



Housing price bubbles and inter-provincial spillover: Evidence from China[☆]



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A B S T R A C T

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The soaring housing prices in many provinces of China have recently attracted increasing attention. This study addresses the questions of whether there are housing price bubbles in the provinces and whether the bubbles are spatially contagious. We adopt a unit root, cointegration test that uses structural changes and loan-to-income ratios to test housing rational bubbles and a vector error correction model (VECM), the Impulse Response Function, and Granger causality to investigate potential contagion and spillover effects from core to peripheral provinces. Housing price data from 28 provinces in China, ranging from the first quarter of 2000 to the fourth quarter of 2012, are analyzed. First, it is found that most of the provinces do have bubbles and affordability problems. Second, housing prices in provinces that were within the same potentially contagious region were cointegrated together. Third, spillover effects existed in contagious regions around Beijing and Shanghai, where each province has severe bubbles and affordability problems.

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Introduction

Continuous ups and almost imperceptible downs of housing prices have been observed in China since 1998 (see Fig. 1), when the government and enterprises ceased to administratively allocate housing to employees and housing turned into an open and private-sector market. Before 1998, the nominal rents of welfare housing provided by government were a direct result of the prevailing low salary levels, which meant that commercial housing (CH) provided by private enterprises had a serious affordability problem. By 1990 the price to income ratio (PIR) had risen as high as 20 for this sector (Chen, 1996). Although the abolition of the

policy on the provision of welfare housing in 1998 caused workers' salaries to rise, the huge increase in rural workers migrating from the countryside to cities stimulated increases of housing prices and many migrants found that they were unable to afford CH because of their relatively poor economic conditions (Chen, Guo, & Wu, 2011).

A PIR of 3 or less counts as reasonable affordability, while a PIR of 5 is already classed as severely unaffordable (Suhaida et al., 2011). According to this standard, most provincial regions in China are suffering from affordability problem (see Table 3). Chen, Hao, and Stephens (2010) discussed the relationship between mortgages and affordability and used the loan to income ratio (LIR) to measure the real affordability of residential property in China. They suggested that the maximum LIR, which is the threshold of gaining a mortgage, is in effect 8.5 times income. According to this LIR standard, China considered as a whole is suffering from an affordability and mortgage problem, as are the provincial regions of Beijing, Shanghai, Zhejiang and Hainan.

High PIR and LIR also imply the existence of housing price bubbles. The affordability problem has been examined from the viewpoint of housing price bubbles by Hui and Shen (2006). They analyzed the relationships between housing prices and fundamental variables and compared theoretical housing prices indicated by economic fundamentals with actual housing prices. The

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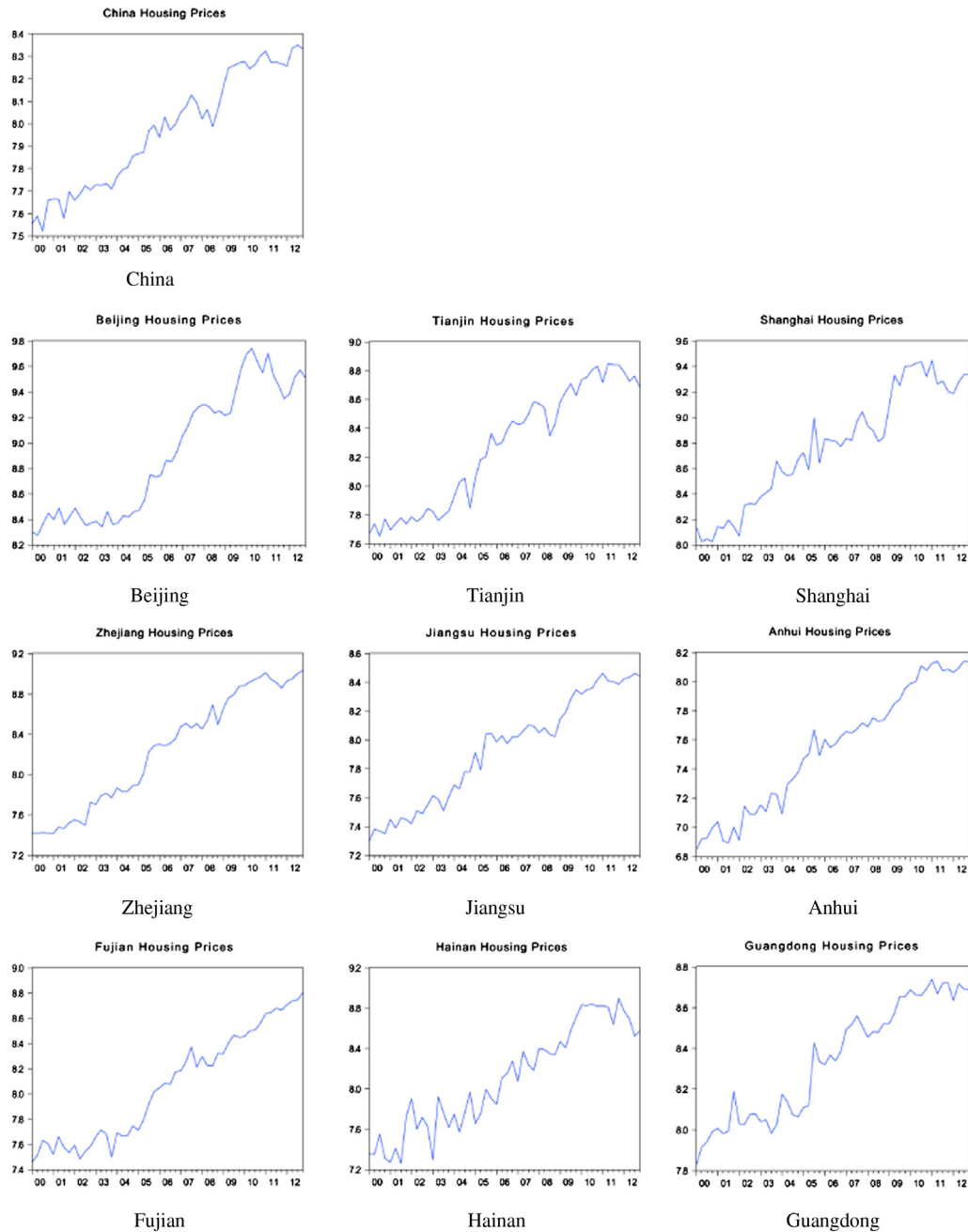


Fig. 1. Housing prices of China and of provinces in contagious regions.

conclusion is that Shanghai had a bubble accounting for 22% of its housing prices in 2003. Although the study did not demonstrate housing price bubbles in Beijing, the average PIR of Beijing in 2003 was 14.15, far above the severely unaffordable level of 5. The provincial regions with the highest LIR, such as Beijing and Shanghai, are in different regions of China and yet each province with extremely high LIR is adjacent to others where LIR is also high. This suggests that certain provinces' higher housing prices may spillover to other provinces. Recently, researchers have begun to notice effects originating from urban centers where speculative activity or housing prices bubbles exist. Costello, Fraser, and Groenewold (2011) suggested that actual house prices often do not reflect underlying fundamental determinants and therefore explored the spillover effects of speculative activity among six Australian states. Riddell (2011) also noticed the spillover effects of speculative

housing prices pressure and researched the effects spilling over Las Vegas ("peripheral market") from Los Angeles ("urban core").

This paper first examines the existence of housing bubbles in the provincial regions in China before analyzing spillover effects. In line with recent literature which adopts the concept of cointegration to examine spillover effects, we apply this method to detect housing price bubbles. In the past, calculating housing prices' fundamental values or treating exogenous macroeconomic variables as market fundamentals to forecast reasonable house value were common approaches used to measure housing price bubbles (Hui & Shen, 2006; Peng & Hudson-Wilson, 2002). More recently, however, adopting the concept of stability and cointegration to measure bubbles has become more common in recent years (Clark & Coggin, 2011; Mikhed & Zemčík, 2009; Tsia and Peng, 2011). Therefore, in this paper we also adopt the concept of cointegration for analyzing

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