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### Policy Brief No. 1/16

Housing Affordability:  
How Important Is the Lending Rate?

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## **Abstract**

Housing affordability in Australia has been declining for some time, but is it across all states or mainly in Sydney and Melbourne? Are there spill-over effects (i.e., transmission of changes in one state to the rest of Australia)? Has the problem been exacerbated by a long period of low interest rates which have acted to fuel borrowing for housing without stimulating growth in household income? We examine the regional differences in housing affordability and its relationship with economic and demographic conditions.<sup>1</sup> We find evidence of the influence of population growth and unemployment and spill-over effects. The influence of interest rates is particularly significant as there appears to be a critical lending rate threshold. When mortgage rates fall below this critical threshold, the probability of sharp rises in house prices, especially in Sydney and Melbourne, is high. The results have clear implications for the National Affordable Housing Agreement, particularly since it is during periods of significant appreciation that the issue of affordability is most important.

**JEL classification:** R31, E40

**Keywords:** Housing affordability, house prices

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<sup>1</sup> The results are largely sourced from the empirical work presented in Lim and Tsiaplias (2016), and readers are referred to this paper for details regarding data and model estimation.

## 1. Introduction

Understanding the determinants of housing affordability is clearly important as the majority of Australians have revealed preferences for owning their own homes. The Great Australian Dream of home-ownership features prominently in economic and social discussion, and in 2008 the National Affordable Housing Agreement (NAHA) was established as a commitment between the Commonwealth of Australia and the States and Territories. Pursuant to the NAHA, the Council of Australian Governments (COAG) Reform Council was required to report on a number of performance indicators related to housing affordability and homelessness.

Housing affordability in Australia has risen and fallen over the years, reflecting changes in economic and demographic conditions. For much of the last two decades, Australia was fortunate enough to avoid the significant economic downturns associated with crises such as the Asian crisis in 1997, the US downturn in the early 2000s and the Global Financial Crisis (GFC) in 2008 (Lim et al. 2010). Spurred by a commodities boom, Australia experienced strong economic growth and sharp declines in its unemployment rate. Despite a strong growth in population, particularly prior to the GFC, housing affordability actually improved as the growth in income outpaced the growth in house prices.

The terms of trade have since turned unfavourable and the state of the economy in the last three years has been one of below-trend growth with an unemployment rate hovering around 6 per cent (a significant increase from the 5 or so per cent observed in 2011 and early 2012). Since 2011, in an effort to stimulate growth in interest-sensitive expenditures, the official cash rate has been cut from 4.75 per cent to 2.0 per cent in a series of 10 rate cuts and has been at the 2 per cent level for the last six months. However, there has been little evidence of a surge in spending. Instead, during this period, house prices have appreciated at a considerably faster rate than wages thereby resulting in a sharp decline in housing affordability levels. In line with declining affordability, the proportion of renter households has also increased, along with rental prices.<sup>2</sup>

Falls in housing affordability are especially onerous for lower-to-moderate income households, reducing their capacity to access the housing market and increasing their debt service and financial stress. While the influence of microeconomic factors is important, our concern here is with the influence of broader macro factors. In particular, what is the role of monetary policy? Will leaving rates too low for too long be favourable or unfavourable for housing affordability?

The aim of this brief is to summarise the results of the empirical work in Lim and Tsiaplias (2016). Section 2 examines the path of housing affordability over the last two decades and considers the time-varying importance of key macro factors such as population and unemployment. Section 3 discusses the role of the lending rate and the econometric finding that there is a threshold rate below which house prices are more likely to escalate. Section 4 considers the spill-over effects of the Sydney and Melbourne housing markets. The brief concludes with some implications of the results for the NAHA.

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<sup>2</sup> The Australian Bureau of Statistics' Survey of Income and Housing shows that the proportion of renter households with a reference person aged 25–34 rose from 47.8 per cent in 1995–96 to 59.5 per cent in 2013–14.

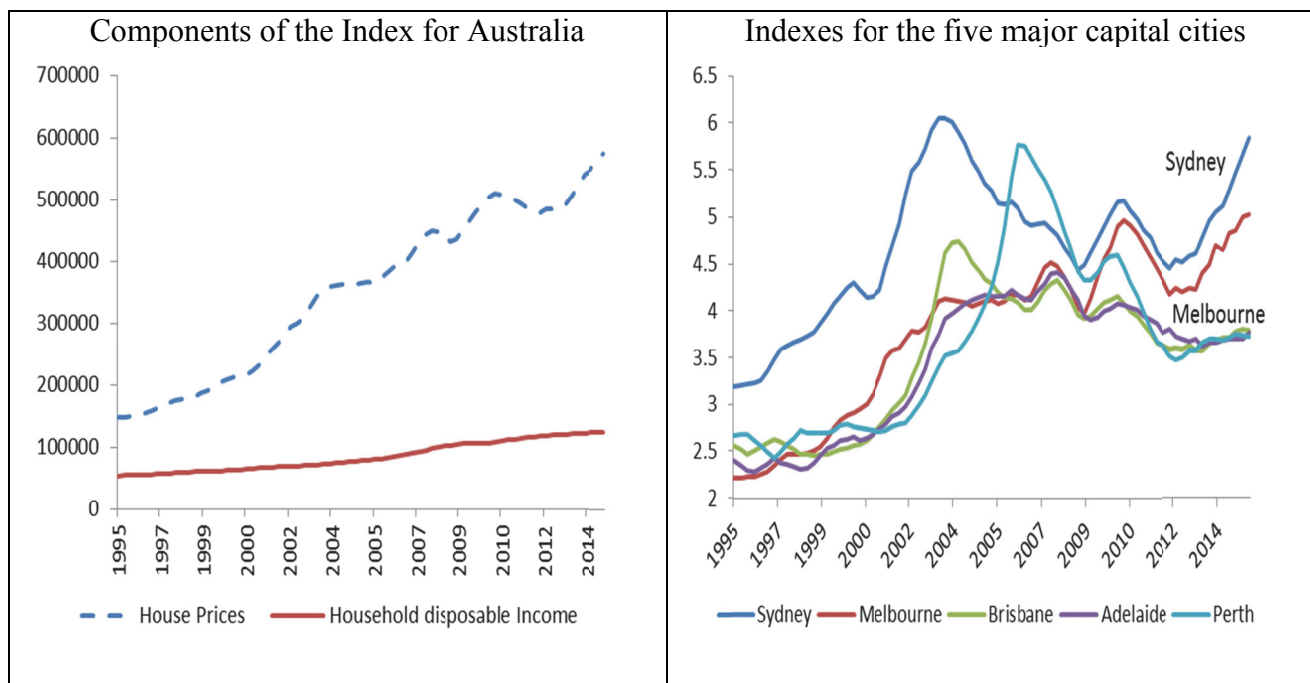
## 2. House price changes and growth factors

Figure 1 shows the relationship between the two components commonly used to infer housing affordability. The left-hand graph shows that growth in the nominal value of houses has outpaced growth in household disposable income. However, this behaviour has not translated linearly to the capital cities, as the right-hand graph shows the cyclical, and at times divergent, paths of housing affordability (the ratio of house prices to disposable income) for Australia's five largest capital cities.

In the mid-1990s, house prices were typically about 2.5 times greater than household disposable income for each of the capital cities except Sydney. In Sydney, house prices were approximately 3.2 times the disposable income of a typical Sydney household. However, with house price growth exceeding household income growth, house price to income ratios rose sharply in the 1990s and early 2000s for all capital cities. By 2005, Perth house prices had risen faster than any other major capital, with Perth surpassing Sydney as the least affordable city. In the last decade, the house price to income ratio has exhibited cyclical, falling relatively sharply in 2008 in response to the GFC, before rising and then falling again in 2011 as commodity prices fell heavily and many economies (particularly in Europe) experienced a post-GFC economic slowdown.

The house price to disposable income ratio explicitly reflects the extent to which house price appreciation has exceeded income growth. In the following sub-sections, we focus on explaining the impact of three key significant factors on housing affordability. These are population growth, the unemployment rate and interest rates.<sup>3</sup>

**Figure 1: Housing Affordability Index (house price to disposable income ratios)**



Note: An increase in the Index means that housing is less affordable.

<sup>3</sup> We have also considered other factors, such as consumer sentiment and share market performance, but in this brief we focus on the three most important factors.

## Population

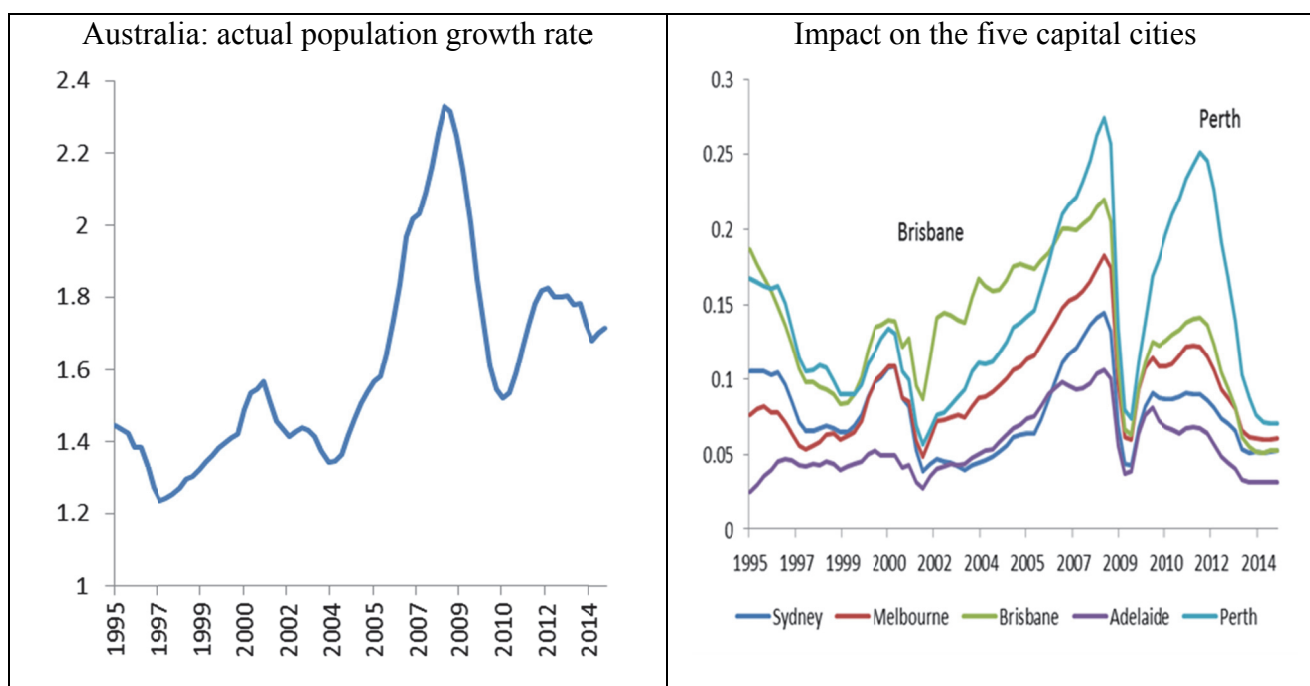
Figure 2 shows the estimated role of population growth in housing affordability. The left-hand figure shows the growth in population in Australia. Note the surge in the years prior to the GFC (from about 2004 to 2008), the collapse thereafter and the stabilisation of population growth from around 2011.

In general, population growth adds to the demand for housing and puts pressure on house prices, unless there is an offsetting increase in the stock of housing and/or a surge in household income (*ceteris paribus*). As shown in the right-hand figure, population growth contributed significantly to house price appreciation across each of the capital cities over the period 2002 to 2007, fell sharply around the GFC, rose and then fell again.

A quick look at the impact of population growth on housing demand across the capital cities shows that the impact was greatest for Perth and Brisbane, particularly for the former. Overall, changes in population growth appear to have induced significant volatility in the Perth housing market, resulting in sharp shifts in housing demand (and housing affordability) since 2007.

In contrast, the recent impact of population growth has been relatively small for the remaining capital cities. In particular, the substantial decline in Sydney and Melbourne affordability levels observed in the last two years (see Figure 1), does not appear to be a function of population growth. Adelaide appears to be the least affected.

**Figure 2: Estimated impact of population growth on the Housing Affordability Index**



Note: The estimated impact of population growth on housing affordability is based on the results reported in Lim and Tsiaplias (2016). The results are obtained from a non-linear threshold model and the estimated impact represents the response of housing affordability to population growth rates.

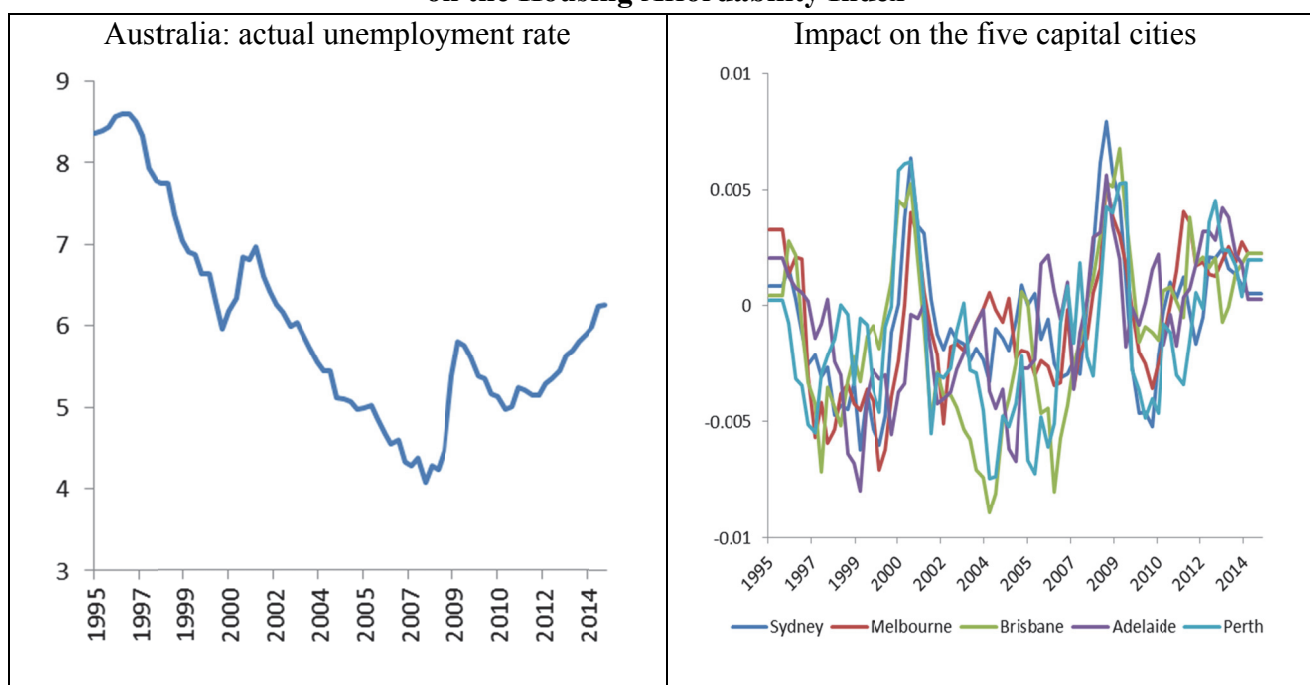
## Unemployment

Labour income is another important component of the determinant of housing demand and we have used the unemployment rate to reflect the macroeconomic influence of labour market effects. The left-hand figure in Figure 3 shows the steady fall in the unemployment rate from around 8.5 per cent in the mid-1990s to a low of just above 4 per cent prior to the GFC. The unemployment rate has since risen to be above 6 per cent.

We find that housing affordability is more sensitive to the change in the unemployment rate rather than the level of the rate. In other words, it is the change in circumstances that appears to have had the greater effect. Since changes are quite volatile, we have presented the smooth estimated impact of the change in the unemployment rate on housing affordability (house price to household income ratios). These are shown in the right-hand figure for each of the five capital cities.

In general, changes in employment conditions have a small but statistically significant impact on housing affordability, including improving the capacity to purchase a house. The impact has also tended towards an improvement in affordability for much of the sample period, with affordability declining during the GFC and the downturn in the early 2000s. However, changes in the unemployment rate do not appear to be the key driver of the recent decline in affordability for Sydney and Melbourne. Although the figure suggests that unemployment conditions appear to be associated with some of the cyclicalality observed in housing affordability levels, these conditions fail to explain the significant divide observed in recent years between housing affordability levels in Sydney and Melbourne with those in other cities.

**Figure 3: Estimated Impact of the change in the unemployment rate on the Housing Affordability Index**



Note: The estimated impact of the change in the unemployment rate on housing affordability is based on the results reported in Lim and Tsiaplias (2016). The results are obtained from a non-linear threshold model and the estimated impact represents the response of housing affordability to changes in the unemployment rate. Figure 3 (rhs) is smoothed using a 5-period moving average to better represent the peaks and troughs of the variable's impact.

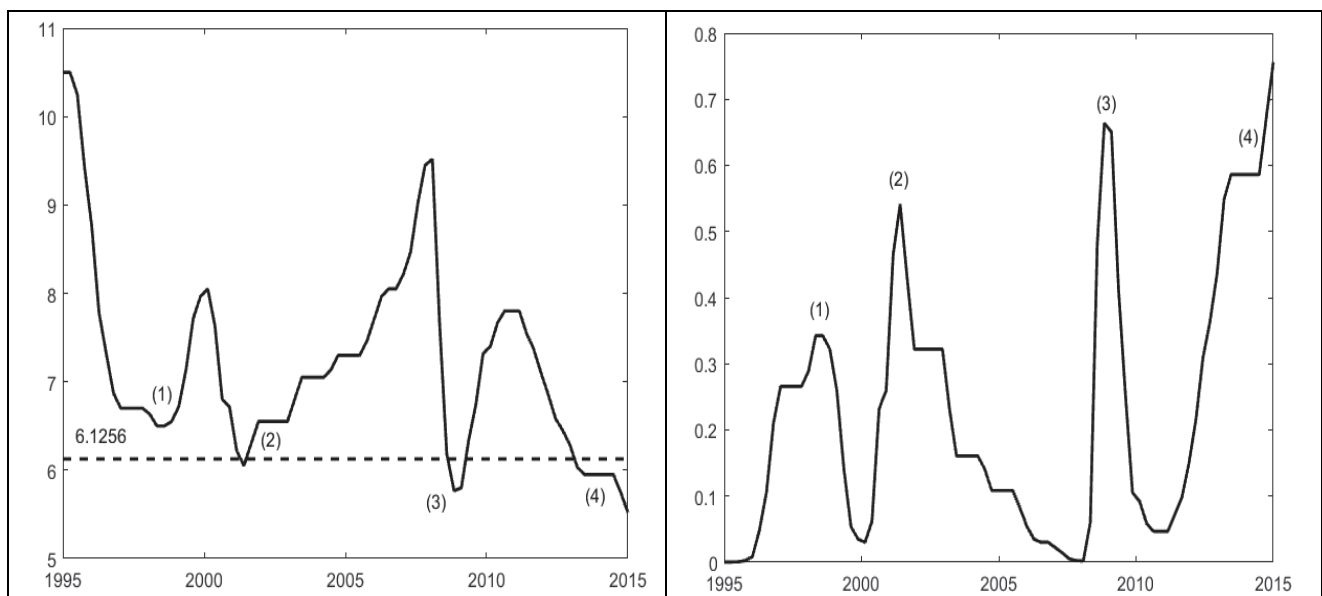
### 3. The impact of interest rates

Our empirical analysis shows that the relationship between house prices and interest rates is non-linear and that there is a critical threshold rate (about 6.1 per cent). When the standard variable mortgage rate rises above the threshold the effect is to discourage borrowing, dampen demand for housing and generally improve housing affordability. In contrast, when the mortgage rate falls below the threshold, investor activity increases dramatically, resulting in price-feedbacks that statistically appear as explosive processes in the house price.<sup>4</sup>

We can express the finding more generally by inferring the probability of a housing bubble (i.e., ‘explosive’ house price growth) as a function of lending rates over the last two decades.<sup>5</sup> As shown in Figure 4, there were four occasions when the probability of escalating house prices and declining housing affordability spiked. The spikes correspond with the four major periods of expansionary monetary policy observed in the last two decades.

Standard variable mortgage rates were close to 11 per cent in the mid-1990s, and over 9 per cent prior to the GFC. Rates also fell sharply following the Asian crisis in 1997 and following the GFC. Currently, standard variable rates are close to record lows (2 per cent) thereby indicating that the probability of instability is quite high. In particular, using data to the end of 2014, the probability of a sharp fall in affordability (such as that observed in Sydney in 2015) was around 60 per cent. Overall, our research suggests that the mortgage rate appears to be particularly important in explaining the house price appreciation observed in recent years.

**Figure 4: Interest rate movements and the probability of explosive house price growth**



Note: The figure on left is the mortgage lending rate, whereas the figure on right is the probability of explosive house price growth. The horizontal line in the lending rate figure represents the ‘stability’ threshold at which prices can become explosive. The four enumerated episodes are: (1) the Asian Financial Crisis; (2) the 2001 US recession; (3) the Global Financial Crisis; and (4) the ‘zero lower bound’ period reflecting close to zero interest rates in the US and Europe.

<sup>4</sup> Interestingly, during these periods, the relationship between house prices and other demographic or employment conditions becomes less clear and, in fact, appears to no longer be statistically significant.

<sup>5</sup> See Phillips et al. (2011) for more information about explosive processes.



#### 4. Spill-over effects of housing affordability changes in Sydney and Melbourne

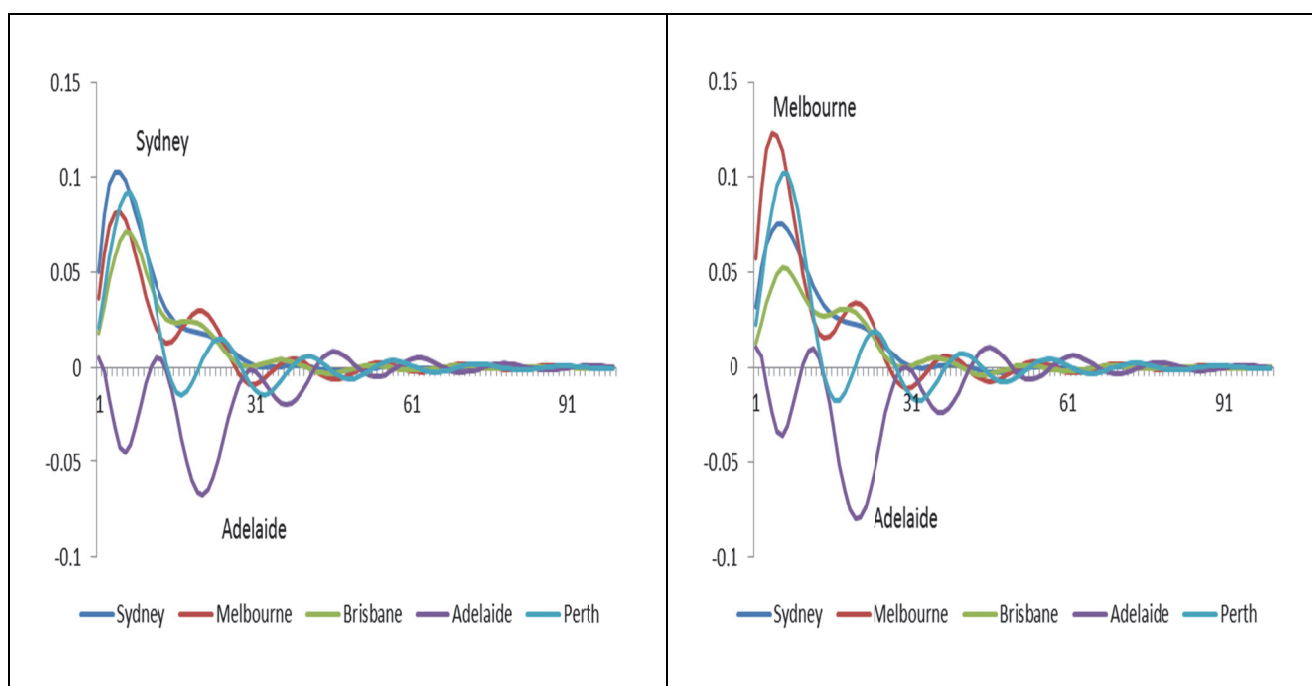
The extent to which housing markets are integrated or segmented has policy implications for a two-speed economy like Australia. The more integrated the housing markets, the greater the spill-over effects of negative housing affordability shocks from the states with high growth to the states with low growth (thereby adding further pressure to their macroeconomic situation).

Figure 5 shows the house price response to shocks in each of the two largest cities in Australia during ‘normal’ interest rate periods. We classify normal interest rate periods as those when interest rates are above the threshold (and hence the probability of the house price to income ratio becoming explosive is low). During these periods, a shock that increases the house price to income ratio in either capital city has wider affordability implications for the remaining capital cities.

In particular, a rise in the house price to income ratio for Sydney (Figure 5 (rhs)) also causes a rise in the relevant ratio for the remaining capital cities (with the exception of Adelaide, which appears to be less integrated than the remaining capital cities). The impact of a price shock in Melbourne (Figure 5 (lhs)) is similar to that of Sydney, although the magnitude of the impact on Sydney and Brisbane is smaller. In particular, Brisbane is clearly more susceptible to a shock emanating from Sydney, whilst Adelaide does not appear to be particularly receptive to either shock.

The inter-relationship observed between Sydney and Melbourne house prices with those in other cities is, however, significantly more ambiguous in low interest rate environments. When interest rates are sufficiently low (viz. below the threshold), sharp price increases do not appear to be directly related to factors such as demographic or employment conditions. Instead, price feedback effects increase for Sydney and Melbourne, with spill-over effects being weaker, such that the overall effect is one that tends to induce asymmetric (or two-speed) housing markets.

**Figure 5: House price response to shocks in Sydney and Melbourne**



Note: Left (right) figure represents response to Sydney (Melbourne) shock.

## 5. Implications for the NAHA objectives

The aspirational objective of the NAHA is to provide Australians with access to affordable, safe and sustainable housing. As part of this objective, it is important to measure geographic and time variations in housing affordability and to examine the factors that are relevant to housing affordability. In this respect, we augment the body of anecdotal evidence about the importance of various factors with an empirical assessment of some of the factors relevant to housing affordability. We focus, in particular, on the impact of interest rates, population growth and unemployment. We find that, although all three factors are relevant, the impact of interest rates appears to be the most significant (with different spill-over effects above and below the threshold lending rate).

Since the NAHA was enacted in 2008, the house price to income ratio has appreciated sharply. The relative pace of house price appreciation to income growth has been particularly pronounced in the last two years thereby hampering the capacity of households, particularly those with low to moderate income levels, to access affordable housing. As interest rates have fallen below normal levels, house prices have risen sharply and it is during this period that the focus on housing affordability measures should be greatest.

As noted in the introduction to this brief, the proportion of renter households has increased in the last two decades, particularly for households in the 25–34 year old age bracket. Rent levels have also increased, rendering it increasingly difficult for low to moderate income households to purchase or to rent. Given both the increasing number of renter households, and the wealth ramifications associated with a negative housing shock (which can have flow-on effects for household consumption levels), it seems prudent to also focus on rental markets. In particular, measures aimed at the minimisation of rental risk and the introduction of incentives that encourage the provision of longer term leases should also be considered as sensible means for improving longer-term access to housing.

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