Bubbles and Central Banks

Abdullah Yavas

UW Real Estate Program Distinguished Professor,
School of Business University of Wisconsin – Madison,
5251 Grainger Hall, 975 University Avenue, Madison, WI 53706,
E-mail: ayavas@bus.wisc.edu

Asset valuation theory states that the value of an asset is equal to the discounted present value of its expected cash flows. An asset market is said to be efficient if prices closely follow fundamental values, and prices change only when new information that affects market participants' expectations about the cash flows becomes available. However, we do know from a large body of empirical and experimental literature that asset prices do deviate from their fundamental values, leading to formation of bubbles in the market. Bubbles are critical because they can result in misallocation of capital and resources, affect investment decisions, and have considerable economic impact. Therefore, it is important to understand bubbles and examine if and how monetary policy and regulatory measures can be used to reduce or eliminate them.

Bubbles are often defined as asset prices being persistently higher than their fundamental value. There is a large and growing experimental literature on bubbles. In a pioneering study, Smith et al. (1988) considers spot asset trading in an environment where all investors receive the same dividend from a known probability distribution at the end of each trading period. Bubbles are observed in 14 of the 22 sessions conducted, and in most of the experiments, bubbles are followed by crashes during which asset prices fall sharply below their fundamental values. It is surprising that bubbles would form in such a simple market environment. However, Smith et al. (1988) results have been replicated in numerous later studies, including King et al. (1993), Van Boening et al. (1993), Porter and Smith (1995), Noussair, Robin, and Ruffieux (2001), Lei et al. (2001), Porter and Smith (2003), Haruvy and Noussair (2006) and Ikromov and Yavas (2011). What these experiments clearly document is that bubbles and crashes can take place in very simple environments with little/no uncertainty about future cash flows, with no need for exotic derivative financial products or any agency problems.

Bubbles are not a new phenomenon. Famous historical examples of bubbles include the Mississippi Bubble (1719-20), the South Sea Bubble in England (1720) and the Roaring 20's that preceded the 1929 crash. In the most well known bubble, Tulip Mania, a single Tulip bulb (e.g., Semper Augustus) sold for more than 5,000 guilders - the equivalent of more than $60,000 today. More recent examples of bubbles include Black Monday, October 19, 1987, when the U.S. equities lost more than 20% of their value in one day, the worst single day in market history. In the internet bubble, internet share prices plummeted 75% from their peak in March 2000 to the end of 2000.

Formation of bubbles seems to be robust to market conditions. Porter and Smith (1995), for instance, test whether bubbles are formed because of dividend risk aversion in a market with uncertain dividends. Lei et al. (2001) study trading in a market where speculation is not allowed. Noussair, Robin, and Ruffieux (2001) examine a market where the fundamental value of the asset is constant throughout trading periods. Haruvy and Noussair (2006) investigate the impact of allowing for short selling. In all of these studies, boom and bust cycles continue to emerge. In support of these experimental studies, a recent study by Jones (2011) highlights how bubbles can emerge even in a very deterministic environment. He studies a set of eBay auctions of Amazon.com gift certificates, and shows that 41.1% of winning prices exceed face value. This face value is an observable upper bound for rational bidding because Amazon.com sells certificates at face value.

These studies show us that bubbles are basically an avoidable part of trading. Does this mean that monetary and regulatory policies will be ineffective fighting bubbles? Fortunately, the answer is (partially) No. While the above studies show that bubbles emerge in very simple and deterministic market environments, these studies also show that the magnitude and duration of bubbles vary with market conditions (such as transaction costs, short selling restrictions, divisibility of the asset, and experience of the subjects).

Given the significant damage that bubbles can cause in the real economy, a crucial question for central banks is whether they should react to bubbles. On one side of the argument, some economists (e.g., Bernanke and Gertler, 2001, and Greenspan, 1999) argue that central banks should not respond to asset prices, unless these prices impact inflation expectations. Thus, central banks should get involved only after the bubble bursts in order to reduce the resulting economic and financial damage. On the other side of the argument, some economists (e.g., Cecchetti, et. al., 2000) argue that central banks can improve macroeconomic performance by responding to excessive asset price movements.

Before we address the issue of central banks' reaction to a bubble, it is important to state that central banks cannot avoid getting involved. The question for central banks is not whether or not to get involved, but rather whether to get involved before or after the bubble bursts. The reason is that central banks are forced to provide liquidity during a crisis caused by the bursting of a bubble because they are the only institutions capable of doing so.

There are two major difficulties for central banks to get involved during the bubble period. One is that it is very difficult to know if there is any deviation in prices from fundamentals (what is the fundamental value of an asset?). The other is to define how large of a deviation from the fundamental value constitutes a bubble, a 10% deviation, a 20% deviation, or a 65% deviation? These two difficulties explain partly why central banks give an asymmetric response to bubbles where they do nothing during a bubble, and mop up the mess after the bubble crashes. However, not knowing for sure if there is a bubble should not be an excuse for central banks. After all, monetary policy always involves uncertainty. For instance, how certain are the central banks about the components of the Taylor Rule?

Another reason why central banks give asymmetric response, where they do not react to bubble formations but react after the bubble bursts, is that it is easier to identify a bursting bubble than a rising bubble. However, this should not be an excuse since monetary policy is about making assessments of uncertain events.

An additional reason for asymmetric response by central banks is that it is easier to justify monetary easing after the crash than monetary tightening in good times. This might be a good excuse for the actions of elected politicians. Central banks, however, are supposed to be countercyclical and serve as party crashers (that is why they are independent).

It is also argued that using interest rate to burst a bubble is inefficient since doing so would impact every sector of the economy, which leads to misallocation of resources. However, bubbles could cause even more significant misallocation of resources. Furthermore, this argument could be used against changing the interest rates for any reason.

Therefore, none of the arguments above are justifiable for monetary policy to ignore bubbles in asset markets. As the enormous damage caused by the last bubble in housing markets illustrates, it is vital for monetary policy to watch asset prices closely and take precautionary measures.

However, monetary policy should not be alone in dealing with bubbles. Related government agencies can have significant contribution with their efforts to supervise and regulate the financial system (e.g. by limiting the loan-to-value ratio and the debt-to-income ratio). Regulations cannot alone deal with bubbles effectively, and the effectiveness of monetary policy can be strengthen significantly by the help of appropriate regulations. Therefore, a good approach would be to have coordinated effort by monetary policy and regulatory agencies (e.g., the recently formed Financial Stability Committee in Turkey meets every month and among its members are the governor of the central bank and the head of the banking regulatory agency).

It is also important to note that most of the literature on bubbles deals with central banks' reaction to stock market bubbles, not to housing bubbles. The reality is that house price fluctuations impact aggregate spending more than stock returns. Households borrow in nominal terms using real estate as collateral, and housing is the biggest component of a typical household's wealth. In addition, house price inflation is a better predictor, than stock price inflation, of both inflation and output (two components of inflation targeting). What experimental evidence also shows is that compared to financial markets, real estate markets involve longer boom and bust periods and lower turnover (Ikramov and Yavas, 2011). Historically, equity price busts occur on average every 13 years, lasts for 2.5 years, and result in about 4 percent loss in GDP. Housing price busts are less frequent, but last nearly twice as long and lead to output losses that are twice as large (IMF World Economic Outlook, 2003). Therefore, both researchers and policy makers need to pay particularly close attention to housing prices.

References

[1] Bernanke, Ben and Mark Gertler, 2001, Should Central Banks Respond to Movements in Asset Prices?, *American Economic Review*, 91: 253-257.

[2] Cecchetti, Stephen G., Hans Genberg, John Lipsky and Sushil Wadhwani, 2000, Asset Prices and Central Bank Policy, Geneva Report on the Global Economy.

[3] Greenspan, Alan, 1999, General Discussion: New Challenges for Monetary Policy, Speech before a symposium sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming, August 28th.

[4] Haruvy, Ernan, and Charles Noussair, 2006, The effect of short selling on bubbles and crashes in experimental spot asset markets, *Journal of Finance*, 3, 1119-1157.

[6] Ikromov, Nuridding and Abdullah Yavas, 2011, Asset Characteristics and Boom and Bust Periods: An Experimental Study, *Real Estate Economics*, forthcoming.

[7] Jones, Matthew T., 2011, Bidding fever in eBay auctions of Amazon.com gift certificates Purchase, Working Paper.

[8] King, Ronald, Vernon Smith, Arlington William, and Mark Van Boening, 1993, The robustness of bubbles and crashes in experimental stock markets, in I. Prigogine, R. Day, and P. Chen, erds.: *Nonlinear Dynamics and Evolutionary Economics* (Oxford University Press, Oxford, UK).

[9] Lei, Vivian, Charles Noussair and Charles Plott, 2001, Non-speculative bubbles in experimental asset markets: Lack of common knowledge of rational actual irrationality, *Econometrica* 69, 830-859.

[10] Noussair, Charles, Stephane Robin, and Bernard Ruffieux, 2001, Price bubbles in laboratory asset markets with constant fundamental values, *Experimental Economics* 4, 87-105.

[11] Porter, David, and Vernon Smith, 1995, Futures contracting and dividend uncertainty in experimental asset markets, *The Journal of Business* 68, 509-541.

[12] Smith, Vernon, Gerry Suchanek, and Arlington Williams, 1988, Bubbles, crashes, and endogenous expectations in experimental spot asset markets, *Econometrica* 56, 1119-1151.

[13] Van Boening, Mark, Arlington W. Williams, and Shawn LeMaster, 1993, Price bubbles and crashes in experimental call markets, *Economic Letters*, 41, 179-185