Asset Bubbles and Financial Crises: An Analysis Based on the Three-Stage Theory

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Abstract: This paper primarily examines the three stages of bubbles—seeding, development, and culmination—emphasizing the role of expectations, changes in economic behavior, financial leverage, vicious cycles, upward trends, and herd behavior. The research provides essential insights for making informed policy decisions and timing interventions during asset bubble phases, contributing to mitigating the impact of bubble bursts.

Keywords: Asset Bubbles, Financial leverage, Expect, Group behavior

1 Introduction

Within the context of this paper, the author aims to outline the key attributes of asset bubbles, specifically the initial stage, development phase, and eventual culmination. Furthermore, the paper emphasizes the pivotal role of expectations, shifts in economic behavior, increased financial leverage, crucial negative loops, favorable upward trends, and herd behavior in the evolution of these bubbles and their link to financial crises. The comprehensive review of scholarly literature informs this analysis.

2 Research background and significance

Recent studies have focused on surging real estate prices in various countries and cities, raising concerns about potential real estate bubbles. This highlights the relevance of understanding asset bubbles and their implications for financial systems and economic stability. Consequently, investigating the features of asset bubbles and their connection to financial crises holds critical research value.

This study helps uncover asset bubble stages and characteristics, aiding risk identification and management for stakeholders. Additionally, it enhances investor market understanding and informs wise investment strategies. Most importantly, it holds practical value for policymaking, financial stability, and investor protection.

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3 Literature Review

This paper synthesizes perspectives from diverse scholars on asset bubbles, shedding light on their developmental patterns. It references significant events such as the 1980-84 dollar bubble, the 1997-98 economic turmoil in Asia, the Chinese stock market bubble of 2006-07, the worldwide economic crisis of 2008-09, the sovereign debt crisis in Europe from 2010 to 2012, the Chinese exchange rate crisis of 2015, and the stock market bubble in the period from August 2015 to early 2016. Additionally, it examines the emergence of the real estate bubble across Hong Kong and several other Asian countries over the period spanning from 2009 to 2018. Yao and Yip[1][2], in discussing the dollar bubble of 1980-84, argued that a growing number of individuals or entities involved in the exchange rate market shifted from a "fundamentalist" approach to a "chartist" approach, which supplied the essential impetus for the expansion of the dollar bubble during that period. In Section 3, the author revises and augments their arguments to elucidate the heightened probability of the eventual collapse of asset bubbles in their concluding phases. Regarding the 1997-98 economic turmoil in Asia, Xiong and Yu[3], Powers and Xiao[4], Liu and Lung[5], and Yip[6] conducted an exhaustive examination of the fundamental causes and catalysts of the crisis. Notably, they emphasized the significance of abrupt reversals in investment streams, self-propagating anticipations that had accumulated within the afflicted economies preceding the crisis. Yip[7] contributed to the discourse by underscoring the impact of speculative attacks by hedge funds as a triggering factor and by emphasizing the significance of asset bubbles as another pivotal underlying cause of the crisis. For the case of the Chinese stock market bubble, Paul[8] and Ken-ichi[9] provided a detailed discussion of the formation and subsequent burst of the 2006-08 parent stock bubble, Tsomaia and Akaki[10] and Miao Jianjun and Wang Pengfei[11] delved into the warrants bubble during the same timeframe, while Liu, Gu, and Rui Huang[12] discussed the 2014-15 stock market bubble. Hori Takeo[13] referenced small-scale currency crisis, a significant drop in foreign exchange reserves, and the bursting of the overvalued stock market in China from August 2015 to mid-2016. Finally, Plantin[14] highlighted that the U.S. financial crisis of 2008-09 had a cascading effect, resulting in two noteworthy secondary crises, one in Europe and the other in East Asia.

4 Some essential insights of asset bubbles

4.1 The Formation of Asset Bubbles

Building upon insights from diverse scholars on previous asset bubbles, we can categorize their evolution into three stages: seeding, development, and final. In the next section, we'll delve into the characteristics of these stages to deepen our understanding of asset bubble formation.

The Seeding Stage.

In the seeding stage, asset prices show signs of recovery or sustained upward movement over several months. To illustrate, Figure 1 illustrates how China's equity market gained momentum in mid-2005, rising consistently from a low point over several months.

Similarly, as shown in Figure 2, Hong Kong's real estate price index can surge after several months of continuous growth, starting in early 2009. This sustained price increase in the initial months creates expectations of further gains in asset prices.

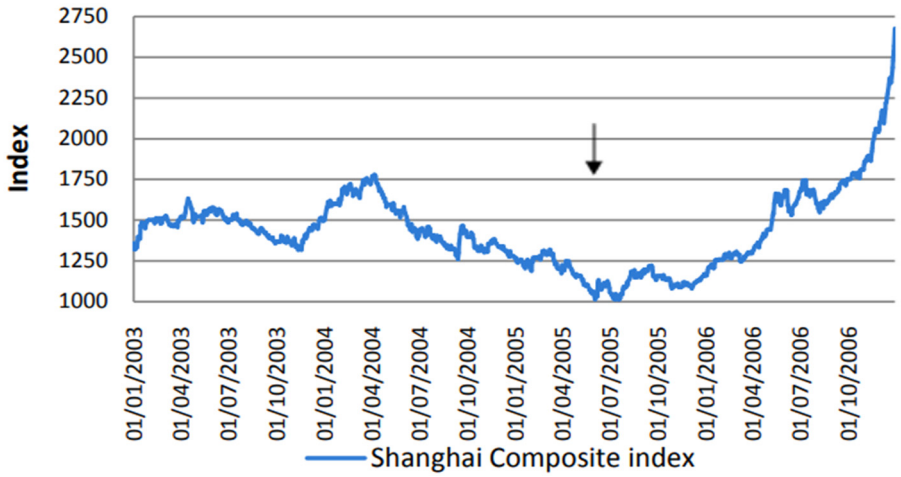

Fig. 1. The seeding stage of the bubble.
(Source: Wind Database)

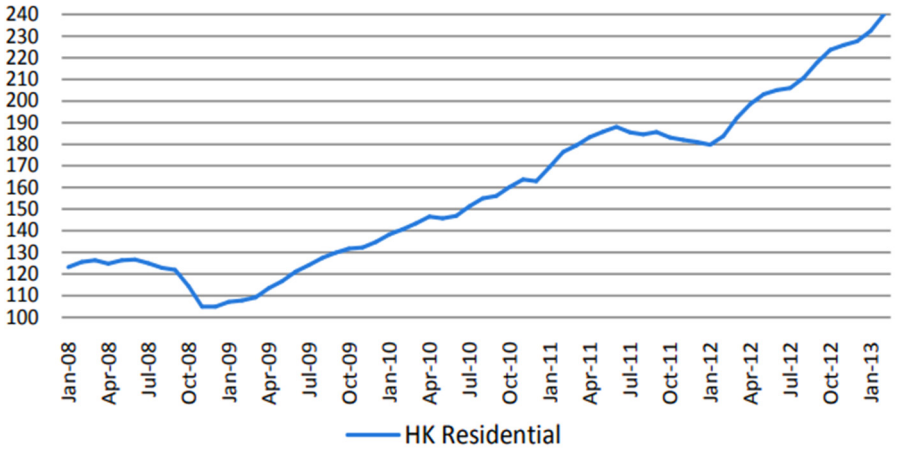

Fig. 2. Hong Kong's residential real estate price index.
(Source: Wind Database)

Direct increase in asset demand.

The anticipation of ongoing asset price growth significantly amplifies demand from both individuals and corporations. This heightened demand persists through the seeding, development, and final stages, leading to increased investment in the asset. Company owners even use corporate funds and borrow money to invest in stocks. During the Hong Kong real estate bubbles, rising real estate prices and the expectation of further increases pushed the real estate markets deeper into the development phase of the bubble. Towards the end of this phase, the continuous uptick in real estate prices sparks a surge in panic-driven demand and further amplifies speculative and investment interest in real estate.

Monetary assistance to stimulate demand for assets.

For the purpose of the heightened demand for assets outlined earlier, there will also be monetary-side behavioral shifts that serve as a catalyst for further asset price escalation.

$$M = C + D \tag{1}$$

$$MB = C + RR + ER \tag{2}$$

$$M = m \times MB \tag{3}$$

The money supply (M) comprises cash (C) and bank deposits (D) held by the public, while the monetary base (MB) includes cash held by the public and the combined sum of required reserves (RR) and excess reserves (ER) held by banks. The money multiplier (m) represents the ratio of money supply (M) generated from the monetary base (MB).

Introducing variables k to signify ratio of cash to deposits that the public prefers, r as the bank's reserve-to-deposit ratio mandated by regulations, and e as the bank's preferred ratio of excess reserves to deposits, We can derive equation (4) by replacing equations (1) and (2) with identity (3)：

$$m = \frac{M}{MB} = \frac{C + D}{C + RR + ER} = \frac{\frac{C}{D} + 1}{\frac{C}{D} + \frac{RR}{D} + \frac{ER}{D}}$$

$$m = \frac{k+1}{k+r+e} \tag{4}$$

This reveals that a decrease (increase) in the banks' preferred ratio of excess reserves to deposits (e) will result in growth (decrease) in the currency multiplier (m). Through specific rearrangements, equation (4) can be transformed into equation (4'):

$$m = 1 + \frac{1-(r+e)}{k+r+e} \tag{5}$$

Based on equation (4'), a decrease (increase) in the general public's desired cash-to-deposit ratio (k) will lead to an increase (decrease) in the money multiplier (m).

In contrast to conventional textbook models that assume static parameters k and e in equations (4) or (4') and an externally determined the central bank's monetary base (MB), scholars highlight that during real estate or stock market booms, changes in economic behavior can lead to a notable decrease in k and e, accompanied by a substantial MB increase. This shift happens because some investors, anticipating rising asset prices, opt to hold more cash, reducing their preferred cash-to-deposit ratio (k). Moreover, during such booms, banks realize that merely lowering their desired excess reserves-to-deposits ratio won't suffice to meet the growing loan demand. As a result, they turn to obtaining overseas loans, converting them into the local currency to accommodate domestic lending, significantly bolstering the monetary base (MB). This, in turn, leads to the creation of multiple deposits (D) and an expansion in the money supply (M). Additionally, asset booms can trigger substantial short-term capital inflows, often referred to as "hot money", which will further amplify the growth of MB.

Therefore, the anticipation of ongoing asset price growth triggers shifts in economic behavior, leading to a decrease in both preferred cash-to-deposit ratio among the public (k) and the preferred ratio of excess reserves to deposits among banks (e). Furthermore, borrowing from foreign sources and the influx of short-duration funds also see significant growth. Following equation (3), $M = m \times MB$, these factors drive a substantial expansion of the money supply (M). Consequently, this infusion of liquidity fuels and reinforces further increases in asset prices throughout all three phases of the asset bubble.

The Development Stage.

Once the anticipation of continued asset price appreciation initiates the previously mentioned alterations in economic conduct, the asset market enters a development phase. In this phase, shifts in economic behavior, coupled with sustained asset price increases, can trigger numerous potent vicious circles and spirals. For example, as emphasized by Yip, tens of millions of individuals with diverse backgrounds transitioned individuals who do not invest to becoming active stock market participants during all three phases of the 2006-07 Chinese stock market bubble.

Emergence of vicious cycles.

In addition to the persistent shifts in economic behavior mentioned earlier, several significant vicious circles can intensify the upward pressure on asset prices. For instance, a vicious circle may develop between the rise of real estate prices and the upswing in stock prices. Elevated real estate prices can lead to increased profits, subsequently boosting the value of real estate stocks. This, in turn, can drive up stock prices in other sectors through various mechanisms like indicator effects, portfolio adjustments, and other spillover effects. Elevated stock prices can, in turn, encourage some stock investors to allocate more capital into real estate, further supporting the expansion of real estate prices.

Upward spiral.

Additionally, a spiral effect will come into play, involving real estate prices, rents, general prices, and wages, further reinforcing and sustaining the increase in real estate prices. For instance, elevated real estate prices lead to higher rental rates. These increased rents prompt workers to demand elevated income, which compels suppliers to raise their prices. This cycle of rising rents, wages, and overall price levels provide support for further increases in real estate prices.

The FinalStage.

In the final stage, a prolonged and substantial surge in asset prices from the preceding period will induce crowd mentality. Unlike the shifts in economic behavior discussed in Section 3.1.1, crowd mentality compels additional participants to join the crowd.

The momentum of the herd intensifies as more participants allocate larger sums to join in. At this point, even a minor adverse shock can lead to a decline in asset prices. This triggers a reversal of the previously described vicious cycle, initiating a spiral effect, financial leveraging, shifts in economic behavior, and changes in expectations. Ultimately, this sequence of events culminates in a steep drop in asset prices, often plummeting well below their usual equilibrium levels.

4.2 Asset Bubbles Leading to Financial Crises

In terms of the stock market, investors in the stock market may include: institutional investors, individual investors and commercial banks. First of all, in order to maximize the effectiveness of financial leverage, institutional investors usually use bank loans to invest in the stock market and apply for new loans using the already purchased shares as collateral. In the event of a stock market crash, the institutional investor would not be able to repay the bank loan if he or she lost a lot of money. It would also be difficult for banks to recover the value of the loan by selling the collateral when the collateral itself is severely devalued. Second, even if individual investors are using their own funds to invest in stocks, then in the event of heavy losses in stock investments, individual investors may withdraw deposits from banks to meet other expenses, and this will also put pressure on bank operations. Eventually, if commercial banks directly participate in stock market investing, then the stock market crash will directly cause the assets of commercial banks to shrink, thus generating huge pressure on debt payments.

5 Conclusions

Within the context of this paper, the author has explored the essential traits of asset bubbles and their connection to economic crises. Understanding these features is crucial for making informed policy decisions and interventions at the right moments during asset inflation or financial crises. This knowledge can aid in averting catastrophic bubble bursts and mitigating their repercussions.

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