Asset Price Bubbles: Lessons From The Recent Financial Crisis
By Douglas Evanoff, George Kaufman and Anastasios G. Malliaris
September-October Issue

The successful performance of the U.S. economy during the ‘Great Moderation’ period appeared to have suggested that asset bubbles could be effectively managed. But the recent global financial crisis had a serious adverse impact on the global economies, and has triggered a renewal of the debate about the impact of bubbles and the role of public policy in addressing them. In this article, we summarize the post-crisis state-of-knowledge on (1) conceptual issues concerning the existence of asset price bubbles, (2) the consequences of bursting such bubbles, (3) monetary policy ‘management’ of bubbles, and (4) the role of macroprudential regulation in addressing bubbles. We conclude with a list of lessons learned from the recent financial crisis and a call for additional evaluation of the characteristics of asset price bubbles.

Should asset bubbles be treated as benign events beyond the practical reach of policymakers? The successful performance of the U.S. economy from 1945 to 2006, and, in particular during the Great Moderation period of 1984 to 2006, including the two stock market crashes in 1987 and 2001, appeared to have offered both the economics profession and policymakers the assurance that asset bubbles could be effectively managed with little or no real adverse economic impact. But, this perception changed following the recent global financial crisis. This crisis has had a serious adverse impact on the U.S. and global economies, and has triggered a renewal of the debate about the impact of asset price bubbles and the role of public policy in addressing them.

Prior to the global financial crisis, the Federal Reserve under both Chairman Alan Greenspan and Chairman Ben Bernanke followed an asymmetric policy approach to asset price bubble management. In the absence of inflation in goods and services, this approach advocated no, or minimal, restrictive monetary policy action during the formation and growth of a bubble, but a speedy response to ease policy once the bubble burst to reduce the potential loss of output and employment. This strategy was based on several factors: ex ante difficulties in identifying bubbles; concerns about the effectiveness of monetary policy to manage asset bubbles; and the expectation that losses to the macroeconomy from bursting bubbles could be limited with quick, aggressive responses.

The strategy was supported by considerable academic research that emphasized that inflation targeting would achieve both monetary and financial stability and seemed to work quite well until 2008, when the financial system came close to a complete collapse. This experience has renewed the debate on policy issues surrounding asset price bubbles and their potentially considerable adverse economic impact, and stressed the need for improved theoretical modeling of bubbles and empirical testing of these models. Indeed, following the recent financial crisis, Fed officials and academic economists have encouraged a vigorous reconsideration of the role of public policy towards asset price bubbles.
To advance such understanding, the authors organized a conference in April 2011 at Loyola University Chicago. Papers were commissioned from leading experts in the area to reexamine and update a number of leading pre-crisis articles on asset price bubbles and reexamine the appropriate policy response, if any, to such bubbles. The papers were subsequently published in a book -- New Perspectives on Asset Price Bubbles (Oxford University Press, January 2012) -- to challenge the pre-crisis state-of-the-knowledge on asset price bubbles. The remainder of the article examines four important topics related to price bubbles analyzed in this book: (1) conceptual issues about the theoretical basis for the existence of asset price bubbles, (2) the consequences of the bursting of asset price bubbles, (3) monetary policy ‘management’ of asset price bubbles, and (4) the role of macroprudential regulation to address asset price bubbles.

**Conceptual Issues Concerning Asset Price Bubbles**

What is an asset price bubble? Do bubbles exist in financial markets? Why do they burst? A bubble is generally said to exist if an asset price exceeds its price as determined by “fundamentals”—i.e., the present value of its discounted expected future cash flows—by a significant amount and this premium persists for some time. If the price of an asset exceeds its fundamentals only by a very small amount, the differential may only represent noise instead of a bubble. If the deviation from fundamentals lasts for only a very short trading interval, this may represent temporary mispricing. The market efficiency paradigm developed in the 1960s argued that prices in financial markets reflect all publically available information regarding the fundamental factors that drive asset prices. Therefore, since observed market prices equal fundamental values, asset bubbles cannot exist. However, these definitions lack precision with respect to the exact meaning of “fundamentals,” “significant amount,” “persistence,” and “some time.”

Because of the above difficulties, some economists describe a bubble as simply any substantial upward price movement over an extended range that suddenly implodes. A bubble forms because the purchase of an asset is made not necessarily based on the rate of return on the investment, but in anticipation that the asset can be sold to a “greater fool” at an even higher price.

Behavioral economists argue that a key factor influencing the formation of bubbles and their eventual bursting is a feedback mechanism. A price increase for an asset leads to investor enthusiasm, which further causes increased demand and additional price increases, and so on. The high demand is supported by the public’s memory of high past returns or by optimism that this new asset will generate high future earnings. Different bubbles have different positive feedback mechanisms, but since price increases driven by factors other than the asset’s fundamentals cannot be sustained indefinitely, a negative feedback pattern will eventually replace the positive one—i.e., the bubble will eventually burst. Usually, the initial price increases are slow; it takes a long time for the bubble to grow. In contrast, bubble crashes take place quite quickly.

The above summary suggests that much needs to be learned about how and why asset bubbles grow, why they burst, and whether and how they can be controlled. Nevertheless, there is greater
agreement that sharp swings in the prices of important assets can have serious adverse implications for the macroeconomy that cannot be ignored.

Consequences Of Bubbles Bursting

In this section, we consider how frequently bubbles occur and how potentially harmful they can be. We assume that significant price declines reflect the bursting of bubbles in stock markets and real estate markets. We concentrate on these markets because, historically, sharp price declines in these markets appear to have been the most disruptive to the macroeconomy, perhaps because equity and homeownership account for most of household wealth. Bubbles may also occur in narrower markets such as metals, energy, currency and commodity markets, but these bubbles generally do not significantly impact the real economy and will not be considered here. To provide some quantitative evidence of past stock market and housing bubbles, we describe a set of stylized facts developed from a study by IMF economists in 2003.1 The study analyzed quarterly equity prices over the 1959-2002 period for 19 industrialized countries, and housing prices for 14 countries over the 1970-2002 period.2

First, between 1959:Q1 and 2002:Q2, there were 52 equity market busts in the 19 countries.3 The average magnitude of a crash for this sample was 45%, which unfolded over a 10-quarter period. Half of these crashes were recorded during the 1970s and were associated with the breakdown of the Bretton Woods Exchange Rate Agreement and oil shocks. Second, housing price busts were less frequent than equity price crashes.4 In the sample period, 20 housing crashes were recorded and the average decline was about 30% and occurred over a four-year period. So housing market crashes resulted in average price declines of about 30%, compared to equity price declines of about 45%, and lasted about 1.5 years longer. Third, only one fourth of all booms ended in a bust.5

The IMF evidence documents that equity and housing bubbles are not “black swan” events occurring, say once every hundred years. They occur relatively often: equity crashes occurred on average every decade and housing crashes about once every 20 years. When stock markets and housing bubbles burst at about the same time, their impact is more severe. For example, consider the recent concurrent crashes of the stock and real estate bubbles in Japan and the U.S. They both had serious real effects in the form of the “Lost Decade” of the 1990s in Japan and the “Great Recession” in the U.S. that was considerably deeper and longer than the average post-WWII recession. As measured by the NBER, the U.S. Great Recession lasted 18 months, from December 2007 to June 2009 and witnessed significant declines in real GDP, increases in unemployment from 4.7% in late 2007 to above 10% in 2009. Moreover, after more than three years from the recession trough, real GDP growth still remains subpar and unemployment above 8%.

Bubble crashes often destabilize financial markets, but need not destabilize the macroeconomy. Both the October 1987 U.S. stock market crash and the bursting of the internet bubble in 2001, despite an almost 75% drop in the NASDAQ, had only relatively small impacts on the real economy. However, at times bursting bubbles do have a significant adverse impact on the real economy. Such instances include the 1929 stock market crash in the U.S. and the recent financial
In light of the potential significant adverse effect on the macroeconomy, we turn to the question of what to do with bubbles in terms of public policy.

**Asset Price Bubbles And Monetary Policy**

Should bubbles be addressed with monetary policy and, if so, how? The Federal Reserve has a dual mandate: to promote price stability and maximum sustainable employment. In addition to these two goals, the Fed strives to maintain financial stability. This involves concern about asset bubbles. Under Federal Reserve Chairman Greenspan, monetary policy began to be formulated in a risk management framework. This framework assessed the various sources of risks and uncertainty facing the economy, quantified the risks, and calculated an expected cost associated with the risk. When no significant financial risks or bubble risks existed, the Fed would review inflation, economic growth, and employment conditions and implement monetary policy by adjusting the Fed funds rate along the lines of a Taylor rule.

However, when significant financial risk existed, such as during the 1997 Asian crisis, the 1998 Russian sovereign default, and the bursting of both the 2001-2002 Internet bubble and the recent housing bubble, the Fed deviated from a Taylor rule. That is, with this “risk-based” approach, policymakers decided to address financial stability in the short run, with an expectation to return to a more normal policy stance in the future.

In 1996, in his well known, “irrational exuberance” speech, Chairman Greenspan raised the question about the possibility of asset bubbles and the need for policymakers to address them. He stated “…We as central bankers need not be concerned if a collapsing financial asset bubble does not threaten to impair the real economy, its production, jobs, and price stability.” These thoughts reenergized the debate as to whether asset bubbles are factors to be taken into consideration in the conduct of monetary policy. Numerous research papers were written addressing this issue. Greenspan, Bernanke, other Fed officials and monetary economists participated in these debates. It was generally concluded that during a bubble’s expansion stage, the Fed should not increase the Fed fund rates to deflate the asset bubble. However, if the bubble burst, the Fed should act immediately and reduce the Fed funds rate to reduce the adverse economic impact of the bursting.

This asymmetric approach to asset bubbles became known as the Jackson Hole Consensus. The reasons for the neutrality of the Fed while the bubble grows include:

- it is difficult to both identify and predict the ultimate magnitude of the bubble;
- the build-up of bubbles may take several years and the Fed cannot follow a restrictive monetary policy for such a long and uncertain period;
- Fed funds rate adjustments are a rather blunt instrument that cannot be directed precisely towards the sector in which the bubble exists (it was said that the Fed could not use an axe to do brain surgery);
there is no need to directly target the bubble because if an asset bubble increased wealth that stimulated consumption that would result in inflation, the Fed would act to curtail the inflation; and

it was thought that price stability also produced financial stability. For these reasons, both during the internet bubble of the mid-to late-1990s and during the housing bubble of 2000-2006, the Fed did not use monetary policy to address the development of these bubbles. However, once the bubbles burst, and the real economy declined substantially, then the Fed responded quickly and decisively to reduce the Fed funds rate to offset the negative consequences of the bursting bubble.

Macroprudential Regulation

Following the recent crisis, there was a renewed realization that financial market instability was an important monetary policy concern. Adhering to the Jackson Hole Consensus seemed inadequate. However, there are still significant concerns about the use of traditional macroeconomic policy tools to address asset bubbles and financial instability. Changes in the Fed funds rate is a rather blunt policy tool affecting the market as a whole instead of specific sectors. In addressing asset bubbles, the goal is typically to target a price build-up in a particular sector—housing, equities, etc. To achieve this objective, it might be preferred to utilize a specific policy tool that can be more accurately directed at the bubble related sector, in addition to one directed at price stability. Such a tool for financial stability is macroprudential regulation.

Financial regulation can broadly be separated into ‘microprudential’ regulation, which considers the condition of individual financial institutions, and ‘macroprudential’ regulation, which focuses across financial institutions and markets, and on the efficient functioning of the financial system as a whole. Until recently, regulatory and supervisory policies operated on the presumption that the financial system as a whole could be made safe by ensuring that individual financial institutions were made safe. This ignored market interconnections and externalities, whereby the actions of one financial institution can lead to spillover effects that adversely affect other financial institutions, general market conditions, and ultimately the economy as a whole. Instead, it may be necessary to use both microprudential and macroprudential policies to manage financial system risks and achieve financial stability.

There is an array of potential macroprudential tools available to address asset bubbles. ‘General’ monetary policy tools are used to influence the overall macroeconomic situation without concern about the particular sector of the economy to be affected. These have included changes in the Fed funds rates, reserve requirements and the discount rate, and the use of moral suasion. Specific tools, which can be directed at particular sectors of the economy, may be more useful in addressing asset bubbles. Part of the difficulty in developing a framework for macroprudential regulation is finding the most appropriate policy tools. Some key tools that have been suggested include:

(1) credit market controls aimed at specific markets; e.g., mortgage markets, commercial real estate markets, etc. (The objective is to constrain activity in certain markets during boom times—i.e., to lean against the wind—and stimulate
activity during market lulls).

(2) changes in stock market margin requirements, which the Federal Reserve regulates, but has not used in recent years.

(3) a time varying bank capital ratio—one in which the capital ratio requirement varies over the business cycle: being higher in boom periods when the risks build up, than in recessions, when losses appear. It may also be desirable if declines in capital ratios during recessionary periods were required to be offset by increasing capital instead of decreasing assets to avoid aggravating the economic slowdown.

(4) monitoring of a credit-to-GDP ratio that may signal an undue buildup in overall credit in the economy that finances rapid asset price increases. This could signal the need for the use of credit constraints on specific asset purchases.

(5) supervisory discretion could be used to target the activities of individual institutions that are systemically important firms.

In the US, the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 introduced a significant role for macroprudential regulation. It created a Financial Stability Oversight Council, with the Treasury Secretary as chair and all financial regulatory agencies as members. The Council is charged with identifying threats to the financial stability of the U.S. This should include the assessment of the risks associated with the emergence and growth of asset price bubbles and the development of leading indicators of financial instability. Once identified, regulators are to put in place regulations that should decrease the potential for systemic problems in the system. The Act also goes beyond commercial banks and brings under common regulatory oversight systemically important nonbank or “shadow” financial institutions that have had less regulatory scrutiny in the past than commercial banks.

**Lessons Learned**

There are a number of take-away lessons about asset price bubbles from the recent global financial crisis.

First, whether or not they represent bubbles, sharp prolonged increases in the prices of important assets followed by equally sharp, but quicker declines in prices occur frequently.

Second, during the Great Moderation period it was believed that another economic depression and deflation, as in the 1930s, was highly unlikely. However, the global financial crisis has demonstrated that there are very large adverse risks to the macroeconomy from the bursting of housing and equity bubbles.

Third, the strong consensus that it was sufficient for monetary policy to pursue goods and services inflation targeting as a means of achieving financial stability has been challenged by the global financial crisis. The Jackson Hole Consensus, favoring an asymmetric approach to responding to asset price bubbles needs to be reconsidered. The presence of concurrent bubbles
in housing and the stock market is a major risk for the financial stability of the economy. Alternative policy strategies need to be considered.

Fourth, monetary policy needs to reconsider the importance of financial stability as an explicit goal that may require an additional policy tool. The triumph of goods and services price stability during the Great Moderation proved insufficient for achieving financial stability in the long run. Such tools include alternative forms of macroprudential regulation, which can more directly target the sector in which the bubble is emerging.

Nevertheless, although the state of knowledge has changed significantly as a result of the financial crisis and we have gained additional experience, we still have much to learn about the full characteristics of asset bubbles. For example, why do they form? Why do they burst? Can they be quantified? What are the welfare implications of bubbles? Who benefits from sharp increases in housing prices? What are the potential costs of the housing bubble bursting? We need further research to learn more about asset price bubbles in order to reduce their potential for great damage.

About the Authors

Douglas Evanoff is vice president and senior research advisor for banking issues in the economic research department at the Federal Reserve Bank of Chicago. He is also an adjunct professor at DePaul University. His research has been published in leading academic journals, and he has also edited a number of books addressing issues associated with financial institutions.

George Kaufman is the John Smith Professor of Finance and Economics at Loyola University Chicago. He has published widely in leading academic journals and authored and edited numerous books. He is past president of several Finance Associations and served on the board of directors of the American Finance Association.

Anastasios G. Malliaris is the Walter F. Mullady Sr. Professor of Economics and Finance at Loyola University Chicago. He is a recognized expert and has published widely in both professional journals and books in the areas of quantitative analysis in economics and the economics of asset price bubbles.

References

2. Importantly, the time period analyzed is generally considered to be a relatively stable period. The adverse effects are thought to be significantly worse in select periods of bursting bubbles; e.g., in the U.S. in the 1930s or the Great Recession of 2007-2009.
3. A bust is defined as a peak to trough price change that is in the most negative quartile of price decreases in the sample. For equity markets this required at least a 37% correction from peak to trough.
4. Given our definition of a bust, house (equity) prices had to decline a minimum of 14% (37%) over the sample periods.
5. A boom or bubble is defined as a trough to peak price change that is in the top quartile of price increases.

6. This is likely an implicit, instead of an explicit calculation. However, a decision would have to be made regarding whether policy should deviate from ‘typical policy.’

7. Interestingly, at the Jackson Hole Conference in 2007 Martin Feldstein discussed the possibility of significantly reducing the Fed-Funds rate (by 100 basis points) to offset the “potential” for a recession and adverse impact of turmoil in credit markets. This is a classic example of an ex ante, “risk-based” policy approach to managing financial instability.