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Detecting bubbles in Hong Kong residential property market☆,☆☆

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ABSTRACT

This study uses a newly developed bubble detection method (Phillips, Shi, and Yu, 2011) to identify real estate bubbles in the Hong Kong residential property market. Our empirical results reveal several positive bubbles in the Hong Kong residential property market, including one in 1995, a stronger one in 1997, yet another one in 2004, and a more recent one in 2008. In addition, the method identifies two negative bubbles in the data, one in 2000 and the other one in 2001. These empirical results continue to be valid for the mass segment and the luxury segment. However, this method has also found a bubble in early 2011 in the overall market, and in the mass segment but not in the luxury segment. This result suggests that the bubble in early 2011 in the Hong Kong real estate market was caused primarily by the mass segment under the demand pressure from end-users of small-to-medium sized apartments.

1. Introduction

Over the last 15 years, both advanced economies and emerging economies have suffered severe financial crises, including the Asian financial crisis, the Dot-Com crisis, the global financial crisis and the European debt crisis. All these crises were triggered by the collapse of price bubbles in asset markets, such as foreign exchange markets, equity markets and property markets. Not surprisingly, the former vice chairman of the U.S. Federal Reserve Board, Donald Kohn, argued that "Federal Reserve policymakers should deepen their understanding about how to combat speculative bubbles to reduce the chances of another financial crisis." Given the adverse effects of these bubbles and the associated crises, economists and policymakers have been searching for ways to detect bubble formation empirically in order to take appropriate measures to deflate bubbles before they burst.

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A very important asset class is property. Housing is an important form of wealth to Asian economies, and real estate investment is a significant component for Asian investors. Moreover, it is widely believed that housing prices and transaction volumes in eastern Asian economies may potentially impact global financial stability. However, it is also believed that many investors in the Asian real estate markets generally buy in the expectation of further price appreciation, rather than simply for dwelling purposes. Not surprisingly, real estate bubbles have constantly been on the radar of the regulators of Asian economies, including China, Hong Kong, Malaysia, the Philippines, Singapore and Thailand, thus an early warning detection system of real estate bubbles is critical to these economies.

A necessary and sufficient condition for the presence of a bubble is the divergence of the actual efficient asset price from the fundamental value of that same asset. This approach to bubble detection makes it necessary to obtain the fundamental value of the asset. Unfortunately, it is often unclear and sometimes impossible to determine the fundamental variables, and how to calculate the fundamental value from the fundamental variables. Instead of looking for a necessary and sufficient condition, in a recent paper, Phillips, Shi, and Yu (PSY, hereafter, 2011) propose to find a sufficient condition for identifying bubbles. The idea is to find explosiveness in the dynamic behaviour of the asset price after the fundamental value is taken into account.

The objective of this study is to use a recent econometric method developed by PSY (2011) to identify asset price bubbles, and to provide real time estimate of the origination date and the conclusion date of all the bubbles in the Hong Kong residential property market. Hong Kong's property market is of interest to us because it is one of the most volatile real estate markets in the world, having experienced a few interesting episodes over the last 20 years. For example, there was a significant rise in price in 1997. In more recent years, since mid-2009, another significant rise in price was noted and hence, it is important, from the policy perspective, to see if there is a bubble in this particular recent period.

This paper is organized as follows. Section 2 briefly reviews the two literatures, econometric identification of bubbles and Asian property markets. Section 3 briefly explains the method proposed in PSY (2011). Section 4 talks about the Hong Kong residential property market. Section 5 reports the empirical results. Finally, a conclusion is provided in Section 6.

2. Literature review

Bubble detection has been extensively studied in the literature. Perhaps the most commonly used detection methods are developed upon the present value model and the rational bubble assumption. The present value model states that the price of an asset is the sum of all its discounted future incomes in the absence of a bubble condition. Blanchard and Watson (1982) show that by solving consumers' optimization problem and assuming no rational bubble and no-arbitrage, the price of a financial asset (e.g. the price of a housing property) is the present value of the future incomes (e.g. the future rental income stream); see also Gurkaynak (2008) for an overview of the literature. This is often referred to as the fundamental part of the price of an asset. Rational bubbles arise when investors are willing to pay more than the fundamental value to buy an asset in the anticipation that the asset price will significantly exceed its fundamental value in the future. When rational bubbles are present, the asset price is composed of the fundamental component and the bubble component.[1]

An earlier method of detecting rational bubbles is the variance bounds test proposed by Shiller (1981). The idea is that, if a rational bubble exists, the variance of observed asset price will exceed the bound imposed by the variance of the fundamental value. However, this test attracts strong criticism for having little structure on the bubble part and the indication of bubbles from the test can be ruled out by other reasonable factors. Another earlier method is the two-step test proposed by West (1987) which requires a detailed specification of an underlying equilibrium model of asset prices. Basically, the test compares the respective estimates of the impact of the fundamental value on the asset price in the underlying equilibrium model in the context of a simple linear model which assumes no bubble component. If the estimate from the linear model is similar to that of the underlying equilibrium model, it suggests no bubble exists. Any discrepancy between the two estimates may suggest the presence of a bubble component. However, the power of this test depends on the strength of the equilibrium model, and therefore, the rejection of the no bubble hypothesis may be due to the model misspecification rather than the existence of bubbles.

To deal with the deficiencies in the variance bounds test and in the two-steps test of West, Campbell and Shiller (1987) propose an alternative method based on the idea that the gap between the asset price and the fundamental value will exhibit explosive behaviour during a bubble-formation process. In particular, Campbell and Shiller (1987) put forward a unit root test as the first step to test the explosiveness and the presence of a bubble. If a bubble exists, the asset price and the fundamental value can be characterized in two possible cases.[2] In case one, the asset price is non-stationary but the fundamental value is stationary. In case two, both the asset price and fundamental value are non-stationary. However, the

[1] From a theoretical perspective, the "bubble" explanation of the housing price dynamics is not satisfactory, as argued by Montrucchio and Privileggi (2001) and Leung (2004). Furthermore, from an empirical perspective, it may be difficult to differentiate the bubble dynamics from the dynamics generated by the regime switching process; see Chen (2001), Chang, Chen, and Leung (2012, in press), and Driffill and Sola (1998).

[2] There are four possible scenarios when a unit root test is applied to the asset price and the fundamental value series: (A) the asset price and the fundamental value are both stationary; (B) the asset price is stationary but the fundamental value is non-stationary; (C) the asset price is non-stationary and the fundamental value is stationary; (D) the asset price and the fundamental value are both non-stationary. Scenario (A) indicates no bubble; Scenario (B) is not compatible with the rational bubble model; Scenario (C) suggests the presence of bubbles in the asset price; and Scenario (D) suggests that a co-integration test is needed to detect a co-integrated relation between the asset price and the fundamental.

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