

## MONETARY POLICY AND ASSET PRICES REVISITED

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We are in the midst of a global financial crisis that is now weighing heavily on economies around the world. Although the outlook remains extremely uncertain, both the fragility of the financial system and the weakness in real activity seem likely to persist for a while. To promote maximum sustainable economic growth and price stability, the Federal Reserve has responded to this crisis by easing monetary policy markedly, and we have greatly expanded our liquidity facilities to keep credit flowing when private lenders have become reluctant or unable to do so. Other central banks have also cut policy rates significantly and expanded their lending. In addition, the federal government and governments around the world have taken extraordinary actions to strengthen financial systems to preserve the ability of households and businesses to borrow and spend.

The current situation is so severe that it calls for careful review of how such a crisis evolved and how we can prevent a similar situation from happening again. This conference is a welcome step in that review, as it asks about the lessons we have learned, particularly for monetary policy, from the collapse of subprime lending and the preceding house-price bubble—developments that contributed importantly to the present financial crisis.

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I would like to reflect on some of what I, in my role as a monetary policymaker, have learned from recent developments in the housing sector and, more broadly, in financial markets as a whole. In doing so, I will revisit the remarks I made in 2006 in Frankfurt at a colloquium honoring Otmar Issing (Kohn 2006). There I argued that a central bank facing a possible asset bubble would have to surmount some high hurdles before it would be justified in tightening policy beyond what the outlook for output and inflation would require, after taking into account past and projected asset price developments. In the aftermath of the collapse of the housing market and in the midst of the ensuing financial and economic turmoil, does that conclusion still hold? More time and study will be needed before we can be confident about the lessons of the current crisis. But to foreshadow the remainder of these remarks, based on what we know today, I still have serious questions about whether trying to use monetary policy to check speculative activity on a regular, systematic basis would yield benefits that outweigh its costs.

I hasten to add that it is evident from the current crisis that much has to change on the regulatory front. Governments around the world face the challenge of revamping the regulatory structure governing financial markets. And changes in this area, I believe, will prove to be the most necessary and effective at reducing the odds on another severe financial crisis. Today, however, I will focus on some of the lessons of the current crisis for monetary policy.

## Alternative Strategies for Addressing Asset Price Bubbles

In my 2006 speech, I discussed two different strategies for monetary policy to deal with a possible asset price bubble—the “conventional strategy” and “extra action.” A central bank following the conventional strategy does not attempt to use monetary policy to influence the speculative component of asset prices, on the assumption that it has little ability to do so and that any attempt will only result in sub-optimal economic performance in the medium run. Instead, the central bank responds to asset price movements, whether driven by fundamentals or not, only to the degree that those movements have implications for future output and inflation. This conventional strategy conforms to the Federal Reserve’s dual mandate under the law and it has been our policy strategy; it also has been consistent with the practices of most inflation-targeting central banks.

However, some observers have argued for a more activist policy than this one. Specifically, they have urged central banks, upon perceiving the development of an asset bubble, to take extra action by tightening policy beyond what the conventional strategy would suggest, with the hope of limiting the size of the bubble and thus the fallout from its deflation. Such a strategy, if successful, could deliver substantial benefits, and a number of central bankers have talked about the need to consider a policy of extra action on occasion, and perhaps have even implemented such a strategy. However, taking extra action also would entail some costs, such as creating, for a time, higher unemployment and lower inflation than would otherwise be desired.

In assessing these two alternatives for monetary policy, in the 2006 speech I concluded that a strategy of extra action might be justified if three tough conditions were met. First, policymakers must be able to identify bubbles in a timely fashion with reasonable confidence. Second, a somewhat tighter monetary policy must have a high probability that it will help to check at least some of the speculative activity. And third, the expected improvement in future economic performance that would result from the curtailment of the bubble must be sufficiently great. Of course, we live in an uncertain world, and accordingly policymakers should always be open to the possibility that these conditions might be satisfied and that extra action would be appropriate. But my thought at the time was that, in practice, the likelihood of ever meeting the three conditions seemed remote. In the aftermath of the bursting of the housing bubble, however, the severity of the fallout might seem to call this judgment into question. So let's reexamine each of the three conditions and see what the current crisis has taught us.

### Potential Gain from Limiting Bubbles

Let me start with my third condition, the potential gain from limiting bubbles, because this is where my views have changed the most. Although I was concerned about the potential fallout from a collapse of the housing market, I think it is fair to say that these costs have turned out to be much greater than I and many other observers imagined. In particular, I and other observers underestimated the potential for house prices to decline substantially, the degree to which such a decline would create difficulties for homeowners, and, most important, the vulnerability of the broader financial system to these events.

In retrospect, I may have been unduly comforted by the resilience of the U.S. economy to the collapse of the high-tech bubble, to the earlier Russian debt default and failure of Long-Term Capital Management, and even to the commercial and residential real estate debacles of the late 1980s and early 1990s (as difficult as that recovery was). But mopping up after this asset price bubble has turned out to be much harder because of its greater magnitude, the centrality of residential housing and finance to our economy and financial system, and the surprising ways obscure and complex financial transactions have exposed banks and other financial institutions to heavy losses. In addition, financial and economic linkages across countries have made this crisis truly global in scope, affecting both developed and developing economies. As a result of all these factors, the economic disruption here and abroad is likely to be considerably more severe than in past episodes.

The severe fallout may indicate a larger potential gain than I had anticipated to leaning against excess exuberance in asset markets. However, realizing that potential rests on meeting my two other conditions as well—the timely identification of the bubble, and the ability of a central bank to materially influence the trajectory of the speculative component of asset prices.

## Identifying Bubbles in a Timely Manner

As for the first of the three conditions, events of the past few years, coupled with advances in our understanding of how bubbles form and persist, have made me a little less dubious that policymakers can reliably identify a serious bubble before it bursts. However, I am still skeptical about our ability to detect bubbles early enough to make a general policy of leaning against them successful on average.

The identification of bubbles in real time is tricky because not all the fundamental factors driving asset prices are directly observable; thus, any judgment by a central bank that an asset is overpriced is by nature uncertain. My views on this aspect of the identification problem have been reinforced by my experience during the inflation of the housing bubble. Over the first half of the decade, we saw a sustained, rapid rise in both home values and mortgage debt. As this process continued, concern about its sustainability grew and many observers started speculating that a bubble was in place. During this period, staff throughout the Federal Reserve System examined whether house prices were overvalued and arrived at a wide range of answers. For example, one set of models that linked rental rates and

house prices indicated as early as the start of 2004 that the market was significantly overvalued, while another set of models suggested, even as late as December 2005, that house prices could be justified by fundamentals.<sup>1</sup> Thus, controversy over the existence of a bubble persisted almost right up to the actual peak in the housing market.

Because the economic consequences of mistakenly responding to a misidentified bubble are substantial, central bankers may be reluctant to take extra action in the face of such uncertainty, especially if they are risk-averse. Policymakers may also be reluctant to act because a bubble “call” might seem to require them to be more knowledgeable than market participants. After all, if at least some market participants perceive the emergence of a bubble, wouldn’t they arbitrage that mispricing away? Recent research, however, suggests reasons for why market participants who think they know that a bubble exists still may not trade to eliminate it. For example, if some market participants recognize the presence of a bubble but do not know how common their knowledge is, they might reasonably expect to make the most profits by riding the bubble for as long as possible, with the goal of trying to sell the asset just before it collapses (see Abreu and Brunnermeier 2003). Other research emphasizes that certain institutional structures—such as secured lending and delegated portfolio management—can create substantial costs in trading against an asset price bubble, so that even market participants who are conscious of the bubble will not find it profitable to trade against it (see Lui and Longstaff 2004, Stein 2005). Together, these studies suggest that policymakers may be able to detect bubbles that will not be quickly arbitrated away, thus strengthening the argument for considering extra action.<sup>2</sup>

Nonetheless, even if policymakers are confident that a bubble has emerged, the question of the timeliness of the call remains. The

<sup>1</sup>For a contemporaneous view that homes were overvalued, see Gallin (2004); for an opposing view, see McCarthy and Peach (2005).

<sup>2</sup>Some of the literature in this area would seem to imply that small policy moves explicitly motivated by a potential bubble, or similarly motivated public statements and regulatory changes, could effectively signal or induce market participants who know about the bubble to trade against it. Whether such actions would be able to limit the expansion of asset price bubbles merits further research. Kohn and Sack (2003) did not find that statements by then-Chairman Greenspan on valuations affected misaligned asset prices, but the many warnings from central bankers in financial stability reports and speeches about mispriced risk and even housing bubbles in some countries would seem to provide material for much needed further research on this topic.

essential problem is the timing of the detection of the bubble relative to the timing of its collapse. The risk is that the detection and subsequent policy response occur not long before the bubble collapses on its own. Given the lags associated with monetary policy, the resulting contractionary effects on the economy of the monetary tightening would occur just when the adverse effects of the bubble's collapse are being realized, worsening rather than mitigating the effects of the bubble's collapse. And the inevitable lags in detecting bubbles increase the likelihood that, by the time action is taken, speculative activity will have progressed to the point that its collapse is not far off. Thus, even if we could have known for sure that a housing bubble existed, and that tighter monetary policy would have significantly checked the unwarranted rise in home prices, policymakers would have had to make this call early on—at least a year and probably more before the peak in the real estate market in 2006—for such an action to have been beneficial.

### Ability of Monetary Policy to Influence Bubbles

This brings me to the remaining condition—the requirement that monetary policy be able to materially check expansions in asset bubbles. Clearly, interest rates play an important role in determining the *fundamental* value of corporate equity, houses, and other assets. However, I noted in my earlier speech that the influence of interest rates on the *speculative* component of asset prices is unclear from both a theoretical and empirical standpoint.

My views on this issue have not changed much, largely because of the still-murky role that monetary policy played in promoting the surge in house prices and the accompanying run-up in both conventional and subprime mortgage debt. Although tighter monetary policy might have succeeded in shifting down the path of house prices, it is still not clear to what extent small or even moderate policy actions would have discouraged the broader speculative developments that have characterized the current episode: overly optimistic expectations of price appreciation, excessive leveraging, and a marked increase in risk-taking by homeowners and investors. Of course, a substantial tightening of policy, leading to a significant slowing in the economy and rise in unemployment, might have had a marked effect on housing price gains. But undertaking such a policy course on a regular basis whenever asset price misalignments are

detected would likely prove to be a relatively poor strategy on average, especially given the possibility of false positives in identifying these misalignments, and the existence of other potential remedies. In general, taking more-targeted steps—for example, regulatory changes intended to strengthen the financial system—would seem a better course of action under such circumstances.

To be sure, some observers contend that the low level of the federal funds rate in 2003 and 2004 was clearly a primary cause of the housing bubble, and that a significantly tighter stance of monetary policy would have been warranted. As you know, the Federal Open Market Committee (FOMC), after having sharply lowered its policy rate during the 2001 recession, further lowered the federal funds rate in late 2002 and 2003 in response to an outlook for continued tepid real growth and a possible unwelcome disinflation. This accommodative stance helped set the stage for a more robust recovery, and as the expansion took hold in 2004, the FOMC began to tighten in a gradual manner that was publicly signaled in advance.

How might these monetary policy actions have fueled speculation? Perhaps a low policy rate early in the decade, by stimulating housing demand and pushing up the level of home prices, incorrectly led households and lenders to extrapolate these price increases into the indefinite future. Overly optimistic expectations may have had an unusually stimulative effect on the housing market after 2003 because borrowing constraints were being eased by new financial developments, such as the growth of subprime lending and other nontraditional mortgages, fueled in part by investor demands for the higher yields on complex structured products.<sup>3</sup> In addition, the increased use of adjustable-rate mortgages—which are more closely tied to short-term policy rates—may have initially boosted the stimulus from a lower federal funds rate.

These stories have a certain plausibility, but a closer examination raises questions about monetary policy and the housing and credit bubbles. Although low short-term interest rates probably supported housing demand and home prices for a time—an effect that helped offset the negative effects on economic growth and employment of the steep decline in business investment—the role of monetary policy in fueling the speculation in real estate is still not clear. Studies

<sup>3</sup>For example, Cardarelli, Igan, and Rebucci (2008) found evidence that house prices have become more sensitive to monetary policy in countries with more mortgage deregulation.

that have tried to address how much monetary policy contributed to the increase in house prices during this period are inconclusive.<sup>4</sup> And in general, the channel from interest rates to house prices has not been strongly established empirically, suggesting it might take a very large hike in the federal funds rate to have a substantial effect on real estate values.<sup>5</sup> Moreover, if accommodative monetary policy engendered extrapolative expectations and speculation starting in 2003, why did it not restrain these factors after mid-2004 as the federal funds rate was increased? Tightening should have limited the extent to which households (especially those using variable-rate mortgages) were able to borrow, thereby slowing the pace of house price appreciation. Furthermore, many of the worst subprime loans were made after the federal funds rate had normalized, and reflected a wide array of deficiencies in the financial markets.

The contrasting movement of short-run and long-term interest rates over this period further complicates any assessment of the link between monetary policy and the housing market. Housing demand and home prices are, presumably, most closely linked to the 30-year fixed mortgage rate and the expected average borrowing rate to be paid over the life of adjustable-rate mortgages. That these actual and expected loan rates moved sideways even as the federal funds rate rose suggests that other factors besides monetary policy were at work, especially since the FOMC clearly signaled that it would be returning the funds rate to a normal level over time (albeit at a “measured pace”).

A good portion of the appreciation in house prices probably is due to the structural changes that were taking place in mortgage financing—specifically, the opening up of subprime lending and the expansion in associated securitization markets with its strong demand for mortgages from investors. Gauging the effects of expanded subprime lending on house prices is complicated by two-way causality—more

<sup>4</sup>Del Negro and Otrok (2007) find little influence on the national component of house price appreciation from 2001 to 2005. In contrast, Iacoviello and Neri (2008) contend that monetary policy accounted for more than a quarter of the run-up. However, both of these papers look only at the effects of the non-systematic component of monetary policy. In addition, Iacoviello and Neri include the Regulation Q period in their estimation sample, likely increasing the effect of monetary policy on the housing sector.

<sup>5</sup>Studies of the relationship between house prices, interest rates, and other factors find only a weak interest-sensitivity of home prices to both short-term and long-term interest rates when estimated using aggregate time-series data over the past 25 years, as documented by Gallin (2004) and Campbell, Davis, Gallin, and Martin (2006).

lending can drive up house prices, but expected house price increases can also induce more lending. Undoubtedly, causality did indeed run both directions. But studies do indicate that an expansion in credit leads to increased house prices, and suggest that structural changes in mortgage finance likely boosted the rate of house price appreciation.<sup>6</sup>

Another key observation that must be reconciled with any explanation of recent events is that the run-up and subsequent decline in house prices was not limited to the United States; indeed, some countries have experienced even larger swings in house prices.<sup>7</sup> In most countries during this period, long-term interest rates were low despite the fact that their central banks did not ease monetary policy as markedly as the Federal Reserve. A common factor behind these low rates, and perhaps in part behind the shared increase in house prices as well, is the “global saving glut” identified by Chairman Bernanke—the large amounts of savings, both official and private, from Asian and oil-exporting nations that tended to lower neutral interest rates globally (see Bernanke 2005).

In a broader sense, perhaps *the* underlying cause of the current crisis was complacency. With the onset of the “Great Moderation” back in the mid-1980s, households and firms in the United States and elsewhere have enjoyed a long period of reduced output volatility and low and stable inflation. These calm conditions may have led many private agents to become less prudent and to underestimate the risks associated with their actions. While we cannot be sure about

<sup>6</sup>Mian and Sufi (2008) found that ZIP code areas with high latent credit demand prior to the bubble’s emergence experienced larger expansions in the supply of mortgage credit and larger increases in house prices, despite being subject to weaker economic conditions; this result also held for ZIP codes that, because of inelastic housing supply, would not be expected to see price increases above the inflation rate for construction costs. Overall, this study attributed 40 percent of the national rise in house prices to increased subprime lending. Leamer (2007) noted that house price increases occurred in some of the lowest-priced ZIP codes. Wheaton and Nechayev (2008), using results obtained from time series regressions for a number of different housing markets over the period from 1975 to 1998, found a correlation between measures of credit availability and unexplained movements in house prices, which suggests that structural changes in mortgage finance may have contributed to the increase in house prices. Finally, Cardarelli, Igan, and Rebucci (2008) found evidence that countries with the most advanced housing finance systems are more exposed to housing sector shocks.

<sup>7</sup>In addition, housing credit in several other countries appears to have expanded beyond the traditional pool of households in recent years, although probably (comparable data are scarce) to a lesser degree than in the United States.

the ultimate sources of the moderation, many observers believe better monetary policy here and abroad was one factor; if so, central banks may have accidentally contributed to the current crisis. But would a somewhat tighter stance of policy in recent years have reversed this complacency? It seems doubtful. Central banks would likely have needed to produce recessions of some consequence in order to force agents to reevaluate the costs of taking on risk—an outcome unlikely to improve societal welfare. Rather than using the blunt tool of monetary policy to induce prudence, we should examine more closely the possibility of using regulation and prudential supervision to address concerns about overleveraging and other risk-taking behavior.

In short, we still do not fully know what caused the run-up in house prices and overbuilding. Short-term rates were low in 2002–04 as the Federal Reserve countered the risks it saw to good economic performance, and these low rates probably had some effect on housing markets at the time. But the problems largely built up after policy rates were well on their way to neutral, and other factors appear to have played major roles. We have learned little about the likely effect that a somewhat higher funds rate would have had on the speculative element of prices. Of course, it is important to keep an open mind about the relationship of short-term interest rates and speculative activity. If it becomes clear that monetary policy can predictably influence the evolution of bubbles, central banks should take that ability into account when crafting policies intended to keep output rising in line with its potential and inflation low and stable.

## Conclusion

I am not convinced that the events of the past few years and the current crisis demonstrate that central banks should switch to trying to check speculative activity through tighter monetary policy whenever they perceive a bubble forming. The recent experience may have made us a bit more confident about detecting bubbles, but it has not resolved the problem of doing so in a timely manner. Nor has it shown that small-to-modest policy actions will reliably and materially damp speculation. For these reasons, the case for extra action still remains questionable, despite our having learned that the aftermath of a bubble can be far more painful than we imagined.

Some may object to this assessment, arguing that the current cri-

sis is so bad that, in retrospect, monetary policy should have been appreciably tighter to deflate or forestall the housing boom earlier in the decade, even if that meant a substantially weaker economy. This argument has two defects. First, monetary policy is made in real time, not with the benefit of hindsight, and any evaluation of competing strategies for the systematic conduct of policy must be grounded in that fact. Although we must learn from history, we cannot implement policy strategies that assume more information about the future than we can ever have. Second, even if we ignore the fact that policymakers at the time could not have known what the future held in store if the funds rate followed the path it actually did, we also need to recognize that we cannot be sure what would have happened if policy had taken a different course. If policy had tightened appreciably at an early stage of the housing boom, say in mid-2003, it would have done so when the unemployment rate was still rising and inflation seemed poised to move to an undesirably low level. Such a course of action might well have created its own unforeseen consequences that we might now be ruing.

This assessment aside, recent events would seem to have some implications for the conduct of monetary policy. For example, in light of the demonstrated importance to the real economy of speculative booms and busts (which can take years to play out), central banks probably should always try to look out over a long horizon when evaluating the economic outlook and deliberating about the appropriate accompanying path of the policy rate. The Federal Reserve staff has for some time regularly provided the FOMC with this sort of extended-horizon analysis. In particular, the staff regularly generates likely paths for the economy over the next five years or so under different economic and policy assumptions; these scenarios often highlight different possibilities for the evolution of prices for homes and other assets. Note that the focus here is not a single baseline outlook; rather, the emphasis is on exploring the various ways events could play out and the implications for monetary policy.

Another lesson of the current crisis is that central banks need to improve their understanding of the workings of the financial system, its vulnerabilities, and its links to the real economy. We must try to find ways to discern more quickly if financial innovation and other factors are leading to a buildup of destabilizing forces, such as rapidly rising asset prices or excessive leverage. Moreover, the unexpect-

edly rapid resonance of financial turmoil through global markets signals a need for further study of the complex cross-country linkages among lenders and borrowers, and the ways in which those linkages are influenced by such factors as leverage, interdependent counterparty relationships, and backup liquidity agreements. Finally, more effort needs to be spent on further investigation of the financial accelerator and other credit-channel effects, given the accumulating evidence that such effects can give rise to an adverse feedback loop between financial markets and the real economy. Overcoming these deficiencies in our knowledge will not be easy, but the potential benefits could be great.

Finally, as I emphasized at the outset, we must thoroughly review the regulatory structure of the U.S. and global financial systems, with the objective of both identifying and implementing the comprehensive changes needed to reduce the odds of future bubbles arising, and improving the ability of banks and other financial institutions to weather the fallout from unexpected adverse changes in asset prices. Ultimately, this process should prove our best line of defense against the problems of the sort we now face.

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