

Spring 5-5-2016

Commonalities of Asset Pricing Bubbles

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COMMONALITIES OF ASSET PRICING BUBBLES

By

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Submitted in Partial Fulfillment
of the Requirements for
Graduation with Honors from the
South Carolina Honors College

May, 2016

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1. Thesis Summary

The focus of this thesis will be to examine the similarities between the 2007-2008 Subprime Mortgage Crisis and other crises resulting from the collapse of an asset pricing bubble throughout United States financial history. Particular emphasis will be placed on the real estate and stock bubbles of the 20th century, including the events leading up to the Great Depression and the Savings and Loan (S&L) crisis of the late 1980s. I explore commonalities throughout the life cycle of a bubble, from the *catalysts* that lead to bubble formation, to the *drivers* that fuel both expansion and collapse, and finally, the *impacts* that persist in the aftermath of a bubble bursting. It is my belief that rising asset prices that eventually form bubbles are not necessarily bad from the start, but that there may be a common catalyst, like a monetary policy, political initiative or other event, that creates excess liquidity and diverts capital into a particular market, leading price to stray from fundamental value. From there, a number of factors come into play to drive the expansion: social, emotional and psychological factors, like herd behavior, self-generating cycles, perverse incentive structures that encourage short-term thinking and disregard for long-term impacts, among others. Finally, I explore the impact of bubbles, post-collapse. Frequently, the market will have a period of overcorrection in the aftermath of a bubble burst, temporarily bringing prices lower than the price that historical averages would suggest. It begs the question of the extent to which the losses sustained in a bubble are true losses, or simply paper losses from paper gains. My hypothesis is that there are in fact a number of identifiable commonalities among the catalysts, drivers and impacts of asset pricing bubbles that may be useful in avoiding (or capitalizing on) future market failures and may explain why markets experience these types of collapses with such high frequency.

2. Introduction

Sixteen panics, bubbles, crises, recessions in the short history of the United States of America, approximately one every thirteen and a half years. And thousands more the world over. This monologue from the highly acclaimed film, *Margin Call*, precisely summarizes the cyclical, repetitive nature of financial markets, suggesting the inevitability of each successive panic:

It's just money; its made up. Pieces of paper with pictures on it so we don't have to kill each other just to get something to eat. It's not wrong. And it's certainly no different today than it's ever been. 1637, 1797, 1819, '37, '57, '84, 1901, '07, '29, 1937, 1974, 1987 [...] '92, '97, 2000 and whatever we want to call this [2008]. It's all just the same thing over and over; we can't help ourselves.

There is a widely held belief that bubbles can only be identified in retrospect, and yet there are countless examples of naysayers and short-sellers that have profited greatly from taking a contrarian view of markets in times of bubble formation and expansion. This suggests that the indicators of a bubble are in plain sight for those who wish to see them.

The focus of this thesis is to explore the commonalities throughout the life cycle of a bubble, from the *catalysts* that lead to bubble formation, to the *drivers* that fuel both expansion and collapse, and finally, the *impacts* that persist in the aftermath of a bubble bursting. Rising asset prices that eventually form bubbles are not necessarily bad from the start, but that there may be a common catalyst, like a monetary policy, political initiative or other event, that creates excess liquidity and diverts capital into a particular market, leading price to stray from fundamental value. From there, a number of factors come into play to

drive the expansion: social, emotional and psychological factors, like herd behavior, self-generating cycles, perverse incentive structures that encourage short-term thinking and disregard for long-term impacts, among others. Finally, there is the impact of bubbles, post-collapse. Frequently, the market will have a period of overcorrection in the aftermath of a bubble burst, temporarily bringing prices lower than the price that historical averages would suggest. It begs the question of the extent to which the losses sustained in a bubble are true losses, and which are simply paper losses from paper gains. Further investigation into the similarities between the events leading up to the 2007-2008 Subprime Mortgage Crisis and other crises resulting from the collapse of an asset pricing bubble throughout United States financial history, particularly the events leading up to the Great Depression of the 1930s and the Dot-Com Bubble of the early 2000s, reveals a number of identifiable commonalities among the catalysts, drivers and impacts of asset pricing bubbles that may be useful in avoiding (or capitalizing on) future market failures and may explain why markets experience these types of collapses with such high frequency.

3. Defining “Bubble”

To begin, it is important to define the term bubble, as it has been so frequently overused in recent years. While there is no uniformly accepted definition of a bubble among economists, a bubble is generally “an economic cycle characterized by rapid expansion followed by a contraction,” (“Bubble”) in which market participants drive up the price of an asset beyond what the underlying fundamentals would suggest. There is often a shift in the way fundamentals are viewed or measured, usually attributed to some new technology, new practice or other new innovation. These innovations are cited as a sign that we are doing things better, smarter, more efficiently, that we have entered a New Era, and become

justification to defy the old ways of asset valuation. Steve Leuthold, one of the top market analysts in the 1980s, explains the flaw in this reasoning as it related to the market in 1987, “I could see that we were at the outer limit of all evaluation benchmarks for the stock market—price/earnings ratio, yields, et cetera. Unless we’d entered a new era, it was clear that we’d topped out. I’ve been in the business a long time, and I’ve heard a lot about new eras, but I’ve never actually seen one. Someday, there may be a new era. But betting on one is a lousy basis for making investment decisions” (qtd. in Mahar). Nevertheless, millions of market participants, from the Dutch during the infamous Tulipomania to the investors worldwide in the subprime market, have driven up the prices of various assets in various “New Eras.” During these periods of mania, price strays from fundamental value, but the increased price only draws more people in, perverting the laws of supply and demand, and current prices become a leading determinant of future prices, completely undermining random walk theory. As bubble psychology takes hold, asset prices continue to inflate. Cofounder of GMO and a leading bubble forecaster, Jeremy Grantham defines bubble territory as a two standard deviation rise above the historical mean. In a normally distributed world, a two-sigma event would occur only once in 44 years; in the real world, such events occur about once every 30 years. The two-sigma threshold may be slightly arbitrary; however, the three bubbles analyzed here – the stock market bubble of the 1920s, the dotcom bubble of the late 1990s/early 2000s and the housing bubble of the late 2000s – all break through this threshold by a wide margin, with each peak qualifying as a three-sigma or greater event.

4. The Subprime Mortgage Crisis

The collapse of the subprime mortgage market triggered the monumental financial panic in 2008. Overexposed and over leveraged financial institutions were brought to their

knees, while the entire system teetered on the edge of the abyss. The bedlam of September 2008 highlighted the worst recession to hit the U.S. since the Great Depression. Real Gross Domestic Product (GDP) shrank by 4.1 percent during the eighteen-month recession (Hamilton). The national unemployment rate skyrocketed, peaking at 10 percent in October 2009, a 3.9 percent jump from a year earlier (*Unemployment*). Wave after wave of foreclosures swept the nation, hitting especially hard in Florida, Nevada and California, where the subprime mortgage markets expanded exponentially (“Record”). The self-generating cycles, which often occur in changing economies, for good or bad, exacerbated the recession. Unemployment and underemployment led to less spending and less demand, which in turn caused a decrease in production that triggered a decrease in employment. While it is clear that the subprime mortgage crisis triggered the financial meltdown and the recession, there is a lack of consensus about what precipitated the subprime mortgage crisis. The assumption of unprecedented levels of debt by the consumer, the significant changes in lending practices, the transfer of risk through investment products like securitization, the poor regulation of the financial and housing sectors, the flawed system of the credit rating agencies, and the monetary policy of the past two decades all contributed to the collapse of the subprime mortgage market. However, the Federal Government and its actions to expand homeownership undermined free market mechanisms, perverting incentives and providing the foundation upon which the subprime mortgage market ballooned. Without this foundation, the bubble and the actions of the aforementioned contributors may not have ever emerged as issues.

4.1 Catalyst: Federal Government Pushes Homeownership

The beginning of the end was the push to bring the dream of homeownership to all. The

political desire to increase homeownership was not a new thing, nor was it always problematic. In the New Deal era, several programs were established to encourage lending and end the credit crisis that arose during the Great Depression. Most notably was Fannie Mae, but others include the Federal Home Loan Bank System, the Home Owners' Loan Corporation and Housing Act of 1934, which created the Federal Housing Administration. Each was intended to expand the credit market and federally insure lenders from loss, similar to the way the FDIC (Federal Deposit Insurance Corporation) insures depositors from loss. In the forties, the Federal Government sought to extend credit to veterans for home loans as part of the GI Bill. Later, under President Johnson, the Fair Housing Act of 1968 was passed as part of the Civil Rights Act. Fair Housing's main purpose was to prevent discrimination in the business of real estate and forbid discrimination among the financiers of home buying. The enforcer of these rights is the Department of Housing and Urban Development (HUD), which was established by the Housing and Urban Development Act of 1965. The mission of the HUD is "to create strong, sustainable, inclusive communities and quality affordable homes for all" (United States. Department of Housing and Urban Development).

4.1.1 Tax Incentives for Homebuyers

The problem is that not every American can afford to be a homeowner. Unfortunately, this concept was lost on Washington in recent decades. Through federal mandates and excessive subsidies, the Federal Government forced an expansion of homeownership, without serious regard for the reverberations. The Federal Government, because of the desire to expand homeownership and as a response to a powerful housing industry lobby, passed a series of tax benefits to encourage investment in the housing market. Daniel Indiviglio of *The Atlantic*, explains, "Tax differences sweeten[ed] residential real estate investment. They

result[ed] in it looking nearly as profitable as business investment.” Among others, the major tax incentives that were used to this end were mortgage interest deductions and capital gains exclusions. In the eighties, as part of the Reagan tax cuts, the Tax Reform Act of 1986 was passed, increasing “Home Mortgage Interest Deduction to incentivize homeownership” (“Tax”). To clarify, this act significantly increased the amount of interest on a home mortgage that could be deducted on a federal tax return. What this meant for the consumer was that when they tapped into their home equity to fund their own consumer spending, the interest was tax-deductible. More significantly, however, were the capital gains exclusions. A provision of President Clinton’s prized Taxpayer Relief Act of 1997 “[eliminated] capital gains taxes of profits of \$500,000 or less on most home sales” (Bajaj). With these tax breaks, the Federal Government over-incentivized housing, which caused an unnatural gush of capital into that sector, and away from other more productive investments.

4.1.2 Federal Mandates to Fannie Mae and Freddie Mac

However, the most harmful activity of the U.S. government was its coercion of lenders and underwriters. In 1992, Congress and the Department of Housing and Urban Development began to pressure Fannie and Freddie to underwrite increasing amounts of mortgages to lower-income borrowers. According to Professor Russell Roberts of George Mason University, “For 1996, the Department of Housing and Urban Development (HUD) gave Fannie and Freddie an explicit target -- 42% of their mortgage financing had to go to borrowers with income below the median in their area. The target increased to 50% in 2000 and 52% in 2005.” These mandates, led by the now-famous Congressman Barney Frank (D-Mass.), encouraged lenders to repeatedly lower the quality of their mortgages to keep up with these high percentages (Pinto). What began as a noble pursuit to improve the nation’s welfare

via homeownership morphed into a major government manipulation of the free market that in the end was incredibly detrimental.

4.1.3 Community Reinvestment Act of 1977

Additionally, the Community Reinvestment Act further forced the erosion of lending standards. First passed in 1977 as a bill to encourage urban renewal and increase loans to “underserved” groups, it was revised repeatedly throughout the nineties. In 1995 provisions were added requiring banks to prove that they were lending to these “underserved” communities (Pinto). The terms like “underserved” and “special affordable” were used to mask these mandates in euphemism. But under this creative titling, the Federal Government was essentially forcing creditors to lend to borrowers who could not usually get a loan due to any number of reasons -- poor credit, no collateral, no job, etc. The Clinton Administration effectively increased homeownership 3.3 percent (after decades of being nearly stagnant) and the Bush Administration pushed homeownership up an additional 1.7 percent before 2007, when the market began to deteriorate (Pinto). For President Bush and Republicans, increasing lending and homeownership among the less qualified was also a way to extend the Republican voting base among minorities (Becker). Former Treasury Secretary John W. Snow remarked, “The Bush administration took a lot of pride that homeownership had reached historic highs ... But what we forgot in the process was that it has to be done in the context of people being able to afford their house,” (qtd. in Becker) shedding light on the major flaw in the policy of nearly a decade. The manipulation of market mechanisms in the pursuit of political gain led to the perversion of incentives at all levels of the subprime mortgage market chain. Underlying all these actions is a perversion of the American Dream, the materialistic pursuit of happiness.

4.2 Drivers

The actions of the federal government to increase home purchases via mandates and subsidies laid the groundwork for a massive housing bubble to expand. Low interest rates encouraged consumers, lenders and banks to take on greater amounts of debt to capitalize on the skyrocketing housing market. The actions of the consumers, lenders, bankers, underwriters and regulators in response to the system established by the aforementioned government policies drove the housing market into a bubble.

4.2.1 Consumers

With this system in place, it is no mystery that the consumer began to assume unprecedented levels of debt: household debt rose above 100 percent of disposable income, and continued to steadily increase, while personal savings as a percent of disposable income dipped into negative territory at the height of the boom (“The End”). A time when home prices decreased was far removed from memory, as they had not significantly dropped since the late 1980s. The monetary policy of the Greenspan era allowed real estate prices to continue on their upward trajectory rather than dropping with the national economy, and cultivated the belief that housing prices are resistant to market turmoil and always appreciate. As the market took off, everyone wanted in. As loan-to-value standards were pared down, homeowners were able to tap into the equity of their homes like never before, then use that cash to buy a new car, a new boat, a second home, whatever they wanted, and the interest, since the loan was through their home, was tax-deductible. The word “mortgage” is of Latin origin, roughly meaning the “dead pledge” (Marples). Home mortgages ceased to be a “dead pledge” during the boom. Americans could qualify for a mortgage with no documentation of income, job, or assets. Homeowners no longer perceived the risk in taking out huge mortgage

loans. As the optimism that accompanies bubbles spread, people began to buy vacation homes or buy homes as investments and “flip,” or resell them quickly for profit, often times without ever living in them. It seemed as if there was nothing to lose, except maybe a nice house, in which many had no equity and were never able to really afford in the first place: “The down payment, which once served to give a buyer a stake in his house, began to disappear. By 2005, 43 percent of first-time home buyers made no down payment, and 68 percent were putting less than 10 percent down” (Woods 43). Often times, refinancing was available to those borrowers in need of more favorable terms, or the home could be sold for profit, but as the market began to sour, this was no longer possible. Some people began defaulting before making the first payment. One could take out a mortgage, live in a house that one could not afford until the foreclosure process was completed, without losing much at all. It is called “strategic defaulting.” Of course, one’s credit rating would be ruined for years, but if one already had poor credit, why not enjoy the stay while it lasted?

Some wrongdoings crossed the line from irresponsibility to illegality. When the housing market tightened, and the easy flow of credit slowed, fraud became “one of the fastest growing white-collar crimes,” and in 2005, cost \$1 billion dollars (Hovanesian). The FBI classifies mortgage fraud among the top financial crimes. Although much of this fraud is committed by industry insiders, there is a trend among borrowers, called Fraud for Housing, in which the “illegal actions [are] conducted solely by the borrower, who is motivated to acquire and maintain ownership of a house under false pretenses such as misrepresented income and asset information on a loan application” (United States. Federal). By falsifying documents, the borrower is able to do much of what the previously mentioned borrowers did, live in a new home, with little perceived risk. Additionally, homebuyers bought products

beyond their understanding, signing documents without reading the fine print. The virtues of self-restraint and caution were swept away by the seeming lack of repercussions innate to bubble psychology, and at the collapse, it was these poorest subprime borrowers that were hit the hardest.

4.2.2 Lenders

The consumers were only able to make the mistakes that they made because the creditors would lend to them. The lowering of mortgage qualification standards made credit accessible to many who had never had that access before. This was primarily the group that overreached and made the poor financial decisions discussed in the previous section. Lenders began to accept stated incomes, instead of verifying income of the potential debtor. This made the lender particularly susceptible to fraud. Creditors, who are usually paid on commission, continually lowered their standards so that they could continue to originate the same volume of loans, and willingly turned a blind eye to the deterioration of their industry. Predatory lending was a major problem before the crash. Mortgage brokers would aggressively push complicated products, like the option-ARMs, and in some places, received a higher commission for selling a more complex loan. Seemingly money-saving features, like teaser-rates and no or low down-payments were highlighted to woo customers into buying, and the downsides and risk were often glossed over in order to make a deal. In the *Business Week* article, appropriately titled “Nightmare Mortgages,” the author explains, “The problem, of course, is that many brokers care more about commissions than customers. They use aggressive sales tactics, harping on the minimum payment on an option ARM and neglecting to mention the future implications. Some even imply verbally that temporary teaser rates of 1% to 2% are permanent, even though the fine print says otherwise” (Hovanesian). The

Federal Government has made an effort to investigate creditors for improprieties in lending, but the massive scale and the blurred ethical boundaries make prosecution extremely difficult. For many homebuyers stuck with confusing loans, there was no easy way out. In the end, since the lenders could turn around and sell the loan and the risk associated with it, the risk to them was seemingly very little. As demand for mortgages on both sides grew, they had every incentive to make more loans, even though the pool of good subprime borrowers was shrinking rapidly. However, it is clear that they, like the subprime borrowers they lent to, gained very little in the short term compared to the consequences of their actions in the long run.

4.2.3 Government Sponsored Enterprises (GSEs)

Why did the lenders so drastically reduce their qualification standards? Because the two mortgage giants Fannie Mae and Freddie Mac did. Fannie Mae was created in 1938 as a part of President Franklin D. Roosevelt's New Deal, "in order to buy mortgages from lenders, freeing up capital that could go to other borrowers" (Pickert). Fannie Mae became public in 1968, and two years later, Freddie Mac created as a competitor, going public in 1989. Although both companies were publicly traded, investors believed that the Federal Government implicitly backed the two companies and would not allow them to fail. In July 2008, that belief turned out to be true. Fannie and Freddie were not originators of loans, but they owned or guaranteed \$6 trillion of mortgages, or 53% of all US mortgages ("Fannie"). The implicit backing of the government allowed for them to dominate the market because they could borrow at lower rates than others and therefore, lend at lower rates, making their mortgages more competitive. There is a limit to the size of a mortgage that the GSEs will guarantee, as their purpose was to open the credit markets to lower-income borrowers who

might not otherwise have qualified. Under President Clinton, Fannie and Freddie were encouraged and required to increase the number of subprime mortgages they guaranteed. It is important to note that there are many borrowers who do not necessarily meet the “prime” criteria, but are worthy of a loan. However, as government pressure to write and underwrite more subprime loans continuously rose, the two GSEs were constantly forced to lower their qualification standards. Fannie Mae and Freddie Mac were always the gold standard for mortgage writing, so when the two GSEs began to liberalize their mortgage writing standards, doing away with income and employment verification, there were reverberations throughout the underwriting industry. When the two lowered their standards, a result of the political drive to expand homeownership, so did the lenders to meet Fannie and Freddie’s demand. It was then that low-doc (low documentation) and even no-doc (no documentation) mortgages began to appear. The continual reduction of standards allowed the subprime market to flourish, but when the market collapsed in July 2008, Fannie Mae and Freddie Mac were nationalized and then put into conservatorship by the Federal Government. As of November 2009, more than a year later, the Federal Government had spent more than \$924 billion on the purchase of the GSEs debt and securities (Goldman). Fannie and Freddie, like the consumers who took out the mortgages they guaranteed, overextended, and according to Chicago School economist and author Johann van Overtveldt, “wandered beyond their mission by engaging in heavy buying of mortgage-backed securities and taking large positions in the derivatives market” (192). While Fannie and Freddie did much to accelerate the growth of the subprime market, they were pushed by the Federal Government to do just that.

4.2.4 Investment Banks

The investment banks further fueled the fire by buying and repackaging the risky subprime loans into different investment products. The loan originators could sell their risky mortgages to the investment bankers, freeing themselves of the risk, and the banks could sell their products all over the world. Wall Street may be the only group more criticized than the GSEs in the post-crisis era. A look at basic supply and demand illuminates the reasoning behind Fannie and Freddie's lowering of mortgage qualification standards. As the subprime bubble grew exponentially, the profit to be made from mortgage products did the same, and the demand for more mortgages grew. The lenders were able to sell their mortgages and thus rid themselves of the responsibility and of the risk. The risk was transferred numerous times from the originator to the guarantor to the investment bank and finally to the investor. If the homeowner defaulted, everyone except the final investor had already been paid. This securitization and spreading of risk was initially thought to be beneficial, as it would allow the market to better manage risk profiles and absorb a wider range of shocks. In reality, it created tremendous moral hazard as the lender felt so far removed from the final investor and from the potential loss and when the subprime market collapsed, the problem was systemic since that risk had been spread to many investors around the world. The mortgages bought from Fannie and Freddie, among others, could be packaged and repackaged into different products like mortgage backed securities (MBSs) or collateralized debt obligations (CDOs). MBSs are pools of mortgages that are broken into tranches. The investors of the higher level tranches are paid first as the homeowner begins to pay off his mortgage; the homeowner is less likely to default on the first payments than the last, and therefore the higher level tranches are less risky and as such, carry a higher credit rating. The lower tranches, for the

same reason, are more risky investments, and accordingly, pay higher dividends to the investors. The lowest level tranches of MBSs were repackaged by the banks into collateralized debt obligations (CDOs) and similarly broken into tranches to be sold to investors around the world. The lowest tranches of CDOs could also be repackaged into synthetic CDOs, and again be broken down into more tranches and sold off. Investment banks were able to market these products to investors all over, and they were extremely successful because so long as everyone did not default at once, there was enough money to cover those losses. Author and *New York Times* journalist, Andrew Sorkin commented, “it was a strategy that worked extraordinarily well right up to the moment that it didn’t” (123). When homeowners began to default en masse, the system of MBSs and CDOs collapsed. Bubbles, especially ones the size of the subprime bubble, rarely deflate slowly. Investors, panicking, sought to unload all mortgage-related products from their portfolios immediately. It was a 21st century bank run. Banks refused to lend to each other, not knowing who was involved in the risky subprime market or how deeply. It was a full-fledged panic, and the system began to crumble. It was unclear who had what amount of subprime exposure because of clever accounting practices deployed by the investment banks. One such practice was mark-to-market accounting. Journalist Seth Jayson, in his article “A Nation of Enrons,” explains, “The problem comes when the market is batty (or doesn't exist), so you instead mark your assets to a *model*, especially one that's wrong, either because you made an error or because you based it on exceedingly generous assumptions.” Mark-to-market accounting “allowed financial institutions to over-leverage themselves as long as home prices were rising, and severely tightened credit – making it harder for the market to recover – as home prices collapsed” (Jayson). The belief that housing prices always appreciate was reflected in

this model, and when the prices began to drop rapidly, the banks were forced to write down huge losses because of this accounting practice. Unfortunately, this deceptive accounting heightened the fear and lack of trust during the meltdown, exacerbating the downward spiral. Like the others, the traders seemed to be acting in their own rational interests, but this obviously led to disastrous outcomes, what author John Cassidy calls “rational irrationality.” However, like the others, they too could pass on the risk. At the individual level, incentive pay structures and commissions transferred much of the long-term downside risk from the trader to the firm, then from the firm to the taxpayer. Deeper investigation reveals the tremendous amount of moral hazard at every level of the subprime mortgage chain.

4.2.5 Regulators

In the midst of all this deceptive accounting and detrimental lending practices, where were the regulators? The move towards deregulation began in the 1980s when free market economic theory began to trump Keynesian theory. A major deregulation for banks was the Gramm-Leach-Bliley Act of 1999, a bill that reversed several provisions of the Glass-Steagall Act of 1933. Basically, Glass-Steagall “gave tighter regulation of national banks to the Federal Reserve System; prohibited bank sales of securities; and created the Federal Deposit Insurance Corporation (FDIC), which insures bank deposits with a pool of money appropriated from banks” (“Glass-Steagall”). Essentially, it was an act that cleaved the banking world in two. From then on, there were commercial banks and investment banks. This separation was to prevent conflicts of interest. Gramm-Leach-Bliley effectively removed this prohibition by allowing bank holding companies to own other financial companies. This allowed banks that lent money for mortgages to also participate in the trade of the lucrative mortgage products. As important as the bills passed are the bills that were not

passed, mainly, the Federal Housing Finance Reform Act of 2005 and the Federal Housing Enterprise Regulatory Reform Act of 2005. The former was a bill to establish the Federal Housing Finance Agency (FHFA) as the sole regulator for Fannie Mae, Freddie Mac and all Federal Home Loan Banks. The FHFA would also be able to collect fees from the companies they regulated in order to finance that regulation. The main purpose of the bill, however, was to continue to expand homeownership among low-income families (“H.R. 1461”). The latter, the Federal Housing Enterprise Regulatory Reform Act of 2005, also sought to strengthen the power of regulatory agencies, but it, too, was never enacted (“S. 190”). From an alternate point-of-view, Thomas Woods explains, “The last deregulation was in 1999. Funds to many agencies like the SEC actually increased. Poor regulation rather than deregulation was the problem, yet there is talk of increasing the funds and powers of these bad regulators” (58-60). Despite the increase in funds, former Secretary of the Treasury Henry Paulson, who served under President George W. Bush, and during the 2008 meltdown, argues that the regulators, like the regulators of Fannie and Freddie were “underresourced and outmatched by the companies they were meant to oversee, and constrained by a narrow view of their charter and authorities” (7). He also explains that the GSEs’ regulator, the FHFA, was forced to rely “on the companies’ own analyses because they lacked the resources and ability to make independent evaluations” (7). The existence of the revolving door between financial regulators and firms raises the question of how to avoid conflicts of interest. As business and government become increasingly powerful and intertwined, the ethical lines are blurred, and it becomes more and more difficult to disentangle conflicts of interest and to know who’s working for whom.

4.2.6 Credit Rating Agencies

Credit rating agencies, such as Standard & Poor's and Moody's, evaluate the riskiness of investing in different companies, countries and products, and give them a rating, from AAA to BB. The previously discussed MBSs, CDOs and synthetic-CDOs were rated by these agencies. The highest tranches of the MBSs were given AAA ratings, while the lowest were given BB ratings. The lowest tranches were pooled into CDOs, and again broken into tranches. Contrary to expectation, the top tranches of CDOs, which are groups of BB-rated mortgages, were given AAA ratings. The system of credit rating agencies is flawed at best, corrupt at worst. Because they are paid by the companies they rate, they often overrate, then when a company begins to show signs of decay, the CRAs are slow to downgrade their rating for fear of losing credibility. Credit ratings should be a resource for investors, not the final word, but because certain types of financial institutions are constrained by government regulation to purchase only investment grade securities, the stakes attached to a rating are much higher, the agencies have more power and thus are more susceptible to corrupting influences.

The actions of each party involved in the creation and collapse of the subprime mortgage bubble seem outrageous and unprecedented at first glance. However, as we delve into the causes of past United States financial crises, we find that each instance is not so unique. Author Michael Lewis explains the recycling of financial panics, "The whole process [starts] over again, [...] but with enough details changed that, up close, the new madness looks entirely different from any madness that has ever before happened" (12).

5. The Crash of 1929

The Great Depression was the deepest and farthest-reaching economic downturn in history. The storied excesses of the roaring 1920s began to deteriorate in the summer of 1929 and were brought to a screeching halt with the crash of October 29, 1929, “Black Tuesday.” More than 16.4 million shares had changed hands that day – record-breaking volume. In total, \$25 billion – some \$319 billion in today's dollars – evaporated that day (Suddath). The panic of that day marked the beginning of a decade-long struggle for the American economy and the American people. Thousands of banks failed in the early years of the Great Depression, leaving many depositors empty-handed, as the Federal Deposit Insurance Corporation (FDIC) was not yet established. Unemployment reached 25 percent in 1933, significantly greater than the 10 percent unemployment peak following the subprime crisis. Industrial production was cut in half. It was not until the nation’s entry into World War II in 1941 that the economy truly recovered from the Great Depression. Nearly eighty years later, when the subprime mortgage crisis unfolded, a repeat of the Great Depression was one of the greatest fears of policymakers and the people alike.

5.1 Similarities to the Subprime Mortgage Crisis

Although the 2007-2008 crisis did not trigger a downturn of the same magnitude as the Great Depression, the events leading up to each crisis are shockingly similar. Just as in the 2000s, the Roaring Twenties were declared a “New Era,” with a tremendous boom on Wall Street and in real estate, especially in Florida and California. This bull market was sparked by a number of political initiatives during and after World War I and loudly supported by public officials until the bitter end. Similarly, the Twenties featured the overleveraging of the American people, new innovations in financial products and consumer

credit, deterioration in lending standards and risk management, and extremely limited regulation, all of which contributed to one of the greatest booms and busts in history.

5.2 Catalyst: Federal Government Promotes The Markets

The makings of the Crash of 1929 and the Great Depression began more than a decade earlier when the United States government took a number of actions that encouraged the American public to invest in the markets.

5.2.1 Liberty Bonds

To finance the American involvement in World War I, the United States Treasury issued Liberty Bonds five times between 1917 and 1919. Although the bonds offered a below-market return, the sensational campaign to sell these bonds drew on both the fear and patriotism of the American people. Moreover, the passage of the Sixteenth Amendment in 1913, introducing federal income tax, made the tax-free Liberty Bonds even more appealing. In the end, about half of American families purchased the war bonds (“Liberty”). For many Americans, it was their first foray into purchasing a financial asset. When the War ended and the bonds were paid off, there was not only a gush of newly available capital, but also a desire to continue investing in the financial markets, as the pay-off on the Liberty Bonds had been so quick and painless. According to *Wall Street: A History*, “Many of the Liberty bond investors had purchased a financial asset for the first time, and when redemption came so, too, did the assurance that investments were relatively safe” (152). The result was one of the greatest bull market runs in history.

5.2.2 Postwar Monetary Policy

The devastation in Europe caused by World War I led to a great structural shift in the global economy, away from Europe and to the United States, particularly New York. In order

to prop up European currencies, starting with the British pound, the Federal Reserve and the Bank of England struck a deal to hold U.S. interest rates below U.K. interest rates and insulate the British market. A similar agreement was later made with the French. The diversion of capital from the other countries to the United States created cheap consumer credit and again laid the foundation for a corresponding boom in asset prices. Bears were written off as unpatriotic, and the greatest bull market in U.S. history raged on for nearly a decade.

5.3 Drivers

Different parties naturally began to take advantage of this highly liquid environment. The gush of investment capital at first enabled the growth of revolutionary technologies like the radio and automobile. However, the industrial and real estate booms of the 1920s quickly escalated into bubble territory in response to the actions of the consumers, lenders and bankers and the inaction of regulators.

5.3.1 Consumers

The rise of the automobile, particularly Ford Motor Company, launched with it the rise of consumer credit. The introduction of monthly installment payment plans enabled the average American to own their own car, and the idea quickly carried over to other industries. The American people took advantage of their newfound access to the credit markets to speculate in the stock market. As historian and author T.H. Watkins explains, “The game was speculation, the definitive material dream of the era of material dreams. Speculation as an enterprise is the child of available capital, and during most of the twenties there was a great deal of capital loose in the land” (34-35). The popularity of the stock market grew exponentially during the 1920s, as did the number of banks and brokerage houses. More and

more small investors piled into the market, often times with the familiar belief that prices would only continue upon their upward trajectory. Many of the newest investors failed to fully comprehend the risks they were assuming, especially with the impacts of their leveraging. At that time, margin requirements were generally only 10 to 20 percent, and there were an abundance of brokerage houses willing to lend. This structure was extremely profitable for both sides during the market's climb; the investors magnified their returns with leverage, while lenders enjoyed wide spreads. The aforementioned introduction of income tax served to reduce selling pressure, as investors sought to avoid taxation by avoiding actually realizing their gains. This both helped to push the market ever upwards and sparked the practice of using the highly valued stocks as collateral to borrow more money to invest. It is reminiscent of homeowners tapping the equity of their homes in the 2000s in order to finance greater consumption and further fuel the bubble expansion.

With easy credit, Americans began to pursue fast money schemes outside of Wall Street. Real estate markets in Florida and California particularly boomed, as they did again in the 2000s. Over a million people moved to Southern California, representing one of the largest internal migrations in U.S. history. According to author T.H. Watkins, "The result was a real estate boom of dizzying proportions: in 1919, the total value of real estate permits in Los Angeles had been \$28 million; by the end of 1923, it was more than \$200 million and in the interim fourteen hundred housing tracts had been laid out ... by the end of 1924 there were more lots than buyers; banks pulled in their loans and the boom died amid the rustle of bankruptcy papers" (35). The collapse in California did nothing to stop the rise in real estate prices in Florida. It was a classic example of bubble thinking: this time, this market, is different in a way that makes it fundamentally more stable and therefore unlikely to suffer

the same fate. Florida real estate continued its climb, peaking in 1926, before the bubble (and several hundred people) was killed by two major hurricanes. In each case, as in the Subprime Mortgage Crisis, the excessive use of leverage accelerated the boom and then exacerbated the bust. As confidence in the markets and in the banks crumbled in October 1929, stock prices began to spiral out of control. With such small margin requirements, investors were quickly wiped out and therefore, unable to meet margin calls or repay their debts. However, banks were forced to call in loans so that they could repay depositors. These calls forced many borrowers into bankruptcy, which in turn led to thousands and thousands of bank closures, plunging the nation towards depression.

5.3.2 Lenders/Banks

Again, consumers were only able to accumulate massive debts because lenders were willing to lend to them. The massive expansion of credit, especially margin accounts for stock market purchases, was coupled with a tremendous deterioration in lending practices. At the same time, the banks ramped up investment banking significantly, creating and selling thousands of new securities. The lack of due diligence in lending mirrored the lack of due diligence in underwriting stock issues. “It is estimated that of the \$50 billion in new securities offered during this period, half became worthless” (“What”). However, creditors and underwriters used aggressive sales techniques to push new financial products into the hands of the American public. The result was a system built solely on trust and confidence in the market, which many times turned out to be misplaced.

Fraud in the 1920s ran rampant. Information inefficiencies were easily exploited by market insiders. Insiders would frequently pool their resources to buy up the stock of a certain company, pump up its value by harping on the company’s pros in the papers, and then

dump the stock on market at its peak, leaving less sophisticated investors holding the bag. The pump and dump scheme was frequently run in reverse as well, with large buyers accumulating massive holdings before encouraging shorts to take a position. When it came time to cover their position, many short sellers would find themselves having to pay a premium to the small group of owners. Price manipulation occurred even with the biggest companies of the age; not even Ford Motor Company or Radio Corporation of America (RCA) was spared. Although this type of fraudulent behavior was not a new thing, it was one of the first times that the general population was defrauded en masse. The collapse of 1929 revealed how widespread the corruption had been and led to the creation of the Securities and Exchange Commission, headed by none other than Joseph Kennedy, stock pool operator extraordinaire and father of President John F. Kennedy.

The 1920s was also the era of the infamous Charles Ponzi and the original Ponzi schemes. Ponzi was particularly active in the aforementioned Florida real estate bubble. “Real estate promoters, including the former presidential candidate William Jennings Bryan, offered seafront lots to investors for 10 percent down. Investors snapped up the properties, much of which turned out to be swamp and scrub land. Prices skyrocketed ... Ponzi himself sold lots "near Jacksonville," which were actually 65 miles west of the city. He divided each acre into 23 lots” (“Digital”). Investors at that time had few resources available to them when they were the victims of fraud, leaving many to struggle with their losses.

5.3.3 Regulators

The Roaring Twenties pre-dated the creation of most commonplace regulatory bodies we have today. The Securities and Exchange Commission was created after the crash to combat insider trading, fraudulent stock issues and a general lack of disclosure. To restore

confidence in banks and put a halt to the bank runs that were shutting down thousands of banks each year post-crash, President Franklin D. Roosevelt declared a week-long bank holiday in the spring of 1933, after which only the banks declared solvent and approved by regulators re-opened. That same year, the Glass-Steagall Act of 1933 introduced the Federal Deposit Insurance Corporation (FDIC) to protect depositors and fully put an end to bank runs. Glass-Steagall also separated investment banks from commercial banks and tightened regulation on each. (Glass-Steagall was repealed in 1999, and created an environment in the banking world in the 2000s resembling the 1920s.) However, all these reforms came after the great build-up of the Roaring Twenties and the crash of 1929. The Twenties, like the Greenspan Era leading up to the crash in 2008, was a time with little support for greater regulation of financial markets. Calls for greater regulation, attempts to stop the bubble, any bearishness at all in this period was a sign of a lack of patriotism, of selling America short.

5.3.4 Role of Bubble Psychology

Underpinning the actions of each group in the run up to the crash of 1929 was the classic way of thinking that appears in every bubble situation. At all levels, there was a widely held belief that prices will only go up, creating more demand from the fear of missing out. There was a need to get in now before prices went even higher. The rules of supply and demand were inverted; higher price only led to greater demand. Justified by the idea that at that time, we were doing things better, smarter than before – in the case of the subprime mortgage crisis, we had a better understanding of risk, risk management and diversification. In the Roaring Twenties, we had entered a new world after the Great War with new technologies, like the radio and the automobile. In each case, the expansion was supported and encouraged by the government, media and other authorities. In fact, President Calvin

Coolidge declared the market a good buy and encouraged the American public to invest, as he left office in 1928 and the stock market approached its peak.

5.4 Differences from the Subprime Mortgage Crisis

The similarities between the 1920s and the 2000s are staggering. However, there are a number of key differences, particularly in the policy response to the two crashes, that shed light on why the crash of 1929 plunged the world into the Great Depression, and the subprime mortgage crisis did not.

First and foremost, there was a widely held belief in liquidationist theory, the idea that a period of decline and deflation was necessary after a period of excess like the 1920s in order to return to economic normalcy. As Treasury Secretary Andrew Mellon, who served in the Hoover administration, once mercilessly put it, “Liquidate labor, liquidate stocks, liquidate the farmers, liquidate real estate” (qtd. in Bernanke 20). This doctrine underpinned the government’s response to the crash of 1929 and the beginnings of the Great Depression.

Further exacerbating the crisis was the United States’ adherence to the gold standard until 1933. The gold standard severely restricted the Federal Reserve’s ability to combat the crisis with monetary policy. In the aftermath of the subprime mortgage crisis and other crises, the Federal Reserve used its power to lower rates and increase the money supply, successfully alleviating those crises. With the gold standard, these monetary policy tools were unavailable. In fact, the gold standard frequently causes the money supply to increase (decrease) and rates to decrease (increase) during good (bad) times, contrary to how a modern central bank would act. This served to both fuel the bubble during the 1920s and intensify the economy’s plunge after the crash. With its commitment to both the gold standard and liquidationist theory, coupled with a desire to stem speculation in the markets,

the Federal Reserve chose to raise rates rather than lower them in order to keep money in the U.S. markets. Basically the crash of 1929 was the Federal Reserve's first test, and they failed miserably, plunging the U.S. economy into the Great Depression. The tightening of monetary policy in the United States also caused a worldwide deflation, due to the fixed exchange rate structure dictated by the international gold standard. When FDR took the United States off the gold standard in 1933, easing monetary policy, the economy saw a great rebound. Unfortunately, the premature raising of rates in the latter part of the decade triggered the dreaded double-dip recession, wiping out earlier gains (Bernanke 20-23). Lessons learned from the Great Depression were crucial in defining the Federal Reserve's response to the Subprime Mortgage Crisis and in preventing that financial crisis from becoming a worldwide depression.

6. The Dot-Com Bubble

The post-Depression and post-war era was a time of great stability and growth. Surviving the oil shocks of the early 1970s, the United States economy began in earnest what is now known as The Great Moderation. From January 1983 to December 1999, just before the bursting of the Dot-Com Bubble, the stock market's real returns averaged 12.1 percent per annum (Mahar 5).

6.1 Catalyst: Policy Response to the Savings & Loan Crisis Sets the Stage

The boom of the 1980s was boosted once again by favorable tax treatments given to the financing of corporate buyouts, such as allowing firms to deduct interest expenses associated with debt issued during a buyout, which increased the number of companies that were potential takeover targets and pushed up their stock prices. The rise of corporate takeovers was frequently financed with junk bonds, pioneered by junk bond king, Michael

Milken. The recently deregulated Savings & Loans (S&Ls) invested heavily in these bonds, with federally insured deposits, in their search for higher yields. The collapse of this market led to the failure of over 1,000 thrifts, and cost the United States taxpayer upwards of \$140 billion. The stock market correction in October 1987 – “Black Monday” – broke the previous record for the largest single day drop, but in the end, the crisis was well contained. The drop was blamed on the new computerized systems, some designed to automatically cut losses as a form of portfolio insurance and others created to take advantage of arbitrage opportunities between cash and futures markets. The Federal Reserve responded to the collapse of the thrifts and the crash of the market swiftly and visibly. The so-called Greenspan Put served to calm markets and prevent reverberations from the financial crisis to the general economy. “The effect of the Fed’s timely intervention,” according to Leon Leavy, cofounder of Oppenheimer, “was to leave investors believing that the markets were less risky than [they really are]” (qtd. in Mahar 94). As a result, the turmoil of the late 1980s did little to slow the growth of the United States economy and effectively set the stage for the expansion of the Dot-Com bubble in the 1990s.

6.2 Drivers

The first seeds of this bull market were not malignant. The rise of the Internet was truly revolutionary. Its commoditization was one of the greatest disruptors of industry since the industrial revolution, and the benefits it brought have continued long after the boom and the bust. However, the enthusiasm for technology stocks as investments in this period was severely overdone. With the initial public offering of the profitless Netscape in 1995, the mania had begun. The NASDAQ over the next five years would launch from 1,000 to over 5,000 before crumbling in the spring of 2000. The rapid descent of the tech sector stocks

began to reverberate throughout the broader economy, and the United States officially entered a recession in March 2001. The decline was compounded by the September 11, 2001 attacks. Following the devastation of 9/11, markets were closed for the longest period since FDR's banking holiday of the 1930s. When the markets finally reopened, the Dow Jones Industrial Average promptly traded down 7 percent. Unemployment peaked at 6.3% in June 2003 before the economy began to rebound and the cycle began again (Beattie).

6.2.1 Federal Government

The lowering of short-term rates that followed the S&L crisis sent previously conservative small investors out of bank savings accounts in search of higher yields. With the rise of the 401(k), small investors funneled their retirement savings, with an employer match, into the stock market. The ability to defer taxes on 401(k)s sweetened the deal for these individual investors, who enthusiastically poured their money into the market, either directly or via mutual funds. Further fanning the flame was the Taxpayer Relief Act of 1997, which created a number of exemptions for capital gains and lowered the capital gains rate to 20 percent from 28 percent for assets held more than 18 months (Ironman). Dividend rates, however, were left untouched. This change encouraged investors to value more highly stocks promising capital appreciation rather than steady dividend payments, a marked shift. Fast growing high tech companies became perfect candidates to absorb the market's liquidity. The Clinton Administration touted the success of the markets: economic advisor Alice Rivlin went so far as to proclaim the era, "a vivid demonstration of how well free-market capitalism can work" (qtd. in Price). Federal Reserve Chairman Alan Greenspan did express some doubts in his famous "irrational exuberance" speech at the end of 1996, but took no monetary policy action to slow the bubble's growth until 1999 (Govetto). At that point, the bubble was

already too formidable for Greenspan to orchestrate another truly soft landing.

6.2.2 Consumers

With this framework in place, the individual investor took advantage of his new-found freedom and control over his retirement planning, self-managing 401(k)s to the tune of \$1 trillion (Mahar 104). Once again the stock market installed itself at the forefront of popular culture as in the 1920s. The media, particularly television news channels like CNBC, endorsed the madness, hyping up companies and investors who had made it big or were surely about to. The Internet not only helped these new tech companies to grow, but also enabled the investing masses to access real-time information about them (as much information as there could be on a company with extremely limited history). As the bull market raged on, more and more small investors piled on, like in a classic gold rush. It is estimated that as early as 1992, 42 percent of all publically traded stocks were owned by Americans making less than \$75,000 a year (Mahar 105). This shift was viewed as the democratization of the market. They declared it the New Economy, one that would no longer be burdened with busts. Unfortunately, like the new eras and new paradigms of the past, the New Economy turned out to be nothing more than a classic bubble.

6.2.3 Venture Capitalists

The rise was fueled by venture capitalists, investment bankers and analysts alike. Mark Heesen, president of the National Venture Capital Association during the boom, estimates that the venture capitalists poured more than \$250 billion into emerging companies, \$175 billion of which went directly into Internet-related plays (Price). Typically, the time to exit for a venture-backed tech company is seven years from first round funding to initial public offering (IPO) or merger/acquisition (M&A) (“It’s Definitely”). During the build-up

of the Dot-Com bubble, that timeline was significantly shortened with the “race to go public.” When fifteen-month old Netscape went public on August 9, 1995, its stock price opened at \$73, well above its \$28 offering price. At close, it had come back down to \$58, representing a market capitalization of \$1.07 billion for a company that had yet to turn a profit. The mania had begun. Between 1995 and the peak in 2001, 439 dot.coms went public, raising a total \$34 billion. Hundreds more venture-backed firms went public during the boom, returning over \$140 billion to the venture capitalists and enriching many a young entrepreneur along the way (Price).

The generous stock-option pay structures of this era were initially designed to align management’s interests with shareholders’ interests. However, critics argue that options may actually pervert incentives by encouraging executives to take unreasonable risks to raise the stock prices and thus the value of their own options. For the executives, these types of gambles have a limited downside, as they have paid nothing for their options, but potentially a great upside. The allure of options was unmatched, especially as more and more young entrepreneurs were made instant millionaires with their options. When the Fair Accounting Standards Board (FASB) sought to regulate the way options packages were accounted for, they were met with the ire of lobbyists, businessmen and congressmen alike. The proposed rule change was simple – the FASB wanted companies to expense the cost of options above the line. The astoundingly unpopular proposal was quickly shot down in Congress, and the true cost of options remained veiled (Mahar 127).

6.2.4 Investment Banks

The role of the banks in the race to IPO was to underwrite and sell all these new companies’ offerings. The investment bank would typically make a seven percent fee on each

deal, a hefty sum when one considers the size of some of these offerings. Just as in the subprime mortgage bubble and other bubbles, the first offerings are decent, and price has not strayed so much from the underlying fundamentals. However, as time went on, the pool of worthy companies dwindled, but demand for tech IPOs only grew. As a result, the quality of these offerings was seriously diminished. Nevertheless, investors continued to scoop them up at rapid speed. Further compounding the issue was the role of the banks' analysts. Many individual investors believed that the analysts were unbiased, but in fact, the analysts naturally projected optimistic views about their own banks' clients. This conflict of interest frequently went undisclosed. It was particularly problematic when these analysts would appear in the media, especially CNBC, to promote their views without disclosing their biases to the investing public. When the bubble burst, these analysts became scapegoats.

6.3 Impacts

The impacts of the Dot-Com bubble were far-reaching. From one standpoint, "Billions of dollars that could have been invested in 'viable projects' were instead squandered on 'massive overinvestment throughout the technology sector,'" fund manager David Tice testified before Congress. "Do you wonder why our country does not have enough power plants and oil refineries, yet we have a reported 80 to 90 percent overcapacity in fiber optic cable? ... This is a consequence of keeping stock prices artificially high for extended periods while extending credit recklessly in the midst of a mania ... As a nation, we are about to pay for this crucial misallocation of capital" (qtd. in Mahar 25). One venture capitalist further explains the damage done, "We venture capitalists did a great disservice to entrepreneurs and entrepreneurship, funding ventures that were just in the idea stage" (qtd. in Price). However, others will argue that the mania fueled rapid innovations, technologies that

would have otherwise taken much longer to bring to market. Although the bubble failed to create long-term wealth for many of the investors, much of this technological innovation is still around and continuing to change lives today. That much cannot be regretted.

In many ways, the Dot-Com bubble set up the housing bubble. Following the S&L crisis and the Dot-Com bubble, the swift and doveish monetary policy response enabled a softer landing for both crashes. On the other hand, neither bubble was ever allowed to reach back down to the historical trend line – a major difference between the Dot-Com bubble and the others studied here. Jeremy Grantham explains in his speech to Columbia University, “The only difference is the earlier three [Crash of 1929, Nifty 50, Japan] all crashed through fair value and stayed there for a long time, 10 or 15 years. We broke their hearts, and they had to put their hearts back together slowly. Greenspan would not allow our hearts to be broken. In 2002 he came back in with such an amazingly powerful cavalry, armed to the teeth with money, that we could not even reach trend in 2002. It was completely unlike any other experience. He managed to double the market, in his usual way, and then finally, in 2008, it completed itself.”

7. Conclusions

Each bubble described here is unique in its own way, as investors generally do not make the exact same mistake twice. However, throughout the life cycle of each bubble arise a number of similarities, from the foundation to the expansion to the collapse. Moreover, bubble theory – the idea that bubbles exist and can be spotted – has serious implications for a host of economic theories.

7.1 Common Catalysts

7.1.1 Monetary Policy

The common theme at the start of each bubble seems to be a lax monetary policy that creates excess liquidity in the market. In the 1920s, it was the holding down of United States interest rates to bolster the currencies of many European nations in the aftermath of World War I. In the 1990s, rates were lowered and liquidity injected into the markets in response to the S&L crisis. The same action was taken after the Dot-Com bubble burst, setting the stage for the most recent housing bubble. In this type of low-rate environment, credit expands and liquidity increases exponentially. The market, awash with cash, goes in search of new investments.

7.1.2 Political Initiatives Divert Capital

Excess capital is often diverted into a particular asset class as a result of favorable tax laws or other political initiatives. The United States Government essentially created an investing public with the introduction of Liberty Bonds to finance the First World War. Moreover, the introduction of federal income taxes set up the market as a tax haven, in addition to severely reducing selling pressure. Decades later, favorable tax treatment of many retirement plans and of capital gains increased the appeal of fast growing high-tech stocks. Finally, those same capital gains exclusions from the Taxpayer Relief Act of 1997, coupled with the mortgage interest deductions, fueled the fire under the housing market, as the Clinton and Bush administrations sought to push up homeownership rates for political gain. Over and over, low rates and favorable tax treatments set the foundation for massive credit expansion and rising asset prices. As too much money chases too few good deals, price begins to stray from fundamental value.

7.2 Common Drivers

Once the stage is set for a bubble, a number of social, emotional and psychological factors come into play, driving its expansion. As bubbles grow in earnest, prices truly begin to stray from fundamental value.

7.2.1 Perversion of Supply and Demand

First, the laws of supply and demand are seemingly perverted. Higher price leads to greater, not less, demand. There is also an anxiety amongst potential buyers as prices climb that they will eventually be priced out, and therefore should pay whatever premium to get in now, as that premium will likely increase.

7.2.2 Herd Behavior

It is important to remember that investors are social creatures, and therefore prone to herd behavior. As Charles Mackay, author of *Extraordinary Popular Delusions and the Madness of Crowds*, puts it, “Men, it has been well said, think in herds; it will be seen that they go mad in herds, while they only recover their senses slowly, one by one.” As bubbles gain momentum, the herd will frequently shun naysayers, branding them as obsolete, cynical, and even unpatriotic. Even the revered Warren Buffet was scorned for missing out during the tech boom. Those who are initially skeptical end up giving in to the allure of the bubble, after watching their friends, neighbors and colleagues do so well. The phenomenon is well-documented in the Asch conformity experiments of the 1950s. Psychologist Solomon Asch gave participants a simple line test, asking them which line – A, B or C – matched the length of another line. The test was designed so that the correct answer would be painfully obvious. However, participants were unknowingly in a room full of actors who would all give a different wrong answer. Full three-quarters of participants would change their answer to the

wrong one in order to conform to the group (Cherry). The social pressure to conform is enormous, and many investors give in, believing that the wisdom of the crowd must be correct.

7.2.3 Market Risk vs. Career Risk

There is also the idea that it is easier and safer to be wrong with the group, then wrong alone. For this reason, many investment professionals choose to take on greater market risk in the time of manias than to take on the great career risk that may accompany going against the grain.

7.2.4 The Greater Fool Theory

Even when it becomes painfully obvious that prices have gone beyond anything fundamentals can support, prices may continue upwards as investors adopt the belief in the Greater Fool Theory – the idea that even if I am overpaying for an asset, be it a stock or house, someone somewhere in the future will be willing to pay an even greater sum for it. On the way up, this theory works quite well for those who get in and out early. Unfortunately, someone – often the individual investor or the taxpayer – is always left holding the bag.

7.2.5 New Eras

During these periods of mania, investors seeking to justify these high prices will argue that the old rules simply no longer apply in this new world. Underlying each bubble studied here is a belief that a burst will not happen. As one author explains, “The essence of the this-time-is-different syndrome is simple. It is rooted in the firmly held belief that financial crises are things that happen to other people in other countries at other times; crises do not happen to us, here and now. We are doing things better, we are smarter, we have learned from past mistakes. The old rules of valuation no longer apply. Unfortunately, a

highly leveraged economy can unwittingly be sitting with its back at the edge of a financial cliff for many years before chance and circumstance provoke a crisis of confidence that pushes it off” (Reinhart 1).

7.3 Common Impacts

In the aftermath of most bubbles (Dot-Com excluded due to the Greenspan Put), asset prices generally fall even lower than historical trends would suggest, as panicked investors engage in a massive sell off. The media reports staggering amounts of money that have just simply vanished or disappeared. However, if the elevated asset prices were unjustified in the first place, to what extent are the losses real losses? It can be argued that the losses are just paper losses on paper gains. This is likely true for the market overall, but for the greatest fool, the investor who bought in at the top, those losses are very real.

7.4 Implications for Economic Theory

It is important to note that the mere existence of bubbles seemingly casts doubt on the rationality of market actors and calls into question efficiency of markets and some of the underlying tenets of capitalism. Information has become more accessible, insider trading has become more difficult, and market systems have been greatly improved to match buyers and sellers. Nevertheless, the business cycle still creates booms and busts. I would argue that these bubbles, despite all our advancement, are deeply rooted in our human nature, which has in fact changed very little through the investing ages.

7.4.1 Random Walk Theory

The Random Walk Theory states that stock prices take a random path, much like the steps of a drunkard. Prices are independent from other factors, and therefore cannot be predicted based on past movements. The theory is based on the idea that all available

information is already reflected in the current stock prices, i.e. markets have at least semi-strong efficiency. However, the build-up of a bubble often seems contradictory to the Random Walk Theory. In the midst of the mania, we see that momentum does build. Increasing prices, rather than improving fundamentals, begin to drive prices upwards. When bubbles finally burst, prices spiral downwards, frequently lower than fundamentals may warrant. These trends, both upwards and downwards, directly counter the idea that price moves are independent of past movements, and further calls into question the rationality of market actors.

7.4.2 Rationality of Market Actors

The true capitalist system requires that all participants be rational and act in their own best economic interest. The existence of bubbles, and moreover, the frequency with which they form, casts doubt on the rationality of market actors. Alan Greenspan himself declared the mania surrounding the Dot-Coms to be a period of irrational exuberance. At first glance, it seems obvious that rational market participants would not drive prices beyond a rationally justifiable level. However, there is a case to be made for the rationality of individual market participants even during periods of mania. During the build-up of each bubble, market actors were arguably acting in their own best interest by taking advantage of incentives like tax breaks and cheap credit. The formation and subsequent bursting of bubbles therefore may be viewed not as a failure of markets, but rather as a failure of government or other parties' intervention in the market.

7.4.2.1 The Prisoner's Dilemma

Paradoxically, everyone acting in his or her own rational best interests can sometimes bring about a worse outcome for the group. Periods of mania can become somewhat of a

prisoner's dilemma. Game theory describes the prisoner's dilemma as such: you and another man are suspected of committing a crime and are interrogated separately (no opportunities for collusion). Each of you can plead guilty or not guilty. If you both confess, each of you must serve a ten-year sentence. If neither of you confesses, you both will get off on a lesser charge and receive a one-year sentence. However, if you confess and your partner does not, you will be rewarded for ratting your partner out and get off completely, while your partner must serve a twenty-year sentence. If you plead not guilty and your partner rats you out, you must serve the twenty-year sentence while he gets off. If you believe your partner will confess, it is in your best interest to confess as well, lest you be stuck with a twenty-year sentence. If you believe your partner will not confess, it is in your best interest to confess and sell him out and serve no jail time. Confessing is your dominant strategy. However, your partner faces the same decision, and is also seeking to serve the minimum amount of time in prison. The dominant strategy for both prisoners individually is to confess. As a result, both of you act in your own rational best interest, confess and receive ten years in prison. However, if each of you had pleaded not guilty, you would have received one-year sentences, an obviously more favorable outcome. This is the prisoner's dilemma.

In the real world, periods of mania can trap investors in their own sort of prisoner's dilemma. For each individual actor, the dominant strategy is to ride the bubble to the top before selling out to the greater fool. There is certainly no economic incentive to get out too early, and the aforementioned social and psychological factors serve to further de-incentivize this move. When bubbles begin to deflate, the rational move for each individual market participant is to protect themselves, much like the prisoners in the above scenario, by unloading the overpriced asset quickly. However, this causes the markets to seize up and

liquidity to disappear, or as John Maynard Keynes once pointed out, “there is no such thing as liquidity of investment for the community as a whole” (qtd. in Cassidy). Prices for that asset free fall, and in the case of the bubbles studied here, bring entire markets and economies down with them. Author John Cassidy summarizes the issue, “Unfortunately, the real causes of the crisis [...] have to do with the inner logic of an economy like ours. The root problem is what might be termed “rational irrationality”—behavior that, on the individual level, is perfectly reasonable but that, when aggregated in the marketplace, produces calamity” (“Rational”). Each individual following the dominant strategy leads to a less than ideal collective outcome – the build-up and burst of a bubble – despite the perfectly rational decision-making of the market participants.

7.4.3 Efficient Market Hypothesis

Beyond the question of the rationality of market participants is the broader question of market efficiency. Eugene Fama of the University of Chicago pioneered the efficient market hypothesis, incorporating the above ideas of random walks and rationality, into a comprehensive theory that asserts that market prices reflect all available information. This implies that it would be impossible for any single market actor to consistently outperform the market via better stock-picking or market-timing. Nevertheless, there are countless examples of people who do just that, particularly in periods of mania. It is ironic that market efficiency actually requires that enough participants believe the markets to be inefficient; otherwise, no one would bother to seek out, exploit and thereby correct any inefficiencies that arose. The idea that bubbles exist, insofar as they represent prices straying from fundamental value, directly contradicts the efficient market hypothesis, at least in the short term. The bursting of bubbles and the subsequent decline in asset prices may be representative of the return to

efficiency. Nevertheless, the existence and the frequency of bubble formation serve as strong evidence against the idea of market efficiency.

7.4.4 Capitalism as the Premier Method of Organizing Trade

The frequent appearance of bubbles, and their often-devastating aftermath, seems to poke holes in the heart of capitalism, questioning its place in modern society. Boom and bust cycles seem, at the surface level, to be detrimental to economies and societies. However, as James Grant of *Grant's Interest Rate Observer*, notes,

“Markets go down because they went up [...] Where free enterprise shines is in its treatment of failure [...] Individuals as individuals are always error-prone ... [they] also make collective mistakes. They overinvest, then underinvest. The underinvestment portion on the cycle is dealt with constructively, with new business formations, bull markets, and initial public offerings. The overinvestment problem is also dealt with constructively, but with the emphasis on demolition; with bankruptcies, bear markets, consolidations, and liquidations ... Without miscalculation there would be no price action, no capital gains, no losses and no commissions. Determining the ideal price, the market would sit on it, preening” (qtd. in Mahar 14).

This suggests that these cycles are simply part of the process of advancement. While not without its shortcomings, capitalism consistently outperforms other structures in terms of output, advancement and standard of living. Furthermore, capitalism generally promotes and rewards creativity and risk-taking, and uses its market mechanisms to sort out the good ideas from the bad, which has in turn led to some of the greatest, life-changing innovations. This is the genius of the capitalist structure. For these reasons, free market capitalism remains the

dominant economic system among developed nations, and the premier method of organizing trade.

7.5 Possibility of Bubble-Spotting

Finally, the commonalities of asset pricing bubbles discussed herein suggest that there are signs, contrary to the popular notion that bubbles can only be identified in hindsight. I believe it is indeed possible to spot a growing bubble before it bursts. Spotting a bubble, however, requires a great deal of independence, both mentally and financially. Mentally, one must avoid succumbing to the many social and psychological pressures discussed in the previous sections, particularly the pressure to conform. This often requires taking on significant career risk and making great personal sacrifices. Furthermore, financial independence is almost essential in order to capitalize on a contrarian view. The fact that the majority of investors are taking the opposite view in times of mania means the bubble-spotter may quickly lose both the moral support and the financial backing of investors, who are likely to disagree. It is important to recognize the near impossibility of timing a market in a bubble. As a result, many contrarians seeking to short a bubble may find they have insufficient funds to do so, particularly if they are too early in placing their bets. It is also important to note that many of the people who have successfully predicted and even profited from bubble bursts in the past have also predicted numerous panics and crashes that never materialized, perpetually forecasting doom and gloom that rarely comes to pass. Each bubble is unique, but one of the major hallmarks of a bubble is the justification for why this particular time is different. I believe that increased interest in and knowledge of bubbles, particularly the common red flags laid out here, will go a long way in alleviating manias and improving market efficiency. Nevertheless, beware the new era or the new economy where

bubbles and bear markets are said to no longer exist. The propensity towards irrational exuberance remains as deeply ingrained in the capitalist spirit as ever.

8. Key Takeaways

- Bubbles occur with relative frequency and exhibit a number of key warning signs.
- Common features at the start of bubble formation are excess liquidity created by a low interest rate environment and the diversion of capital into a particular market often for unrelated or non-economic reasons.
- Consumers play a role in the expansion of bubbles, frequently overleveraging to participate in the mania.
- Banks contribute to the expansion by extending credit unscrupulously, and creating and selling new financial products without the appropriate due diligence.
- Regulators are often silenced during periods of mania.
- Each party is subject to bubble psychology, including herd behavior and the pressure to conform.
- Each group is incentivized to take on market risk rather than career risk; to ascribe to greater fool theory; and to try and “surf” the bubble.
- Top red flags include: an extreme and rapid rise in prices; talk of a new era; the rejection of old methods of valuation, typically related to some technological advancement; and pressure to get in now before prices go even higher, especially amongst individual investors.
- Bubbles may undermine efficient market hypothesis, but do not warrant a rejection of the capitalist structure.

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