed to be 40 years of age.
- The 30/40 rule for gross includes government credits (only applies to households with children).
- Income tax and benefits are based on 1 July 2010.
- Assumed savings include stamp duty, deposit and legal fees of \$1000.

APPENDIX C

The assumptions required to construct renting price points are:

- For a sole parent, the child's age is eight.
- For a couple, the children's ages are eight and ten.
- All adults are assumed to be 40 years of age.
- The 30/40 rule for gross includes government credits (only applies to households with children).
- Rental amounts for modest budget standard, 30/40 rule gross and nett includes rent assistance for households with children (added after the rent has been established).
- Income tax and benefits are based on 1 July 2010.
- The Office of Housing rent amount does not take into account the market rent cut-off.

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