

EC 371 – ECONOMIC ANALYSIS OF ASSET PRICES

TERM PAPER

“Examine the distinguishing characteristics of ‘bubbles’ in asset prices and discuss their implications for government policies. Illustrate your analysis with reference to the financial crisis of 2007/09.”

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INTRODUCTION

Asset price bubbles are arguably the most dramatic and devastating economic phenomena to occur throughout history. In section 1 this paper will endeavour to define the characteristics of bubbles by reference to historically significant examples, whilst highlighting the difficulty of correct diagnosis. Furthermore, the implications of bubbles in asset markets will be analysed in section 2 and the opposing policy arguments shall be evaluated. Finally, in section 3 the role of the 'housing bubble' will be explored in the context of the recent Global Financial Crisis along with an assessment of the policy responses. Throughout this paper the discussion will evaluate the hypothesis that *if* one can in fact identify an asset price bubble, there are measures that can be taken to decrease the likelihood of a consequential recession or at least mitigate the potential damage incurred by financial markets.

SECTION 1: CHARACTERISTICS OF BUBBLES

The word bubble often projects an impression of inevitable fragility and indeed in economics a price bubble has been defined as, 'a cumulative upward movement in the price of an asset that occurs mainly because speculators believe the price will rise still further... such speculative behaviour can force prices to rise for some period on a path that is eventually realized to be unsustainable.'¹ These phenomena are notorious for inflating asset prices to irrational price levels until investors realise the unrealistic overvaluation, at which point the asset price crashes back to a more rational level. Various historical examples have taught important lessons to the world of economics. There are infamous

¹ John Black, Nigar Hashimzade, and Gareth Myles, *Oxford Dictionary of Economics* (Oxford University Press, 4th ed, 2013) < <http://0-www.oxfordreference.com.alpha2.latrobe.edu.au/view/10.1093/acref/9780199696321.001.0001/acref-9780199696321-e-281?rskey=yklbol&result=8>>

examples of bubbles ranging throughout history but perhaps the most well-known early example is that of the tulip frenzy of 17th century Europe which has since become known as 'Tulipmania'. In the early 1600's the Netherlands was fast becoming the primary trading market for rare species of tulips and the rapid escalation of their value attracted the attention of investors which saw prices continue to rise until 1637 at which point prices started to decline to a price which was ultimately 0.5 percent of the price of tulip bulbs at their peak.² Of course in hindsight, it is easy to judge the investors' optimism as irrational, but history suggests that the allure of a quick return can be too good to pass up. Almost a century later there were two key examples of asset price bubbles in Europe which shall be referred to jointly as The Mississippi and South Sea Bubbles. The Mississippi and South Sea Companies respectively acquired French and English government debt before offering shares in these companies to the public with the promise of high returns.³ The expectation of rapid profits meant that the stocks were in high demand which expedited the rise in share price and subsequently attracted the interest of investors who were impressed by its early performance.⁴ Therefore, the promise that an asset price will rise can stoke the demand which raises the price; that is, bubbles can start as self-fulfilling prophecies. In 1720 the share price crashed to a level comparable to the price of the stocks when they were initially offered to the public. Clearly, speculative expectation can wreak havoc on the price of an asset or even an entire market. In 1929 share prices on the New York Stock Exchange ultimately dropped by an unprecedented margin and marked the beginning of the decade long Great Depression.⁵ It is interesting however, to contrast the 'Great Crash' of

² Peter Garber, 'Famous First Bubbles' (1990) 4(2) *Journal of Economic Perspectives* 35, 37.

³ Roy Bailey, *The Economics of Financial Markets* (Cambridge University Press, 2005) 238-9.

⁴ *Ibid.*

⁵ Ben Bernanke, 'Non-Monetary Effects of the Financial Crisis in the Propagation of the Great Depression' (1983) *National Bureau of Economic Research*, working paper 1094, 2.

1929 to the stock market crash of 1987; the latter was one of the most violent crashes recorded among developed economies with the New York Stock Exchange dropping 20 percentage points in a single day, yet in contrast to the Great Crash no period of depression followed.⁶ From these two stock market crashes one can conclude that the bursting of a bubble can plunge interconnected economies into recession, however the bursting of a bubble does not guarantee that a recession will follow. More recently, in the late 1990's, investors experienced a period of 'irrational exuberance' regarding many internet and information technology companies listed on the major stock exchanges which caused such share prices to skyrocket.⁷ Interestingly, when the prices fell in 2000, it was the high technology based stocks that were worst affected but the fallout was far more widespread due to the tumultuous period in which many deceptive financial practices were discovered causing risk premiums to rise; consequently investors made more conservative predications of asset prices for their investment decisions.⁸ Thus, financial and technological innovation can cause excessive optimism among investors leading to prime conditions for a price bubble.

While there are attributes of bubbles that can be observed by comparing the historically significant bubbles, many economists may desire quantitative measures to suggest that an asset may develop a bubble trend in the near future. A relevant concept in this regard is the fundamental value of an asset which can be calculated as the discounted value of its expected rates of return. If the standard assumptions behind predictive models are modified

⁶ Douglas Evanoff, George Kaufman and Anastasios Malliaris, *New Perspectives on Asset Price Bubbles: Theory, Evidence and Policy* (Oxford University Press, 2012) 3.

⁷ Alan Greenspan 1996 as cited in; Robert Shiller, *Irrational Exuberance* (Princeton University Press, 2nd ed, 2005) 1.

⁸ William Hunter, George Kaufman and Michael Pomerleano, *Asset Price Bubbles: The implications for Monetary, Regulatory, and International Policies* (The MIT Press, 2003) 72.

to include the possibility that the expected return of the next period may be partially determined by the existence of a bubble, then investors may seek to utilize the predicting capabilities of the Capital Asset Pricing Model (CAPM) or Arbitrage Pricing Theory (APT).⁹ If the market price deviates from the fundamental value, particularly if the market price is higher, there is ostensibly evidence of an asset price bubble.¹⁰ A determination of an underpriced asset may explain the early stages of a speculative bubble where price rises very quickly. However, a conclusion that an asset is overpriced could occur just before the crisis of confidence that often indicates the imminent price crash.¹¹ Therefore, the results of these models are somewhat ambiguous and they should be interpreted in the context of the current state of the economy since blind reliance on predictive models is a risky approach to investment decision making. This is because one may erroneously justify any price fluctuation as the work of a bubble since it can be difficult if not impossible to distinguish between price fluctuations and bubble that is separating an asset's market price from its fundamental value.¹² Ultimately, the fact that any model must depend on an *expected* flow of future income imports the familiar problem in finance where one uses expected values (which will differ from the actual observed values) to predict outcomes.

SECTION 2: POLICY DILEMMAS UPON EVIDENCE OF A BUBBLE

Due to the lack of certainty in the diagnosis of asset price bubbles, such bubbles pose a unique threat to Governments and central banks around the world. Correct diagnosis of a bubble is essential in light of the difficult policy questions and the potential consequences

⁹ Roy Bailey, *The Economics of Financial Markets* (Cambridge University Press, 2005) 241.

¹⁰ Oliver Blanchard and Mark Watson, 'Bubbles, Rational Expectations and Financial Markets' (1982) *National Bureau of Economic Research*, working paper 945, 1.

¹¹ Robert Shiller, *Irrational Exuberance* (Princeton University Press, 2nd ed, 2005), 72.

¹² David McMillan, 'Present Value Model, Bubbles and Returns Predictability: Sector Level Evidence' (2010) 37(5) *Journal of Business, Finance and Accounting* 668, 676.

that threaten markets and indeed entire economies.¹³ However, the primary difficulty lies in the inability to formulate an accurate test for the existence of bubbles in the economy. For instance, failure to identify the existence of a bubble due to a false-negative error would cause governments to be surprised when the effects of a bubble eventually distort economic indicators, and thus immediate response would be virtually impossible and the remedy most likely delayed. By comparison, concluding that there is an asset price bubble distorting the economy when in fact there isn't one is a false-positive error that could tempt governments to apply contractionary policy, which would unnecessarily constrain economic performance. Therefore theoretically, the inability to test with certainty could perhaps lead to undetected bubbles and misused policy.

Nevertheless, if a government suspects that the price of an asset is being distorted by the unfounded optimism of investors, the immediate question becomes; what to do about it? Theoretically, the optimal response from a central bank would be to ignore asset price fluctuations caused by a variation of the fundamentals and to offset asset price fluctuations caused by bubbles.¹⁴ There is widespread debate on whether or not monetary policy should be used to combat emerging bubbles.¹⁵ On the more radical side of this debate are those who believe that a central bank should endeavour to identify bubbles and apply disinflationary pressure via higher interest rates to combat the tendency for asset prices to rise. This policy makes existing debt repayments more challenging which may lead to the

¹³ Douglas Evanoff, George Kaufman and Anastasios Malliaris, *New Perspectives on Asset Price Bubbles: Theory, Evidence and Policy* (Oxford University Press, 2012) 4.

¹⁴ Douglas Evanoff, George Kaufman and Anastasios Malliaris, *New Perspectives on Asset Price Bubbles: Theory, Evidence and Policy* (Oxford University Press, 2012) 189-190.

¹⁵ William Hunter, George Kaufman and Michael Pomerleano, *Asset Price Bubbles: The implications for Monetary, Regulatory, and International Policies* (The MIT Press, 2003) 274.

'cashing in' of collateral where the aggregate effect is a falling asset price.¹⁶ The problem with this policy is that the central bank can effectively initiate a chain of events that could potentially cause the very collapse that it was concerned about in the first place.¹⁷ The merit of this policy lies in the rationale that asset bubbles eventually collapse, so perhaps it is better to burst the bubble while it is smaller and the central bank can offset a more manageable negative demand shock. The alternative school of thought is a more *laissez faire* approach whereby central banks do not interfere with asset prices unless they cause a deviation from the targeted inflation rate or a bubble bursts and the central bank initiates the recovery through expansionary policy.¹⁸ Advocates of the latter approach suggest that:

Central banks should adjust monetary policy actively and preemptively to offset incipient inflationary or deflationary pressures. Importantly, for present purposes, it also implies that policy should *not* respond to changes in asset prices, except insofar as they signal changes in expected inflation.¹⁹

The benefits of this 'Bernanke-Gertler policy' are twofold: First, the central bank maintains its objective of inflationary targeting in the face of emerging asset price bubbles which ensures consistency. Secondly, this policy reduces the likelihood of a collapse in financial markets since a bubble places upward pressure on inflation which would yield a contractionary response from the central bank and vice versa which provides some resistance to the potentially massive swings that can be caused by bubbles. However, the

¹⁶ Evanoff, Kaufman and Malliaris, above n 14, 177.

¹⁷ Oliver Blanchard and Jeffrey Sheen, *Macroeconomics* (Pearson, 2009) 361.

¹⁸ Hunter, Kaufman and Pomerleano, above n 15, 74.

¹⁹ Ben Bernanke and Mark Gertler, 'Monetary Policy and Asset Price Volatility' (1999) *Economic Review* 17, 18.

Bernanke-Gertler policy has received further criticism since the Global Financial Crisis because in hindsight the central banks of major economies could have taken contractionary action as soon as they were satisfied that asset prices had become overpriced instead of waiting for inflation rates to rise.²⁰ Nonetheless, it is important to bear in mind that in isolation the Bernanke-Gertler approach to monetary policy is insufficient to contain the damaging effects of bubbles; an economy needs effective legal systems, transparent accounting practices and a well regulated banking sector.²¹ Therefore, the other important aspect of economic policy falls upon the government to ensure that efficient mechanisms are in place to facilitate trade in asset markets.

SECTION 3: OVERVALUED ASSETS IN THE GLOBAL FINANCIAL CRISIS

The global financial crisis of 2007 provides a fitting context to draw many of the above-mentioned principles of asset price bubbles together and explore their role in the collapse of the financial system. In the wake of the 'dot-com' bubble and September 11 the United States Federal Reserve lowered interest rates to 1%, seemingly to stimulate the economy which is consistent with the Bernanke-Gertler policy discussed above. However, on reflection it appears that the interest rate cut was excessive in both degree and duration which led consumers to splurge on the readily available cheap credit, overheating the economy and fuelling asset price bubbles.²² This problem was exacerbated by the booming Asian economies who were investing in the United States which created an extremely liquid

²⁰ Douglas Evanoff, George Kaufman and Anastasios Malliaris, *New Perspectives on Asset Price Bubbles: Theory, Evidence and Policy* (Oxford University Press, 2012) 212.

²¹ *Ibid* 173.

²² John Taylor, 'The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong' (2009) *National Bureau of Economics Research*, working paper 14631, 3.

money supply.²³ Stockbrokers had easy access to relatively inexpensive credit which they could use to leverage their trades. The reverse side of this policy was that investors who would usually invest in treasury bonds went in search of low risk assets with a better expected return. At the same time financial institutions had been entering mortgage arrangements with households, and combining them to create Collateralised Debt Obligations (CDO) which are a portfolio of loans secured by the value of the houses that each mortgage contract relates to.²⁴ However, due to a shortage of AAA rated CDOs, financial institutions were guaranteeing the performance of lower rated assets via Credit Default Swaps in order to be upgraded to the AAA rating.²⁵ These CDOs made a satisfactory substitute for the investors who weren't happy with the return on treasury bonds because the investors believed that even if the worst should happen and the household defaults on their mortgage, the holder of the CDO would instead acquire a share of the house which was perceived to be an appreciating asset due to the housing bubble. To meet the rising demand to make more CDOs financial institutions needed more mortgages so lenders and brokers started entering subprime mortgage arrangements.²⁶ The housing bubble temporarily disguised the inadequate analysis that lenders were conducting before granting loans.²⁷ Furthermore, the traditional models used to calculate the fundamental value of real estate investment did not match the escalating market price for the decade preceding the collapse in 2007, however such indications indicated the magnitude of the bubble by calculating the price difference between the fundamentals and observed market prices.²⁸

²³ Francis Warnock and Veronica Warnock, 'International Capital Flows and U.S. Interest Rates' (2006) *National Bureau of Economic Research*, working paper 12560, 16.

²⁴ John Black, Nigar Hashimzade, and Gareth Myles, *Oxford Dictionary of Economics* (Oxford University Press, 4th ed, 2013)

²⁵ Marc Jarsulic, *Anatomy of a Financial Crisis* (Palgrave Macmillan, 2010) 29.

²⁶ Oliver Blanchard and Jeffrey Sheen, *Macroeconomics* (Pearson, 2009) 520-521

²⁷ Marc Jarsulic, *Anatomy of a Financial Crisis* (Palgrave Macmillan, 2010) 14.

²⁸ *Ibid* 36.

Inevitably, as households defaulted on their subprime mortgages the supply of houses increased and the price fell to the extent that even those who could afford to pay their mortgage decided to walk away because the cost of their mortgage was greater than the value of the house itself which exacerbated the excess supply problem and ruined the desirability of real estate investment and CDOs.²⁹ Financial institutions became unable to trade their high risk assets and thus unable to repay their debts from their leveraged investments.³⁰ Borrowing and lending dried up causing a credit crunch which caused the financial market to stall. Furthermore, the Federal Reserve's ability to stimulate the economy in the ensuing crisis was impaired because interest rates were already rather close to zero percent meaning the Federal Reserve was stuck in the liquidity trap.³¹ A liquidity trap occurs when 'real interest rates cannot be reduced by any action of the monetary authorities... The real interest rate cannot be reduced beyond the point at which the nominal interest rate falls to zero, however much the money supply is increased.'³² For many, the crash of asset prices was so severe that it led to bankruptcy, merger or a government bailout.³³ Due to the globalisation of contemporary investing, the crash of house prices and CDOs in the United States affected individuals who had international investments and countries that rely on international trade or tourism.

²⁹ *Ibid* 33

³⁰ Apostolos Serletis, Khandokar Istiak and Periklis Gogas, 'Interest Rates, Leverage and Money' (2013) 24 *Open Economies Review* 51, 52.

³¹ *Ibid* 51.

³² John Black, Nigar Hashimzade, and Gareth Myles, *Oxford Dictionary of Economics* (Oxford University Press, 4th ed, 2013)

³³ Marc Jarsulic, *Anatomy of a Financial Crisis* (Palgrave Macmillan, 2010), 89.

By 2008 the Federal Reserve was in damage control and had to take measures to keep financial institutions functioning. The collapse of the housing market bubble had caused banks and lenders to stop extending credit which led to a lack of liquidity.³⁴ However, due to the burden of the now illiquid CDOs the Federal Reserve also acted as a 'lender of last resort' and allowed financial institutions to borrow funds against collateral that was not being accepted by any other lenders.³⁵ Due to the infamous decline of major corporations in the banking, insurance and automotive sectors, the United States government spent hundreds of billions of dollars on equity and debt in order to bail out companies that were deemed 'too big to fail'. This arguably suggests that companies exploited their position which suggests that perhaps there should have been greater regulation of financial institutions' trading activities.

CONCLUSION

While a precise trigger of the Global Financial Crisis remains elusive the preceding investigation indicates that a speculative bubble fuelled by cheap credit may have distorted the market and contributed to the collapse of asset prices. History has illustrated that swift action by central banks is essential for the preservation of asset markets and institutions. While it must be acknowledged that identifying a bubble during the phase of escalating prices is particularly difficult, some indication may be gained by calculating an asset's expected price based on its fundamental value and comparing it to recent observed market prices. On balance, the renewed support for the notion that central banks should explicitly target asset prices that demonstrate fluctuations that resemble bubbles seems to be an

³⁴ Oliver Blanchard and Jeffrey Sheen, *Macroeconomics* (Pearson, 2009) 516.

³⁵ Gary Gorton and Andrew Metrick, 'The Federal Reserve and Panic Prevention: The Roles of Financial Regulation and Lender of Last Resort' (2013) 27(4) *Journal of Economic Perspectives* 45, 59.

overreaction attributed to the Global Financial Crisis. The more traditional Bernanke-Gertler flexible inflation targeting policy ensures that central banks act upon economy wide fluctuations as opposed to targeting specific sectors which may distort others. Thus central banks should focus on economic indicators and ensure that they are not caught in a liquidity trap in times of crisis. Asset price bubbles are a reoccurring disaster for economies, it is likely that there will be bubbles again in the future and perhaps the best defence is preparation and regulation.

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