

ASSET BUBBLES, FINANCIAL CRISIS AND COUNTERCYCLICAL POLICIES

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ABSTRACT

In this manuscript, we examine the causes of asset price bubbles and financial crises as well as the current challenges facing the regulatory framework of the financial system. We argue that the current model of regulations cannot stop the inevitability of either asset bubbles or financial crises in the future. In a causal relationship, the current system of regulations tends to deal with the effects of liquidity shortage during recessions rather than with the causes, which can be referred to as distorted financial intermediation. In fact, regulations seek to cure symptoms rather than disease. The rules function like antibiotics, against which infection may develop immunity. We propose a modification of the current regulatory system and believe that this model should be taken into account when developing an effective regulatory framework for the financial system.

Keywords: Asset Bubbles; Asset Pricing; Money Supply, Credit, Money; Monetary Policy; Central Banks and Their Policies; Government Policy and Regulation; Financial Institutions and Services; Economic History of Financial Crisis.

JEL Classification: E51; E52; E58; G12; G18; G2; N2

Introduction

For the last three centuries, the world has been moving around the same circle of financial crises. Asset price bubbles periodically form, sometimes leading to the collapse of the financial system and inducing an acute financial crisis. Much of the blame for these repetitive crises rests with undulations of business cycles that are poorly tempered by financial institutions. Through a drive to maximize periods of opportunity, the boom phase of the business cycle paves the way for asset price bubbles. Financial organizations often play an important role in this process, among which depository institutions are key players. Boom phases are accompanied by increased demand for credit, subsequently incentivizing financial institutions to lend irresponsibly and excessively, leading to unbacked and increasingly inflated asset value. As high-risk loans begin falling into default, these asset bubbles burst and economies go into recession. During the downturn of the business cycle, financial institutions radically change their behavior. By drastically reducing lending, they further exacerbate the recession, and this is why financial institutions, especially banks, are heavily regulated. From crisis to crisis, policymakers and academics have been considering potential change in the regulatory model. The goal is to prevent future asset price bubbles and liquidity shortages in the economy through periodic tightening or relaxing of regulation. Moreover, every new financial disaster is an inspiration for reforms. For example, after the 2007-2009 recession, macro-prudential regulation is being actively pursued, the purpose of which is to identify and minimize systemic and structural risks.

We argue that the current model of regulations cannot stop the inevitability of either asset bubbles or financial crises in the future. In a causal relationship, the current system of regulations tends to deal with effects of liquidity shortage during recessions rather than with the causes, which can be referred to as distorted financial intermediation. In fact, regulations seek to cure symptoms rather than disease. The rules function like antibiotics, against which an infection may develop immunity. That is why, until the distorted financial intermediation is corrected, these economic infirmities will periodically appear in creative and innovative ways with the same consequences, fating the world to perpetual cycles of boom to asset bubbles to bubble explosions to recession.

Microeconomic and Macroeconomic Models of Asset Price Bubbles

Asset values rise dramatically before bursting (Kindleberger, 2000). It is thought that asset bubbles form when the price of an asset prologedly deviates from its

fundamental value, which is the present value of future cash flows from the asset (McGrattan, Prescott, 2003). For example, the fundamental value of a bond is the present value of the cash flow of the interest payments, and in the case of stocks it is the present value of the dividend streams (Froot, Obstfeld, 1991). Accordingly, asset owners, believing that an increase in fundamental value will follow a spike in asset price, will look to sell the asset at a higher price in the future.

The microeconomic views of bubbles are based on rational and behavioral finance models. A rational approach claims that in a state of perfect information, asset bubbles will not appear. However, if they exist, prices are constantly rising to infinity. If investors have complete and reliable information, overall prices will slightly fluctuate in the equilibrium of demand and supply, and no rational buyer will pay more than the market price. (Tirole, 1981). The intuition behind it is that if the market price exceeds the fundamental value, the difference will be smoothed out through arbitrage. If it's believed that a share price is overvalued and will likely decline, rational agents will borrow company shares from a broker to then sell those assets into the market with the anticipation of later buying those shares back when the prices drop, returning the shares to the broker while pocketing the financial gain from selling high and buying low. While, on one hand, the market price can not deviate from its fundamental value (Fama, 1970), if an asset bubble forms and investors anticipate a further increase in price, this will force other rational investors to join the process, which will drive prices up exponentially (Long, Shleifer, et al., 1990). From the rational theory perspective, such "herd behavior" results in more costly outcomes, such as when fear of a bank's solvency leads to a run on the bank, depleting it of all its cash reserves. (Allen, Douglas, 1998). The effective market hypothesis is not violated by the fact that a bubble can be created. Due to frictions, imperfect markets, and asymmetric information, investors make their choice on the basis of currently available information, which leads to a random walk (Fama, 1965). Abiding to the rational approach, credit and monetary policy facilitate the creation of asset bubbles.

The behavioral approach deviates from neoclassical economic models, according to which investors are rational actors. Instead, inexperienced investors trade-in "noise" that is not related to assessing the fundamental value of assets (Shiller, 2001). Behavioral finance models argue that investors are "bounded" and are unable to 1) have complete information about fundamental values; 2) accurately calculate probabilities and risks, or 3) maximize utility through heuristic methods (Tversky, Kahneman, 1974). Such cognitive biases, which are systematic errors in the interpretation and processing of information then applied to judgements

and decision making, entice investors to follow established trends as prescribed in neoclassical economic model. Examples include ... such as overconfidence which means that investors tend to overestimate their own abilities (Bradford De Long, Shleifer, 1991), availability bias, which means excessive influence on an individual's estimate of probabilities (Herring, R. J., Wachter S, 1999), framing (Kahneman, Tversky, 2000) etc. These mental biases push investors to follow the established trend that is a herd behavior from the behavioral finance theory. The trend makes arbitrage impossible (Powers, Schizer, et al., 2004). Rational speculators fear that trend followers will push prices up. They start to move toward a trend and further contribute the prices to rise (Shleifer, Vishny, 1997).

Experimental evidence for the appearance of bubbles makes it possible to draw interesting conclusions. Experimental economists have conducted experiments in which players trade fixed-income security with each other. After several experiments, it became quite clear that despite investors' understanding the fundamental value of the asset (the exact probability of future cash flow) asset bubbles were created at each game and each new game ended with a burst of the asset bubble (Porter, Smith, 1995).

The macroeconomic picture of asset bubbles focuses on the effects of monetary policy, arguing that expansionary monetary policy is favored while tightened monetary policy impedes their development. Empirical studies show that, „*There is evidence of a significant multidirectional link between house prices, monetary variables and the macroeconomy*“ (Goodhart, Hofmann, 2008). Although higher interest rates contribute to the deflation of asset bubbles, monetary policy is an undesirable and blunt tool (Bernanke, Gertler, 2001). In contrast, Woodford argues that monetary policy, rather than macroprudential regulation, should be used to deal with financial instability (Woodford, 2012). Some economists argue that, „*asset price bubbles might be spurred by investor anticipation of fluctuations in interest rates due to inconsistent and changing monetary policy*“ (Flood, Hodrick, 1986). However, in most macroeconomic models that investigate the impact of interest rates on asset price bubbles the latter is an exogenous variable and needs no explanation. See for example (Bernanke, Gertler, 2000). Other economists accuse the government for providing various types of guarantees, such as deposit insurance or the motive of “too big to fail” to save large financial institutions. Any government support or guarantees pose a moral hazard problem and push borrowers to excessive risk-taking. As a result, demand for assets grows excessively, leading to an asset price bubble (Collyns, Senhadji, 2002). The influx of large amounts of foreign capital can also cause asset price bubbles (Reinhart, Rogoff, 2009), which

in turn, can be a consequence of a, „*global wave of savings that notably appeared in developing countries during the 1980s, and most forcefully in the U.S., inducing substantial changes in credit markets*” (Bernanke, 2009). Monetarists argue that, in some cases, inconsistent monetary policy may contribute to the formation of asset price bubbles which can subsequently transform into a financial crisis. For example, one of the most influential economists of our time, Taylor, asserts that the recession and slow recovery of 2007-2009 were due to the fact that monetary, fiscal, and regulatory policies became more discretionary and interventionist and less predictable. In particular, the main focus is on the impact of low-interest rates (that deviated from the Taylor rule) on real estate prices (Taylor, 2014). Other monetarists share a similar opinion. For example, see (Schwartz, 2009) and (Meltzer, 2009). Perhaps, the most influential monetarist, Milton Friedman, believed that the great depression was a purely monetary phenomenon, in particular, the consequence of contractionary and inconsistent monetary policy (Friedman, M., Schwartz, 1963).

Recently, researchers from different economic schools agree that the formation of asset price bubbles is regularity, and this cannot be avoided. From this perspective, the rational theory of asset price bubbles with credit constraint gains greater popularity. According to this theory, the following dynamics are observed in the financial cycle: Optimistic beliefs over the value of firms contribute to reduction in the credit constraint (asset as collateral) which, in turn, increases the credit limit and attracts more investment, which further boosts optimistic beliefs over the value of the firm. As a result, asset price bubbles are formed, the burst of which brings the economy into recession (Miao, Wang, 2018). A regulatory Instability Hypothesis provides an interesting but “none economical” explanation of the dynamics of the financial cycles (Gerding, 2014).

Causes of Asset Price Bubbles

Bubbles arise due to excessive and false expectations of investors, which can be called irrational exuberance, leading to the ineffective allocation of investment resources in securities and real estate. Irrational exuberance may spike the following factors: Break-through innovations and positive supply shocks; Government interventions in specific industries; and Securitization or other types of complex actions, as a result of which investors lose the ability to measure risks properly. Asset bubbles are regularities.

The asset price bubble may be a consequence of innovations and/or technological progress in any sector of the real economy (eg. dotcom, the energy sector before

the Great Depression, the railroad industry in the 19th century, etc.). Innovations increase investors' appetite and willingness to take excessive risks. The large flows of investment are channeled into unpredictable sectors, which further boosts the demand for long-term debt instruments that attract investments. This explains the herd behavior, "noise", or trend in the unpredictable sector both from a rational and behavioral perspective. Investors receive updated economic indicators for industry performance later. If the forecasts regarding the sector performance are confirmed, then investors' reward rate will exceed the average growth of the economy. If investment expectations are not met, asset prices deviate from their fundamental value, which is a sign of a bubble. Investors start to sell their securities, and this "herd behavior" leads to a bubble breakdown. Could this bubble explosion cause an economic downturn? We assume that the real economy must not shrink because of the loss of some investments. Put differently, a failed attempt to increase wealth will dampen future economic growth but it should not affect the current economy. The intuition behind it is that liquidity must suffice to maintain real GDP. However, if the banking sector heavily invests in securities (or real estate), the bubble explosion can evaporate not only the savings but also the liquidity needed for daily transactions. The loans are transformed into toxic assets that banks must sell at a "fire price", leading to a credit crunch. The liquidity shortage will deepen the recession which may give rise to bank-runs and bring the economy to the financial crisis that would do incredible damage to the real economy. Why was the dotcom crisis so mild? The answer is simple. The banking sector rarely finances start-ups. That is probably why fewer bank loans have been channeled to a bubble (Goldfarb, 1996). However, when the bubble burst, many companies went bankrupt in 2001.

State incentives, investments, and guarantees may also trigger the asset price bubbles. State-sponsored companies, Freddie Mack and Fannie Mae played a key negative role in the 2007-2009 real estate crisis. In 2007, their total debt on MBSs exceeded \$5 trillion, more than half of the total market (Office of Federal House Enterprise Oversight. "Relative Size of Enterprise Obligations (March, 2007).

There is no tool that can detect an asset price bubble at a particular moment. Moreover, it is impossible to determine the size of the bubble or the impact of its explosion on the economy. Bubbles are detected after they burst, no matter what is the cause of the bubble. Uncertainty is a source of irrational exuberance. Investors obtain incomplete, inaccurate, or false information about the probabilities of future cash flows. Investors make decisions based on the information available to them. The information is constantly updated. Uncertainty gives birth to asymmetric information, which in turn creates a moral hazard and adverse selection problems,

whereby the financial system fails (Mishkin, Eakins S. G., 2012). In essence, there is nothing negative when the bubbles burst. It reveals the fact of inefficient allocation of investments and resources. This information is vital to bringing the economy back on track. However, the bubbles inflated by banking loans are not so harmless. The higher a banks' the participation ratio, the more severe is the liquidity shortages when the bubble collapses, leading to a wider recession or financial crisis. Macroeconomic studies point to the pro-cyclical nature of a credit. Credit growth in booms and credit crunch in downward periods amplify the fluctuations in the business cycle (Kiyotaki, Moore, 1997). Other empirical studies also confirm the cyclical nature of leverage of households, financial institutions, and the state (Adrian, Shin, 2009).

Current Challenges to Regulatory Framework of the Financial System

There are two regulatory policy instruments: "Lean against the wind strategy" through monetary policy or macroprudential regulations. Assuming asset bubbles are a monetary phenomenon (as monetarists claim), an inconsistent monetary policy can trigger financial crises. The monetarists have made an invaluable contribution to the development of macroeconomic theory; however, we believe that neither the Great Depression nor the 2007-2009 recession were a monetary phenomenon. Convincing counterarguments of other influential scholars strengthens this opinion.)see Mishkin, 2010 ; Bernanke, B, 2009b; Stiglitz, J., 2010; Romer, C. D., Romer, D. H., 2012. For example, Taylor argues that the "great deviation from the Taylor's rule" (Fed's interest rate cuts) have boosted demand for mortgage loans. In turn, the rest of the world responded by cutting taxes. As a result of global interaction among central banks of many countries, the world's interest rates have decreased. This factor triggered the housing frenzy in all of these countries (Taylor, 2009). Let's assume that the interest rate indeed has deviated from the Taylor rule which means expansionary monetary policy. Then it is obvious that the low-interest rate would trigger the increase in loans for all industries and the housing market is among them. Therefore, it is not entirely clear, why housing prices skyrocketed relative to other commodities. As Taylor points out, rising housing prices have attracted a larger number of investors. Furthermore, state-owned companies, such as Freddie Mack and Fannie Mae, pursued reckless policies. It turns out, that the bubble was formed due to the concentration of investment in one sector and state intervention which was provoked by expansionary monetary policy. Now it is quite obvious why it happened. However, economic agents were buying property basically through mortgage loans and depository institutions together with

the shadow banking sector was attracting money from real “savers” in exchange for asset-backed securities (and securities backed on these securities), which was perceived to be a safe investment. It turns out that without securitization and with reckless performance of the state-owned companies, expansionary monetary policy was unable to drag so much investment into one sector, which means that if in 2002-2004 the interest rate indeed deviated from the Taylor rule, expansionary monetary policy could not stir up the bubble which turned into the financial crisis. Conclusion is simple. During expansionary monetary policy, prices rise on securities, but, as interest rates fall, demand for securities should also decrease (as prices go up), which may have a negative impact on savings, leading to reduced investments in securities. Some empirical studies show that, *„expansionary balance-sheet measures tend to lessen the bubble component of stock prices“* (Blot, Hubert, Labondance, 2017), and, *„evidence points to protracted episodes in which stock prices end up increasing persistently in response to an exogenous tightening of monetary policy“* (Jordi, Gambetti, 2015). In the real sector, on the other hand, cheap credit boosts investments. Aggregate demand moves right, which pushes prices upward. However, it is not clear why prices should skyrocket for just one asset, such as real estate? Inflation is a result of expansionary monetary policy, which means a relatively proportional increase in CPI components.

Even if it is believed that asset bubbles are a monetary phenomenon, the “Lean against the wind strategy” is an inflexible and blunt tool. On the one hand, the so-called financial-cycle output-gap model (FCMOD) is used to fill the gap between actual and potential GDP through correct interest rate, but on the other hand, a different approach is needed to measure bubbles. These are two different concepts that significantly increase the risks of conducting inconsistent monetary policy, paying no heed to failed attempts of economists to reach consensus over methodology on how to investigate bubbles. For example, how to represent the formation and dynamics of the bubble in a model? Here are the following options: first, in a rational bubble model the asset price consists of a fundamental value, equal to the sum of expected cash-flows, and a bubble component, which is a rational stochastic deviation from the fundamental value which grows with the discount factor (Blanchard, Watson, 1982). In this context, bubbles are linked to monetary policy, because the discount factor is related to the real interest rate. Given the nominal rigidity, the central bank affects the real interest rate. Consequently, tightened monetary policy will adversely affect the fundamental value of the asset (Gali, 2014). Second, in imperfect financial market models, expansionary monetary policy would feed the bubbles through the credit dynamics (Allen, Gale, 2000). Accord-

ingly, real credit growth should be linked to real estate prices. Third, the behavior of private agents is a key factor for bubbles with a focus on information frictions or heterogeneous beliefs (Abreu, Brunnermeier, 2003). Taking into consideration the models discussed above, the role of the monetary policy is not clearly defined. The purpose of the monetary policy should be inflation targeting. Extending the policy mandate will increase the risks of false calculations and inappropriate decisions. *“The benefits of a leaning against the wind” strategy are negative, as it creates high unemployment risks in both crisis and non-crisis periods*” (Svensson, 2016).

According to Jackson Hole consensus, macroprudential tools are suggested as an alternative instrument for “hunting the bubbles”. Perhaps it may conduct through the independent macroprudential authority that will take responsibility for implications of the policy, which means that this special agency will identify and measure bubbles, as well as define excessive risk-taking by banks or excessive debt-taking by households and corporations, etc. To avoid possible risks, the agency is authorized to increase capital requirements for banks, impose limits on the number of mortgage loans, determine debt-to-income (DTI) or value-to-loan (VTL) ratio, change standards of leverage margin, require banks to increase capital buffers in the boom times, etc. In spite of the fact that financial institutions may meet with microprudential requirements separately, negative externalities may create systemic risks that must be taken into account. Macro-prudential regulation sounds better than “lean against the wind strategy”. Perhaps it uses a powerful counter-cyclical engine to smooth the financial volatilities. Nevertheless, our concern is that (i) this can’t prevent a financial crisis in the future and (ii) this will maintain unemployment risks during both crisis and non-crisis periods for the following reasons:

1. It cannot respond to Lucas’ critiques. Rational agents can predict the consequences of new policies and develop strategies that will influence policy outcomes. The new regulations derive from past experience and are therefore backward-looking. One may face unexpected consequences when financial intermediaries change their behavior in response to a modified financial system. It is evident from history that in all crises, financial institutions outperformed regulators because they were able to evade regulations through various methods, including regulatory arbitrage..

2. Always, but especially in the midst of breakthrough innovation, when there is a positive supply shock rational agents lobby for deregulations. It is conventional wisdom that regulations hinder economic growth. Imagine, the counter-cyclical device of macro-prudential regulation is being turned on in anticipation of an economic boom (For example, stricter requirements on capital buffers

or LTV and DTI ratio, etc.). It is unlikely for politicians to maintain the countercyclical regulations for the following reasons: (a) Expecting higher profits, it would not be difficult for rational agents to bribe influential decision-makers and politicians. b) Political parties are rational agents as well. They strive to maximize their benefits. This happens through winning an election and gaining public trust. They know that in boom times, the deregulation of the financial system will have the “turning on an extra engine” effect. The boom may last longer than the political cycle. Consequently, one can predict that the ruling party would not be in power when the downturn cycle starts. The rational political party will use this opportunity regardless of its ideological beliefs. From the history reviewed one may judge that all financial crises were preceded by the deregulation of the financial system in booming times, which was followed by a tightening of regulations in the post-crisis period. A Regulatory Instability Hypothesis proves the same.

3. The purpose of macroprudential regulation is to identify and manage systemic or structural risks to prevent financial crises. However, it can not be achieved without costs. Excessive regulations such as tightening capital requirements, DTIs and other ratios reduce the availability to liquidity, which is a burden for individual economic agents and adversely impacts the economy.

4. The first three opinions are based on the assumption that the macroprudential agency correctly identifies risks based on information available at the moment. However, the data provides information about past activities. Is it even possible to predict the future? The sudden increase in economic activity are not necessarily translated into an economic boom. It is conditioned by many factors. How much should capital requirements increase? How much credit should be allowed? Will LTV or DTI ratios have an effect on loans? Would be it possible to look at the big picture and figure out short, medium, and long-term consequences based on the calibration results? At what stage of price increase will the agency reveal a bubble? Would financial organizations have enough saved liquidity when the bubble bursts? These are questions challenging the macroprudential regulations.

Conclusions

Despite contrast arguments, researchers agree that (i) boom phases create favorable grounds for creating a bubble while the downturn phase contributes to its destruction, and (ii) during the boom, there has been excessive credit growth, leading

to a credit crunch in downturn periods. Bubbles arise due to excessive and false expectations of investors, which can be called irrational exuberance, leading to the ineffective allocation of investment resources in securities and real estate.

- The capital market is well regulated today and no major changes are needed. These are depository institutions along with the shadow banking sector, which plays a key role in triggering financial crises. These are financial intermediaries in the money market, providing the real economy with liquidity. However, at the same time, they can buy corporate securities, issue long-term loans, finance start-ups, etc. Although banks are tightly regulated, neither bubbles nor financial crises prevent the occurrence.

- Today, researchers propose two instruments for dealing with bubbles: this is countercyclical monetary policy and macroprudential regulation. According to consensus, Jackson Hole, researchers agree that the “lean against the wind” strategy is quite ineffective and blunt tool.

Besides the judgments based on research and history, we seek to add some value to the problem. In particular,

- We assume that asset bubbles are not a monetary phenomenon. Moreover, bubbles are regularities. Consequently, monetary policy is an indirect and inflexible tool to deal with bubbles. We consider that macroprudential regulation may be a more effective instrument;

- Nevertheless, we argue that even with macroprudential regulation there is no guarantee that financial crises will not occur in the future, and that the countercyclical nature of macroprudential regulation creates the same favorable basis for recessions as the “lean against the wind” strategy does.

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