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Telling the Narrative of the Financial Crisis: Not Just a Housing Bubble

Major crises, such as the recent financial crisis, usually end up being understood by the public in terms of some simple narrative, which then heavily influences the choices politicians make. We believe there are three major story lines still vying for acceptance by the public and that whichever one comes to dominate could strongly affect public policy.

For example, our entry into World War I came to be seen after the fact as the result of financiers looking to protect their loans to Europe and our trade flows. This attitude played a major role in the isolationism that kept us out of World War II for so long. Similarly, one of the earliest theories of the Great Depression was that it sprang from the crash on Wall Street, which came to be associated with financial manipulation by bankers and rich speculators. This created much of the impetus for the separation of commercial and investment banking and the creation of the Securities and Exchange Commission and the associated laws to protect investors. In both cases, there were many complex causes and therefore the potential for alternative story lines to have taken hold, which would have led to different legislative outcomes.

We have a great body of facts about the current financial crisis, but do not yet have a consensus narrative about the fundamental causes. In our view, there are three major story lines vying for acceptance:

Narrative 1: It was the fault of the government, which encouraged a massive housing bubble and mishandled the ensuing crisis.

Narrative 2: It was Wall Street's fault, stemming from greed, arrogance, stupidity, and misaligned incentives, especially in compensation structures.

Narrative 3: "Everyone" was at fault: Wall Street, the government, and our wider society. People in all types of institutions and as individuals became blasé about risk-taking and leverage, creating a bubble across a wide range of investments and countries.

The authors believe that narrative 3 comes closest to the truth and that it matters whether that story line becomes accepted by the public. In our judgment, a well-designed program of regulatory reforms would fix the wide-spread problems in both the markets and in government regulation, or at least greatly improve the problems in both areas. In contrast, public acceptance of narrative 1 would lead to too little regulatory change or change of the wrong kind, while narrative 2 would likely encourage a stifling of markets without fixing the problems inherent in our regulatory structure. Our preferred narrative encourages a balanced and comprehensive set of changes.

This paper will explain our reasons for preferring narrative 3 to narrative 1, since the “government did it” story line presents the strongest challenge to our beliefs, as it essentially treats the financial crisis as a one-off fluke extremely unlikely to be repeated in our lifetimes. We believe narrative 2 is also flawed, but we have addressed that previously as part of our larger papers and may tackle it again in other contexts.

Caveats and apologies

Postulating simple narratives that may take hold in the minds of the public intrinsically forces us to oversimplify and to ignore the subtleties of the analyses presented by those whose views come closest to these simplistic stories. We do not mean to imply that any of the policy analysts arguing for facets of narratives 1 or 2 fail to understand the complexities of this crisis nor that any of them hold precisely the views described here. In addition, we must note that this paper is considerably too short to do justice to those complexities. We have tried to cover some of this ground more comprehensively in several previous, much longer, pieces¹.

We should also note that we will be using the term “bubble” somewhat loosely, in the manner in which it has come to be used in popular discussion. It will refer to any situation in which asset prices become substantially over-valued as a result of psychological factors, including an unsustainably large decline in the premium investors charge to take on a given level of risk. We generally will not attempt to distinguish between over-optimism about future prospects and a willingness to take a correctly estimated risk for an unusually low premium.

The three story lines

This section lays out the three narratives in greater detail.

Narrative 1: The government created the crisis by inflating a housing bubble and mismanaging the resulting risks and problems, especially in regard to Fannie Mae and Freddie Mac. This narrative is popular among conservatives, particularly since it argues for a scaling back of government interventions in the economy and suggests less regulation, not more.

The core of the story is that the crisis was the result of a housing bubble of unprecedented proportions which wreaked havoc because of the central role of housing in the financial system and the economy. This effect was significantly magnified because Fannie Mae and Freddie Mac were effectively encouraged by the government to take on \$5 trillion of housing exposure with minimal capital to cover the risk.

¹ See, for example, “Origins of the financial crisis,” by Martin Neil Baily and Robert Litan and the forthcoming “The Causes of the Crisis and the Impact of Raising Capital,” by Martin Neil Baily and Douglas Elliott.

The government bears prime responsibility for the housing bubble because it strongly pushed a substantial increase in home ownership rates. Not only did this encourage millions of families to own homes without having strong enough finances to handle the commitment, but the various methods used to make home ownership easier led millions of others to buy larger homes than they could afford or to speculate by buying houses purely as investments. The massive increase in demand for housing led to sharply higher prices, increasing the risks for everyone who bought at the inflated prices. The bursting of the bubble destroyed so much wealth, especially at financial institutions, that it led to all the other problems of which we are so aware. Proponents of this narrative often accept that there were other financial imbalances and even bubbles, but believe that without the housing bubble the other problems would have been much easier to handle, leading to a mild recession at worst.

There is another part of this narrative that is distinct enough that it almost forms another narrative in its own right – perhaps we should call it Narrative 1A. This looks beyond the housing bubble itself to ways in which regulators failed to curb the excessively risky behavior of the private sector financial institutions, so that the government silently facilitated build-up of risk in the financial system. And in some ways it mishandled the crises that eventually broke out, such as the rescue of Bear Stearns and the non-rescue of Lehman. For example, many argue that the government implicitly encouraged depositors and creditors of the large banks to assume that the government would protect those banks from failure. This problem was made worse by rescuing Bear Stearns, which brought investment banks under the same assumed umbrella of protection. Worse still, the government sowed massive confusion by then stepping back and allowing Lehman to fail, breaking the presumed new covenant with creditors and counterparties. The failure of Lehman caused true panic as investors and bank counterparties had to reassess their risk exposures in the middle of a very frightening and confusing environment.

Narrative 2: Wall Street created the crisis by reckless behavior, greed, and arrogant belief in its own ability to understand and manage excessively complex investments. These behaviors were encouraged and magnified by perverse incentives that encouraged wild risk-taking and activity that bordered on the fraudulent and which sometimes went well past that border. This narrative is popular with the left, but is accepted much more widely than that, including by a broad populist sentiment that sees large banks and large corporations as at the root of many of the country's economic problems. Many in the media have also adopted this position.

The housing part of the crisis is viewed as principally resulting from financiers pushing naïve consumers into taking on mortgages bigger than they could handle and which were structured to hide large fees and interest rates that would jump after a few years. Financiers knew the loans were too risky, but did not care, since they could package them into mortgage-backed securities and sell them on to investors who relied on the evaluations of rating agencies that were essentially in the pocket of Wall Street. Financiers further took advantage of the silent complicity of the rating agencies by creating collateralized debt obligations (CDO's) that owned the less attractive parts of mortgage backed securities and even CDO's that owned portfolios of other CDO's (CDO Squareds). At heart, these instruments were meant to obtain excessively high ratings for most of the tranches of these risky instruments in order to sell them to investors who relied almost purely on ratings. However, perverse

incentive compensation structures even led traders to commit their own banks' capital to owning many of these risky securities, since in most years they would perform well and produce big bonuses for the traders. The worst that could happen is that a bad year would lead to no bonus, but also no repayment of excessive past compensation.

Outside of housing finance, Wall Street created many other excessively complex financial instruments in the areas of derivatives and securitization, often to give the appearance of holding less capital or more capital per unit of risk. In the end, most of these risks, both those related to housing and those that were not, eventually blew up and created the mess we are cleaning up now.

Narrative 3: Everyone is responsible. Not literally everyone, of course, but virtually every major type of institution and class of people made bad decisions. This crisis was a very broad-based event with a wide range of people and institutions bearing responsibility, including many outside the United States. Two of the most important mistakes made were, first, that Wall Street financial institutions failed to put in place or enforce the sound risk management processes and restraints that were needed. In other words, they made the kinds of mistakes and bad actions that lie at the heart of Narrative 2. Second, government regulators did not adequately oversee these institutions, including, importantly, Fannie Mae and Freddie Mac. Supervisors and regulators should have made sure that the right risk management strategies were being followed, and they did not do so. In other words, government made the kind of mistakes described in Narrative 1. Some of the federal government's actions to encourage home ownership also overshot and provided incentives for reckless behavior.

Another important manifestation of the combination of public and private failures can be seen in the ratings agencies. They used models to assess the risk levels of many financial assets that were highly inadequate possibly as a result of strong conflicts of interest. The government exacerbated the problem by installing the ratings agencies as quasi official arbiters of risk without overseeing their behavior properly.

Responsibility does not stop with these institutions. Individual consumers and investors are hardly blameless in this narrative. Some people were scamming the system by obtaining mortgages under false pretenses or while knowing that they were taking crazy risks, but could always walk away from their tiny equity investments in the houses on which they were speculating. Many other homebuyers willingly accepted the fantasy that house prices could only go up. Similarly, large parts of the middle class over-invested in the stock market, including those who went into retirement with portfolios consisting almost entirely of common stock. Further, Wall Street financial institutions were not the only ones responsible. Small state-chartered institutions originated a large fraction of the mortgages that subsequently went into default. These were often not banks as they did not take retail deposits and thus they avoided supervision by the FDIC.

According to Narrative 3, the principal underlying cause of this widespread behavior was a major reduction in the risk premium resulting from roughly 25 years of strong performance by the financial markets, encouraged by and associated with the "great moderation" in the macro-economy, whereby

business cycles seemed almost to vanish. This showed most tellingly in the stock market. The Dow Jones Industrial Average bottomed out at roughly 800 in 1982 and went up by a factor of almost 20 times over the ensuing quarter of a century. There were a few bumps along the way, such as the Crash of 1987, but the troubles were generally relatively short-term and not usually that severe.

People “learned” that it was good to take financial risks. Not only would one expect on average to be rewarded, as the textbooks tell us, but actual experience showed it almost always paid off much more handsomely and with less pain than the theories said. Individuals learned a similar thing with housing, which did experience some declines but generally produced very satisfactory results. Since homeowners were usually highly levered through mortgage debt, a fairly steady and decent return became a very attractive levered return. The returns on housing, of course, shot up even further as the bubble inflated in the middle of this century.

This increased willingness to take risks worked in dangerous combination with the “easy money” conditions of the mid-2000’s. Investors working in institutions or acting as individuals found that they could easily fund their purchase of investments whose risk they were significantly under-estimating. The combination was highly intoxicating and seemed to produce great risk-adjusted returns, since the risks were not fully apparent.

It was not a coincidence that so many financial market participants made bad mistakes. Financial institutions were making high profits and convinced themselves that approaches that were clearly very lax in retrospect were sufficient to police their own risks. These risk management approaches, whose flaws should have been obvious even at the time, were accepted because they allowed behavior that was very profitable in the short term. For their part, regulators thought everything was going fine and generally relied heavily on the internal risk management approaches of the financial institutions. Even when they did independent analyses, they often bought into the same analytical approaches.

There are a couple of good examples of this last effect that show the failure to correctly assess and limit risk was not just a US problem. The United Kingdom had a single financial regulator, the Financial Services Authority. Two of the banks under its care that went under were Northern Rock and RBS. Northern Rock was earning very strong profits and seemed to be doing fine, issuing large amounts of mortgages. Royal Bank of Scotland was hugely successful and was taking over other banks, apparently with great success. It turned out that Northern Rock was relying on very short term wholesale borrowing to expand its mortgage lending, resulting in huge risks. And Royal Bank of Scotland (RBS) was greatly overpaying for its purchases of other banks (notably ABN AMRO), as well as making very risky commercial loans. Neither risk factor was hard to spot, but regulators did not treat them with the seriousness they deserved.

One important question that arises with narrative 3 is whether or not financial crises are inevitable and there is really nothing that can be done to avoid them. Risk taking, after all, is part of a dynamic market economy and drives economic growth, so we discourage risk taking at our peril. Regulators are human and prone to errors and if sophisticated market participants fail to see bubbles in the making, how can

we expect regulators to see them? As we have said, our preference is for narrative 3, but that still leaves open the question of what policymakers can and should do. For our part, we believe that it makes sense to fix the many known problems that became evident during this crisis and to strengthen the rules on capital and liquidity, which serve as safeguards against any type of trouble and therefore do not necessitate guessing the exact form of a future crisis. Accepting that some crises may still occur does not imply that systemic weaknesses in the markets or regulation should be accepted passively.

Why do we prefer Narrative 3 to Narrative 1?

Narrative 1 does have significant elements of truth: in its zeal to encourage homeownership and investments in housing the government failed in its role as the cop on the beat for financial institutions originating and holding risky mortgage-related assets. Its approach to Fannie Mae and Freddie Mac stands out because they were allowed to hold massive portfolios with economically insufficient capital to protect against errors and bad luck. Their management of potential default risks was severely flawed and the government, which had the ability to regulate them closely, did little to correct their behavior. Apart from its role in allowing or even encouraging the crisis to get started, the government also bears responsibility for failures in handling the crisis once it was underway. The combination of rescuing Bear Stearns and letting Lehman fail was a major source of financial panic.

Despite these sharp criticisms of the role of government, we believe there was a much more comprehensive bubble at work that could have produced great harm even if housing had been a more minor part of the problem. We also believe that the moral hazard problem was a less crucial factor than some advocates of Narrative 1 would assert. The rest of this paper will lay out the reasons for our beliefs.

The larger bubble

We believe, in line with Narrative 3, that a major contributor to the financial crisis was a dramatic and comprehensive transformation in attitudes towards risk across virtually all financial markets and sectors of society that built slowly over the course of 25 years and accelerated in the mid-2000's. "Risk aversion" is the term economists use to describe the preference of individuals and institutions to avoid risk when they make economic decisions, if they can do so without cost. There are always exceptions, otherwise we would probably not have a large gambling industry, but the prices of financial instruments virtually always reflect such risk aversion. That is, people have to be paid a higher expected return on an investment that has a greater level of risk. This is most notable in the stock market, where there is a long history of investors demanding the expectation of higher returns than on ultra-safe Treasury bonds in order to compensate for the risk of not achieving the expected return. Conceptually, there is a difference between risk aversion (which in economics relates to the curvature of a utility function) and expectations about the degree of risk—the probability that some adverse outcome will actually take place. In recent years, it is likely that both risk aversion and expectations of risk changed. We do not know exactly the relative importance, nor is it essential to know. We do know that behaviors towards risky assets changed dramatically.

An impressive array of measures of the risk premium in the financial markets declined significantly leading up to 2006 or 2007 and then soared as the financial crisis brought a return of fear to the markets. This dramatic increase in perceived risk caused the prices of risky assets, such as stocks, to plummet. It also caused a drying up of the liquidity that allows markets to function efficiently. All of this translated into the real economy by hitting consumers and businesses with a huge loss of wealth, at least as measured by market prices. Further, the drop in market values, combined with the vanishing of liquidity, caused severe problems for the banking system, which consequently pulled back on the provision of credit. Worse, the securitization markets, which had grown to provide roughly 40% of new credit, virtually disappeared. Higher loan rates, tougher terms, and decreased availability of credit made it harder for businesses and consumers to continue investing and spending.

Thus far, advocates of Narrative 1 and Narrative 3 could probably both agree, even though they would emphasize different aspects. Narrative 1 focuses on the bubble in housing and the government actions that encouraged it, while Narrative 3 looks more broadly.

A key policy question, therefore, is whether the housing bubble was the unique driver of the crisis or whether we might have had a damaging crisis even if housing had played a more minor role. (The next section will deal with the related question of whether it was government actions which primarily accounted for the housing bubble.) Few would dispute that other bubbles existed and could have burst in a painful way – the argument is whether those bubbles would have been more like the stock market crash of 1987 or the Long-Term Capital Market failure, both of which hurt, but neither of which dramatically damaged the economy. Housing is a very large sector of the economy and the financial markets and one which affects a large portion of consumers, so there is some reason to argue that a housing bubble of this magnitude was uniquely situated to give us our worst recession since the Great Depression.

However, we believe that there would have been a painful recession due to the bursting of the more comprehensive financial bubble, even if housing had played a significantly more minor role. There is no way to prove or disprove this, just as there is no way to prove or disprove the assertions of Narrative 1 about the uniqueness of the housing bubble, because we cannot go back and replay history. Nonetheless, we see a number of strong reasons to support our view that the housing bubble was not necessary for the kind of extremely painful financial crisis that regulation needs to focus on preventing or mitigating. These reasons fall into five broad categories:

The signs that a comprehensive financial bubble existed are virtually impossible to dispute. The premium that investors demanded to take on risk in many different investment markets around the world came down to unusually low levels by 2006/2007. History shows us that such periods of irrational exuberance, particularly when fueled with high levels of liquidity, often lead to severe financial crises.

The credit losses that drove this crisis are not primarily in housing. More of the losses come from a wide range of other categories, such as commercial real estate lending, ordinary business loans, and credit cards. This does not rule out the possibility that housing started the problem and the blow was so

strong that it took down the other sectors. However, it is strongly suggestive that the imbalances in other areas were also very large prior to the housing bubble bursting, reinforcing the notion of a more comprehensive bubble made up of many sectoral bubbles. In addition, it supports the notion that the bursting of other bubbles, such as in commercial real estate and the stock market, could have started a chain reaction that would have led to very large losses and that the problem did not have to begin with housing.

The sequence of mini-crises that constituted the larger crisis did not occur in the manner one would expect if housing were the sole important issue. The first domino to fall was the failure of some hedge funds with excessive exposure to subprime mortgages in the U.S., as one might expect. But, the second domino was the “leveraged loan” market, a wholesale business in which banks and other investors supplied funds to highly levered corporations, generally to fund the buyout of a business. There is no significant direct relationship between leveraged loans and housing. We believe the connection is that both markets experienced excessive risk-taking and suffered from the dawning of a less aggressive era.

If the housing bubble had not burst when it did, the other bubbles might have grown even larger and burst more painfully than they did. The history of bubbles suggests they often inflate until they burst simply because they have reached a natural limit. If the housing bubble had not burst when it did, the other bubbles might have grown for another year or two before they became so big that they burst. Thus, the pain in those sectors could have been worse than we actually saw.

Finally, it seems unlikely that there would have been no housing bubble at all in a period when so many other investments were in a bubble. Perhaps more sensible government actions would have avoided fueling the housing bubble, but private market forces appear more than sufficient to have created at least a more modest bubble.

The comprehensive nature of the bubble

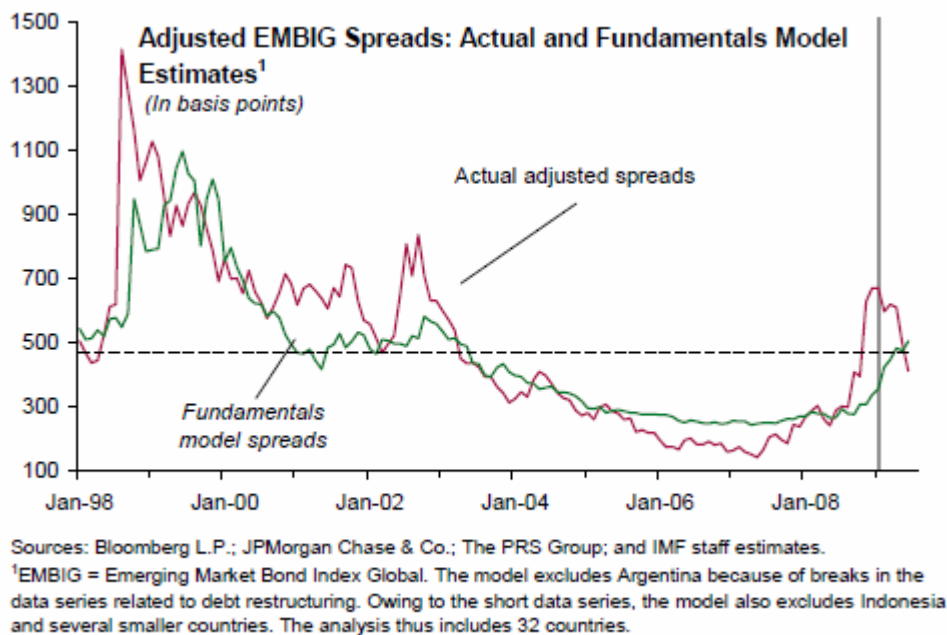
Housing clearly experienced a bubble in which investors and lenders paid too little attention to risk, allowed underwriting standards to deteriorate markedly, and supported house prices that became excessively high and a cost of borrowing through mortgages that was excessively low. All of this, of course, encouraged the creation of an over-supply of housing particularly in certain speculative markets, such as Las Vegas or Florida.

However, this situation was hardly unique to housing. Experts in commercial real estate generally view that market as having gone through a similar process. An underlying, excessive comfort with risk led to weaker underwriting standards on commercial mortgages, prices that rose too far, borrowing costs that were too low for the real risk, and major overbuilding in certain markets or types of real estate.

The same story was repeated in different guises in the stock market, the leveraged loan market, the bond market for less creditworthy companies, the bond market for sovereign debt of emerging economies, and on and on. The easiest part of this to demonstrate in a shorter paper such as this is the

increasing price offered by investors and the declining premium demanded by them to take risk in these various categories.

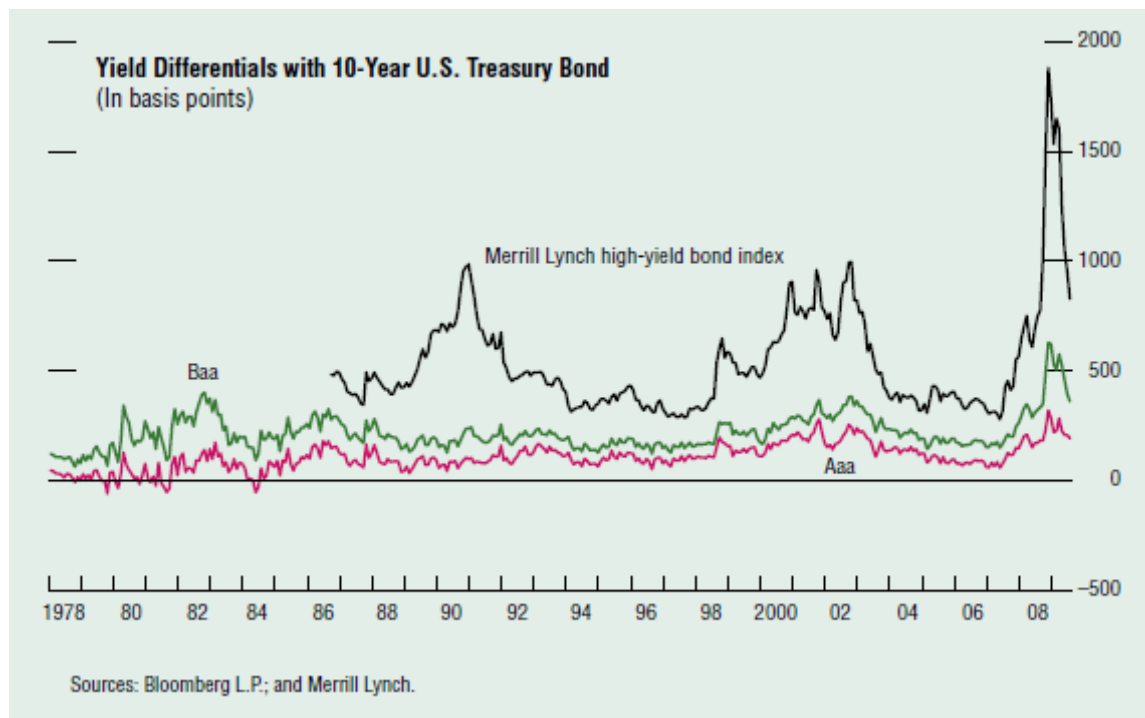
For example, Robert Shiller provides a useful measure of the relative priciness of common stocks in the U.S., in his excellent book on bubbles, "Irrational Exuberance." The measure divides the value of the S&P 500 index at the end of each year by the average reported earnings for the companies comprising that index over the preceding decade, with both index price and earnings adjusted for inflation. His view, following some of the classic value investors such as Ben Graham, is that average earnings over a decade are more reflective of underlying earnings power than is a single year's earnings. By our calculations, the ten-year price/earnings ratio was in the range of 26-28 at the end of each year between 2003 and 2007. (The ratio at the index's peak over the course of a year would have been higher.) This is well above the average of 15 for the last 108 years, suggesting quite substantial over-valuation. For comparison, the ratio is about 17 now.



Note: Reproduced from the October 2009 IMF Global Financial Stabilization Review, Figure 1.37 on page 51 of Chapter 1.

Sovereign bonds of emerging market countries also appear to have been in a true bubble. As the figure above shows, the spread over U.S. Treasury bonds of similar maturity (viewed as the lowest risk investment for a U.S. dollar investor) came down to about 150 basis points for an extended period in 2006 and 2007. This compares to an average credit spread of almost 500 basis points for the period from January 1998 until recently and an estimated "fundamental" credit spread produced by the International Monetary Fund (IMF) of about 300 basis points. (The fundamental spread is their attempt to reflect what the spread "should" be, given fundamental economic conditions.) At the peak of the current crisis, the spread had widened back out to about 700 basis points, producing massive price declines. As a further comparison, the spread on the emerging market bonds at the low point was

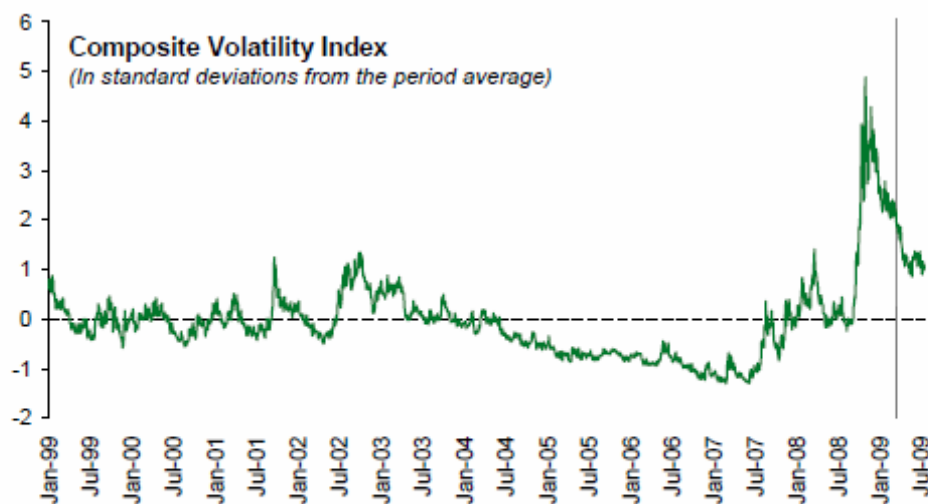
about the spread investors were charging for “Aaa” U.S. bonds as recently as 2003-4. It does not seem possible to us that those spreads could have reflected a fully rational long-term view of the potential risk.



Note: Reproduced from the October 2009 IMF Global Financial Stabilization Review, Figure 3 of the Appendix.

The graph above shows that the spreads on U.S. corporate bonds were also unusually low in 2006-7, at levels that were rarely if ever seen in the preceding 20 years. High Yield bonds, for example, reached a record low spread of about 300 basis points over Treasuries. The average over the 20-some years of data was closer to 500 basis points and the spread blew out to close to 2000 at the peak of the financial crisis, although it has since come back to around 800. Even the 300 basis point spread does not tell the whole story, as the composition of the high yield index had changed over time to reflect a junk bond universe with a higher proportion of credits with lower ratings, which would normally be expected to increase the required spread.

Bonds of higher credit quality did not show as stark a contrast with historical norms, but the spreads on Aaa and Baa bonds were also at or near historic lows in 2006-7, compared to the period since 1987 or so, when the distorting effects of the inflationary episode of the 1970's and early 1980's had dissipated.



Sources: Bloomberg L.P.; and IMF staff estimates.

Note: Representing an average z-score of the implied volatility derived from options from stock market indices, interest, and exchange rates. A value of 0 indicates the average implied volatility across asset classes is in line with the period average (from 12/31/98 where data is available). Values of +/-1 indicate average implied volatility is one standard deviation above or below the period average.

Note: Reproduced from the October 2009 IMF Global Financial Stabilization Review, Figure 139 of Chapter 1.

Another interesting measure is the IMF's calculation of the average volatility forecast built into option pricing for a wide range of stock market, interest rate, and foreign exchange markets. This showed a clear decline in volatility expectations from 2003 to 2007. By the end of that period, the expected volatility was a full standard deviation below the average levels for the decade. In simple terms, this implied that actual volatility would be higher 84% of the time, if the decade's average forecast were a good long-term estimate. Even this probably considerably understates the extent of the increased willingness to take risk, for various technical reasons².

² First, the models used to calculate the "implied volatility" presumably suffer from the same problem as did so many other models of failing to capture the "fat tails" of the real underlying distributions of potential results. One indicator of this is that the measure shot up to over 4 standard deviations above the average by the middle of the crisis, which theoretically implies an event that would occur well under once in a thousand years. Although this could be random, it strongly suggests a mis-specified model. Second, the volatility of price movements over a period only captures the true risk accurately if the statistical properties of price movements are fairly well-behaved. To give an extreme example, if markets were consistently too optimistic for 20 years, but the degree of optimism stayed stable and economic conditions were relatively steady, there would be very little volatility. If something suddenly punctured the over-optimism, the price movement would be extreme when measured in terms of standard deviations based on historical volatility. However, a less mechanistic view of risk might have discerned a much higher probability of major losses.

Why would so many investors in so many markets stop caring enough about risk? As with most bubbles throughout history, there were some rational bases for the initial price increases and relaxation of lending terms. The economy had been relatively steady from the mid-1980's to the mid-2000's compared to the historical norm. Many people, both experts and non-experts, believed that central banks and governments around the world had learned the secrets necessary to tame the business cycle. People began writing of "The Great Moderation" and debating why the economy was so much less volatile. A lower level of volatility in the economy as a whole translates fairly directly into a lower risk level for many financial investments.

Shiller and others have done an excellent job of explaining how bubbles can become self-perpetuating. A key element is that a strong belief arises that conditions are ripe for continued price appreciation in some investment category, such as housing. Further price rises then serve as a kind of confirmation of the theme, leading more and more investors into joining the trend, aided by a media focus on an exciting trend, which causes prices to rise further. Unfortunately, like a Ponzi scheme, there will be a natural limit to how much money investors in the aggregate will be willing to invest. Even if no bad news occurs to cause a questioning of the underlying theme, price appreciation will slow down and eventually stop as it becomes difficult to find enough new investors to keep inflating the bubble. The deceleration of price appreciation makes it less attractive for new money to come in and more tempting for existing investors to cash in their investment in whole or in part. Once prices start down, either as a result of bad news or simple extreme over-extension, the momentum starts to reverse as investors increasingly pull back out to avoid further losses, either "paper" losses or actual ones. Since prices are well above their intrinsic values, there is little to protect against a severe decline. Such a decline can cause a panic in which prices overshoot on the way down, as they did on the way up.

In theory, sophisticated investors, either at large financial institutions or investing on their own, would recognize the deviations from intrinsic value and sell on the way up and buy as prices overshoot on the way down. However, many of those investors have come to realize that bubbles can inflate for considerably longer than one would intuitively think, so it is profitable to ride them on the way up and dangerous to sell into them too early. Further, institutional incentive structures tend to work against betting on intrinsic values as opposed to the market trend. If a mutual fund manager correctly spots a bubble and pulls out of that investment category, they may underperform for several years as the bubble continues to inflate. That underperformance can get them fired. On the other hand, investing in the bubble in the same proportions as other investors would lead to good bonuses on the way up. On the way down, there is the comfort of performing no worse than the others who invested. Anyone who has worked at a large financial institution, as one of the co-authors has, knows that it is a lot easier to keep your job when you are wrong alongside most everyone else than when you are wrong on your own. Thus, sophisticated investors try to ride the bubble as far as possible on the way up, generally aiming to get out as prices start to fall. Unfortunately, it can be extremely difficult to get this right. More often, one tries to get out the same door that everyone else is rushing for, leading to difficulty in selling except at far lower prices.

For all of these reasons, bubbles are a reasonably common phenomenon in history, frequent enough to cause a great deal of damage over time, but rare enough that we do not tend to learn from them as a society. By the mid-2000's we were ripe for a wide-ranging bubble because of the favorable economic environment, a multi-decade history of broadly quite favorable financial conditions, and a flood of liquidity in the markets. There is a fair amount of debate as to why there was so much money floating around, but it is undeniably true that investors and lenders found it very easy to raise the funds to make the investments that appealed to them. Indeed some of the investment strategies, such as the "carry trade," were effectively a play on the easy money conditions that prevailed.

Easy availability of funds serves as an accelerant for bubbles and significantly increases the danger when the bubble bursts, since many investors will have invested more than they could afford to lose, given the ease of borrowing. This was certainly the case in the current crisis.

Credit losses from this crisis are not primarily in housing

The bursting of the housing bubble has indeed created massive financial losses for lenders and investors, but it appears that credit losses from other types of loans and investments will actually exceed the losses from housing credit. For example, according to estimates from the International Monetary Fund (IMF)³, about 41% of the credit losses that U.S. banks will suffer from this crisis will have come from residential mortgages, including losses from holdings of residential mortgage-backed securities. The other three-fifths of the losses come from a variety of other loan types, of which the next largest categories are consumer loans (19% of the total losses), commercial mortgages (16%), and general corporate loans (12%).

The direct effect of housing-related losses is only a little bigger proportionally when viewed in the context of all household and non-profit assets, rather than just bank holdings of loans and securities. In 2006, residential mortgages represented about \$10 trillion out of total household and non-profit assets of approximately \$77 trillion. The IMF's predicted loss rates imply roughly \$1.2 trillion of mortgage losses, a good chunk of which would be absorbed by Fannie Mae and Freddie Mac (and ultimately the tax payer, in all likelihood.) In addition, the value of household real estate fell by about \$4.3 trillion between the end of 2006 and the second quarter of 2009. The total of these housing-related losses comes to \$5.5 trillion, including the GSE's share. This is admittedly a huge sum, but is only a little over half of the \$10.3 trillion drop in the net worth of households and non-profits.

Nor are the severity of losses on residential real estate that much worse than for other major credit categories. The IMF estimates an ultimate loss rate of around 12% on all U.S. residential mortgages, both those still held by banks and the larger portion which was securitized, again including losses that will fall on Fannie Mae and Freddie Mac. This 12% compares to about 18% for consumer loans, 11% for commercial mortgages, and 5% for general business loans. Losses on the latter three categories would be about 10% in aggregate, not far below that for residential mortgages.

³ Please see the IMF's Global Financial Stability Report of October 2009.

Given the size and vulnerability of these other loan categories, and the even greater size and vulnerability of the highly priced stock market of 2007, it is very reasonable to imagine an alternative history in which these other financial categories caused a financial crisis. Perhaps commercial mortgages would have been the first to crack, leading to concerns about other financial sectors that caused a general pullback in risk-taking. The ensuing fall in prices and freezing of liquidity might not have been as bad as we witnessed in reality, but could easily have been harsh enough to raise many of the same problems with the freezing of different markets and increases in uncertainty. As these problems translated into the real economy, there would have been an increase in unemployment and expectations of worse figures still to come, which would have hit the consumer sector, including the housing and mortgage markets. Even if housing had been priced fairly for the economic future optimistically expected in 2007, it would almost certainly have been hit by the swing in credit conditions and economic forecasts.

We are not arguing that a saner housing market would have been immaterial, but rather that it would have been no guarantee of avoiding a very severe financial crisis and ensuing deep recession. Put another way, if we find ourselves in the future in another situation of widespread, excessive risk-taking, preventing problems in the housing sector is unlikely to be enough to prevent severe financial and economic problems when the bubble bursts.

The curious case of the dominos

If the financial crisis was largely about a massive housing bubble, it is difficult to understand the order in which the dominos fell, particularly at the beginning. Most observers would agree that the first domino to fall was when several hedge funds that took large risks on sub-prime mortgages imploded, particularly two run by Bear Stearns. That makes sense in the context of a housing bubble bursting. But, the second domino, falling very soon after, has no apparent direct connection to housing -- the "leveraged loan" market froze up. This is the lending market for less creditworthy companies, which was dominated at the time by large new loans being made to finance the acquisition on a highly levered basis of companies that were allegedly capable of providing the steady cash flows that would be needed to service the extra debt.

The rate a bank could charge for a leveraged loan was significantly higher than for a loan to a more creditworthy company, but not nearly high enough to pay for the level of risk that it is now clear was being taken. The lead bank in the transaction could potentially make this difference up by earning fees for syndicating most of the risk out to other banks and non-bank investors and by the informal promise of mergers and acquisitions and other advisory fees for aiding in the transaction. However, most of the ultimate holders of these loans were simply investors in the loans and did not benefit from these other fees. Their actions only really make sense if we assume that they viewed the risk as significantly lower than we now see that it was.

There appear to be two connections between the subprime problems and the leveraged loan market. First, both markets had suffered from a severe drop in risk aversion which led to excessively low risk

premiums. The subprime problems may have been the signal for some of the relatively sophisticated financial institutions involved in the leveraged loan market that the long bull market in risk was coming to a close, leading them to pull back on leveraged loans. Second, many of the new investors in leveraged loans were structured vehicles that may have begun to experience difficulty raising funds from new investors or which feared this was a possibility. They, in turn, may have cut back on their willingness to purchase these loans.

In theory, the subprime mortgage problems could have caused leveraged loan investors to expect a significantly worsening economy that would be especially bad for highly levered companies. However, economic forecasts were not coming down particularly strongly at that point and it does not appear that these investors were becoming more pessimistic about the economy than the economists were.

Bubbles grow until they burst

The work on bubbles by Shiller and others makes clear that a bubble can grow for a very long time before it hits a natural limit. Such a limit will always be reached, because a key part of the dynamic of a bubble, like a Ponzi scheme, is that it needs to suck in increasing amounts of money in order to continue. It is almost impossible for a bubble to stabilize for any substantial period, since a key element of the bubble mentality is that people are chasing after assets whose price keeps going up because more and more people are chasing the asset, following the price momentum. If demand temporarily stabilizes, then prices stop their headlong climb, leaving the bubble vulnerable to any piece of bad news that causes questions about the excessive valuation.

It is quite possible that the non-housing bubbles, in the stock market, commercial real estate, etc., would have continued growing for a longer period if the bursting of the housing bubble had not choked off their growth. Sometimes a good chunk of a bubble's growth occurs in its final months, so extending these other bubbles by even a year might have created considerably more vulnerability, and eventual losses, in these non-housing areas. So, it is not necessarily accurate to assess their potential damage by the state of these bubbles at the time when everything came crashing down.

Why wouldn't housing have been caught up in the mega-bubble?

It seems unlikely that housing could have fully escaped the wider bubble mentality even if the government had refrained from pushing homeownership and supporting Fannie and Freddie excessively. Housing is a major asset category, one whose valuation would have looked better and better relative to other investments if it continued to avoid the bubble pricing showing up so strongly elsewhere in the financial system. Housing is also the major investment category for most individuals in the middle class, so it seems unlikely that they would have confined their overly optimistic behavior to the stock market and other non-housing markets.

Doubtless better government actions would have reduced the size of the housing part of the bubble, but it is hard to imagine that it would have negated the larger bubble effects entirely.

It wasn't just the financial markets

This part of the paper has tried to demonstrate the bubble's existence and its effects on the financial markets. However, the harm that was done by over-optimism and excessive risk taking spread far beyond Wall Street. Many of the regulators, the politicians that guide them, and the rating agencies that acted as monitors, were caught up in the same view of risk and the effectiveness of the markets as was Wall Street. They were lulled into a false sense of security that led them to accept actions that they would not have allowed if they were as concerned about the risks as they should have been. They almost certainly remained more conservative than Wall Street, and placed limits on certain actions, but their degree of vigilance and aggressiveness was reduced by a sense that risks were low enough to be acceptable, given the overall moderation of volatility in the economy and the markets. Being somewhat more conservative than the average in the middle of a period of strong over-optimism may not mean that much.

The same was true of individuals, many of whom were caught up in the house-buying frenzy or who over-invested in the stock market. It is chilling to hear some of the tales of over-extension by individuals pushing for homes larger than they could afford or looking for a housing investment as a quick path to wealth. Equally disturbing is the number of retirees and near-retirees who kept almost all of their financial wealth in the stock market, against virtually all tenets of good financial management. People did these things because they had seen risk-taking work over many, many years and came to believe that it was just the way the world worked, or at least in the lucky land of America. This is the type of attitude that can build up over many years of good fortune.

The problems created by government policies in banking and housing

Narrative 1 focuses heavily on the role government policy played in encouraging excessive borrowing to invest in residential housing. Peter Wallison of the American Enterprise Institute spoke recently at a conference at the Chicago Federal Reserve Bank and he forcefully re-iterated his position that the GSEs and government housing policy are at the heart of the financial crisis we have been through. Without the GSEs, he argues, there would not have been a major crisis.

Homeownership clearly has social benefits. Families that own their own homes generally take care of them better, are more concerned about their schools and neighborhoods and fight crime. Belief in these benefits has driven a US policy at least since World War II of encouraging homeownership. One important element in this policy is that the implicit rental that people earn on their homes is not subject to income taxation. Another element is that mortgage interest is deductible for families that itemize their tax deductions. A third element is that the government set up the GSEs (starting before World War II) as institutions that would make it easier for middle income families to get mortgages. A virtually unique feature of the US mortgage market is that borrowers can obtain 30 year fixed interest rate mortgages, usually allowing them to repay the mortgage early if they want to move or get a better interest rate. Such a mortgage provides a one-way guaranty that monthly mortgage payments will never rise, so that a family that buys a house is protected as long as they can keep paying the fixed monthly mortgage.

One important feature of the US government's efforts to encourage homeownership is that it was often done by allowing families to borrow more and to minimize down-payments. Rather than giving a direct subsidy to potential homeowners, policymakers endorsed over-leverage. The reason is easy to see. Direct support for low income housing would have been part of outlays and counted as government spending. Increasing leverage with the GSEs did not show up as a budget cost even though, ex post, there will be much more government spending to clean up the mess.

The policy of encouraging housing started to run into problems in various ways. First, Fannie and Freddie were given a dual status where they were shareholder-owned even though they had been started by the government. Because of their government links, they were able to borrow in the capital market at only a very small premium above the Treasury interest rate. This allowed them to out compete private banks for those mortgages that conformed to the restrictions placed on the GSEs and, for a number of years, to make very large profits. Some of those profits were channeled into campaign contributions to Congress and direct and indirect lobbying to keep the money machine operating. One of the innovations introduced by the GSEs was the securitization of bundles of mortgages as a way of spreading and hence reducing risks. However, by far the most profitable activity for Fannie and Freddie was to keep a large portfolio of mortgages on their books. These were particularly profitable since they were not required to hold much capital against this portfolio of mortgage-backed assets.

Despite the flow of campaign contributions, members of Congress began to be concerned about the status of the GSEs. Senator Shelby, with support from Alan Greenspan, argued that they should limit the size of the portfolio of mortgages they held on their books to reduce risk. Some Democrats argued that they should be required to use some of their excess profits to make more mortgage loans to low income families or to families that lacked the normal down payment. Fannie and Freddie were allowed to fulfill their mandate to support low income borrowers by purchasing sub-prime mortgages, even though these had often been originated by brokers and small state chartered institutions that paid little attention to verifying FICO scores or income statements. Thus, the GSEs ended up with very large sub prime portfolios. It is possible that Fannie and Freddie may have known before the crisis hit that these sub prime mortgages were likely to result in losses, but figured that exposure was a price they had to pay for their profitable prime business. Even before the crisis, they were aware that the combination of being pushed to reduce the profitable part of their portfolio and expand the unprofitable part could drive them into a financial squeeze. However, in common with many others, they did not foresee the large declines in house prices. When this started, they quickly ran through their capital and had to be placed into receivership as the sub prime assets defaulted and even many prime mortgages went into foreclosure.

Thus, it is clear that the government played a significant role in supporting the expansion of a housing market that grew too large and too pricey. However, we believe government actions were only one part of a complex of mistakes made by various institutions and individuals. For example, there is no reason to believe that the top executives of Fannie Mae and Freddie Mac willingly accepted a situation that they thought would bankrupt their companies. They may have accepted additional government mandates to take on more risky mortgage exposure as a way to head off the need to sell down their profitable

portfolios, but this was premised on an acceptance of the same mistaken view of the housing market as was accepted by so many in the bubble era. If the executives had realized that housing risks were significantly overpriced, they could easily have cut a deal with the Bush Administration to sell down substantial parts of their (overpriced) portfolios without having to accept additional mandates.

Further, as we will argue later, the housing bubble should be seen in the context of a larger financial bubble. It would have been very difficult for housing to have avoided being caught up to some extent in the frenzy of risk-taking unless the government had actively discouraged it, not merely stepped back from *encouraging* it.

One controversial issue around the role of the GSEs in the crisis is the extent to which they were leading the demand for the subprime (or near subprime) mortgages that subsequently got into difficulties or whether they were simply following along behind the train that was being powered by the private sector. Really understanding this issue is beyond the scope of this paper, because there is no agreement on the data. One important measure to look at is the rate of default on GSE mortgages compared with rate of default on mortgages held by the private sector. We have been told that the GSE default rate is lower, which suggests that they were being pulled along by the private sector not pulling the train themselves. These data and this view have been disputed, however, and we are not in a position to form a judgment ourselves at this point.

Supporters of Narrative 1 also believe that the government made the banking system significantly more risky by eliminating many of the sources of market discipline. For example, one of the measures introduced as a result of the Great Depression was federal deposit insurance and the FDIC has become a key part of the regulatory system. The case for deposit insurance is that it prevents a run on the bank by retail depositors. When Citibank or Indymac experienced serious threats to their survival in the crisis, few if any customers were standing in line to get their money out because they knew that the FDIC would make sure they had access to their funds, even in the event of a bank failure, as occurred with Indymac. Prior to the introduction of the FDIC, bank runs were relatively common in the US, and indeed Northern Rock in the United Kingdom experienced a run by retail depositors in 2007 because their deposit insurance was less complete than in the US.

The problem with deposit insurance is that it means that the people who deposit money in federally insured banks do not spend any time checking to make sure the bank is sound. In other words, an element of market discipline is undermined by deposit insurance. Prior to the crisis, the limit on deposit insurance in the US was \$100,000 per account, so that in principle large depositors still had an incentive to examine the stability of the bank that held their money. But in practice, large depositors can often spread their funds around to multiple accounts and multiple banks in order to make sure they were fully covered by deposit insurance even for amounts above the limit. The existence of the FDIC, in short, created a moral hazard problem because it encourages banks to take excessive risks knowing that their deposit base will not flee to a safer bank. Some observers, notably Charles Calomiris of Columbia Business School and an expert on banking, has argued that deposit insurance is the most important failure of regulatory policy and the biggest cause of recurrent banking crises. (See his article for the Cato

symposium on the crisis). To give the full picture, Calomiris judges that FDIC insurance is so firmly entrenched in the banking system that it a fact of life at this point. In terms of solutions, he argues for measures that could minimize the problems he believes the FDIC system has created.

Probably most critics of bank regulation focus on another aspect of moral hazard, however. They note that the development of the financial crisis took place among large financial institutions, including the large universal banks that emerged after the repeal of Glass Steagall, and among the investment banks and broker dealers.⁴ When the financial crisis struck, the Federal Reserve and the Treasury determined that some of these institutions were too big (or too interconnected) to fail and had to be supported, in some cases by very large infusions of funds or by guarantees of debts that put taxpayers at risk. This support of large banks was even extended to GM and Chrysler that were also judged to be too big or too important to the economy to be allowed to fail.

Those who blame the government for the crisis argue that it had created the presumption among large financial institutions that they would be bailed out if they got into trouble. And once the crisis unfolded and Bear Stearns was “taken care of” by Fed and Treasury actions, this reinforced the notion that large or important institutions were protected. In fairness, the bank bailouts did not protect the shareholders of the failing institutions—the shareholders of Bear Stearns, including the senior management of the company, lost a vast amount of money. However, the government’s critics point out that counterparty risk holders were protected. Financial institutions that had entered into agreements with Bear Stearns were protected at taxpayer expense. Debtors were protected, both at Bear Stearns and in most other rescues.

When Lehman got into trouble the government did not step in to bail out the company or the counterparties. The Fed and Treasury tried to broker a deal with Barclays Bank, but could not bring it off, partly because the UK authorities did not agree, so Lehman went down. The collapse of Lehman is generally thought to have triggered a severe worsening of the financial crisis and is cited as one reason the government must provide protection to large or important entities. Government critics, however, draw a different conclusion. The problem, they say, was not that Lehman went under, but that Bear Stearns was supported (or its counterparties and creditors were supported). If Bear had been allowed to go into bankruptcy, that would have signaled to markets that Lehman was on its own and market participants would have taken the necessary steps to protect themselves.

The government’s support of financial institutions was widespread. They tried to help large banks get the bad or toxic assets off their books and when that did not work, they injected capital directly into them. The Fed provided guarantees for money market mutual funds and created a variety of special

⁴ One caveat. State chartered non depository institutions originated many of the bad loans that ended up in the large banks or at Fannie and Freddie. Some state regulators failed to police lending standards adequately. Since the originators (and brokers) passed on the loans to other institutions, they were able to make money without taking any default risk.

lending facilities to free up interbank lending and expanded the Fed's balance sheet hugely in its capacity as lender of last resort.

As both authors of this paper have written, we believe that most of the steps taken by the Treasury and the Fed were necessary to stabilize the US and global financial system. But we acknowledge the argument the critics are making that the government has reinforced a presumption that some institutions are too big to fail. This creates a serious moral hazard problem that gives them an advantage in the capital market when they borrow (maybe a 50 basis point advantage) because the buyers of the bonds of big institutions believe they will be protected if the company gets into trouble. At a minimum, it indirectly encourages the managers of these large institutions to take excessive risks, since creditors and counterparties will not balk.

We also agree that the inconsistent, changing nature of the government response to the crisis accentuated the problems in the financial markets, particularly letting Lehman fail after rescuing Bear Stearns. Various of the decision makers have argued that technical legal constraints or political ones prevented an effective rescue of Lehman, but we believe that these problems would have been overcome if policymakers had accepted the critical importance of doing so.

In general, those who argue the whole crisis was the government's fault do not give much credence to the idea of intrinsic systemic risks. "No more bailouts" is a fine slogan, but if there is really a massive storm out there in the economy, there has to be strong decisive leadership to counter it. Anyone caught in a small boat in a storm is probably going to start bailing out with vigor.

We also fundamentally disagree with the view that the FDIC is a cause of instability on balance. On the contrary we think it is one of the institutions that came out of the Great Depression that has done the most to stabilize the banking system by preventing runs on the banks. The existence of deposit insurance does mean that the FDIC has to make sure that banks are not using the protection to take excessive risks. The S&L crisis was in some measure a product of deposit insurance (FDIC and FSLIC). The moral hazard from insurance must be countered by supervision by the provider of the insurance. Private insurance companies who insure companies against accidents or fires send inspectors out to make sure the companies are following safety rules. The FDIC must do the same and it does.

Conclusions

We believe there were many factors that led to the financial crisis and which explain its intensity, as we have laid out in more detail in other papers. These causes reflect mistakes, bad incentives, and flawed structures across the board: in the financial markets, among regulators and government officials, and in our larger society.

We believe it would be a tragic error to operate under the assumption that the massive blow to our economy from which we are slowly recovering was the result simply of a huge housing bubble. The danger of this belief is that it provides arguments for inaction on many of the problems that we see continuing to exist in our financial markets and institutions and their regulation. If we are correct, the

chances of another major blow-up in the next decade or two are much higher than one would assume when judging the crisis as effectively just a housing bubble of mammoth proportions. There are many other things that could blow up and we need to be vigilant about all of them.