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House price cycles in Australia's four largest capital cities

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ABSTRACT

The aims of this paper are twofold. First, we propose a threshold cube equation, augmented with the optimal number of autoregressive terms, to model the likely future path of house prices in Australia's four major capital cities. The proposed framework can be adopted to simulate house prices in other cities experiencing similar price cycles (spirals) such as London and Vancouver. Second, using a proprietary dataset not publicly available (1995m12–2015m10), we use the proposed model to simulate house prices in Brisbane, Melbourne, Perth and Sydney, which have been on a steep upward trajectory since 2013. To check the sensitivity and robustness of our results, we evaluate the model in terms of the out-of-sample accuracy for two separate 12-month periods. We find that the forecasting performance of the model appears to be reasonable. Then we use the model to provide the ex ante future path of house prices during the next twelve months (2015m11–2016m10). Although we do not seek to forecast all see-saw changes in property prices, based on the historical length of boom and bust cycles in the past, some interesting overall price paths are detected. It is observed that during the next year house prices in all capital cities will start plateauing with some likely moderate falls. This downward price adjustment is particularly more noticeable in Perth.

1. Introduction

House prices in Australia are considered among the most expensive in the world (Worthington, 2012). House price levels in Australia's major capital cities have been a continual topic of debate within the popular press, and general economic policy forums. The issue of housing affordability and the influence of negatively geared property investments have been major points of debate and proposed policy changes during the 2016 federal election campaign. Importantly in an international context Australian housing markets remain of interest to the international research community due to the lack of significant price declines in major housing markets that has characterised other major economies in the post-GFC era.[1] Aston (2015) argues that the Australian real estate market is on the verge of the largest housing price adjustment in living memory with Melbourne being at the epicentre of this "bloodbath". Duke (2015) supports the view that the oversupply of apartments makes Melbourne more vulnerable to a price correction than Sydney. He believes that the current situation is worse than

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[1] See Costello et al. (2011) for a detailed overview of Australian and international housing markets responses to the GFC.

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those witnessed in the 1880s, 1920s, mid-1970s and late 1980s.[2] If true, the market will require sizeable price adjustments to restore and reflect economic fundamentals. Lannin (2015) of the ABC News reports that the Reserve Bank of Australia's (RBA) deputy governor supports the view that house prices in Sydney will soon fall due to the increasing supply of new housing in the market.

The national housing debate during 2016 appears to have settled around three significant areas of general agreement. First, the existence of important regional disparities in house price levels and price changes in Australia's capital cities. Most commentary with respect to a potential housing bubble has focused on Sydney and Melbourne with general recognition of stable or declining house prices in other major capital cities. Second, recognition that the influence of monetary policy to uniformly impact upon house prices across the nation is now limited due to the record low level of official interest rates. Third, increasing discussion supporting the role of non-monetary policy interventions into housing markets in order to (i) increase supply of housing and (ii) regulate lending practices to avert the adverse consequences of significant declines in house prices.

In this paper we take a time series approach that utilises systematic patterns in the data to develop in and out-of-sample simulations of house prices in four of the largest capital cities in Australia We make several important contributions to the literature. First, we use a new and important data source, the patented CoreLogic Index (also available from Sirca). This index has been specifically developed as a reference asset for the settlement of exchange traded property index contracts. The accuracy and robust characteristics of this index make it preferable to other indices such as the Australian Bureau of Statistics' (ABS) quarterly median house prices previously used in studies of this type. We use compiled data to create a higher frequency time series (monthly) than has typically been used. Our empirical objectives are to examine the statistical properties of time series data for Australia's major capital cities and to evaluate the in-sample and out-of-sample forecasting characteristics using an augmented threshold cube equation model. To our knowledge, this is the first study to use this model format for the analysis of time series data for major Australian housing markets. Finally, our out of sample forecasts may be useful in the current environment. Our analysis indicates that prices should plateau towards the end of 2016 followed with some likely price falls (adjustments).

The rest of this paper is structured as follows: The literature is reviewed in Section 2. The empirical methodology is succinctly presented in Section 3 followed by a discussion of the data in Section 4. Estimation and forecast results are given in Sections 5 and 6 concludes the paper.

2. Literature review

The historical record suggests that booms and busts in house prices can occur in a relatively short period of time but it may take several decades for the economy to pick up afterwards, a view supported by Ergas (2015, p. 16) who posits that "the greatest damage asset price bubbles cause is not the price gyrations; rather, it comes when the bust decimates households' assets while leaving high debt burdens intact, forcing drastic reductions in consumption". Fisher et al. (2010) in a comprehensive study examined the response of non-housing consumption to permanent and transitory changes in housing wealth in Australia in the post-1970 era. They provide evidence that after 2004 large variations in housing wealth led to significant changes in the level of household wealth and consumption. Gitelman and Otto (2012) find support for a significant decline in the supply elasticity of residential property in Sydney between 1991–1996 and 2001–2006. Windsor et al. (2015) using panel data for Australia find that increased house prices are linked with increased consumption through alleviating credit constraints on consumers and through potential factors such as effects on expectations about income, particularly for younger agents. One may argue that real house prices in Australia are overvalued due to demand shocks and wealth effects arising from equity markets. For example, Rong and Trück (2014) find significant positive correlation between the Australian equity and real estate markets, complicating risk in both.

Costello et al. (2011) have also examined the extent to which house prices in various capital cities in Australia deviate from the fundamental price path using quarterly data (1984Q3–2008Q2) and a dynamic present value model within a VAR framework. They compare and contrast the "fundamental prices" with actual prices and measure "non-fundamental" spillovers across states (Akimov et al., 2015) examine cohesion in the cyclical performance of the eight largest housing markets in Australia and find that Sydney and Melbourne are associated to each other. Costello et al. (2011) conclude that house prices are overvalued as they have sustainably deviated from expected prices warranted by economic fundamentals particularly in the NSW market.

From an international perspective, in a pre-GFC (global financial crisis) study, Ahearne et al. (2005) argued that many international housing markets were overpriced, noting that low interest rates led to higher house prices for a period of one to three years. They note the influences of land supply, population movements and general economic productivity across industry sectors as important influences on both house prices and general economic activity within regions. Leung et al. (2013) argue that changes in commodity prices can also influence local house prices in commodity-dependent economies such as Australia. Based on a geographical and hierarchical model, they find that changes in commodity prices can influence local house prices directly and indirectly through macroeconomic variables. They consider the effects of commodity prices similar to "income shocks" rather than "cost shocks" with regional heterogeneity.

[2] See Stapledon (2012) for a detailed account of trends and cycles in Sydney and Melbourne house prices during the period 1880–2011.