

QUANTITY AND QUALITY ESTIMATES OF CHANGES IN DWELLING AFFORDABILITY IN METROPOLITAN MELBOURNE

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ABSTRACT: The sale price of Australian dwellings has increased dramatically in recent times. Interestingly, the percentage of households owning their own home has remained relatively constant. This raises the important question of what dimensions of housing might households be trading-off in order to secure their own home?

We estimate three aspects of the trade-off being made between house price and house quality/distance from the CBD. Using Melbourne metropolitan data we look at the changes over time in the relationship between income and house prices, affordability by income cohorts and distance cost by income cohort.

Using data spanning 1994 to 2010 we find that affordability has declined across all income cohorts. Our findings indicate that households are facing a distance cost in some instances of over 10 kilometres to maintain a given level of affordability. Given our findings that the distance cost also varies by income cohort, this suggests a decline in the level of socio-economic diversity in some localities close to the CBD.

KEY WORDS: Housing, Affordability, Accessibility, Distance, Income

1. INTRODUCTION

While there is consistent evidence that housing in Australia has become less affordable over the past decade, ownership rates across Australia have remained relatively constant (Bourassa et al. 1995, ABS 2010). This suggests that households are prioritising the ownership of a dwelling. We extend previous research on the ability of prospective first-time buyers to enter the housing market (Hulse et al. 2010) and estimate one particular trade-off: distance from the CBD and how it has increased over time. Distance from the CBD can be thought of as a proxy for quality, as it (imperfectly) represents commuting time to work.

The structure of this paper is as follows; in the next section Australian dwelling ownership rates in the post- World War Two era are discussed. Having shown that ownership rates have remained approximately the same over the last two decades, the relationship between the distribution of house prices and the distribution of income is analysed, and estimates of the changes in affordability between 1994/5 and 2009/10 across the Melbourne metropolitan market are provided and discussed. This research expands upon observations made on the long run patterns of house prices in Melbourne by the Spatial Analysis & Research team at the Victorian Department of Planning and Community Development (Victorian Department of Planning and Community Development 2011). The final stage of our analysis will be to estimate the additional distance cost (measured as distance from the CBD) required to maintain a given level of affordability. We will then discuss our findings in light of previous research and the implications for the Australian community.

Ownership

Figure 1 presents the tenure type as a proportion of households from 1998 to 2010. Importantly, despite the significant decrease in affordability (Yates et al. 2007) it seems the proportion of all tenure types have changed relatively little. Interestingly, the percentage of owners (mortgaged plus outright) has remained relatively constant.

According to Figure 1 there are a slightly smaller proportion of households owning their own homes outright and a slightly larger proportion of households with mortgages. It has been suggested that affordability is unlikely to be the sole reason for the increase in mortgage ownership, for example financial innovation in the form of 'low doc' loans are also likely to be driving this increase (ABS 2010). Other

possible factors include the rise of two-income households, financial gifting from family members to help with first time home purchases, and falling family size. Unfortunately, a lack of research makes it difficult to disentangle the causal mechanisms behind this change.

An interesting feature of Figure 1 is that the proportion of those renting privately has also increased. This in part is probably attributable to decreases in affordability, but other factors are also likely to be at play here, for example demographic changes in the form of increased delay in family formation.

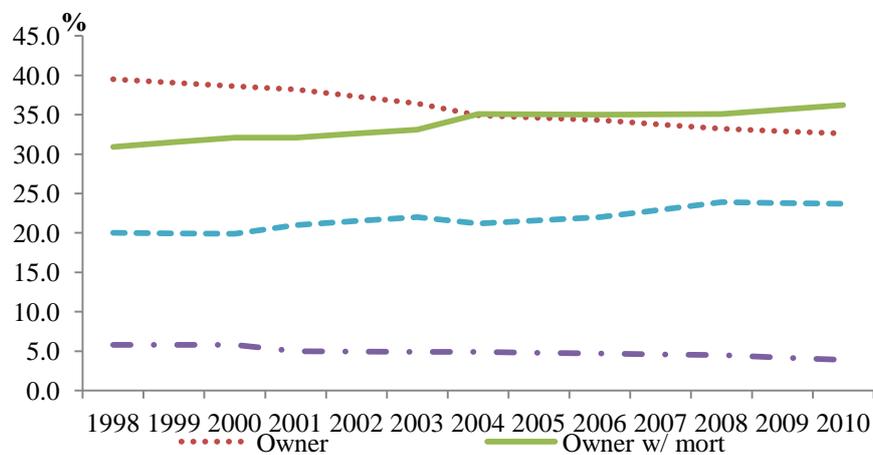


Figure 1. Proportions of Tenure and Landlord type for Australia. Table 1; Dec 2011. Missing years were 1999, 2002, 2005, 2007 and 2009. These values were estimated as the midpoint of years immediately before and after. Source: ABS. Cat 41020.

Upon comparing recent ownership rates over time we find that the rate has been relatively stable over the last two decades. (Bourassa et al. 1995). Further, they are well above the rates experienced in the two decades following World War 2. Across states and territories the level is fairly consistent with the national picture, that is, in general relatively small decreases in home ownership rates and increases in private rental rates have occurred across Australia (see Explanatory notes, ABS 2011a).

It would seem therefore that Australian households are managing to attain their own homes at a rate that is historically comparable. This suggests, given the documented decreases in affordability (Yates et al.

2007), that the population of Australian households are choosing to prioritise home ownership.

Importantly, when comparing recent ownership rates internationally the same conclusion can be drawn. Specifically, current ownership rates are comparable with many western economies such as the UK, Canada and the US (Andrews and Caldera Sánchez 2011). Further, they continue to be well above ownership rates in developed nations such as Germany (ABS 2010).

In summary, recent ownership statistics indicate that the population of Australian households are managing to attain their own property at historically consistent levels. The important question therefore is at what cost? We measure this cost in terms of one aspect of housing quality, distance to the CBD, and show that it is significant and discuss the potential economic and social consequences.

Previous analyses of the changing ability of households to afford dwelling purchases have either suffered from a lack of local housing market data or a narrow focus on those potential purchasers with incomes below the 40th percentile. The first issue is of concern as there have been significant differences in the growth of house prices in different areas within Australian cities (Richards 2008) and a resulting polarisation of where households on different levels of household income can afford to buy properties. The increase in the premium households that will pay to live close to the CBD is unsurprising given an increase in real incomes and population and an associated increase in the opportunity cost of commuting. Secondly, the lack of consideration of households other than those in the lower end of the income distribution is based on the assumption that higher income households have sufficient income to meet minimum housing and non-housing standards. In addition such households may choose to incur relatively high housing costs because they prefer a relatively high standard of housing instead of other consumption possibilities. This restriction, however, ignores the trade-off between home ownership and location that is likely to be faced by moderate income earners wanting to purchase homes in areas relatively close to the CBD (ABS 2004).

Measures of Housing Affordability

There are two main ways in which housing affordability is measured in Australia and abroad (see Gabriel et al. 2005 for a more detailed explanation of housing affordability measurements). The ratio measure,

which we use in this paper, tends to be used most often. It is typically a ratio of the cost of housing to household income, however, it can also be linked to some kind of benchmark as is quite often seen with the 30/40 rule of thumb. With the 30/40 rule housing is considered affordable if it costs less than 30% of household income for the bottom 40% of households (Gabriel et al. 2005).

The residual method looks at household income after housing costs have been met and is based on the assumption that both housing and other expenses should be met by a household's income. Gabriel et al (2005) identify two particular residual measures of housing affordability in use in Australia: the Henderson poverty line and the budget standard.

In this paper, one particular aspect of affordability is considered, that being *accessibility*. Accessibility is defined as the ability of aspiring home buyers to purchase a dwelling, rather than a consideration of the ongoing costs of home ownership for current purchasers (see for example, Yates 2007). Accessibility problems, whereby would-be first homebuyers are discouraged from entering home ownership, are not captured by standard affordability measures based on housing cost to income ratios. Such problems may be policy relevant given the potential financial and nonfinancial benefits of homeownership identified in the literature (for a comprehensive review of these benefits see Hulse et al. 2010).

Accessibility can be conceptualised in terms of a ladder of affordability which shows the maximum house prices affordable for first home purchases at each income decile given certain assumptions relating to: repayment to income ratios, interest rates, loan length and deposit size. These can then be compared to current dwelling prices in order to identify accessibility issues at different income levels (Gabriel et al. 2005).

2. RELATIONSHIP BETWEEN DWELLING PRICES AND INCOME OVER TIME

The primary determinants of accessibility are income and dwelling prices. In this section we explore the relationship between the distribution of dwelling prices and the distribution of income. Income data was obtained from the Australian Bureau of Statistics (ABS) Survey of Household Income and Income Distribution (2009), which reports equivalised household income. Equivalised household income takes into account household composition by adjusting disposable income using an

equivalence scale. In this way it becomes possible to make comparisons between households of different sizes and compositions (see ABS 2011b, 6523.0 Explanatory notes on Equivalized Income for a more detailed account of the process). Using this particular income information differentiates this study from typical property market analyses which often use (median) household disposable income, although we note that Yates and Gabriel (2006) is an exception. We believe that by using equivalised income the ability of households to access the market will be more accurately reflected as the amount of residual income required after housing costs will differ greatly by household composition.

Dwelling price data was obtained from the Victorian Government Valuer General¹. The top and bottom 2.5% of the price data has been trimmed to account for potential data entry errors in the tails of the distribution in order to minimise the effects of outliers due to errors or the observations that are not typical of the market. The elimination of any “valid” results is expected to have negligible consequences. As there is insufficient data available to match income and house prices across households, we compare percentiles by matching up the xth percentile of the dwelling price distribution with the xth percentile of the income distribution.

Figure 2 presents a plot of the sale price of dwellings compared to household equivalised income in real terms for selected financial years between 1994-95 and 2009-10. While the ABS does not provide income data for all years, all available income data is used in our analysis. The relationship, as expected, is positive, with both income and dwelling sale prices increasing over time for each of the percentiles.

¹ Valuer General residential transactions data, obtained by RMIT University in unit-record form by request from the Department of Planning and Community Development.

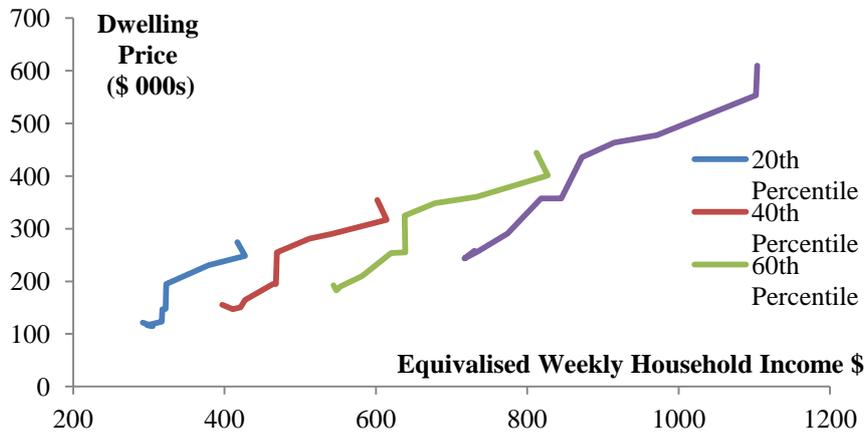


Figure 2. Real dwelling price and real equivalised household income, 1994-05 to 2009-10. Source: the Authors.

The general patterns of all four decile levels appear similar with the most striking feature being the price jump between the financial years 2000-01 and 2002-03. The jump in housing price between these two periods is estimated using the linear regression technique, the results of which are presented in Table 1.

Table 1. Estimated housing price jump, 2000-01 to 2002-03.

Percentile	Estimated House Price Jump from 2000-01 to 2002-03	Ratio of Change in Dwelling Price to Income from 2000-01 to 2002-03
10	46400	3.4
20	56200	3.3
30	58400	2.8
40	62400	2.6
50	71100	2.5
60	70200	2.1
70	76600	2.0
80	53500	1.2
90	75900	1.4

Note: These estimates are guides only as the sample size is small ($n = 11$) in each case. Source: the Authors.

The large upward shifts in housing price from the financial years 2000-01 to 2002-03 indicate that housing accessibility deteriorated dramatically over this time period. The biggest shifts, in absolute terms, are associated with the fifth, sixth and seventh deciles. However, to interpret these values without taking into account the various income levels is misleading. The last column of Table 1 shows the ratio of the price jump to annualised income. The largest ratios pertain to the three lowest income deciles suggesting that lower income earners were the most adversely effected by the increase in price.

3. ACCESSIBILITY AND THE MELBOURNE METROPOLITAN DWELLINGS MARKET

It is commonly accepted that house prices have increased considerably in recent times. Interestingly, using the estimates from the previous section, equivalised income for Victoria in 2009-10 is now 1.5 times larger than it was in 1994-95 (See Table 1.1B, Equivalised Disposable Household Income, VIC in ABS 2011b). This is somewhat smaller than the growth in real house prices which more than doubled over the same period (based on author calculations using Valuer-General data and CPI figures).

This would imply that the ability of households across all income levels (especially low income earners) to access the dwelling market has deteriorated significantly, all other things being equal. In this section we estimate accessibility as the percentage of houses; a household earning at a particular decile could buy, for each of the financial years for which equivalised income is available spanning 1994-95 to 2009-10.

Measuring accessibility requires knowledge about lending practices of financial institutions, in particular, the amounts of funds lending institutions are willing to provide households earning income at various levels. To calculate these amounts the ABS income data was modified to reflect nominal values. In addition three key assumptions were made: the maximum amount lending institutions will provide is no more than 90% of the dwelling price; no more than 30% of the monthly income can be allocated to mortgage repayments and; the duration of the loan is 30 years. In addition, information on interest rates for each financial year was obtained from the Reserve Bank of Australia (RBA) which reflects the average of the standard variable rates at lending institutions.

The maximum purchase prices, subject to the maximum amounts financial institutions will lend, are then compared to the dwelling price of

all units and houses sold within the Melbourne Metropolitan region. Figure 3 presents the proportion of dwellings accessible to households earning at the various percentile levels. This figure clearly shows that the proportion of dwellings accessible for lower income households declined dramatically over the 15 years, while the accessibility for high income earners has remained relatively constant. The 2005-06 peak is most likely attributable to the changes in the Survey of Income and Housing administered by the ABS and therefore this peak is considered to be an aberration in the data rather than a temporary increase in accessibility (see Explanatory Notes for ABS 2007).

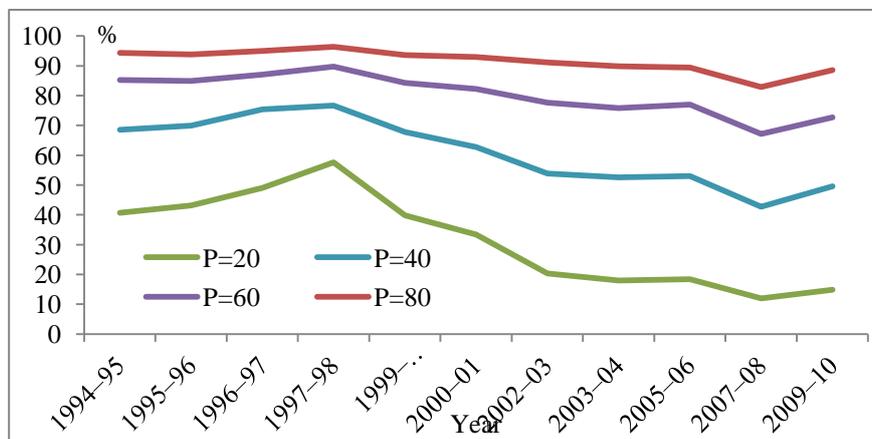


Figure 3. Accessibility by market share by income decile for the Melbourne metropolitan area (missing years imputed), 1994-05 to 2009-10. Source: the Authors

4. DISTANCE FROM THE CBD

Having established that overall accessibility has declined over the 15 year period, this section looks at the area by distance to the CBD. The “negative rent gradient” hypothesis (Alonso 1964) has a long history in the urban economics literature, and suggests that increasing distance from job centres ought to have a negative impact on housing prices. While distance to work is only one dimension of housing quality, it is a dimension that is increasingly policy relevant. This of course assumes that Melbourne is a unacentric, rather than polycentric, city.

To investigate whether accessibility varies according to distance from the CBD the percentage of properties purchasable in a given (financial)

year at the suburb level is considered, according to the borrowing rule outlined in the previous section. Accessibility for households earning at the 20th, 40th, 60th and 80th percentiles are considered for 2002-03 and 2009-10 (note we begin from 2002-03 so that the change in distance prices are not corrupted by the atypical jump in the ratio between equivalised income and house prices observed in Figure 2). The measure of accessibility used is percentage of properties purchasable with a given suburb. Suburbs are divided into eleven groups, the closest being within 5kms of the CBD and the furthest being more than 50kms from the CBD. These distances are worked out “as the crow flies” using longitudinal and latitudinal data provided by the Department of Sustainability and Environment.

Figures 4-6 below illustrate the relationship between accessibility and distance from the CBD for these two financial years. For each income percentile, box and whisker plots are constructed by distance from the CBD. These charts are useful as they summarise the location, spread and shape of our accessibility measure by distance. The unshaded box in each graph represents the financial year 2002-03 whilst the shaded box represents 2009-10. Within each box the bolded line represents the median of our accessibility measure for suburbs between x and y kms of the city, while the lower (upper) boundary of each box represents the 25th (75th) percentiles. In each case the whiskers are capped with a horizontal line that depicts the minimum and maximum.

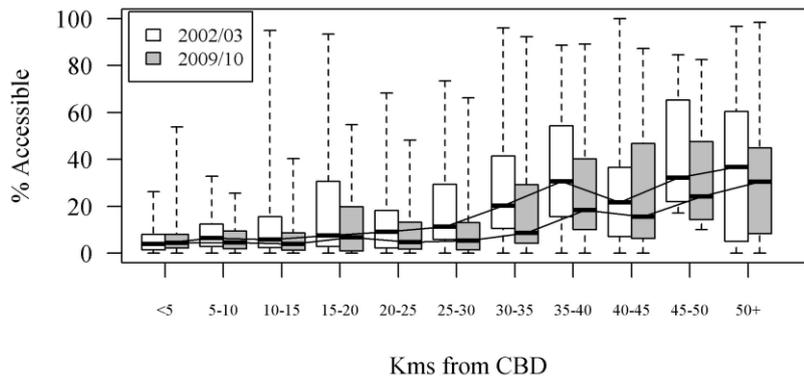


Figure 4. Proportion of properties purchasable by distance for the 20th income percentile. The unshaded box in each graph represents the financial year 2002-03 whilst the shaded box represents 2009-10. Within each box the bolded line represents the median of our accessibility measure for suburbs between x and y kms of the city, while the lower (upper) boundary of each box represents the 25th (75th) percentiles. In each case the whiskers are capped with a horizontal line that depicts the minimum and maximum. (Note: the bottom and top 1% of properties in each suburb have been excluded from this analysis. Further, only suburbs with more than 20 or more sales in the financial year have been included.). Source: the Authors.

Figure 4 presents the percentage of properties purchasable by distance for households on the 20th income percentile. The chart indicates an absence of a trade-off between location and accessibility for this income group in either year for properties within 15 kms of the CBD, given the very limited financial opportunity to purchase properties located within this area. As indicated by the vertical distance between the lines and the reduction in the degree of positive skewness over the period, housing accessibility to suburbs 25 kms and further from the CBD declined significantly for households earning at the 20th percentile. For example, 50% of suburbs between 25 and 30 kms from the CBD had an accessibility measure of more than 15% in 2002-03, whereas in 2009-10 approximately only 25% of suburbs had a similar accessibility measure. Furthermore, the terms of the trade-off between location and accessibility for suburbs 20 kms and further from the CBD generally declined between

the two periods, reflected in a flattening of the curve joining the median accessibility measures for each period.

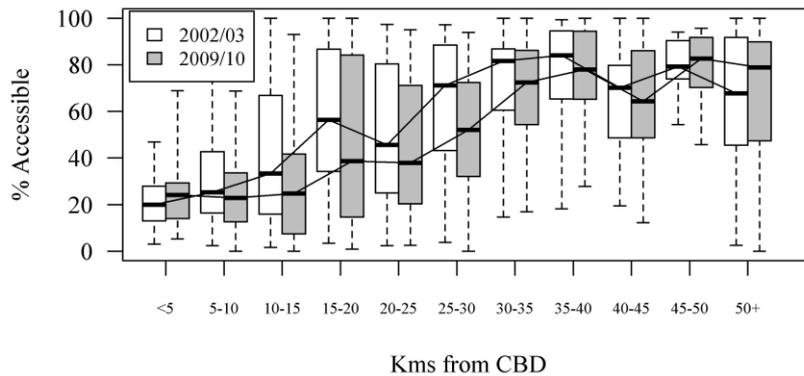


Figure 5. Proportion of properties purchasable by distance for the 40th income percentile. Source: the Authors.

Figure 5 depicts the accessibility for households earning at the 40th income percentile. The relative positioning of the medians and the change in the distribution indicate the opportunity to purchase a property has decreased most noticeably in the case of suburbs between 10 and 45 kms from the CBD. The opportunity to purchase properties more than 45kms from the CBD has, however, marginally improved. The terms of the trade-off between location and accessibility for this income group also generally declined from 2002-03 to 2009-10.

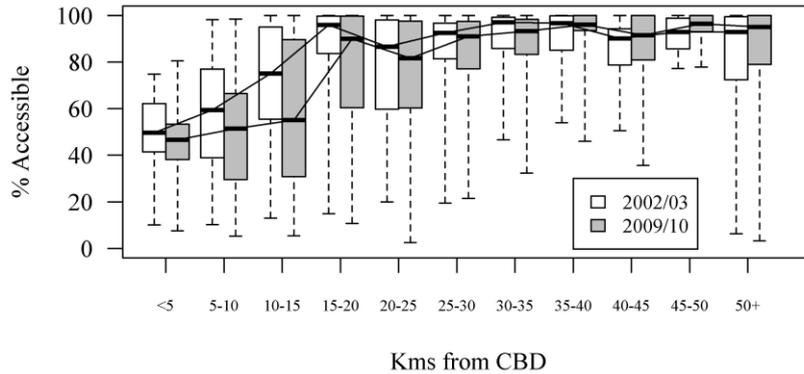


Figure 6. Proportion of properties purchasable by distance for the 60th income percentile. Source: the Authors.

Figure 6 illustrates this accessibility for households earning at the 60th percentile. As expected households earning at the 60th percentile have significantly more opportunity to live in suburbs located close to the CBD. However, the opportunity to live in suburbs 10-15kms from the CBD deteriorated significantly over the period. A striking feature of this graph is that suburbs more than 25kms from the CBD remained highly accessible to households earning at the 60th percentile.

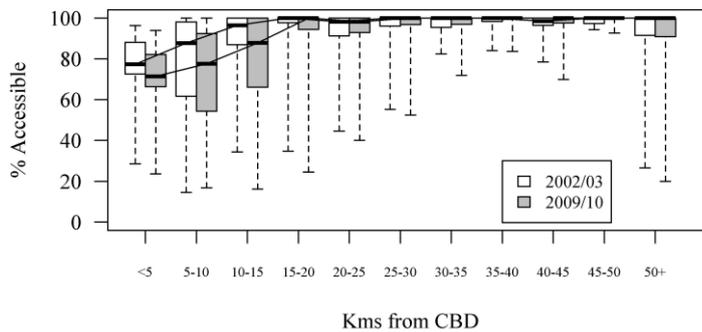


Figure 7. Proportion of properties purchasable by distance for the 80th income percentile. Source: the Authors.

The final category considered is households earning at the 80th percentile. These households have the ability to purchase in most areas of the city with relative ease. Their access to suburbs within 5-10kms of the CBD did deteriorate over the period in question but otherwise they maintained a strong position when it comes to accessibility.

Whilst these findings have indicated a relative decline in accessibility by quantity for the households on the 40th income percentile compared to those on the 60th percentile, we can now consider whether, and to what extent, prospective purchasers on low incomes have also been particularly disadvantaged in terms of accessibility by location. Where a trade-off between accessibility and location exists, the data enables us to estimate the distance away from the CBD a potential purchaser would need to move to maintain accessibility to, for example, 50% of the properties in the median suburb between 2002-03 and 2009-10.

For aspiring home buyers in the 80th income percentile just under 80% of the properties in the < 5 km area were accessible in 2002-2003 while in 2009-10 these households would have needed to move out to the 5-10 km area to maintain the same level of accessibility. Similarly, for aspiring home buyers in the 60th income percentile, approximately 50% of the properties in the median suburb in the < 5 km area were accessible in 2002-03. In 2009-10, approximately 50% of the properties in the median suburb in the 5-10 km area were accessible to these aspiring purchasers. This represents an increase in the "distance price" of 5 km between the two periods for the same rate of accessibility for both the 80th and 60th income percentiles. For aspiring home buyers in the 40th income percentile, approximately 50% of the properties in the median suburb in the 15-20 km area were accessible in 2002-03. In 2009-10, approximately 50% of the properties in the median suburb in the 25-30 km area were accessible. Low income purchasers would have needed to move 10 km further out between the two years to maintain the same rate of accessibility. The relative decline in dwelling accessibility for prospective low income purchases is reflected in this significantly higher "distance price".

Importantly, our findings are consistent with previous research, such as Wood et al (2008), Landsell et al. (2009), and Wood and Ong (2009). However, unlike previous findings we have shown that the accessibility has deteriorated for middle and higher income earners and provided an estimate of the distance price for these cohorts. Further, we have shown that this deterioration has happened over a short period of time.

In addition to estimating a distance price we are also able to gauge changes in the degree of socio-economic diversity by geographic area (note that this analysis does not incorporate the contribution that public or community housing may have made to socio-economic diversity over time). Declining diversity is indicated by a downward shift in the box and a narrowing of the whiskers. For example, in Figure 4 the distribution of the accessibility measure of suburbs beyond 5 kms from the CBD suggests lower income earners have reduced opportunities to participate in these housing markets. Interestingly for households earning at the 40th and 60th deciles (Figures 5 and 6) a similar pattern is observed, suggesting declining diversity is particularly acute in suburbs 15 kms from the city.

These findings of diminished locational choice are policy relevant given the importance of location. In the next section we draw upon past research that has shown that dwelling location is an important determinant of a household's wellbeing.

Broader Implications of Reduced Location Choice

The most common factor cited as influencing where households choose to live is income. Accordingly, a lot of research has focused on the link between housing and the labour markets (O'Connor and Healy 2002; Bradbury and Chalmers 2003; Yates et al. 2006). Notably, Dodson (2005, 7) commented that "the housing market appears to be acting as a mechanism through which socio-economic status, as determined by the metropolitan labour market is distributed, and in many cases concentrated." This has led some to suggest that this theory provides some insight into the socio-economic marginalisation that has been occurring in Australian cities in the past several decades (Winter and Stone 1998; Black et al. 2009).

Regional homogenisation has been an ongoing area of policy debate for decades. Proponents of diversity (for example Audretsch and Thurik 2001) argue that diversity drives innovation and therefore growth. Diversity has also been viewed as an important mechanism to address a number of problems associated with concentrated poverty and community disinvestment. In the context of our findings we suggest that areas closer to the CBD are becoming more homogenised in terms of socio-economic status and household type, as the choice of location for middle and lower income earners has diminished.

In terms of socio-economic status our distance cost estimates a lower level of occupational diversity of residents in these areas. It is also probable that would be first homebuyers may also be crowded out by

wealthier households looking to upgrade their dwelling, suggesting a change in the age characteristics of homeowners in these areas.

While income and occupation influences a household's ability to purchase in a particular location, all households negotiate trade-offs between housing costs and commuting time (Yates and Gabriel 2006), locational amenities such as employment prospects, nearby shops and parks (Bradbury and Chalmers 2003), house and lot size (Wulff et al. 2004), and environmental hazards (Levy 2009). For example, when looking at low income households, the literature suggests that while single person households are more likely to live near the city centre, single- or 2-parent households tend to be in middle to outer areas of the city (Vipond et al. 1998; Wulff and Evans 1999). There are a variety of reasons for this demographic split suggested in the literature, for example the inner city lifestyle being associated with a particular life stage and suburban living with another (Wulff et al. 2004).

Our results show (in general) that lower and middle income households are facing increasing difficulty in accessing inner city markets and therefore are potentially having to make a difficult decision between high housing costs and high transport costs. This in turn may be leading to increased housing affordability stress – that is as cost of living (of which transport is an important component) increases, the ability to comfortably service mortgage repayments diminishes.

Importantly, this problem may be exacerbated by the way in which mortgages are assessed. By ignoring the impact of transportation expenses on the household budget, banks make outer suburban homes appear more affordable than they really are (Dodson and Sipe 2008; Lansdell et al. 2009). The consequence of not measuring affordability adequately is particularly problematic for lower income households, those that have been forced to move further away from the CBD. Furthermore, outer suburban households are more vulnerable to increases in oil prices because of their car-dependency (Dodson and Sipe 2008).

Limitations

Our analysis indicates that there has been a significant deterioration in homebuyers' ability to enter the housing market, markedly so for low income households. Although we believe our results are robust and generalisable there are two limitations that are worth noting.

The borrowing rule we use is restrictive. It does not take account of financial innovation in the form of low doc loans for example. Neither

does it take account of intergenerational gifting and government programs such as the First Home Owners Grant which have been engineered to help some first time buyers in purchasing their own property.

Interestingly Yates (2007) discusses intergenerational gifting as a potential source for bridging the affordability pressures felt by present day would-be home buyers. It is difficult to establish how widely spread it is practiced. It does imply however that children of low income earners, especially those whose (grand)parents do not own their own property, are significantly disadvantaged in the current climate.

A further limitation, suggested by O'Connor and Healey (2002), is that moving out to the city fringes may not increase locational disadvantage, due to the increasingly polycentric nature of our cities, and to "a complex set of trade-offs between limited local job availability on the one hand, and open space, the newness of an area, cultural compatibility and access to various other amenities and lifestyle options on the other." (O'Connor and Healy 2002, 54).

5. CONCLUSION

The opportunity for first home buyers to purchase a dwelling in the Melbourne Metropolitan area has deteriorated significantly in recent years. This paper explores changes in dwelling accessibility by quantity and quality over time for different income levels. Both accessibility measures provide policy relevant information that is often missed in other housing affordability analyses. Low income households appear to have faced the greatest deterioration both in terms of their ability to purchase a dwelling and the trade-off between ownership and location. While even households earning in the upper middle range of incomes have significantly less opportunity to purchase a dwelling within close proximity to Melbourne's CBD than previously, those on lower income have seen the most significant increase in the "distance price" needed to maintain an average level of housing affordability. Our findings suggest a need to further investigate effective policy responses. As inner city areas are becoming more and more inaccessible for low income earners, the effectiveness of policy initiatives such as the Clarence Valley Affordable Housing Strategy (Tiley and Hil 2010) need to be appropriately assessed in terms of their ability to increase the provision of affordable housing in inner CBD areas.

Further, the effectiveness of government policies such as the first home owners grant (FHOG) need to be properly assessed. Importantly, the

FHOG has been criticised in the past (Freebairn 1999) and has arguably fuelled the affordability problem.

Richer data that provides information on other aspects of dwelling quality would be useful to further explore changes in the nature of the quality-accessibility trade-off over time for households on different levels of income.

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