

**Behavioral Finance in the Financial Crisis:
Market Efficiency, Minsky, and Keynes**

Hersh Shefrin

Meir Statman

Santa Clara University

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Abstract

We explore lessons from behavioral finance about the origins of the crisis and the likelihood of averting the next ones. And we argue that the crisis highlights the need to incorporate behavioral finance into our economic and financial theories.

Psychology, including aspirations, cognition, emotions, and culture, is at the center of behavioral finance. We discuss this psychology and its reflection in our behavior and the institutions that bring us together, including corporations, governments, and markets.

Our discussion encompasses Keynes' view that psychology drives economic booms and busts, and Minsky's view that crises are inevitable in capitalistic systems. It also encompasses efficient markets and free markets, bubbles, links between financial markets and the real economy, debt financing and innovation, tugs of war over government regulations and rules of fairness, and a culture where homeownership is prized beyond its economic benefits.

The financial crisis that peaked in 2008 is still roiling us in a Great Recession, where the economy is barely growing and the unemployment rate is frighteningly high. What inflicted this crisis? And what, if anything, can we do to prevent the next one? We argue that behavioral finance offers some answers to these questions. The answers are rooted in the psychology that move us in the baffling uncertainty in which we live, including our aspirations, cognition, emotions, culture, and perceptions of fairness. We discuss this psychology and its reflection in the institutions that bring us together, including corporations, markets, and governments. Our discussion encompasses Keynes' view that psychology drives economic booms and busts, and Minsky's view that crises are inevitable in capitalistic systems. It also encompasses efficient markets and free markets, bubbles, links between financial markets and the real economy, debt financing and innovation, tugs of war over government regulations and rules of fairness, and a culture where homeownership is prized beyond its economic benefits.

Keynes (1936) highlighted the role of psychology in economics long before behavioral economics and finance were formed. He argued that sentiment, reflecting unrealistic optimism or pessimism, leads to booms and busts. He noted that securities prices often diverge from their intrinsic values, and explored the implications of such divergence for employment, income, and money. Keynes' framework is as relevant to our financial crisis and Great Recession as to the Great Depression he studied.

Minsky (1986) argued that economists, misreading Keynes, downplay the role of financial institutions. In particular, he argued that financial innovation can create economic euphoria for a while before destabilizing the economy and hurling it into crises rivaling the Great Depression. Minsky's insights are evident in the effects of innovations in mortgages and mortgage securities.

Houses are at the heart of our current crisis, and their psychological appeal extends beyond utilitarian benefits. Homeowners' aspirations propelled many into houses they could not afford. Moreover, these aspirations evoked emotions and cognitive errors, blinding homeowners to risk. A mortgage banker wrote that home buyers were willing to sign anything placed in front of them. "After witnessing literally thousands of signings," he wrote, "I will tell you that most people are so focused on getting into their new home that they have no idea what it was they just signed." (Sanders 2007)

Aspirations for wealth and status blinded bankers to the risks they were taking when issuing or holding mortgages and mortgage securities. McLean and Nocera (2010) wrote that Stan O'Neal, Merrill Lynch's CEO from 2002 to 2007, was constantly prodding his people to take on more risk, aspiring to surpass Goldman Sachs. "You didn't want to be in Stan's office on the day Goldman reported earnings," said one of his lieutenants. (p. 163). Shefrin (2009, 2010) describes some of the biases that affected managers of companies associated with mortgage securities as they sped along the road which ended in the financial crisis. Overconfident Merrill Lynch executives sidelined their company's most experienced risk managers and proceeded to boost their company's exposure to subprime mortgages. Investment bankers at UBS were beset by confirmation errors, searching for evidence confirming their rosy assessments of the subprime markets and ignoring disconfirming evidence gathered by their own analysts. Analysts at the financial products division of AIG were misled by categorizing errors, effectively relegating to a single category the credit default swaps they were selling, ignoring differences in the subprime composition of mortgage pools. And executives at Standard and Poor's, aspiring to enhance their wealth and position, chose to lower their standards for rating mortgage securities rather than lose business to competitors.

A culture of homeownership, encouraged by government, deepened the crisis and extended it. President Clinton declared in 1994: “More Americans should own their own homes, for reasons that are economic and tangible, and reasons that emotional and intangible, but go to the heart of what it means to harbor, to nourish, to expand the American Dream.(Morgenson and Rosner (2011) p. 1) So did a culture where mortgage debt is accepted, even applauded. Louis, a 57-year-old man said: “[A mortgage] is a huge, it's a big credit, because if you had to save money to buy a house, 90 percent of people would never do it...It feels like someone gave you credit so that you can live in a house.” (Peñaloza and Barnhart (2011))

Corporations were eager to cater to the culture of homeownership, financed by mortgages. Countrywide Financial was the largest mortgage lender in the country before it nearly collapsed into bankruptcy in 2008 and was acquired by Bank of America. In 2003, Angelo Mozilo, its chief executive, said: “Expanding the American dream of homeownership must continue to be our mission, not solely for the purpose of benefitting corporate America, but more importantly, to make our country a better place.”(Morgenson and Rosner (2011) p. 181)

Corporations regularly engage in a tug-of-war with other corporations, consumers, and governments, whether over penalty fees for late payments of credit card bills, regulation of derivatives, or pollution of air and water. Corporations, including banks and other financial institutions, often capture regulators, turning public servants into corporate servants. “Our goal is to allow thrifts to operate with a wide breadth of freedom from regulatory intrusion,” said James E. Gilleran in 2004, while serving as the director of the Office of Thrift Supervision. John M. Reich, who directed the Office in 2007, canceled a scheduled lunch so he might have lunch with

Kerry K. Killinger, the chief executive of Washington Mutual. “He’s my largest constituent,” Mr. Reich wrote.¹

Tugs-of-war are fought in a world where people subscribe to different ideologies and notions of fairness, as we observe in the debate over the “Occupy Wall Street” movement. Eugene Robinson (2011), a Washington Post columnist, empathizes with the movement. He wrote: “Three decades of trickle-down economic theory, see-no-evil deregulation and tax-cutting fervor have led to massive redistribution. Another word for what’s been happening might be theft.”² But Jeff Jacoby (2011), a Boston Globe columnist, bristled at Robinson’s condemnation of “income growth among the highest-earning Americans as theft.” Jacoby wrote: “Economic envy may cloak itself in rhetoric about “inequality” or “egalitarianism” or “redistribution of wealth,” but its oldest name is *covetousness*. That is the sin enjoined by the last of the Ten Commandments: “Thou shalt not covet thy neighbor’s house; thou shalt not covet thy neighbor’s wife, or his manservant, or his maidservant, or his ox, or his ass, or anything that is thy neighbor’s.”³

Moreover, tugs-of-war are fought in fields fogged not only by uncertainty about the future, but also by uncertainty about the present and the effects of present actions on future outcomes. In 2004, Alan Greenspan dismissed the possibility that we were in a housing bubble: “a national severe price distortion,” he declared, was “most unlikely.” Ben Bernanke said in 2005 that home-price increases “largely reflect strong economic fundamentals.” Four years later, testifying before Congress in 2008, Greenspan said: “Those of us who have looked to the self-interest of lending institutions to protect shareholders’ equity, myself included, are in a state of

¹ Appelbaum (2010).

² http://www.washingtonpost.com/opinions/the-study-that-shows-why-occupy-wall-street-struck-a-nerve/2011/10/27/gIQA3bsMNM_story.html

³ <http://www.bostonglobe.com/opinion/editorials/2011/11/01/sinful-occupation/v9yxkVv4m4iNeG7ksLfLEL/story.html>

shocked disbelief.”⁴ (Andrews 2008) And in a 2010 speech Bernanke placed blame for the housing bubble on financial innovation of the kind that alarmed Minsky. Bernanke (2010) said: "The availability of these alternative mortgage products...is likely a key explanation of the housing bubble."⁵

The interaction between the components we noted amplified them into our crisis. Aspirations for homeownership and a culture fostering homeownership interacted with mortgage securities innovated by banks, insured by credit default swaps, and rated erroneously by rating agencies. Power in the regulatory tug-of-war shifted to banks, which used it to increase their financial leverage. Unrealistic optimism which Keynes associated with booms was paramount, as were the market dynamics emphasized by Minsky.

U.S. home prices increased from 1997 to 2006 by approximately 85 percent, adjusted for inflation, fostering the largest national housing boom in the nation’s history. The cost of owning houses relative to renting them increased dramatically from 2003 to 2006, suggesting the existence of a bubble, where home prices greatly exceeded their intrinsic values. Home prices have subsequently fallen by more than 30 percent. See Figure 1.

Bubbles pose a challenge to the efficient markets hypothesis. This hypothesis is on trial now, accused of facilitating the crisis by misleading its adherents into docility. "How did economists get it so wrong?" asked Krugman (2009). Some of the blame, he wrote, belongs to the belief that markets are efficient. "In short, the belief in efficient financial markets blinded many, if not most, economists to the emergence of the biggest financial bubble in history. And efficient-market theory also played a significant role in inflating that bubble in the first place."⁶

⁴ Andrews (2008). Andrews, Edmund L. 2008. "Greenspan Concedes Error on Regulation," *New York Times* (24 October):B1.

⁵ <http://www.federalreserve.gov/newsevents/speech/bernanke20100103a.htm>

⁶ <http://www.nytimes.com/2009/09/06/magazine/06Economic-t.html?pagewanted=print>

Our paper consists of three parts. The first part, sections 1 through 4, is devoted to market efficiency and its behavioral aspects. The second part, sections 5 and 6, is devoted to the insights into the crisis and human behavior we find in the work of Keynes and Minsky. The third part, sections 7 through 10, describes additional behavioral issues associated with the crisis, with a focus on financial innovation, aspirations, and tugs of war. Section 11 concludes.

1. Efficient markets, rational markets, and bubbles

There are two main definitions of efficient markets, one ambitious and the other modest. The ambitious definition is better called rational markets. *Rational markets* are markets where the 'the price is always right.' Specifically, these are markets where securities' prices always equal their intrinsic values. The modest definition of efficient markets is as unbeatable markets. *Unbeatable markets* are markets where investors are unable to generate consistent excess returns. (Statman (2011a))

Rational markets are unbeatable because excess returns come from exploiting gaps between prices and intrinsic values, gaps absent in rational markets. But unbeatable markets are not necessarily rational. It might be that prices deviate from intrinsic values but such deviations are hard to identify in time or difficult to exploit for generating consistent excess returns.

All citizens care about whether markets are rational since the rational allocation of capital enhances overall economic welfare. But investors, especially traders, also care about whether markets are unbeatable, since beatable markets provide opportunities to generate excess returns whereas unbeatable markets do not.

Krugman's definition of efficient markets corresponds to rational markets. He described the efficient market hypothesis as the claim that "financial markets price assets precisely at their

intrinsic worth given all publicly available information." Krugman went on to fault financial economists for rarely attempting to discern whether indeed "markets always get asset prices right" by investigating "whether asset prices make sense given real world fundamentals like earnings."

Bubbles cannot exist in rational markets because bubbles imply deviations of prices from intrinsic values. A positive bubble in a security exists when its price is higher than its intrinsic value, whereas a negative bubble exists when its price is lower than its intrinsic value. Bubbles can persist in unbeatable markets if investors are unable to exploit them for excess returns because, for example, digging for information about intrinsic values is difficult, trading on such information is costly, and risk embedded in necessarily imprecise estimations of intrinsic values can bring losses. Investors who know their estimates of intrinsic values are imprecise are deterred from investing much in attempts to exploit bubbles because they risk losses if their estimates are wrong. Moreover, investors risk losses even if they are right to conclude that a bubble exists. Gaps between prices and intrinsic values can widen during months and years, before they narrow. Investors might not have sufficient funds or fortitude to sustain their investments during extended periods when their estimates of intrinsic values are right yet prices continue to be wrong. Witness the debacle of Long Term Capital Management.

No single investor has all the information necessary for accurate estimates of the intrinsic values of securities. The genius of the market, presumed by the rational markets hypothesis, is in its ability to aggregate our individual bits of information into securities prices, such that, in the end, prices of securities provide accurate estimates of intrinsic values. But are markets rational?

Markets aggregate information as investors exploit information for excess returns. We can think of a series of intrinsic values of a security over time as a series of mosaics. Investors

gather information which uncovers portions of the mosaics, infer that the overall mosaic shows intrinsic values higher or lower than prices, and proceed to buy or sell securities so as to gain excess returns. While each investor might uncover only one portion of one of the series of mosaics, perhaps a blurred one, the collective trading action of all investors on prices serves to uncover the full series of mosaics in clarity corresponding to the aggregate information in the hands of all investors today.

Some evidence indicates that markets are indeed good at aggregating information. Huberman and Schwert (1985) examined whether announcements of Israeli Consumer Price Index (CPI) contain information that is not already aggregated in index-linked bond prices. Each of us is likely to see today some portions of the mosaic that makes up the CPI number that will be announced by the Central Bureau of Statistics next week or next month, perhaps the price of milk or the price of automobiles. Each can form an imperfect inference from his or her bit of information as to whether the CPI number to be announced will be relatively high or low. And each can trade on that information, selling bonds if we conclude that inflation is high or buying them if we conclude that inflation is low. If the bond market aggregates our individual bits of information perfectly we should find that the prices of bonds do not change at all when the CPI number is announced, because the market has already aggregated our bits of information about inflation and incorporated them into bond prices. Huberman and Schwert found that bond prices change little when the Central Bureau of Statistics announces the CPI numbers, consistent with the hypothesis that the market is indeed good at aggregating information. Similarly, Weinstein (1977) found that announcements of changes in bond ratings by rating agencies exert little effect on bond prices, implying that the bond market is good at aggregating information. Yet Dichev and Piotroski (2001) found that stock prices fail to aggregate information fully before changes in

bond ratings are announced. Stocks of companies whose bond ratings were increased by rating companies had higher subsequent returns than stocks of companies whose bond ratings were decreased.

Gorton (2008) argued that the market for subprime mortgage securities before 2006 was opaque, far from able to assure that securities prices equal their intrinsic values by aggregating information. He wrote that "the subprime residential mortgage securities (RMBS) bonds resulting from the securitization often populated the underlying portfolios of collateralized debt obligations (CDOs), which in turn were often designed for managed, amortizing, portfolios of asset-backed securities (ABS), RMBS, and commercial mortgage securities (CMBS). CDO tranches were then often sold to... off-balance sheet vehicles or their risk was swapped in negative basis trades. Moreover, additional subprime securitization risk was created... synthetically via credit default swaps as inputs into (hybrid or synthetic) CDOs. This nesting or interlinking of securities, structures, and derivatives resulted in a loss of information and ultimately in a loss of confidence since, as a practical matter, looking through to the underlying mortgages and modeling the different levels of structure was not possible." (p. 3)

Information aggregation was significantly enhanced by the introduction in 2006 of the ABX indices of subprime risk, traded over the counter. Gorton wrote: "For the first time information about subprime values and risks was aggregated and revealed. While the location of the risks was unknown, market participants could, for the first time, express views about the value of subprime bonds, by buying or selling protection." (p. 3)

We hear the impediments to rational markets which aggregate information correctly in the voice of John Paulson, whose hedge fund, Paulson and Company, gained \$15 billion in a bet against subprime mortgage securities. Speaking to the Financial Crisis Inquiry Commission

(2011) (FCIC), Paulson described the bits of information he had. First was the bit of information, gleaned from his personal experience during years of living in New York, that real estate prices do not always go up. Instead, they often bubble up only to deflate later. “New York periodically goes through a real estate crisis,” as it did in the ’70s, early ’80s and early ’90s. “I didn’t subscribe to the school that real estate only goes up.”

Paulson found additional bits of information when he researched the subprime market and was astounded by the low standards set for borrowers. He compared these low standards to the high standards he had to satisfy when he bought his own home. “When I purchased my home, it was very strict underwriting standards. I had to provide two pay stubs, two years tax returns, three months of bank statements, all sorts of credit card information. All of a sudden I saw these lowest quality mortgages with basically no underwriting standards at all.” Paulson added: “When you get to a private guy who doesn’t care, he may just fill it in, state an income, appraisal and say ‘yes we check’ when they didn’t. That’s when you got the really bad quality stuff.”

Paulson inferred from his bits of information that subprime mortgages were overpriced. But the mosaic he saw was of securities as they would be priced years later. He did not see clearly the mosaics as they would be priced in the following days and months. Indeed, his bets brought him losses during those early days and months. He told the Commission that professionals and peers thought that he was a misguided "novice" who is likely to lose his bet against subprime mortgage securities. “Most of them, when we did express our viewpoints, thought we were inexperienced novices in the mortgage market. We were very, very much in the minority. If I said a thousand-to-one, we were the one. Even friends of ours thought we were so wrong, they felt sorry for us.”(Ahmed (2011))

The cost of digging for information impedes uncovering information and its aggregation. Indeed, we know from Grossman and Stiglitz (1980) that we cannot expect securities' prices to equal intrinsic values because markets where prices always equal intrinsic values provide no compensation to investors who dig for information and aggregate it, as Paulson did when he dug into subprime mortgage securities. Aggregation of information is also hampered by limits to arbitrage. While Paulson inferred that subprime mortgage securities were overpriced, he could not have been entirely sure that his inference was correct. He surely could not have been certain that securities prices would fully reflect his inference soon, before he ran out of funds or fortitude. This uncertainty limits the amounts that investors such as Paulson are willing to bet on their bits of information. In turn, smaller bets retard and diminish the aggregation of information into prices. Moreover, some markets lack structures or securities that allow investors to bet against securities they consider overpriced. Indeed, Paulson wanted to bet against subprime mortgage securities earlier than he did but was delayed by the absence of structures and securities that allow such bets. Last, some investors who infer that current prices exceed intrinsic values might choose to ride the bubble by buying overpriced securities rather than sell them, expecting the bubble to inflate further, and hoping to sell later on before the bubble deflates. Such investors move prices further away from intrinsic values rather than closer to them.

2. Cognitive errors and bubbles

So far in our discussion of rational prices and bubbles, we have assumed that investors are not hampered by cognitive errors or misleading emotions. Instead, investors are hampered only by a failure of securities prices to properly aggregate bits of information available to each investor into complete mosaics reflecting the intrinsic values of securities. In Shefrin and

Statman (1994) we have developed an asset pricing model where investors are hampered by such errors and emotions. For example, some investors might be excessively optimistic, some excessively pessimistic, whereas others are 'smart-money' investors, free of cognitive errors and misleading emotions.

In the model, the equilibrium price of a security is a wealth-weighted average of all investors' subjective valuations of the intrinsic value of that security. Prices are rational, equaling intrinsic values, when all investors are smart-money investors. Prices can be rational even when all investors commit cognitive errors. This is the case where the cognitive errors of some completely cancel the cognitive errors of others.

Complete cancellation occurs when the wealth-weighted average error of investors is zero, a condition involving the sum of two distinct terms. First is the average error across all investors. Investor errors are nonsystematic if the average error is zero. The second term relates to non-concentrated errors among investors. Errors are non-concentrated when the covariance between investors' wealth and their errors is zero.

Patient smart-money investors drive prices to their rational levels in the long-run even in the presence of investors who commit cognitive errors. This is because, over time, wealth shifts from investors who are misled by cognitive errors to smart-money investors who are free of errors. This drives the wealth-weighted sum of investor errors toward zero. Yet prices are not necessarily rational in the short run even in the presence of smart-money investors because smart-money investors might lack sufficient wealth to offset the impact on prices of investors whose errors are not self-cancelling. Smart money investors are smart enough not to take on excessive risk in attempts to exploit gaps between prices and intrinsic values. Their caution

serves to limit arbitrage, limiting the extent to which trades by smart-money investors drive prices to equal intrinsic values. (See Shleifer and Vishny, 1997).

Rational prices exist when investor errors are not systematic or not concentrated. Yet there is much evidence that errors tend to be systematic. For example, investors are commonly misled by availability bias, where they overweight bits of information readily available to memory, while underweighting equally important bits of information not readily available to memory. To understand the role of concentration in the formation of non-rational prices, consider the evolution of a bubble.

Imagine a stock market with optimistic investors and pessimistic ones. Assume that errors at the outset are neither systematic nor concentrated, such that stock prices are rational at the outset, equal to their intrinsic values. Now imagine a long run of good news, accompanied by increases in stock prices. Optimistic investors find that their bets have paid off handsomely, while pessimistic investors find that their bets have not. As a result, wealth shifts to optimists.

If optimistic investors remain optimistic, then the shift in their relative wealth leads optimism to be concentrated among the more wealthy investors. This concentration tends to inflate the prices of securities above their intrinsic values, creating bubbles. Optimists might even ride these bubbles with leveraged positions. Moreover, if bubbles last long enough, some pessimists might become persuaded that they were wrong to be pessimists and turn into optimists. In the process they likely exacerbate bubbles. Some pessimists remain true to their pessimistic beliefs and these beliefs are indeed directionally correct. They can engage in arbitrage, making bets large enough to eliminate bubbles by pushing prices down to their rational levels. But pessimists are not likely to make large bets because large bets are very risky. This limits arbitrage and leaves bubbles inflated.

The crisis highlights the roles of optimism and pessimism. Excessive optimism leads investors to expect unwarranted increases not only in the prices of stocks and other assets, such as houses, but also in future short-term (real) interest rates. This creates a steep, positively sloped yield curve in the present, providing impetus for borrowing short-term and lending long-term. This, indeed, is what financial institutions do. A bubble can make the yield curve even steeper. Yet expectations of future short-term interest rates decline as excessive optimism wanes, and prices of long-term bonds rise, as long-term bonds are discounted by expectations of future short-term rates. Consequently, financial institutions earn low returns on their subsequent investments. In contrast, the expected rise in short-term rates is warranted when prices are rational, in which case the prices of long-term bonds fall over time rather than rise. (See Xiong and Yan , 2010).

3. Did our belief that markets are efficient cause the crisis?

Behavioral finance is perceived by some as a repudiation of the efficient markets hypothesis. And the crisis seems to provide one more piece of evidence, if one were needed, that markets are indeed not efficient. Yet discussions about market efficiency are muddled because the definition of efficient markets as rational markets is confused with their definition as unbeatable markets.

We have known that, by logic, markets cannot be efficient in the sense of rational markets since at least 1980, when Grossman and Stiglitz (1980) published their article "On the impossibility of informationally efficient markets." This is because markets where securities prices always equal their intrinsic values provide no compensation for the cost of digging for information which might uncover deviations of prices from intrinsic values. Moreover, there is

much empirical evidence that prices regularly deviate from intrinsic values. The story of John Paulson who dug for information about mortgage securities is one of many examples. Paulson had incentives to uncover deviations of prices from intrinsic values and profited by exploiting them. Indeed there is evidence that, on average, professional investors, such as hedge fund and mutual fund managers, are able to generate consistent excess returns, compensating them for the cost of uncovering information. Yet the bulk of evidence also shows that clients of money managers, both individual and institutional, do not share in these excess returns. This indicates that, from the perspective of clients, markets are efficient in the sense of being unbeatable.

As Statman (2011a) noted, it is difficult to lay blame for the crisis on a belief that markets are efficient, whether rational or merely unbeatable, when more than four out of every five mutual-fund dollars are in active mutual funds whose managers refuse to believe that markets are efficient, whether rational or unbeatable. And mutual fund managers are just one group among many who refuse such beliefs, including hedge fund managers, security analysts, and individual investors who try to glean market-beating information from magazines and television programs. It is further difficult to lay blame for the crisis on a belief that markets are efficient, knowing that crises occurred regularly centuries ago, long before the 1960s, when the efficient markets hypothesis was formed.

Indeed, the puzzle of beliefs in market efficiency is not that people believe that markets are efficient, whether rational or unbeatable, but that they think that markets are easily beatable. One category of attempts to beat the market takes the form market timing or tactical asset allocation. This category is especially relevant in the context of the crisis since, in essence, it involves attempts to identify bubbles and exploit them. Price-to-earnings (P/E) ratios and dividend yields are prominent among the possible indicators of bubbles. For example, a high P/E

ratio of a stock index, such as the S&P 500 Index, might indicate the presence of a bubble in a market that is not rational, where stock prices exceed their intrinsic values. Investors who know bubbles in real time might use that knowledge to beat the market by selling stocks now or later, when bubbles are fully inflated.

Markets that are not rational are not necessarily easily beatable. High P/E ratios and low dividend yields might indicate the presence of bubbles, but not everyone agrees that investors can use P/E ratios and dividend yields to beat the market. Campbell and Shiller (1998) found that relatively high P/E ratios and relatively low dividend yields predict relatively low subsequent long-run returns. This implies that markets are not rational and opens the door to beating the market.

The P/E ratio developed by Campbell and Shiller reached its peak of 44.2 in December 1999 and P/E ratios of many large technology companies exceeded 100. Siegel (2000, 2001) wrote at the time: “[T]hese lofty valuations could not be justified even if these firms achieved analysts' very optimistic long-term earnings growth estimates (which ranged from 20 percent to over 55 percent annually) for periods of as long as 10 years.”

Yet Shefrin (2000) pointed out that large deviations of prices from intrinsic values actually reduce the ability of P/E to predict future returns. In particular, the Campbell-Shiller P/E ratio stood at 27.7 in December 1996, the highest it had been since the stock market bubble and crash of 1929, when the P/E ratio reached 32.6. At the time, Campbell and Shiller predicted that in ten years, through December 2006, the real value of the market would be 40 percent lower than it was in December 1996. Shefrin (2000) wrote that “from a statistical perspective, the confidence associated with the 1996 Campbell-Shiller prediction for the 1997-2006 period is very low...” (p. 313) We know now that real stock prices did not fall by 40 percent between

December 1996 and December 2006. Instead, they rose by 49.7 percent. Moreover, several studies indicate that the relation between P/E ratios and dividend yields and subsequent returns is not tight, and that P/E ratios and dividend yields are not reliable predictors of subsequent returns. See Malkiel (2003), Fisher and Statman (2000, 2006), and Goyal and Welch (2003).

Fisher and Statman (2000) argued that cognitive errors explain why many investors believe that market timing is easy, when the evidence indicates that it is difficult. We note two of these errors here, hindsight error and confirmation error. Hindsight errors persuade us that it was clear in 2007, in foresight, that returns in 2008 would be disastrous. But the evidence indicates that few saw in 2007 foresight what we see today, in hindsight. We see today that the S&P 500 Index fell from 1,468 at the end of 2007 to 891 at the end of 2008, but this is not what prominent Wall Street strategists saw in foresight. *Business Week* conducted a survey among strategists at the end of 2007, asking them to forecast the level of S&P 500 Index at the end of 2008. Estimates ranged from 1,780 at the high end to 1,350 at the low end, still exceedingly higher than the actual 891.⁷ Two other surveys are the National Association for Business Economics (NABE) Outlook survey and the Blue Chip Economic Indicators survey. Surveys conducted in December 2007 and January 2008 show GDP growth forecasts much higher than actual growth, and unemployment rate forecasts much lower than actual unemployment.

Confirmation errors guide some to focus on economists who were correct in forecasting the coming crisis, confirming the belief that forecasting the crisis was easy, but neglect many more economists, including those surveyed by *Business Week*, NABE, and Blue Chip, who were incorrect.

Shefrin (2000, 2008) points out that, in general, Wall Street strategists are poor forecasters, and so their 2007 forecasts for 2008 are no exception. Using panel data for

⁷ <http://seekingalpha.com/article/58150-business-week-2008-forecasters-expect-further-gains>

individual forecasters, he found the simple rule where the forecast of next year's return equals its historical mean outperforms the forecasts of each Wall Street strategist, and also the average of all the forecasts. Yet few strategists would keep their jobs if they were to adopt simple, even if superior, forecasting rule. Hindsight bias and confirmation errors are persistent, leading Wall Street strategists and their clients alike to believe that markets are beatable once expertise is applied.

Malkiel (this volume) recognizes the distinction between rational markets and unbeatable markets. He notes that bubbles occur from time to time, where prices deviate from intrinsic values, implying that markets are not always rational. Yet he argues that the crisis provides no evidence to counter the claim that markets are unbeatable. We agree. Because of limits to arbitrage, opportunities to beat the market by earning abnormally high risk-adjusted returns are typically small, even when markets are not rational. Yet the debate about the role in the crisis of the belief in efficient markets has little to do with whether markets are unbeatable and much to do with whether they are rational. Recall that Krugman's definition of efficient markets corresponds to rational markets, describing the efficient market hypothesis as the claim that "financial markets price assets precisely at their intrinsic worth given all publicly available information." Moreover, Krugman blames the crisis on the belief that free markets are always better than regulated markets, even more than he blames it on the belief that markets are rational.

4. Efficient markets and free markets

Free markets are markets where, in their extreme form, government puts no imprint on economic activities. In their moderate form, they are markets where government puts little imprint. Free markets are often conflated with efficient markets in their form as rational markets.

Whereas Milton Friedman is most closely associated with free market advocacy, Merton Miller was foremost in advocating free financial markets. He titled a 1994 keynote address "Regulating Derivatives: Enough Already!" and wrote: "But despite what I and most other economists, at least of the Chicago variety, see as the social benefits of these financial derivatives, they have, let us face it, also been getting a very bad press recently." (1997, p. 67) Miller went on to "emphasize that no serious danger of a derivatives-induced financial collapse really exists," and that financial market disasters tend to be policy disasters committed by government entities, such as the Federal Reserve Bank, rather than by free financial markets. "A classic example," he wrote, "has been the turmoil in the U.S. bond market since the spring of 1994 after our Federal Reserve Bank suddenly nudged up short-term interest rates." (p. 68)

Free markets can easily be conflated with rational markets version of efficient markets because proponents of one are often also proponents of the other. But the two are distinct. Consider a rational market which is also free of government regulations of pollution emitted by power plants owned by utilities. Now imagine that the government enacts regulations limiting pollution, imposing fresh costs on utilities and reducing the intrinsic value of their shares. The market can remain rational if share prices drop instantaneously to equal the new intrinsic value, but the market is no longer as free as it has been.

A central bank takes interest in financial markets, in major part, because markets serve as allocators of capital. Capital is allocated productively in rational markets since prices which equal intrinsic values send correct signals as to where capital should be allocated. But capital is misallocated in bubbles, when prices deviate from intrinsic values. Free markets are best if they result in rational markets, but central bank intervention, such as popping bubbles, might be called for in markets which are not rational. A Federal Reserve Bank which identifies bubbles is likely

to pop real bubbles, doing much good, or illusory bubbles, doing much harm. A belief that bubbles cannot exist is dangerous, but so is a belief that bubbles are easy to identify. This was the quandary Alan Greenspan posed in December 1996. Prompted by Campbell and Shiller's P/E ratios analysis, Greenspan asked how "we know when irrational exuberance has unduly escalated asset values, which then become subject to unexpected and prolonged contraction...?"

Greenspan learned that the question does not have an easy answer: The dot-com bubble did not burst for another five years, bursting only after the Fed raised interest rates six times from June 1999 to May 2000.

Consider next the housing bubble of 1997-2006 which came to an end after the Fed engaged in seventeen consecutive interest rate hikes between June 2004 and June 2006. There was no consensus that a bubble was underway before it burst. In 2005, TIAA-CREF published two competing views. The bubble view was expressed by Shiller (2005), who based his opinion on Figure 1 (up to 2004). Speaking about the historical record of home prices he said: "The upswing looks quite anomalous by historical standards, suspiciously like a bubble... [T]he situation is unstable, and if expectations of further increases disappear, prices may fall sharply... [W]e should temper our expectations and recognize that there is substantial risk." The other series in Figure 1 suggest that the increase in home prices was not driven by fundamentals such as construction costs, population growth, or interest rates.

Richard Peach, Vice President of the Federal Reserve Bank of New York, presented the opposing view. Peach (2005) acknowledged that bubbles might exist in some housing markets, but argued that this was not true for all markets. Peach said: "While national average home prices are high, they do not appear to be overvalued relative to fundamentals." Moreover, Peach argued that increased home prices and the ratio of rental incomes to home prices were reflecting

improvements in the quality of houses and lower interest rates. He added that the number of people who indicated that it was a good time to buy a home was historically low, even if rising, that the average loan-to-value ratio was low, and that delinquency rates on prime adjustable rate loans was somewhat lower than on prime fixed rate mortgages. None of these facts, he pointed out, indicated the presence of a national housing bubble.

Future home prices are mosaics, fully revealed only in the future. Shiller and Peach based their assessments on different portions of the mosaics. Shiller focused on the series of home prices, a series he created. Peach focused on other portions of the mosaics, such as house quality and loan-to-value ratios. Later in the paper we shall encounter a third view from 2005, that of John Dugan, who at the time was head of the Office of the Comptroller of the Currency, and focused on weak lending practices in the market for subprime and Alt-A mortgages. Shiller's view ultimately prevailed, but note that his statements from 2005 were cautious. Moreover, Peach's view fell within the realm of plausibility. At the time, it was far from obvious to most that a national housing bubble existed. Moreover, there is not necessarily a direct line between a deflation of a housing bubble and the financial crisis that followed.

5. Keynes, bubbles, and rational prices

Our perspective on rational prices and bubbles corresponds to Keynes' ideas on economic expansions and downturns, bubbles, financial crises, rational pricing, and psychology. Indeed, Keynes wrote extensively about psychology and focused on concepts at the center of behavioral finance, such as optimism, confidence, and sentiment. Keynes applied these concepts in assessing conditions where securities prices are not rational, and in describing how bubbles

develop and burst.⁸ Writing about the psychology of financial booms and crises, Keynes noted: “The later stages of the boom are characterized by optimistic expectations as to the future yield of capital goods...of speculators who are more concerned with forecasting the next shift of market sentiment than with a reasonable estimate of the future yield of capital assets, that when disillusion falls upon an over-optimistic and over-bought market, it should fall with sudden and even catastrophic force. Moreover, the dismay and uncertainty as to the future which accompanies a collapse in the marginal efficiency of capital naturally precipitates a sharp increase in liquidity preference... it is not so easy to revive the marginal efficiency of capital, determined as it is by the uncontrollable and disobedient psychology of the business world. It is the return of confidence, to speak in ordinary language, which is so insusceptible to control in an economy of individualistic capitalism.” (pp. 315-317).

The portion of *The General Theory* most often mentioned in connection with rational prices and market efficiency is Chapter 12, “The State of Long-Term Expectation.” It is here that Keynes introduced the concept of “animal spirits” and used a beauty contest analogy to describe the behavior of investors in stock markets and the impact of their behavior on stock prices.

In the beauty-contest analogy, Keynes argued that the price of a stock does not necessarily equal its intrinsic value. Rather, it equals the average of investors’ subjective valuations of that stock. Moreover, investors are not driven to find the intrinsic values of stocks. Instead, they are driven to buy the stocks other investors will find ‘beautiful.’ Keynes wrote: “Thus certain classes of investments are governed by the average expectation of those who deal on the Stock Exchange as revealed in the price of shares” (p. 151). This property is reflected in our Shefrin-Statman model, where security prices equal wealth-weighted averages of investors’ subjective valuations.

⁸ See Chapter 22 of *The General Theory*, which Keynes titled “Notes on the Trade Cycle.”

Keynes was forceful in his view that an assumption that prices are rational is unwarranted. He wrote: “We are assuming, in effect, that the existing market valuation, however arrived at, is uniquely *correct* in relation to our existing knowledge of the facts which will influence the yield of the investment, and it will only change in proportion to changes in this knowledge; though philosophically speaking, it cannot be uniquely correct, since our existing knowledge does not provide a sufficient basis for a calculated mathematical expectation. In point of fact, all sorts of considerations enter into the market valuation, which are in no way relevant to the prospective yield. ” (p. 152).

6. Minsky and Keynes

Minsky regularly criticized economists for failing to grasp Keynes’s ideas. In his book *Stabilizing an Unstable Economy* Minsky argued that while economists assimilated some of Keynes’s insights into standard economic theory, they failed to grasp the connection between the financial and real sectors. Specifically, he argued that finance is missing from macroeconomic theory, with its focus on capital structure, asset-liability management, agency theory, and contracts. He wrote: “Keynes’s theory revolves around bankers and businessmen making deals on Wall Street...(p. 114) ... One of the peculiarities of the neoclassical theory that preceded Keynes and the neoclassical synthesis that now predominates economic theory is that neither allows the activities that take place on Wall Street to have any significant impact upon the coordination or lack of coordination of the economy...” (p. 132)

Minsky’s work on financial crises builds on Keynes’s insights, using terms such as “euphoric economy” (p. 237), and “unrealistic euphoric expectations with respect to costs, markets, and their development over time” (p. 233). Yet Minsky considered the issues of rational

prices and market efficiency as only the tip of an iceberg. His broad framework addresses issues related to the lending practices by financial institutions, central bank policy, fiscal policy, the efficacy of financial market regulation, employment policy, and income distribution.

Minsky argued that that capitalism is inherently unstable. "The history of capitalism," he wrote, "is punctuated by deep depressions that are associated with financial panics and crashes in which financial relations are ruptured and institutions destroyed. Each big depression reformed the institutional structure, often through legislation. The history of money, banking, and financial legislation can be interpreted as a search for a structure that would eliminate instability. Experience shows that this search failed and the theory indicates that the search for a permanent solution is fruitless." (p. 349)

Minsky argued further that we seem destined to go through predictable cycles, including bubbles. These cycles involve a shift in weight across the three types of financing he called hedge, speculative, and Ponzi. Hedge financing takes place when we can reasonably expect cash flows from capital assets and financial contracts to meet contractual payments today and in the future. Speculative financing takes place when we can reasonably expect cash flows to fall short of contractual payments in some, typically near-term, periods. Nevertheless, if we separate cash receipts and payments into income and the return of principal, as we separate monthly mortgage payments, we find that expected income receipts meet interest payments. Thus, speculative financing involves the rolling over of maturing debt. Ponzi financing is similar to speculative financing except that it involves the equivalent of negative amortization. Thus the face value of the outstanding debt increases. Borrowers engaged in speculative and Ponzi financing expect payment on debts to be met by refinancing, increasing debts, or liquidating other assets. Minsky wrote that "The mixture of hedge, speculative, and Ponzi finance in an economy is a major

determinant of its stability. The existence of a large component of positions financed in a speculative or a Ponzi manner is necessary for financial instability." (p. 233)

Financial institutions, such as banks, become increasingly innovative in their use of financial products when the business cycle expands, boosting their leverage and funding projects with ever increasing risk. Minsky's words on financial innovation are striking, as if foretelling the recent crisis. "Over an expansion, new financial instruments and new ways of financing activity develop. Typically, defects of the new ways and the new institutions are revealed when the crunch comes." (p. 281)

The horizons of the cash flows from the projects in speculative and Ponzi financing exceed the maturities of the associated debt. Prices of capital assets, interest rates, and default risk all rise during an economic expansion. The ensuing dynamic eventually leads to contractionary monetary policy which induces economic downturn and financial crisis. The government responds by injecting economic stimulus and rescuing financial institutions that are too big to fail. These mitigate the magnitude of the downturn, but also set the stage for the next expansion and subsequent crisis.

Minsky illustrated some of his ideas with the 1974 run on commercial paper backed by real estate investment trusts (REITs). REITs offer a tax advantage, as investors avoid corporate income tax if REITs pay out at least 90 percent of their earnings in dividends. The REITs at the center of that run mainly financed construction of multifamily housing, condominiums, and commercial properties.

Construction projects do not generate cash flow until they are completed. Therefore, REITs that finance construction with commercial paper while paying dividends to shareholders must rely on their ability to roll over short-term debt. This implies speculative financing,

possibly Ponzi financing, rather than hedge financing. Thus, REITs are exposed to risks stemming from rising short-term interest rates, as well as operating risks stemming from declines in the market value of their projects.

Interest rates rose during the recession of 1973-75, construction projects were delayed, and the market for finished apartments weakened. REITs found it increasingly difficult to roll over their commercial paper and the volume of REIT-issued commercial paper fell by 75 percent from 1973 to 1974. Commercial banks almost doubled lending to REITs in 1974 and they bore the brunt of the run on commercial paper. In effect, banks acquired real estate in exchange for the loans they extended. Consequently, banks headed into the subsequent expansion with weaker balance sheets.

7. Financial innovations and crises

Two kinds of housing-related financial innovations were central to the crisis. One relates to the originations of mortgages and the other relates to their securitization.

Adjustable rate mortgages (ARMs) have been singled out as financial innovations contributing to the crisis, contrasted unfavorably with fixed-rate mortgages. Yet ARMs come in many varieties, some helpful and likely more stabilizing than fixed-rate mortgages, and some harmful and destabilizing. Plain ARMs can be very helpful, especially when coupled with substantial down-payments. These typically include rates of interest that increase or decrease with a benchmark rate, such as that of one-year Treasury bills. But the initial interest rates in plain ARMs is usually lower than the corresponding rate in a fixed-rate mortgage.

Statman (1982) showed that plain ARMs can serve homeowners as hedges superior to fixed-rate mortgages. Consider the case where interest rates, salaries, and the value of houses,

move in tandem with inflation. A homeowner with an ARM might receive bad news that inflation pushed up interest rates, such that her monthly mortgage payment would now be reset higher. Yet this increase in mortgage payments might be hedged against corresponding increases, fueled by inflation, in her salary and the value of her house. Indeed, she might even choose not to increase her monthly payment, dipping into the equity of her home. Yet such dips do not constitute negative amortization as long as the value of her home equity increases by more than her dips reduce it. Moreover, ARMs include, in effect, automatic refinancing as interest rates increase or decrease, obviating the need to refinance and saving its cost. ARMs do not prevent the loss of the homes of homeowners who encounter calamities such as extended unemployment or crushing medical expenses. But fixed-rate mortgages would do no better at preventing the loss of the homes of homeowners who encounter such calamities.

The ARMs innovated in the years leading to the crisis, however, were far from plain. Hybrid ARMs, such as 2/1 ARMs, offered an artificially low “teaser rate” for the first two years, which would then be reset to a substantially higher rate, which was to reset further once a year. Similarly, 5/1 ARMs lock in an initial rate for five years before being reset once a year thereafter. Borrowers (and lenders) were regularly lulled into a belief that they need not worry about reset rates because they would be able to refinance their original mortgages at lower rates before rates on these mortgages were reset. This made buying small homes possible for people who would have otherwise be disqualified from buying any homes, and it made buying large homes possible those who would have otherwise been qualified to buy only small homes.

Alternative-A loans, known as Alt-A loans, fall in between prime and subprime loans. Financial innovations in these loans include variable monthly payments, such as interest only and payment option ARMs. Payment option ARMs allow borrowers to choose their payment each

month, subject to a pre-specified minimum. Indeed, borrowers could choose, within limits, low payments that entail negative amortization. These loans, however, converted to fixed-rate loans once limits were reached, as the loan's principal became too large or the equity in the home too small.

Buying a home was made easier when down payments were reduced from the conventional 20 percent to 15 percent in 2004, and 10 percent in 2005. Buying homes was made even easier when there was a surge of mortgage loans known as no-documentation or limited-documentation loans ('liar loans'), where buyers could state whatever income and assets they pleased, knowing that no one would check. The Angelides report quoted Sheila Bair, FDIC Chairman, on liar loans: "I absolutely would have been over at the Fed writing rules, prescribing mortgage lending standards across the board for everybody, bank and nonbank, that you cannot make a mortgage unless you have documented income that the borrower can repay the loan." The Angelides report stated: "In the end, companies in subprime and Alt-A mortgages had, in essence, placed all their chips on black: they were betting that home prices would never stop rising." p. 111

John Dugan, who headed the Office of the Comptroller of the Currency (OCC) from 2005 to 2010, said in a 2005 speech: "It seems like only yesterday when a 5/1 ARM was considered a risky mortgage product... Today's non-traditional mortgage products – interest-only, payment option ARMs, no doc and low-doc, and piggyback mortgages, to name the most prominent examples – are a different species of product, with novel and potentially risky features."

Dugan continued: "We can readily understand why these new products have become fixtures in the marketplace in such a short time. One reason is that they have helped sustain loan

volume that would otherwise almost certainly be falling, because rising interest rates have brought an end to the refinance boom. More important, lenders have scrambled to find ways to make expensive houses more affordable – although there’s now a concern that the very availability of this new type of financing has done its share to help drive up house prices, which in turn stimulates demand for even more non-traditional financing.”

Conventional fixed rate mortgages and plain ARMs with 20 percent down payments and the verification of buyers’ incomes and assets correspond to Minsky’s notion of hedge financing, where homeowners and bankers can reasonably expect cash flows from income and assets to meet mortgage payments now and in the future. ARMs with teaser rates, prominent among subprime mortgages, correspond to speculative financing, where homeowners must roll over mortgages, refinancing them before the teaser period ends and higher rates kick in.

Option ARMs that lead to negative amortization correspond to Ponzi financing when homeowners must count on appreciation in the prices of their homes for mortgage refinancing and meeting future mortgage payments. John Dugan said: “To the extent that they are planning for such contingencies, many payment-option-ARM borrowers calculate that they will be able to sell their property or refinance the mortgage by year six. But if real estate prices decline – and there already is evidence of softening in some markets – these borrowers could face the bleak prospect of loan balances that exceed the value of the underlying properties. In that case, selling the property or refinancing the loan would not be a viable escape valve for avoiding huge payment shocks.”

Three innovations compounded the deficiencies of liar ARMs with teaser rates. First is securitization, the pooling of mortgages into mortgage-backed securities. Securitization was innovated by Lewis Ranieri and his Salomon Brothers team in the late 1970s, and became

popular after the Savings and Loan crisis of the 1980s. The Resolution Trust Corporation, the government body that held nonperforming thrift assets, found it convenient to sell pools of assets instead of individual assets. Second is collateralized debt obligation (CDOs), which divided cash flows from mortgage-backed securities into tranches prioritized by default risk. Mortgage-backed securities were quite opaque, combining many mortgages, and their tranches were even more opaque. Investors gained confidence about holding mortgage-backed securities and their tranches with the introduction of their ratings by rating agencies. Ratings were familiar to investors, whether AAA rating or BAA, and rating agencies, such as Standard & Poor's, were considered as objective and reliable judges of securities quality. Third is the credit default swap (CDSs), effectively an insurance policy against bond default. Actual credit default swaps were used to create synthetic credit default swaps.

Commercial banks sponsored conduits to finance long-term assets through special purpose entities such as structured investment vehicles (SIVs). These were off balance sheet entities, subjecting them to lower regulatory capital requirements. Special purpose entities used commercial paper to raise funds they then used to buy mortgages and mortgage securities. In effect, banks relied on Minsky-type speculative and Ponzi financing, borrowing short-term and using these borrowed funds to buy long-term assets. Whereas runs on commercial paper in 1974 centered on REITs, runs on commercial paper in 2007 and 2008 centered on the deteriorating conditions in the subprime market, which decimated the values of the assets of special purpose entities. Indeed, the panic surrounding the 2007 run swept the entire commercial paper market, not just the portion related to subprime housing. See Covitz, Liang, and Suarez (2009).

Lewis Ranieri, the father of mortgage securitization, rejects the claim that mortgage securities are to blame for the housing crash. "Securitization is not the villain. Abuses in

securitization are to blame,” he wrote in a 2010 letter to the regulations divisions of the Department of Housing and Urban Development and the Department of the Treasury. “What went wrong?” asked Ranieri. “[O]ver-leveraging at every level - beginning with the homebuyer, the lender, the speculator, the Government Sponsored Enterprises, while rating agencies and Wall Street turned a blind eye. Home buyers began treating homes like ATM machines; lenders began offering products that preyed on unsophisticated borrowers, the GSEs loosened their standards and encouraged Alt-A lending and subprime lending, and Wall Street supported their activities and generated fees on the expanded products without any real liability.”⁹ Indeed, mortgage securities, like most financial innovations, begin as attempts to do good, helping people buy houses. Yet the promise of good and the profits generated along the way tend to blind us to drawbacks. Mortgage securities did not have to make it easy for homeowners to treat their houses like ATMs, but they did. Mortgage securities did not have to lead lenders to lower their lending standards, but they did.

Money market funds played a role in the crisis, as they bought the commercial paper sold by the financial firms in order to purchase mortgages to package into mortgage securities.. Money market funds were a major component of the speculative and Ponzi financing of which Minsky was so critical. Money market funds are also interesting financial innovations, on their own, illustrating how the desire to provide benefits, including psychological benefits, can exacerbate crises.

Money market funds were innovated in the early 1970s to circumvent regulations that limited the rate of interest banks could pay. They soon turned into substitutes for bank checking accounts. Money market fund investors received checkbooks similar to bank checkbooks and could write checks for use everywhere. But money market funds were not a close enough

⁹ <http://online.wsj.com/public/resources/documents/Ranieri0723.pdf>

substitute for checking accounts because, as Statman (2011b) noted, they lacked the "no-mental-loss" psychological benefit.

Investors who deposited a dollar in a checking account were assured that they would be able to withdraw a dollar the following day, week, or year. But money market fund investors had no such assurance. A dollar invested in a money market fund one day might be worth 98 cents the following day. Investors who contemplated buying a television set for \$500 would have had to withdraw 510 shares of the money fund if its share price declined from \$1 on the day of the purchase to 98 cents when their check was cashed. The extra ten shares registered as a loss in the minds of money market fund investors.

Investing, whether in a stock or a money market fund, marks a hopeful beginning. We place a stock into a mental account, record its \$100 purchase price and hope to close it at a gain, perhaps selling the stock at \$150. As stock fate has it, the stock's price plummets to \$40 during the following month rather than increase to \$150.

Losses make us feel stupid. Hindsight error misleads us into thinking that what is clear in hindsight was equally clear in foresight. We bought the stock at \$100 because, in foresight, it seemed destined to go to \$150. But now, in hindsight, we remember all the warning signs displayed in plain sight on the day we bought our stock. Interest rates were about to increase. The CEO was about to resign. A competitor was ready to introduce a better product.

The cognitive error of hindsight is accompanied by the emotion of regret. We kick ourselves for being so stupid and contemplate how much happier we would have been if only we had kept our \$100 in our savings account or invested it in another stock that zoomed as our stock plummeted. Pride is at the opposite end of the emotional spectrum from regret. Pride accompanies gains. We congratulate ourselves and feel proud for seeing in foresight that our

\$100 stock would soon zoom to \$150. Mark-to-market accounting of money market funds opens the door to both regret and pride every time we write a check, but regret is more painful than pride is pleasurable. It is no wonder that money market fund investors prefer buck accounting over mark-to-market accounting, and money market fund executives hear their voices.

In 1977, following much lobbying by mutual fund companies, the SEC approved the use of buck accounting such that the price of their shares remains at \$1 even when the market value of the shares deviates from it. Managers of money market funds promised not to “break the buck” and, at last, money market funds seemed to have acquired the no-mental-loss benefits of checking accounts.

The promise of managers of money market funds not to break the buck was sincere but not guaranteed. The small print always said that the buck might be broken. Still, managers of money market funds kept their promise for many years, on occasion paying from their own pockets so as not to break the buck. But when the financial crisis arrived in 2008 the managers of the Reserve Fund announced that their fund contained securities of bankrupt Lehman Brothers and they must break the buck and set its shares to 97 cents. The development “is really, really bad,” said Don Phillips of Morningstar. “You talk about Lehman and Merrill having been stellar institutions, but breaking the buck is sacred territory.” This breaking of the buck was prominent among the events that led Henry Paulson and Ben Bernanke to recommend drastic measures, including government insurance of money market funds, fearing a run on money market funds that would ensue if money market fund investors raced to withdraw their money at a dollar per share, before the fund is forced to price its shares at less than a dollar. (See Statman 2011b)

The demise of Reserve Fund is ironic because Bruce Bent, one of its founders, opposed buck-accounting when it was considered in the 1970s. Bent feared that buck-accounting would

compel money market fund managers to buy risky securities in attempts to provide higher returns than their competitors. In a 1978 letter to the SEC Bent wrote that buck-accounting "presents the illusion of higher returns in times of declining interest rates" and makes money market funds "appear to have overcome the risk" of fluctuating interest rates. Bent noted further that buck accounting would encourage money market funds to buy risky securities that "pay higher interest rates than those which must achieve stability by exercising judgment..." Bent vowed not to buy such risky securities, but he broke his vow under the pressure of competition. This is why the Reserve Fund held Lehman securities when Lehman went bankrupt. What started as an attempt to turn money market funds into no-mental-loss investments ended with very real losses.

Today's money market fund agenda centers on mitigating systemic risks associated with money market funds, risks made obvious in 2008. Yet a proposal to price money market fund shares by mark-to-market accounting has been met with fierce opposition. Paul Schott Stevens of the Investment Company Institute wrote that "investors prize the stability, simplicity, and convenience" of money market funds. David Hirschmann of the U.S. Chamber of Commerce wrote that investors would flee from money market funds burdened by "the complexity and cost of accounting" of mark-to-market funds. And Kenneth White, a Chicago investor, threatened to liquidate his money market funds if their prices were set by mark-to-market accounting. (See Letters to *The Wall Street Journal*, May 13, 2011).

In truth, there is nothing complex about mark-to-market money market funds and no cost of accounting. Mutual fund companies provide an annual accounting of total gains and losses of each mutual fund we own, ready to be placed in our tax returns. But such real accounting is not mental accounting; it does not mitigate the cognitive error of hindsight and the sting of regret.

Our normal psychology drives us to accept systemic risks to the entire economy and our own wealth so as to avoid the psychological sting of regret.

8. Aspirations

We know that we could have prevented the crisis. We know it in foresight, not only in hindsight. There would have been no foreclosures of homes financed by subprime mortgages if no subprime mortgages were granted, and no failures of banks holding them. Yet we must consider aspirations for houses, tradeoffs in crisis prevention, and tugs-of-war powered by ideology and self-interest.

Minsky was well aware of these tradeoffs, between too little innovation and its downside of stagnation, and too much innovations and its downside of disaster: “Ponzi finance is a usual way of debt-financing in a capitalist society. Consequently, capitalism without financial practices that lead to instability may be less innovative and expansionary; lessening the possibility of disaster might very well take part of the spark of creativity out of the capitalist system.” (p. 364) Keynes was equally aware of tradeoffs. He wrote: “Thus if the animal spirits are dimmed and the spontaneous optimism falters, leaving us to depend on but a mathematical expectation, enterprise will fade and die...” (p. 162)

"Men will and do take great risks to distinguish themselves even when they know what the risks are," wrote Friedman and Savage (1948). It is easy to characterize poor subprime borrowers as risk seekers, eager to buy houses as one buys lottery tickets, and losing them in the crisis. But aspirations for houses of their own drove subprime borrowers, and risk was merely payment for a chance to reach their aspirations. Sharon and Russ Gornie, a young couple with children aspired to own a dream house. “This is our dream house,” said Sharon, pointing to

blueprints of a house. “We look at it when we are off to work in the morning and when we come home tired. . . . Isn’t it beautiful?” (See PBS, Isnbeautifu*PBS Frontline* television program, broadcast on January 14, 1997.) The rich, whether on Wall Street or Main Street, often join the poor in aspirations for more. Some with two houses aspire for three.

One implication of Kahneman and Tversky’s (1979) prospect theory, articulated in Shefrin and Statman's (2000) behavioral portfolio theory, is that people whose incomes fall short of their aspirations are inclined to take great risk as they strive to reach their aspirations. People whose wealth exceeds their aspirations are less inclined to take risk. Indeed, Koedijk, Pownall and Statman (2011) found that people whose aspirations exceed their incomes are more willing to take risk than people with equal incomes but lower aspirations. They also found that competitive people are more willing to take risk than people with equal incomes who are less competitive.

The current financial crisis is centered on houses and loans, both cultural emblems in the United States and beyond it. Homes are the place of the middle class, central to the American Dream. And loans are an integral part of middle class life, beyond the means they provide to home buyers. The central place of homes and loans made the crisis more severe than the bust that followed the technology boom of the late 1990s and even the S&L crisis of the late 1980s, which centered on loans to real estate developers rather than loans to homeowners.

Aspirations for homes of our own drive us even if we should be guided by utilitarian benefits to rent rather than own. We are seduced by the expressive and emotional benefits of beautiful dream houses. We take pride in home ownership and feel powerful, knowing that no landlord can kick us out. We take comfort in our freedom to drill holes in walls for hooks to hold our favorite paintings.

The proportion of homeownership among whites in the U.S. remains greater than the proportions of among minorities, and the proportions of families aspiring to houses out of their reach are greater among minorities than among whites. Still, the housing boom in the decade ending in 2005 narrowed the gaps in homeownership. The Pew Hispanic Center, a project of the Pew Research Center, found that homeownership rates rose more rapidly among minorities than among whites. Yet blacks and Latinos remain far more likely than whites to depend on relatively expensive subprime loans. In 2007, 27.6 percent of home purchase loans to Hispanics and 33.5 percent to blacks were at relatively high rates, compared with just 10.5 percent among whites. Moreover, the ratios of loans to incomes were higher among blacks and Hispanics than among whites, making their home ownership more precarious.¹⁰

The pull of home ownership remains strong even now, when the pain of the crisis is searing. A 2011 poll by New York Times/CBS News revealed, as Streitfeld and Thee-Brenan (2011) wrote, that "Owning a house remains central to Americans' sense of well-being, even as many doubt their home is a good investment after a punishing recession. Nearly nine in 10 Americans say homeownership is an important part of the American dream..."

Aspirations and the culture in which they are embedded explain subsidies extended to American homeowners for many decades, channeled through Fannie Mae, Freddie Mac, and the Federal Housing Administration. As Shiller (2010) wrote, American culture contains "a long-standing feeling that owning homes in healthy communities is connected to individual liberties that embody our national identity. Historically, homeownership has been associated with freedom, while renting — often in tenements or mill villages — has been linked to the oppression of a landlord." Shiller noted further that homeownership is not central in all cultures.

¹⁰ Kochhar, Gonzalez-Barrera, and Dockterman (2009).

Only 34.6 percent of Swiss families owned their homes in 2000, whereas 66.2 percent of American families owned their homes that year.

Most people need loans if they are to buy houses and many were precluded from buying homes by conditions set by lending banks, including sizable down payments and documents testifying to incomes sufficient to pay loans. Democrats wanted to help people reach their dreams for homes and so did Republicans. Republican Senator Phil Gramm was persuaded to support subprime lending by his mother's story. "Some people look at subprime lending and see evil. I look at subprime lending and I see the American dream in action. . . . My mother lived it as a result of a finance company making a mortgage loan that a bank would not make. . . . What incredible exploitation," he said sarcastically. "As a result of that loan, at a 50 percent premium, so far as I am aware, she was the first person in her family, from Adam and Eve, ever to own her own home."

Cultural changes made loans and credit part of normal middle-class life, even when loans extended into consumption much beyond buying a house. Indeed, credit in the U.S. has become a necessity. Penaloza and Barnhardt (2011) describe that cultural change as "The normalization of credit/debt." They quoted Jill, a 26-year-old woman who found it impossible to get a cell phone because she had no credit card. "I tried to get a new cell phone a couple of years ago, and I couldn't sign up for a new service because I didn't have a credit card. You know, it's like they don't care if you always have enough money to pay your bill. . . . If you don't have a credit card, you can't get the phone."

People learn to use credit by trial and error. Penaloza and Barnhardt quoted Barry, a 26-year-old man, who said: "I started getting credit cards, in college, you know, and would use them and say, oh, I will be fine, I'll make the minimum payments. Yeah, I never really followed

through on that and I ended up getting pretty screwed. So, yeah. I learned the hard way." Many distinguish 'good' credit from 'bad' credit, and mortgages fall into the good category.

Banks and other financial institutions are quite willing to extend credit and that willingness was facilitated in the late 1970s and early 1980s when federal laws permitted mainstream banks to offer home equity loans. Story (2008) wrote that some bank executives believed that homeowners would use these loans responsibly. She quoted a Merrill Lynch executive who predicted in 1988 that homeowners would not "pledge the house to buy a blouse." Yet many homeowners defied this prediction, proceeding to use home equity loans to buy blouses, cars, vacations, and more. The ease of home equity loans and mortgage refinancing led many homeowners to extract all their equity in their homes. See Story (2008).

A major change in tax law in the early 1980s, under President Reagan, eliminated many tax deductions, including the deduction of interest paid on credit cards, auto loans, student loans, and other consumer credit. Yet it allowed tax deductions, with some limits, of interest paid on mortgages and equity lines of credit. Borrowing against home equity to buy a car, for example, now had a tax advantage over a car loan, increasing the use of equity lines of credit and normalizing the extraction of home equity for consumption.

We see the importance of constraints on borrowing against home equity in a natural experiment in Texas, described by Abdallah and Lastrapes (2010). A 1997 Texas constitutional amendment made it easier for homeowners to use home-equity as collateral for loans. They found that Texas households increased retail spending from before to after the passage of the amendment, relative to the change in spending by non-Texas households, by 4 to 15 percent.

Greater household debt retards economic recovery. Mian and Sufi (2011) conducted a microeconomic analysis of U.S. counties and found that U.S. economic weakness, especially

weakness in employment growth, is closely related to high levels of household debt incurred during the housing boom. They wrote that "Counties where household debt grew moderately from 2002 to 2006 have seen a moderation of employment losses and a robust recovery in durable consumption and residential investment. By contrast, counties that experienced large increases in household debt during the boom have been mired in a severe recessionary environment even after the official end of the recession."

9. Tugs of war

The search for policies that prevent crisis is complicated by varying ideologies and self interest. Policies favored by libertarians are not necessarily favored by paternalists, and policies serving the interests of borrowers do not necessarily serve the interests of lenders. Interest groups regularly enlist politicians and regulators in their tugs-of-war with one another. Stigler (1971) described this enlistment in "capture theory." He noted that each interest group, including bankers, lawyers, union members, and employers, wants regulations that maximize its wealth. Politicians have the power to direct regulators to benefit one interest group or another. At the same time, politicians need resources such as campaign contributions to maximize their chances at re-election. Similarly, regulators want to steer the regulatory process in directions that benefit them, in prestige or industry jobs once they leave public service. The political process involves competition among interest groups each attempting to capture politicians and regulators by some combination of votes, contributions, and favors in exchange for enacting and executing regulations which transfer wealth to them. Statman (2009) and Shefrin and Statman (2009) describe this tug of war in the context of the crisis. Mousavi and Shefrin (2010) analyze how

relative strength and influence among participants in the political process shape financial market regulations such as those comprising the Dodd-Frank Act.

Stigler emphasized that an interest group is likely to capture its regulators when the per-capita benefits to the members of the interest group are large relative to per-capita benefits to the general public. Peltzman (1976) augmented capture theory, noting that interest groups would not capture their regulators when the total benefits to the general public are sufficiently large, even if the per-capita benefits are relatively small. Politicians and regulators who allow interest groups to capture them under such circumstances might lose more political support than they gain.

Politicians and regulators have limited power to tilt regulation toward interest groups and their power varies by the environment in which they operate. Economic booms and rising financial markets placate the general public, reducing its vigilance and making it easier for politicians to tilt regulations toward interest groups. Yet recessions and plunging financial markets enrage the general public, increasing its vigilance and its clamor for regulatory protection from interest groups.

The Riegle-Neal Act illustrates this tug-of-war and its links to the crisis. The Riegle-Neal Interstate Banking and Branching Efficiency Act, implemented in June 1997, permits banks to establish branches and buy other banks across the country. States began imposing restrictions on branching in the nineteenth century, justified in part by the argument that allowing banks to branch could give strong banks excessive financial power. Weak banks supported these restrictions because they limited competition and state governments supported them because restriction gave them power over the supply of bank charters. Writing not long after the Riegle-Neal Act was enacted, Jayaratne and Strahan (1997) argued that the Act allows banks to become more efficient as they grow bigger, reducing costs, lowering loan rates, and accelerating

economic growth. They cautioned, however, that “[w]hether there is additional room for improved efficiency through the process of selection remains to be seen.” We know from today’s vantage point that the Riegle-Neal Act was not an unmitigated blessing and that banks which are ‘too big to fail’ can precipitate a collapse of the entire financial system.

Public outrage against banks over their role in the crisis mobilized a drive toward stricter banking regulations. But Morgenson and Van Natta (2009) wrote that banks were preparing for post-crisis tugs-of-war as the crisis was unfolding: “Even in crisis, banks dig in for battle against regulation.” They noted that in November 2008 the nine biggest participants in the derivatives market, including JP Morgan Chase and Goldman Sachs, created a lobbying organization, the CDS Consortium, to counter the expected attempt to rein in credit default swaps and other derivatives.

Morgenson and Van Natta added that “To oversee the consortium’s push, lobbying records show, the banks hired a longtime Washington power broker who previously helped fend off derivatives regulation: Edward J. Rosen, a partner at the law firm Cleary Gottlieb Steen & Hamilton.” They added that “Mr. Rosen’s confidential memo...recommended that the biggest participants in the derivatives market should continue to be overseen by the Federal Reserve Board. Critics say the Fed has been an overly friendly regulator, which is why big banks favor it.”

“Occupy Wall Street,” a movement spurred by the crisis, reflects a tug of war involving two notions of fairness embedded in two fairness rights and tradeoffs between fairness rights and economic efficiency. On one side is the right to freedom from coercion, which some argue goes alongside economic efficiency. On the other is the right to economic justice, a form of the right to equal power.

Conflicts between fairness rights and tradeoffs between fairness rights and economic efficiency are the subject of Shefrin and Statman (1992, 1993). The right to freedom from coercion implies, for example, that bank shareholders are entitled to pay bankers any compensation they choose, whether salary or bonus, free from any coercion by government. The right to economic justice implies that all people are entitled to an economic safety net, even if the construction of such a net involves coercing the relatively rich, whether bankers or not, to pay for it. The right to economic justice is reflected in Occupy Wall Street protesters who describe themselves as the 99 percent, standing against the wealthy 1 percent.

Stark facts underlie the discontent of the 99 percent. Figure 2 shows that the share of income of the top 1 percent of households increased from 8 percent in 1980 to 23 percent in 2007. The average inflation-adjusted income of the top 1 percent of households increased by 275 percent, or an annualized 4.8, between 1979 and 2007, according to the Congressional Budget Office. In contrast, income increased by 18 percent, an annualized 0.6 percent, for the poorest 20 percent of households. These facts are punctuated by a Census Bureau October 2011 report, revealing that the poverty rate has by now climbed to a 17-year high. The fate of the middle class is not much better than that of the poor. Although incomes of middle class households increased by an annualized 1.2 percent between 1979 and 2007, Census Bureau data indicate that middle class families suffered a 7 percent income decline between 2000 and 2010. As the incomes of the poor and middle class stagnated between 2000 and 2007, their borrowing increased dramatically according to Flow of Funds data, at approximately 10 percent per year.

Elizabeth Warren gained public attention for highlighting concerns about the fairness in consumer financial products, especially credit card debt, made complex by financial services companies. In our framework, the key fairness right associated with complexity is equal

processing power, by which consumers are entitled to means that let them process information easily and accurately. Such means range from disclosure in plain language to prohibition of complex financial products. Warren's recommendations led to the establishment of the Bureau of Consumer Financial Protection as part of the Dodd-Frank Act of 2010. Tugs-of-war by the financial services industry blocked Warren's appointment to head the Bureau, and tugs of war limit the effectiveness of the Bureau by restricting its budget. Warren is now recognized as a leader of those concerned about unfair practices in the financial services industry, special interest politics, and disparities in income. She has shifted her efforts to winning a seat in the United States Senate.

Murphy (this volume) analyses complaints leveled against banker bonuses. He finds, contrary to the complaints, that banker bonuses neither caused nor contributed to the financial crisis, that banker bonuses are not excessive, and that bonuses should not be regulated. So why do TARP and Dodd-Frank impose restrictions on pay? "I conclude," writes Murphy, "that the apparent intent of the pay restrictions in TARP and Dodd-Frank are not to reduce risk, improve pay or protect taxpayers, but rather to attack perceived excesses in pay levels and destroy the banking-bonus culture. I then argue that the attacks on banking bonuses are driven primarily by anger, jealousy and envy, and not by evidence that the bonuses are set in a non-competitive market."

Murphy's argument focuses on economic efficiency, and makes no explicit mention of fairness. He touches on fairness implicitly, however, when he speaks of anger, jealousy, and envy, implying that demands for social justice reflected in anger, jealousy and envy should be dismissed because they detract from economic efficiency and impinge on the more important fairness right of bankers and shareholders to be freedom from the coercion of the government

and the general public. Minsky understood the tradeoff between fairness rights, and between them and economic efficiency. He was particularly concerned about social frictions brought about by high unemployment associated with economic crises resulting from the behavior of the financial sector. As we discuss in section 10, Minsky advocated employment programs as a remedy. He also identified “games” played by banks against the much weaker authorities that regulate them. The authorities lose the game, but the true losers are all who are hurt by unemployment and inflation in a destabilized economy.

Minsky wrote: “The standard analysis of banking has led to a game that is played by central banks, henceforth to be called the authorities, and profit-seeking banks. In this game, the authorities impose interest rates and reserve regulations and operate in money markets to get what they consider to be the right amount of money, and the banks invent and innovate in order to circumvent the authorities. The authorities may constrain the rate of growth of the reserve base, but the banking and financial structure determines the efficacy of reserves... This is an unfair game. The entrepreneurs of the banking community have much more at stake than the bureaucrats of the central banks. In the postwar period, the initiative has been with the banking community, and the authorities have been “surprised” by changes in the way financial markets operate. The profit-seeking bankers almost always win their game with the authorities, but, in winning, the banking community destabilizes the economy; the true losers are those who are hurt by unemployment and inflation.” (p. 279)

We observe the tug of war within the Federal Reserve Bank. The government appoints the seven members of the Board of Governors, and its chair regularly reports to Congress, but the Federal Reserve is not a government institution. The twelve regional Federal Reserve Banks issue shares of stock to member banks, so we should not be surprised to find that the Federal

Reserve Bank reflects the interests of member banks. These interests are evident in the tug of war between inflation hawks and doves at the Federal Reserve Bank. Leonhardt (2011) quoted David Levey, a former managing director at Moody's. "The Fed regional banks represent, in essence, the banking community, which tends to be very conservative and hawkish." Levey continued: "Creditors don't like inflation — it's good for debtors." Thus we should not be surprised that the Fed hawks on inflation are regional bank presidents: Richard W. Fisher of Dallas, Narayana R. Kocherlakota of Minneapolis and Charles I. Plosser of Philadelphia.¹¹

Earlier we quoted excerpts from the public speeches of John Dugan, who headed the OCC. Dugan was a regulatory voice for prudent lending practices which would especially constrain what Minsky called Ponzi finance, such as option ARMS leading to negative amortization. Dugan worked to strengthen regulations along these lines. In his speech from December 1, 2005 he stated: "[I]f all goes according to plan, the Federal banking agencies will propose new guidance with respect to nontraditional mortgage products by the end of this month. While the guidance will cover many other issues besides negative amortization and payment option ARMs, these will certainly be central..."

The process for developing these guidelines led to a tug of war. The Associated Press (2008) reported that lobbying efforts by financial institutions led to the removal of guidelines requiring banks (1) to increase efforts at verifying that mortgage applicants were employed and could afford intended home purchases; (2) to advise applicants about the risks associated with rising interest rates and consequent larger payments; and (3) to improve disclosure when bundling and selling mortgages.

¹¹ <http://www.nytimes.com/2011/08/28/sunday-review/dissecting-why-the-fed-does-what-it-does.html?pagewanted=print>

Banks offered many reasons for their resistance to the proposed guidelines. . Mary Jane Seebach, managing director of public affairs at Countrywide Financial Corp., at the time the nation's largest mortgage lender, stated that the proposal "appears excessive and will inhibit future innovation in the marketplace." Ruthann Melbourne, chief risk officer of IndyMac Bank, stated: "It is not our role to be the regulator for the third-party lenders." Joseph Polizzotto, counsel to Lehman Brothers, stated: "An open market will mean that different institutions will develop different methodologies for achieving this goal".

Dugan's side did not have the strength to win that tug of war. Other regulatory bodies were involved, notably the Federal Reserve, the Federal Deposit Insurance Corporation (FDIC), and the Office of Thrift Supervision (OTS). Grovetta Gardineer, the managing director for corporate and international activities at OTS, stated that the proposed guidelines "attempted to send an alarm bell that these products are bad." She told the AP that regulators were persuaded that the loans themselves were not problematic as long as banks managed the risk.

On October 17, 2006, Dugan commented that: "while the guidance applies to insured depository institutions and their affiliates, it does not apply to the many mortgage originators that have no such affiliations." Minsky sounded cautionary notes about what he called "fringe banking institutions" lying outside the Federal Reserve system, noting that through relationships such as lines of credit, member banks became "de facto lenders of last resort" to these institutions. He warned that these "relations can be a source of weakness for the financial system as a whole" with the "potential for a domino effect..." (pp. 96-97)

In June 2006, Sheila Bair became chair of the FDIC, and criticized the OCC for being too timid. She knew that the proposed subprime guidelines were unlikely to be effective, since most subprime loans were issued by institutions outside the regulated banking system. Therefore, she

advocated for applying subprime guidance to any institution financed by a regulated bank, knowing that institutions outside the regulated banking system depended on the regulated banks for their own financing. In retrospect, she notes that banks “fought us tooth and nail” and prevailed. See Nocera (2011).

Chapter 10 of the FCIC report is titled “The Madness,” a term used by Lewis Ranieri to describe “the willing suspension of prudent standards... Regulators reacted weakly. As early as 2005, supervisors recognized that CDOs and credit default swaps (CDS) could actually concentrate rather than diversify risk, but they concluded that Wall Street knew what it was doing. Supervisors issued guidance in late 2006 warning banks of the risks of complex structured finance transactions—but excluded mortgage-backed securities and CDOs, because they saw the risks of those products as relatively straightforward and well understood.” (pp. 188-189)

The FCIC highlights the risks financial institutions took in late 2006 and 2007, after housing prices peaked and defaults began to rise. Instead of winding down their CDO-CDS strategies, and consistent with the behavioral tendency to increase risk taking when facing perceived losses relative to aspiration levels, financial institutions did the opposite. The report states: “Securities firms were starting to take on a significant share of the risks from their own deals, without AIG as the ultimate bearer of the risk of losses on super-senior CDO tranches. The machine kept humming throughout 2006 and into 2007.... The CDO machine had become self-fueling. Senior executives—particularly at three of the leading promoters of CDOs, Citigroup, Merrill Lynch, and UBS—apparently did not accept or perhaps even understand the risks inherent in the products they were creating.” (p. 188)

In the end the U.S. government had to bail out AIG and Citigroup, and arrange for Bank of America to rescue Merrill Lynch by buying it. The Swiss government had to bail out UBS. These banks had become too-big-to fail.

10. Minsky's prescriptions and doubts

Minsky noted the link between the game played by bankers against regulators and the problems of moral hazard and too-big-to-fail. Addressing too-big-to-fail, Minsky wrote: “The United States has a type of contingency socialism, in which the liabilities of particular organizations are protected either by overt government intervention or by the grant of monopoly price setting powers... Big or giant corporations carry an implied public guarantee (i.e., contingency liability) on their debts. This introduces a financing bias favoring giant corporations and giant banks, for the implicit public liability leads to preferred market treatment.” (p. 354)

Addressing moral hazard, Minsky wrote: “Whenever the Federal Reserve steps in and refinances some positions, it is protecting organizations that engaged in a particular type of financing, and is expected to do so again... The central bank virtually assures that there will be another crisis in the near future unless, of course, it outlaws the fragility inducing financial practices.” (p. 364) Minsky made a series of recommendations about stabilizing an unstable economy, about the size of government, employment policy, industrial policy, and financial reform. As to the size of government, Minsky advocated a government sector that comprises about 20 percent of gross domestic product, a bit larger than the 16 percent contribution of gross private domestic investment. This size of government would be large enough to run deficits whose magnitude could offset sharp declines in gross private domestic investment, as occurs during recessions.

As to employment policy, Minsky advocated that we resurrect the Roosevelt era employment programs such as the Civilian Conservation Corps, National Youth Administration, and Works Progress Administration. He also advocated reforms to the labor participation features of transfer payment programs associated with Social Security, some of which were later changed in the direction he proposed. In particular, his recommendation to terminate the program Aid to Families with Dependent Children (AFDC) was subsequently implemented by the Clinton Administration in 1996.

As to industrial policy, Minsky recommended that corporations not be allowed to grow too big to fail, be they automobile manufacturers or financial firms. Minsky advocated doing so with aggressive anti-trust policy which would limit the size of corporations and the unfair advantage and moral hazard size brings.

As to financial reform, Minsky advocated policies to control leverage by controlling capital-asset ratios and the rate of growth of bank capital. He criticized the Fed's emphasis on open market operations relative to its operations at the discount window. In particular, he advocated that the Fed resume its practice of a century ago, by engaging in rediscounting, thereby co-financing economic activity. This activity, he suggested, would force the Fed to monitor the banking sector much more closely than it had been doing for most of the twentieth century. Fed chair Ben Bernanke belatedly reached the same conclusion, stating: "The crisis has forcefully reminded us that the responsibility of central banks to protect financial stability is at least as important as the responsibility to use monetary policy effectively."¹²

Minsky's major objective in his recommendations about the Fed's work was to limit increases in speculative and Ponzi financing during economic expansions. Instead, he favored to-

¹² Binyanmin Applebaum, "Lessons From the Financial Crisis," October 18, 2011, *New York Times*, <http://economix.blogs.nytimes.com/2011/10/18/lessons-from-the-financial-crisis/?hp>

the-asset, hedge financing as being more prudent. By this he meant lending against specific project cash flows, not general corporate cash flows, with the maturity of the loan closely matched to the expected horizon of the project. Minsky also believed that the corporate income tax should be eliminated because that tax encouraged excessive investment and with it a capital structure with excessive debt.

Yet Minsky doubted that the right solutions can be implemented effectively, even if found. He wrote: “I feel much more comfortable with my diagnosis of what ails our economy and analysis of the causes or our discontents than I do with the remedies I propose... Even if a program of reform is successful, the success will be transitory. Innovations, particularly in finance, assure that problems of instability will continue to crop up; the result will be the equivalent but not identical bouts of instability that so evident in history.” (p. 319)

In the end, Minsky recommended that we expect less than we are promised. As he wrote: “Political leaders and the economists who advise them are to blame for promising more than they or the economy can deliver... The normal functioning of our economy leads to financial trauma and crises, inflation, currency depreciations, unemployment, and poverty in the midst of what could be virtually universal affluence...” (p. 319)

11. Conclusion

Psychology is at the center of behavioral finance and psychology underlies much of our crisis. That psychology includes aspirations, cognition, emotions, culture, and perceptions of fairness. Aspirations propelled many renters into houses they could not afford, evoking emotions and cognitive errors that blinded homeowners to risk. And a culture where houses are central to the American Dream deepened the crisis and extended it. Aspirations for wealth and status

blinded bankers to the risk of mortgages and mortgage securities. Overconfident bankers sidelined risk managers and proceeded to boost their company's leverage. And much of the public and its political leaders were persuaded that regulations are unnecessary because free markets are not only inherently efficient, but also inherently fair.

Psychology is also at the center of much of the writings of Keynes and Minsky. Long ago, Keynes identified the psychology that hurls financial markets and economies up into booms and down into busts. Minsky, building on Keynes's work, developed a framework exposing the sources of economic instability and contemplated ways to avert crises or alleviate them.

We see, in hindsight, that our crisis fits well within Minsky's framework. That framework emphasizes the destabilizing effects of financial innovation, the role of euphoria, and the skill of bankers at outmaneuvering regulators. Minsky, who was pessimistic about our chances to avert financial crises, instead proposed policies for mitigating crises. These policies include a role for the Federal Reserve Bank in constraining speculative and Ponzi finance, and government actions in the wake of a crisis, running budget deficits, instituting direct employment programs, and acting as a lender-of-last-resort.

Can we hope that next time will be different? Financial crises come much too often to leave us much hope. The crisis of 1974-75 was almost as long and severe as the Great Recession of 2007-2009. The twin Reagan-era recessions of the 1980s brought high unemployment and were followed by a sovereign debt crisis and an S&L crisis. The foreign currency crisis of the 1990s required action to dispose of Long Term Capital Management without breaking the global financial system. And the recent housing bubble followed a stock market bubble.

Our world will always be uncertain, unfolding in unexpected ways. Hindsight misleads us into thinking that we can see future crises as clearly as we can see past ones, and find policies

that would prevent future crises. Moreover, we would be unable to implement policies which prevent crises even if we could identify them because those who would lose stand in the way. Limiting bank leverage might be good policy for averting crises, but bankers have the clout to resist it. We are left to remind ourselves of our psychological fallibilities so that we can avert some crises and mitigate others.

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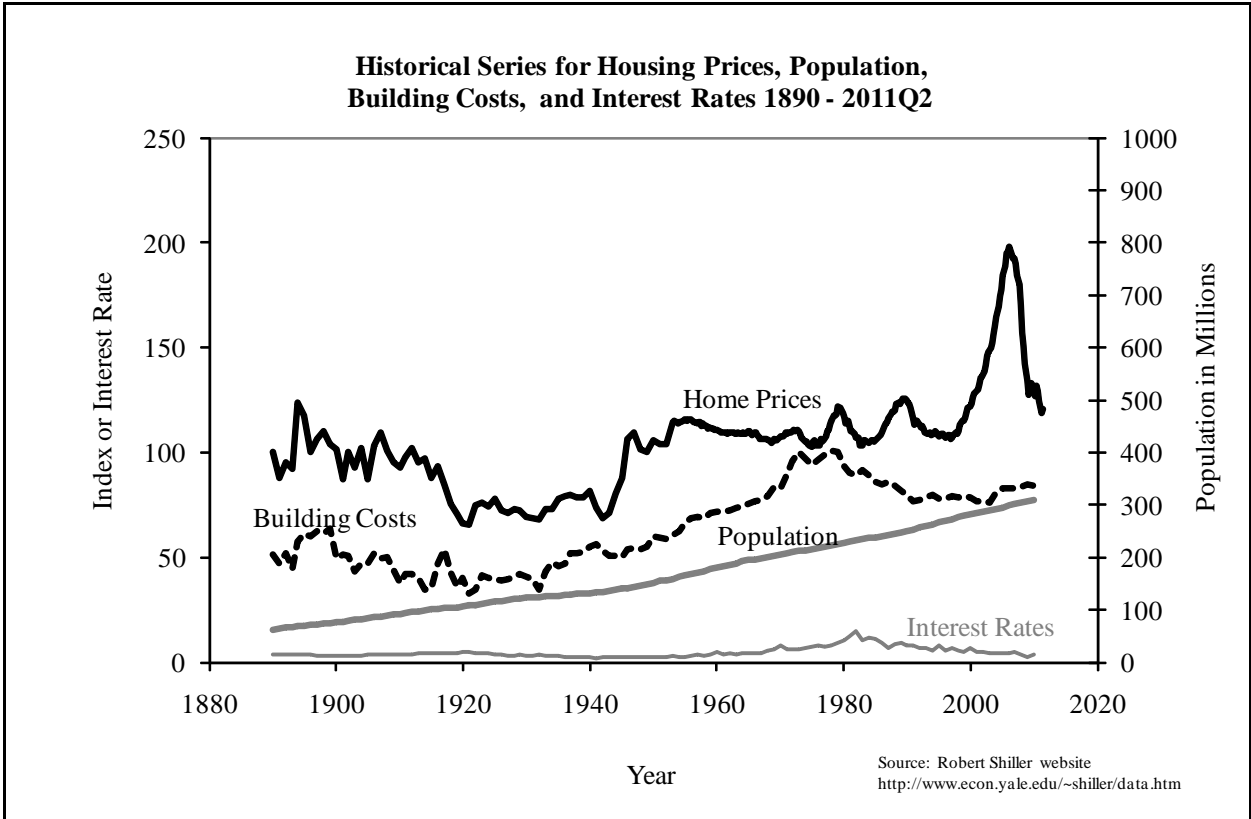
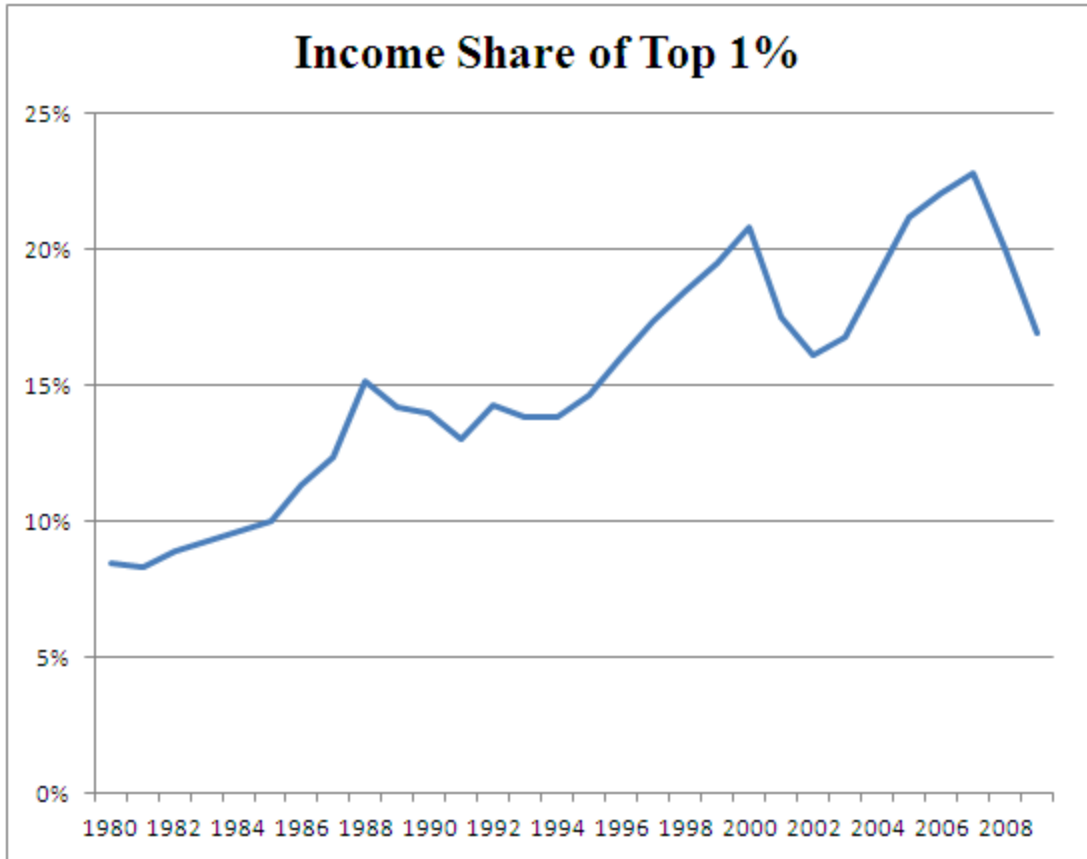


Figure 1



Source: Tax Foundation

Figure 2