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Home price beliefs: Evidence from Australia ☆

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ABSTRACT

New facts are documented about self-assessed home valuations using household panel data and a near-census of home sale prices. Between 2002 and 2012, homeowners' display a small positive bias of around 1% in estimating the market value of their homes, although there is considerable dispersion in beliefs and prices. Household characteristics, including age, tenure, and income and local area characteristics, such as unemployment, are associated with differences between beliefs and prices. The extent of overvaluation is positively associated with household spending, leverage and risky-asset holdings. Over the housing cycle, homeowner valuations appear less volatile than sale prices and are backward-looking; homeowners also learn from past 'errors'. These facts support recent literature on the importance of belief formation for household decision-making.

As the real estate agent said, 'Location, location, location', and we're right next door to the airport. It will be very convenient if we ever have to fly one day.

Dale Kerrigan, The Castle (1997)

1. Introduction

Housing is the largest component of household wealth in Australia. Variation in housing prices has been shown to be important for household leverage, portfolio allocation decisions and consumption (Ellis et al., 2003; Kohler and Smith, 2005; Berger-Thomson et al., 2009; Windsor et al., 2013). However, timely data on the prices of individual homes are not readily available. For this reason, households are typically required to infer or form a belief about the value of their home when making these economic decisions. As the quote above from the Australian film *The Castle* illustrates, these beliefs can be quite subjective.

This paper explores homeowners' beliefs about housing prices in Australia. Our goal is to provide insight into the differences between homeowners' beliefs and market-inferred home sale prices, and whether these are important for economic decision-making. Our paper makes three contributions:

1. We estimate the difference between beliefs and prices (hereafter 'home valuation differences') in a way that is free of recollection bias.
2. We explore correlation between home valuation differences and various household characteristics (for example, age, income and education), the local area unemployment rate and a proxy for housing market information (the tenure of ownership).
3. We investigate whether the size of home valuation differences across neighbourhoods is correlated with household spending, leverage and the share of risky assets held in households' financial portfolios.

Understanding how well Australian homeowners assess the value of their homes is important for a number of reasons. First, self-assessed home values sourced from

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household surveys are the main source of data used to measure the distribution of household wealth (and related financial indicators, such as leverage). If homeowners do not accurately value their homes, then survey measures of household wealth may be biased. For example, if home valuation differences vary systematically with age then the estimated age profile of household wealth using self-assessed home values will be biased, giving a misleading picture of the actual distribution of wealth by age.

Second, by focusing on the distribution of average differences in beliefs and prices across neighbourhoods, our approach provides insight into alternative theories of homeowner belief formation. In particular, we consider whether beliefs are unbiased on average (rational) or whether there is skewness in beliefs that could reflect optimism or pessimism. Some models of decision-making under uncertainty that focus on factors such as robust control (Hansen and Sargent, 2008; Bidder and Smith, 2012) and ambiguity (Epstein and Schneider, 2008) predict that some households may hold pessimistic beliefs and therefore undervalue their homes.

In contrast, Genesove and Mayer (2001) show that loss aversion may cause some homeowners to hold optimistic beliefs relative to market-inferred prices when prices are declining. Likewise, the recent literature on optimism and other rational biases (see, for example, Van den Steen, 2004 and Brunnermeier and Parker, 2005) predicts that some households may hold optimistic beliefs and hence overvalue their homes. In particular, households may trade off the utility gains from optimism with any costs from making distorted decisions because of overvaluation. We provide empirical evidence that speaks to these alternative theories of belief formation.

A novel feature of our paper is the data we use. Our data include a census of all sales in Australia's three largest cities, Sydney, Melbourne and Brisbane and cover around half of all sales in the Australian housing market. These data also cover several dwelling price cycles and a much longer time span than comparable best-practice studies (see, for example, Agarwal, 2007 and Henriques, 2013). This permits more accurate inference about the determinants and effects of beliefs over the full dwelling price cycle, rather than being conditional on a single market upswing or downturn in prices.

We use hedonic regressions to measure the average price of homes in a homeowners' locality (at a very disaggregated level) and match it to the timing of self-assessed home valuations. By using this alternative method, differences between market-inferred and self-reported values can be measured in a manner that is free of bias in the homeowner's recalled purchase price, and that is free of any distortion that occurs from using a price index for a broad geographic region to estimate the market value of an individual home.

The early research instead compared estimates of housing prices by homeowners and professional appraisals.[1] The literature has also compared self-assessed home values to recalled sale prices. For Australian homeowners, Melser (2013) assesses home valuation differences in this way and finds a positive bias of around 4%. In other studies, homeowners that have recently moved are surveyed and asked to make an assessment of the current value of their homes, as well as recall the original sale price of their homes. Local housing price indices are typically used to control for the passage of time between the current estimate and the initial purchase price.[2]

The limitation of these approaches are the small samples of recalled purchase prices (generally less than 1,000 observations); their inability to distinguish between valuation bias and recollection bias;[3] and their reliance on external indices to update self-assessed home values.[4]

In contrast to previous literature, we find that homeowners' home price beliefs exhibit only a small positive bias of around 1%. In terms of the absolute differences, we find that half of the average home valuations fall within 11% of the average market value across neighbourhoods. However, while beliefs are essentially unbiased on average, we do find statistically significant differences between average beliefs and average sale prices for many neighbourhoods. In particular, a relatively large share of neighbourhoods are undervalued (have a significant negative valuation difference) and a relatively large share of neighbourhoods are overvalued (have a significant positive valuation difference).

Certain average household characteristics are correlated with valuation differences. In particular, neighbourhoods with older homeowners and higher disposable income are more prone to overvalue their homes, on average. In contrast, regions with relatively high unemployment are more likely to undervalue their homes, on average, while regions in which homeowners have lived for a long time (have greater information) tend to have more accurate valuations.

We also explore how home valuation differences are associated with households' consumption and financial decisions – that is, we examine whether beliefs matter. We find evidence that valuation differences are positively associated with spending, leverage and the allocation of

[1] For example, Kish and Lansing (1954) and Kain and Quigley (1972). However, Robins and West (1977) showed that homeowners and professional appraisers assess the value of homes with the same degree of inaccuracy.

[2] See, for example, Ihlanfeldt and Martinez-Vazquez (1986), Goodman and Ittner (1992), DiPasquale and Somerville (1995), and Kiel and Zabel (1999).

[3] In Appendix B we directly estimate the degree of recollection bias and find that surveyed homeowners understate the purchase price of their homes by 3.4%, on average. McCarthy and McQuinn (2014) also find that some households, in particular those that are mortgaged, display significant 'error' in recalling the actual price paid for their properties.

[4] A recent paper by Henriques (2013) is an exception. For a panel of non-moving US homeowners, Henriques compares the growth in self-assessed home values over the period 2007 to 2009 for each homeowner to the growth in regional house price indices. She finds that the median home valuation difference on the rate of change in housing prices is around 2.5%. Agarwal (2007) is another exception. The benchmark housing price data used in this US study comes from homeowners' financial institutions, with the financial institution's estimate of the market value coming from the Case-Shiller repeat sales index. However, despite both of these studies having access to market values, they only have access to self-assessed home values for particular periods. Agarwal uses observations from households who engaged with a particular financial institution in 2002, while Henriques uses observations from homeowners who were surveyed in 2007 and 2009, in the midst of the US housing downturn.