



## *Asset Bubbles and Systemic Risk*

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Thank you, Charles, for your kind introduction. I am very happy to be here today, to offer some perspectives on central banking and systemic supervision in an interdependent world – and in particular some lessons from the past that may serve us well in the future.\*

The past three years have dramatically underscored the interdependence of the world's financial institutions and financial markets. The financial crisis also, by the way, increased awareness of the interdependence of the actions of monetary and fiscal authorities around the world. In light of the crisis and the reality of financial interdependence, the Federal Reserve expanded the types of policy actions it was willing to take. My view is that our openness to innovative measures was critical to avoiding far more severe outcomes – by which I mean cascading failures of financial firms and a locking up of liquidity and credit extension, further impeding households and companies and eventually leading to unemployment that far exceeds our current, far too high, level.

However, I must also stress that the nation's "financial crisis toolkit" was, unfortunately, incomplete, resulting in the Federal Reserve needing to reluctantly take some controversial actions – notably as a result of government in general lacking adequate

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\* *Of course, the views I express today are my own, not necessarily those of my colleagues on the Board of Governors or the Federal Open Market Committee (the FOMC).*

tools or powers to address the resolution (or “winding down”) of certain institutions, especially systemically important nonbank financial firms. If the U.S. puts in place better resolution powers for such institutions, the Federal Reserve will not need to be involved in lending under unusual and exigent circumstances to systemically important institutions that we have no regulatory or supervisory powers over, to prevent even worse outcomes. Unfortunately, at this point the U.S. is operating with the same incomplete toolkit available to policymakers that we had before the crisis. I know that Congress is considering various proposals for financial regulatory reform. My hope is that establishing resolution authority for systemically important nonbank financial firms will be an area with broad bipartisan agreement and support for change.

### **Looking Back, to Look Forward**

Despite the Fed’s aggressive use of both traditional and non-traditional policy tools, the economy is experiencing a slow recovery from a very severe recession, particularly when it comes to jobs.<sup>1</sup> Still, with recent events fresh in our minds it is an appropriate time to discuss the actions a central bank should take during a crisis – and in the periods that precede a crisis – and the tools and powers needed to help avoid future crises. Of course, policymakers and lawmakers are studying these matters right now.

So now is the time to be compiling and applying the lessons of the crisis and its lead-up. But as I’ve noted in other talks, we must learn the *right* lessons, not necessarily the commonly accepted ones. The generally accepted narrative does not always stand up to closer scrutiny, and reacting to these narratives might lead to the wrong remedies. When you consider the human toll of this financial crisis and recession, nothing is more important than making sure we parse out and learn the “real” lessons. Otherwise the fixes may miss the mark and invite unintended consequences.

So today I would like to pose some key questions: Did monetary policy cause the housing bubble that played such a large role in this crisis? Was it, as some have suggested, mainly due to the Fed keeping rates too low for too long, after the 2001 recession? Or should our attention be less on monetary policy and more on *supervisory* policy? Looking forward, what are the best remedies to avoid a similar crisis in the future? Do we need traditional supervision done better, as some assume, or do we need something quite different? And does the recent financial crisis and recession suggest, as some say, that the central bank should not be involved in supervising financial institutions and mitigating financial instability, going forward?

Again, my focus is on avoiding future financial crises. In that spirit, I will touch on the ways that the Federal Reserve could and should use a combination of monetary *and supervisory* tools to foster better macroeconomic outcomes. To do this, I will look back at our recent economic history – specifically, the early part of the last decade<sup>2</sup> – to investigate whether we could have employed a better mix of policy actions to strengthen

the economy after the 2001 recession while avoiding the buildup of financial imbalances that occurred – in other words, avoiding the bubble that eventually burst.

### **Causes of the Crisis?**

As we unpack these issues I should begin by emphasizing that understanding the causes of asset-price “bubbles” is very difficult. Most economists are uncharacteristically humble in admitting their ignorance about what causes asset prices to diverge from their fundamentals (in other words, what causes bubbles).

Still, research by Boston Fed economists points to a clear role for house prices in the recent crises. The rapid ascent of house prices – which started in 1998, accelerated in 2004, and reversed in 2006 – is in our view central to understanding the eventual challenges. The expectation of rising prices provided the incentive for potential homeowners to invest more in housing, and made them – and their lenders – more comfortable with putting relatively little money down. Rising prices also mitigated the risk to institutions and investors that held assets based on these mortgages. After all, as long as prices continued to rise, mortgage holders who got into financial trouble could sell or refinance rather than default, insulating the holders of their mortgages from financial loss. This encouraged more relaxed credit standards, including low downpayments. Of course, a higher loan-to-value ratio exposed the homeowner and the lender to risk should prices fall significantly, but this risk was judged to be minimal. House prices were expected to continue rising.

There is evidence that financial institutions understood the risks that would arise if house prices fell, but assigned too low a probability to this potential outcome. Thus they were woefully unprepared to weather the consequences when prices did indeed fall. Many investors believed that rising house prices made the possibility of significant losses on securitized pools of subprime loans remote.<sup>3</sup> They realized that a significant decline in house prices would indeed cause subprime securitization deals to suffer enormous losses, but assigned a very low (or nonexistent) probability to the sort of drop in house prices that actually occurred. Although some housing experts had raised concerns that the rise in housing prices was not sustainable, noting unusually high ratios of house prices to income or rent, most took comfort in the fact that nominal housing prices had not fallen at the national level since World War II. Even the pessimistic forecasts tended to envision a gradual leveling off of prices rather than an outright decline.

The story fits with the notion of a classic bubble. The key feature of a bubble is that investors willingly pay high prices not because of the asset’s intrinsic value, but because they believe some other investor will pay more for it in the future. The other key element of a bubble is that it almost always bursts.

All of this implies an important role for supervisors in undertaking scenario analyses that would make clear the exposures to such risks, both for individual institutions and for the financial system as a whole. I will return to this theme in a moment.

## Did Monetary Policy Cause the Bubble?

Again, understanding asset bubbles is not easy. One of the most prevalent theories on the source of the bubble involves the low interest rate policies of the Federal Reserve during the recovery from the 2001 recession, when the federal funds rate remained quite low – staying at 1 percent from June 2003 to June 2004 (**Figure 1**).

Let's look closely at the episode. At the time, the rationale for maintaining such a low federal funds rate seemed clear. That rationale is summarized in the FOMC's outlook for inflation and unemployment. **Figure 2** shows the internal Board of Governors staff forecast – a well-respected input to the FOMC's policy deliberations – for core inflation and unemployment as of the end of 2003. At the time, the Board staff had forecast that the unemployment rate would gradually fall to 5 percent over the next two years, while core inflation (as measured by changes in the core consumer price index or CPI) would edge down slightly and remain around 1.5 percent. Five percent was the staff estimate of “full employment” at that time; so to put this another way, the unemployment rate was expected to be above the full employment level for the next two years. Meanwhile, inflation was expected to be low.<sup>4</sup>

While the unemployment forecast was spot on, the inflation forecast was, in contrast, too low. Actual inflation was higher and more erratic. Had the Federal Reserve's inflation forecast been more accurate, monetary policy might have been somewhat less accommodative.

Additionally, in the post-September 11 environment, potential downside risks to the economy from other terrorist attacks were a concern. Policymakers were also anxious not to repeat the mistakes of their Japanese counterparts in the 1990s, who had withdrawn support prematurely, leading to deflation and a lost decade of economic growth.

So, did accommodative interest rates fuel the housing bubble? Actually, the relationship between interest rates and bubbles is not as obvious as one might think. **Figure 3** highlights the federal funds rate and the 30-year fixed mortgage rate. While the 30-year rate declined during the period of federal funds rate easing, the drop was relatively modest relative to the decline in the fed funds rate. Over the 10 years shown in the chart, the 30 year mortgage rate averaged 5.99 percent; while during the one-year period when the federal funds rate was 1 percent, the 30-year mortgage rate averaged 5.51 percent. As the federal funds rate increased in 2005 and 2006, the 30-year mortgage rate fluctuated close to the 10 year average.

So mortgage rates were a bit lower while Fed policy was accommodative – but not dramatically lower.<sup>5</sup> Most economic models of housing price movements would suggest that such relatively modest fluctuations in mortgage rates – less than half a percent – would produce only modest changes in house prices.<sup>6</sup>

Moreover, contrary to the generally-assumed narrative, the empirical link between periods with low interest rates and asset bubbles is not particularly strong. Generally

speaking, lower interest rates lead to higher prices for a wide variety of assets, but they do not necessarily lead people to *expect continued increases* in asset prices – that key characteristic of a bubble that I mentioned a moment ago.

In addition, house prices also rose rapidly in other countries – in many cases more rapidly than in the United States. See **Figure 4**. Ireland and Spain, in particular, witnessed dramatic booms in house prices – and subsequent declines. Note that in contrast Germany, which had the same monetary policy as Ireland and Spain, did not experience a dramatic increase. All this makes it difficult to root an explanation for the bubble entirely in the choices made by U.S. monetary policymakers.

I am not saying that low rates could have had *no* role in moving housing prices higher. But I suspect the booming demand for real estate derived in large measure from incorrect expectations that housing prices would not fall, rather than from the short-run effect on housing demand of low short-term rates and slightly lowered mortgage rates.

### **Policy Responses**

If we cannot predict when bubbles will happen – or even, as many suggest, identify their presence – then what can policymakers do? Financial policymakers can ameliorate the problems that bubbles cause by taking a forward-looking and systemic view of financial risk regulation. Traditional “prudential” supervision tends to focus on areas of high risk at individual institutions. Systemic or “macroprudential” supervision needs to focus on possible misperceptions (and mispricing) of risk more generally and the way that risk is dispersed throughout the system, directly and indirectly. More scenario analysis, such as that done in the so-called “stress test” of large institutions last year, needs to be a focus for future systemic supervision – whether accomplished by a given agency or a council charged with systemic oversight.

In the financial context, forward-looking risk regulation focused on scenario analysis may have done a better job of identifying potential risks from a bursting bubble. Properly done, scenario analysis would have highlighted the sensitivity of financial institutions to various risks, like falling house prices. Not that this is easy to do. But certainly it is realistic to say that scenario analysis could have identified that values and ratings of subprime securities (especially the most exotic) were extraordinarily sensitive to assumptions for which no one had especially good information. This suggests the need, going forward, for more “stress-test” type exercises – to first identify, and then address,<sup>7</sup> emerging risks.

Traditional bank supervision tends to focus on the current condition of a firm by identifying write-downs of nonperforming assets and validating the ratings of loans and the adequacy of reserves. This partly reflects the current focus in accounting on incurred losses. In contrast, the systemic supervision that is needed would focus on possible future losses and is *inherently forward-looking*. Doing this well requires an understanding not only of institutions but also markets, and it requires taking into account the full range of outcomes, both expected and potential – including those that have a low

likelihood of occurring but that could have serious adverse consequences. While we may not be able to eliminate all bubbles, we should be able to limit the degree to which the financial sector feeds and propagates these booms, and the sector's vulnerability to subsequent busts.

Such work is particularly well suited for the Fed. Its role as "lender of last resort" (where we *lend* at a penalty rate and have never had a Discount Window loss), its responsibility for bank supervision, and its constant monitoring of the economy provide the Federal Reserve with a unique window on financial-stability issues. It is a serious gap that there is no assigned responsibility for forward-looking, systemic risk supervision – and filling this gap in some way is probably the highest priority in regulatory reform.

I would also emphasize the systemic nature of optimal supervision and regulation, because another aspect of achieving financial stability involves understanding the interdependence of financial institutions. Ideally, supervisors should have a good idea of how a failure of one institution would impact its counterparties; as well as the circumstances under which a large number of institutions would become insolvent. Most accounts of the financial crisis make clear how concern about counterparty risk fuelled panic among market participants. It also weighed mightily on policymakers trying to cobble together solutions to the crisis.

It goes without saying that understanding counterparty risk can be exceptionally complicated. Large financial institutions have a variety of subsidiaries around the world. As a result of acquisitions they often have legacy information systems that can make it difficult to aggregate their true counterparty exposure to one entity. Certainly this is an area where financial institutions and regulators need to do more work, to be better prepared for any future crises.

As part of scenario analysis, firms should be asked by supervisors to provide information on counterparties and exposure, to examine how major counterparty failures would affect them – and, if possible, how their own failure would impact their major counterparties. The regulators should then be able to compare results across institutions to get a better appreciation of, and ability to monitor, the counterparty risk.

We want analysts within a given financial institution to realize their firm would take big losses if, for example, a particular asset price were to fall. A systemic supervisor, conducting similar analyses across a variety of institutions, could see if others were in similar shape. And even if this supervisor saw only a small chance of a "meltdown" scenario for a particular asset price, they could evaluate the impact and perhaps conclude that the chance of a cascading systemic financial crisis was too big of a chance to take.

Of course, it is also important to understand under what economic or financial situations such problems might rear their heads. Supervisors need to collect this information regularly, and some public reporting of interconnectedness would provide the public with a useful understanding of the risks inherent in the institutions, markets, and systems on which they rely.

## **Concluding Observations**

To conclude, I would just stress that supervisory tools can and should provide an alternative to monetary policy actions for addressing bubbles or other imbalances in certain areas of the economy or financial system. If we take a good hard analytical look at the last recovery, we see that the low fed funds rate was not the standout, and standalone, culprit that many assume. This is a crucial matter to consider right now, when rates are very low – in my opinion, totally appropriately – because some are predicting that these rates will fuel another bubble.

Financial regulatory reform needs to address who has responsibility for regulating and supervising systemic risk as well as who has responsibility for regulating and supervising systemically important institutions. In particular, reform should enhance the potential to wind down or resolve systemically important institutions that are failing. This is critical to avoiding future crises.

Because of the substantial synergies between monetary policy, the lender-of-last-resort role, and supervision of banks, I believe the Federal Reserve should play a significant role in overseeing systemically important institutions and addressing systemic risks. It is also important that the Federal Reserve continue to supervise community banks, which provide a window on lending to small businesses and other bank-dependent borrowers. The reality is that supervisory policies should not be independent of monetary policy – and similarly monetary policy should not be conducted without the valuable insights gained from supervision of large and small banks. Understanding the business cycle and its potential impact on the institutions under supervision should be integral to bank supervision and to understanding systemic risk. And supervisory powers provide an important alternative tool to traditional monetary policy as a way to address bubbles and insure the best possible economic outcome.

The crisis has highlighted how undesirable it is for the U.S. central bank to have to be involved in the rescue of individual institutions. However, it has also reinforced the important role that the central bank can and should play in maintaining financial stability. Remember that concerns over financial instability and the experience of financial panics were key motivations for the founding of the Federal Reserve by Congress. No one is happy with the current state of the economy and the suffering of so many Americans who seek jobs or face foreclosure. But the Federal Reserve's efforts to help maintain financial stability have averted much worse outcomes.

I believe the Federal Reserve can and should be more focused on financial stability issues going forward. As a result, whatever actions are taken in Washington with regulatory reform, it is in everyone's interest that any changes not impede the ability of the Federal Reserve to be a lender of last resort or to troubleshoot the functioning of financial markets during a crisis.

With all this in mind, I would say that legislation that does not provide a significant supervisory and systemic responsibility for the Federal Reserve risks making us as a nation even less prepared for the next crisis than we were for this one.

Thank you.

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<sup>1</sup> See my recent remarks on prospects for employment and evidence from prior recoveries, available at <http://www.bos.frb.org/news/speeches/rosengren/2010/010810/index.htm>

<sup>2</sup> A disclaimer: while the comparison yields insights, we should also recognize that the 2001 recession and recovery were of course somewhat different than the current situation.

<sup>3</sup> For example, an August 2005 Lehman Brothers report on the expected performance, under various house-price scenarios, of securitized pools of subprime loans suggests that Lehman Brothers realized that a significant decline in house prices would cause subprime securitization deals to suffer enormous losses. Specifically, in the report's "meltdown" scenario for house prices, the cumulative collateral losses would be 17.1 percent as all but the highest-rated securities in the subprime pools default. To understand why investors might have viewed these securities as a good investment anyway, one need only see that Lehman's analysts assigned the "meltdown" scenario a probability of only 5 percent. Note that the meltdown scenario implied a smaller drop in housing prices than what actually occurred.

<sup>4</sup> For an in-depth analysis of monetary policy during this period, as well as the relationship of interest rates to housing prices, see Dokko et al. (2009): "Monetary Policy and the Housing Bubble," by Jane Dokko, Brian Doyle, Michael T. Kiley, Jinill Kim, Shane Sherlund, Jae Sim, and Skander Van den Heuvel. Finance and Economics Discussion Series Paper 2009-49, Divisions of Research & Statistics and Monetary Affairs, Federal Reserve Board, Washington, D.C. (<http://www.federalreserve.gov/pubs/feds/2009/200949/200949pap.pdf>). Also see Chairman Bernanke's speech at the annual meeting of the American Economic Association, entitled "Monetary Policy and the Housing Bubble." (<http://www.federalreserve.gov/newsevents/speech/bernanke20100103a.htm>)

<sup>5</sup> Fixed-rate mortgages generally account for the majority of conventional mortgage originations, approximately 81 percent of purchase originations on average over the past decade, and 75 percent over the June 2003 to June 2004 period (while adjustable-rate mortgages account for 19 percent and 25 percent, respectively). Over the decade the one-year adjustable-rate mortgage rate averaged 5.06 percent and fell to 3.71 percent over the June 2003- June 2004 period.

<sup>6</sup> Nor is the theoretical logic that links housing prices and asset bubbles to low interest rates nearly as obvious as many suggest. Standard models of housing prices, based on the user cost of owning a home, imply that housing prices rise only modestly when interest rates fall. This does not necessarily mean that those models are correct, only that it is hard to build a prima facie case that monetary policy caused the housing bubble.

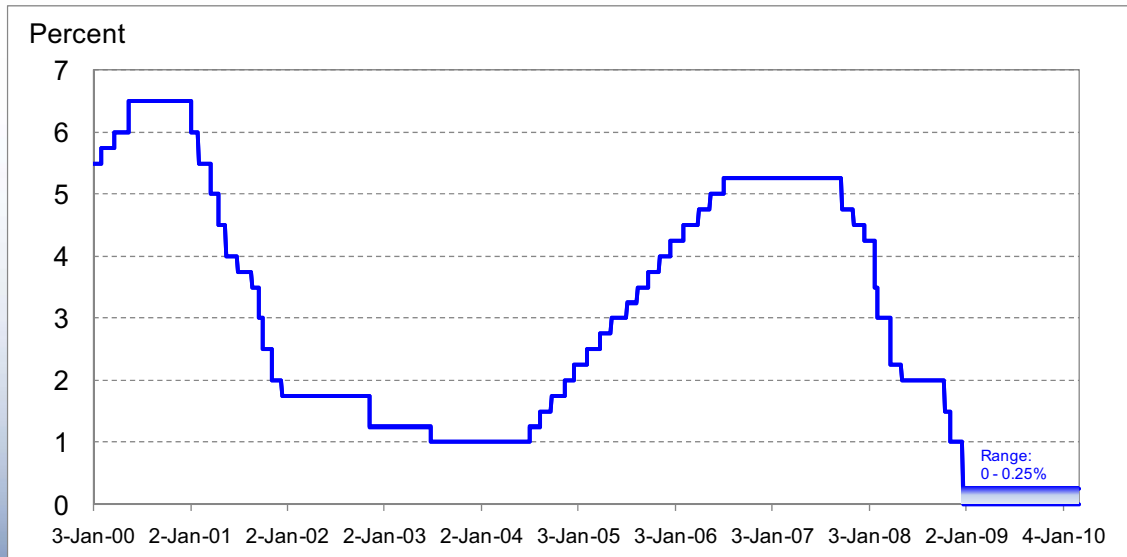
<sup>7</sup> For example by requiring that capital be raised or certain activities curtailed.



# Figure 1

## Federal Funds Target Rate

January 3, 2000 - February 26, 2010



Source: Federal Reserve Board / Haver Analytics

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# Figure 2

## Unemployment and Core Inflation Rates: Board of Governors Internal Staff Forecast and Actual Results

Fourth Quarter 2003 - Third Quarter 2005

Year	Quarter	December 2003 Greenbook Forecast		Actual Results	
		Unemployment Rate	Core CPI Inflation Rate	Unemployment Rate	Core CPI Inflation Rate
		%	% Change	%	% Change
2003	Q4	6.0	1.8	5.8	1.0
2004	Q1	6.0	1.6	5.7	1.9
2004	Q2	5.8	1.5	5.6	2.6
2004	Q3	5.5	1.5	5.4	1.7
2004	Q4	5.3	1.5	5.4	2.5
2005	Q1	5.2	1.5	5.3	2.5
2005	Q2	5.1	1.5	5.1	1.9
2005	Q3	5.0	1.5	5.0	1.3

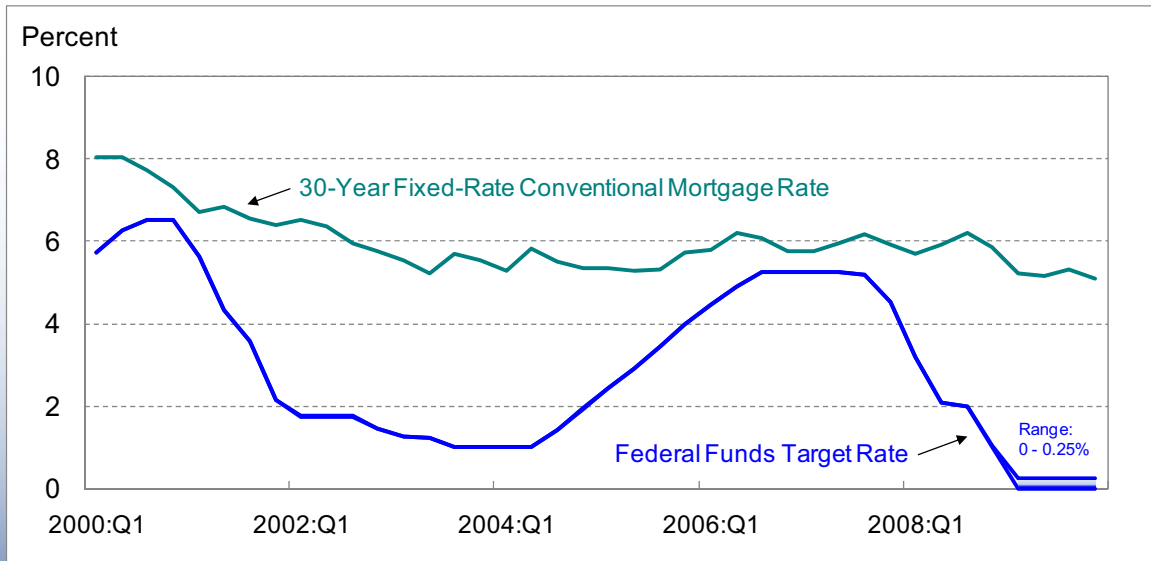
Source: Federal Reserve Board, BLS / Haver Analytics

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# Figure 3

## Mortgage Rates and the Federal Funds Target Rate

2000:Q1 - 2009:Q4



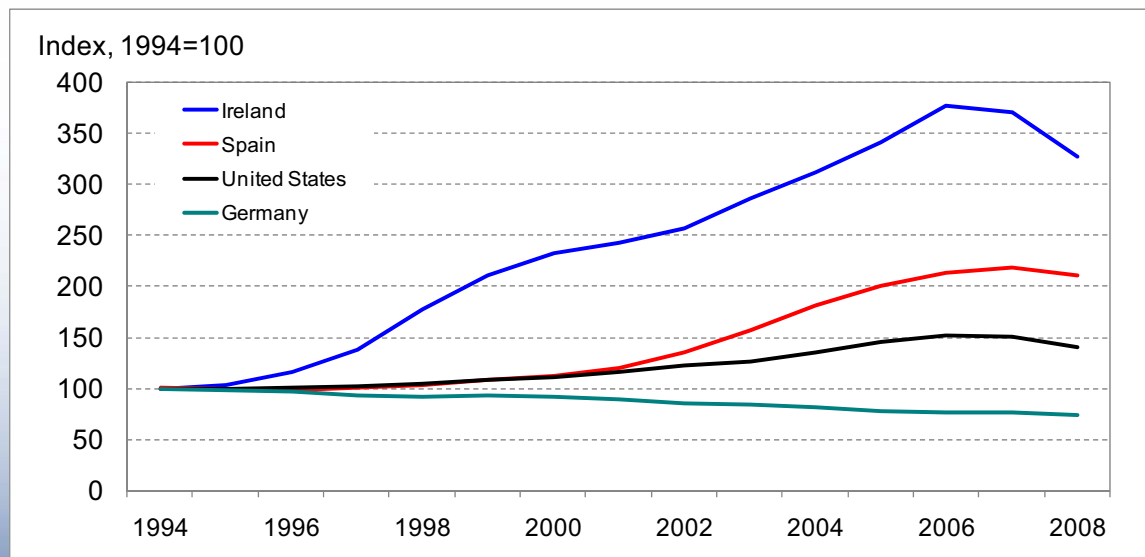
Source: Bloomberg, Federal Reserve Board / Haver Analytics

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# Figure 4

## Real House Price Increases

1994 - 2008



Source: OECD

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