Monetary policy has come under heavy fire in recent years. Indeed, some blame it for the housing boom and subsequent bust—with all their disastrous consequences. Monetary policy was kept too loose for too long, these critics contend, enabling the excesses in housing and credit that ultimately brought such ruin. If policy had been tightened sooner and more forcefully, the reasoning goes, the vicious boom/bust cycle could have been avoided, or at least ameliorated. A second, more general critique transcends the recent experience (though that experience has certainly made it resonate more forcefully). According to this argument, monetary policy needs to broaden its focus to take more explicit account of asset prices, rather than just the effects of those prices on the traditional objectives of price stability and maximum sustainable employment. Specifically, policymakers should try to identify incipient asset price bubbles and lean against them, by more than would be warranted by the normal inflation/output considerations, even if doing so means more short-term volatility in the economy. By preventing bubbles from inflating, or at least limiting their size and duration, rather than waiting to clean up the mess after they’ve burst, policymakers may actually be better able to achieve their inflation and growth objectives over the longer term, or so some believe. On this thinking, even if monetary policy didn’t cause the recent housing bubble, it was complicit in the events because it failed to prick the bubble before it fully inflated.

These are weighty criticisms. And they have some prominent advocates. But that doesn’t necessarily mean they’re right. In fact, as we’ll argue below, the preponderance of evidence suggests monetary policy was not the prime cause of the housing bubble, nor was it set inappropriately given the economic conditions prevailing in the years leading up to the crisis. The broader question of what role asset prices should play in the setting of monetary policy is a tougher one to answer. The recent crisis highlights the heavy costs that asset bubbles can sometimes inflict, and the considerable benefits that could be had from avoiding them, at least in some cases. But it’s not clear that policymakers can regularly identify misalignments of asset prices from fundamentals in real time, or that monetary policy can easily correct these misalignments should they be identified, or that using the rather blunt instrument of monetary policy to do so wouldn’t impose costs on the economy that would outweigh the benefits of containing bubbles, or that other policies might not be better suited to the task. Though the recent trauma seemingly strengthens the case for using monetary policy more proactively to ward off nascent bubbles, it by no means clinches it. It’s hard to know for sure in part because it’s difficult to construct the counterfactual—what would have happened had policy been set differently. Also, no two bubbles are exactly alike. What might be optimal in one set of circumstances—say, in response to the early signs of housing-related excesses and the economic conditions of 2003–2004—might not be best in response to, say, the tech-related equity bubble and the IT-led productivity surge of the late 1990s.

**Was monetary policy too easy, and did it fuel the housing boom?**

The Federal Reserve cut the funds rate from 6.50% to 1.75% during the 2001 recession, then trimmed it further, to 1% by June 2003, then held it there until June 2004 before slowly starting to edge it higher, taking more than two years to raise it to 5.25%. It was in this period that critics argue monetary policy was inappropriately accommodative, stoking the housing and credit boom. Of course, just looking at the funds rate in isolation is no way to tell if policy is too loose, too tight, or just right. A benchmark is needed to provide proper context. This is where Taylor-type rules come in handy. These are simple prescriptions for where the funds rate should be set based on traditional output and inflation considerations. They generally take the following basic form:

$$F = i^* + \pi + a (\pi - \pi^*) + b (Y - Y^*)$$

Where $F$ is the nominal funds rate, $i^*$ is the equilibrium real funds rate, $\pi$ is the rate of inflation, $\pi^*$ is the central bank’s desired, or targeted rate of inflation, $Y$ is GDP, $Y^*$ is potential GDP, or the level consistent with full resource utilization, and $a$ and $b$ are the weights placed on the inflation gap and the output gap, respectively.

In brief, the funds rate should be raised (lowered) if inflation is above (below) the central bank’s target, and/or if output is above (below) potential. If inflation is at the target rate and output is at potential, the real funds rate should be set at its equilibrium level—that consistent with the economy’s sustainable, potential growth.

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There are several advantages to simple formulations like these. They are straightforward, directly linked to the Fed’s dual mandate (price stability and maximum sustainable output/employment), and offer a useful benchmark for policymakers and a helpful framework for communicating policy to financial markets and the general public. Also, these kinds of Taylor rules have done a pretty good job of capturing the broad contours of the Fed’s actual behavior, especially in recent decades, in which macroeconomic outcomes have been generally favorable.

Simple rules have their shortcomings, though. First, they require selecting appropriate variables and parameters, which can be tricky. For example, what measure of inflation ought to be used? Taylor originally selected the GDP price index, but the Fed tends to focus more on consumer prices, particularly the personal consumption expenditures (PCE) price index. A bigger question is whether to use headline inflation or some measure of the underlying trend (like the core); the choice may not matter much on average in the long run, but at times can lead to vastly different policy prescriptions. Another practical problem is that potential output is unobservable; it must be estimated, and estimates can vary widely and often revise years after the fact – too late to be of help to monetary policy, which must be made without the benefit of hindsight. The equilibrium real funds rate is also unobservable, and it too may change over time, in response to changes in productivity trends, savings inclinations, and financial stress. It’s common to use 2% as an estimate of the equilibrium real funds rate, which is close to the long-run average, but which may mask substantial shorter-term fluctuations that can matter for the appropriate setting of policy. Finally, there’s the question of how much weight to place on the output gap vs. deviations of inflation from target. Taylor originally set them each at 0.5, but later considered alternative specifications (e.g., doubling the weight on the output gap), while many other formulations have been advanced and estimated. The problem is, there’s no firm theoretical or empirical basis for knowing what the “right” weights are or ought to be—yet the policy prescription is obviously quite sensitive to the choice.

With these reservations in mind, a range of Taylor rule prescriptions for the period 2001 through 2006 are presented in Chart 1. The range is based on two different inflation measures (core vs. headline PCE price index), two different estimates of the gap between actual and potential output (one from the CBO, and one that averages the CBO estimates with those from the IMF and OECD), and two different sets of weights on the inflation gap and the output gap (0.5 and 0.5, and then 0.5 and 1.0, respectively). This by no means constitutes the entire panoply of possible Taylor rule prescriptions. Not only could alternative inflation gauges, estimates of output gaps, and weights be used, but this exercise restricts the equilibrium real funds rate to be a constant 2% and relies exclusively on currently available information—not what policymakers actually had in hand at the time. Later, we’ll explore the effects of relaxing these assumptions.

Even with these fairly restrictive conditions, the range of prescriptions for the funds rate is pretty wide. Between 2002 and 2006, for example, the difference between the high and low Taylor-rule prescriptions sometimes exceeds 2%, and averages about 1.5%. The lower bands of the range are based on core inflation (which ran below headline inflation from 2003 through 2005), and on output gap estimates from the CBO, which suggest the US had more slack in 2003/2004 than the IMF and OECD reckoned, and didn’t breach potential by as much in 2005. Even these lower-bound prescriptions, however, were persistently above the actual funds rate set by the Fed from about mid-2003 through the latter part of 2005—strengthening the case that monetary policy was inappropriately accommodative at this critical juncture, and was the primary culprit behind the then-gathering housing boom.

But things are not quite so tidy. Taking a longer perspective, there have been other times when the funds rate has deviated from Taylor rule prescriptions by more and for longer; the shortfall in 2003–2005 is not that large or persistent by historical standards (Chart 2). And it virtually disappears when real-time data are used rather than

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current information (which was obviously not available to policymakers at the time). From 2003 through 2005, PCE inflation was running about one-half percentage point per year lower than what current data suggest; in 2003, in particular, core PCE inflation appeared to be on a sharp downtrend that has since been erased by revisions but that at the time was worrisome to policymakers because underlying inflation was so low to begin with. Also, real-time estimates of the output gap suggested the economy had more slack than it now appears to have had. For example, from 2002 through 2006 the CBO estimated the economy to be operating with a persistent shortfall of actual relative to potential GDP, while current CBO estimates show a smaller output gap from the second half of 2003 that was virtually eliminated by the end of 2004. Figures from the OECD exhibit a similar pattern. Perhaps most importantly for monetary policymakers, the Fed’s own staff estimates showed a large and still-widening output gap until late 2003 that was not fully closed until 2005.4

Using the real-time information that was available to policymakers results in Taylor rule prescriptions that more closely track the actual behavior of the funds rate (Chart 3). Even in 2003 and 2004, the funds rate was near but not below the lower end of the prescribed range, and by 2005 it was well back within that range. By this reckoning, monetary policy was not inappropriate, but was actually in accord with historical patterns of Fed behavior given the information in hand and conventional inflation/output considerations. Other approaches yield similar conclusions. A recent Federal Reserve staff study, for example, finds little evidence in either structural or unrestricted VAR-type econometric models that monetary policy from 2003 through 2006 differed from what historical relationships would have suggested given the prevailing economic conditions, yet compelling evidence that housing was much more robust than would have been expected, even given where the funds rate was set.6 Other studies corroborate and extend these basic results, finding that only a small portion of the boom in housing was attributable to monetary policy.6 Most estimates suggest the interest-sensitivity of house prices is fairly small—far too small to explain a bubble of the magnitude that developed, or to attribute it to monetary policy.7 Even Shiller—who warned early and often about excesses in housing—argues that monetary policy was not responsible for those excesses.8

And this doesn’t even take into account the possibility that the equilibrium real funds rate may have been lower in this period than normally assumed in Taylor rule prescriptions. After the bursting of the tech bubble and the widespread accounting scandals at the turn of the century, confidence in the financial system was

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7Dokko, ibid.

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low, uncertainty high, credit spreads wide, and general financial conditions tighter than would historically have been associated with any given funds rate. To counter these headwinds, the funds rate would have needed to be below the usual Taylor rule prescriptions. Moreover, standard policy rules say nothing about risk management considerations. When the risks to a central bank’s objectives seem skewed in one direction, or the perceived costs of missing an objective are asymmetric, it may be prudent to hedge against those risks in a way not captured by a framework that looks only at the modes of the distribution of potential outcomes and not the tails as well. That may have been especially true in this period, as the Fed sought to guard against the risk of deflation by moving preemptively and aggressively, in ways not reflected in simply policy rules or standard economic models. This is exactly what a significant body of economic research counsels—to maximize the efficacy of monetary policy by easing quickly and forcefully, and committing to keep policy accommodative for awhile—all before the constraint of the zero bound on the funds rate is reached and the economy gets caught in a Japan-style deflationary trap. The Fed basically followed this advice in 2003–2005. And it proved largely successful. Macroeconomic outcomes were generally favorable in this period, and in broad agreement with both the Fed’s own projections and those of most private sector forecasters. The output gap comes were generally favorable in this period, and in

Finally, there’s the international evidence. The housing boom/bust was not confined to the US. On the contrary, many (though not all) countries experienced housing bubbles. And many also pursued accommodative monetary policies in this period, often motivated by considerations similar to those driving the Fed. If monetary policy was the primary cause of these housing booms, we’d expect to find that countries with the most accommodative monetary policies had the most intense housing booms. But that’s not what we find at all. As detailed in a recent IMF study, there is virtually no correlation between the stance of monetary policy in a country—measured either by the level of real short-term interest rates, or the deviation of those rates from Taylor rule prescriptions—and the magnitude of the rise in house prices in that country (Charts 4 and 5). Some nations had accommodative monetary policies and enormous house price gains (e.g., UK, Australia, New Zealand), while still others had accommodation monetary policies and enormous house price gains (e.g., Spain, Ireland, Greece), others had housing booms without very accommodative monetary policies (e.g., Germany, Austria, Japan). Clearly, something other than monetary policy was the key driver.

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11Dokko, ibid.
In sum, while Fed policy was accommodative for part of the period in which the housing bubble was inflating, it was not a major cause of that bubble, nor was it at odds with the central bank’s traditional inflation/output objectives (which were largely achieved). But that still leaves a nagging question: even if they didn’t cause the bubble, should monetary policymakers have tried to deflate it anyway, by making policy tighter than would have been warranted by their standard macroeconomic objectives? More generally, should monetary policy broaden its focus to take explicit account of asset prices, beyond the impact of those prices on the normal inflation/output nexus, by seeking to restrain developing asset bubbles?

**What role should asset prices play in monetary policy?**

There are a number of conditions that have to be met before monetary policymakers would be justified in responding more directly to asset prices. Central banks must be able to identify looming asset busts in enough time to take action, those actions must be able to restrain bubbles, the benefits of that restraint must outweigh any costs to output/inflation objectives in the short run and, finally, there must not be anything else that could get the job done better than monetary policy. These are high—but not clearly insurmountable—hurdles.

If markets were perfectly efficient, it would be impossible to predict the timing of asset price busts. In fact, it would be hard for any major misalignments of asset prices from fundamentals to develop in the first place because investors would short the overvalued asset and deflate the bubble before it got going. But painful experience has shown that asset bubbles can and do occur, and recent research suggests this may be because it is costly for investors to arbitrage them away.\(^\text{13}\) The question is not whether asset price bubbles can develop—they clearly can—but whether they can be reliably detected in real time by policymakers.

A recent IMF study of asset price busts (both houses and equities) across 21 countries over the past several decades found several interesting patterns.\(^\text{14}\) Most notably, above-trend growth in credit and investment (both residential and nonresidential), coupled with deteriorating current account balances, are significant predictors of asset price busts in the next one to three years. However, even the best predictive variables have raised alarms in advance of only one-fourth to one-half of impending asset price busts. The study concludes that asset price busts are not easy to predict, and timing the collapse is especially hard.

The recent house price bust in the US is a case in point. It too was preceded by several years of unusually rapid growth in credit and residential investment, soaring house prices, and widening current account deficits. But at the time, there was widespread disagreement about how much home prices were overvalued, in part because lower real long-term interest rates and a reduced risk premium justified somewhat higher house prices relative to rents and incomes, and the disparity of views on these issues persisted up until the bubble burst.\(^\text{15}\) Also, there’s the question of timing. Even if several warning signs

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\(^\text{14}\)Fatas, ibid.

suggest an asset price bust is likely, predicting when is fiendishly difficult. That’s a big reason investors are often unable to trade against a bubble, even if they’re quite sure it exists. It’s not clear why central bankers can do a better job of anticipating the timing of the bust. And timing can be crucial, because monetary policy works with a lag. If policymakers correctly identify a bubble only in its latter stages, and lean against it by tightening monetary policy, the restraining impact will likely be felt too late—as the bubble would have burst on its own, and policy should be acting to cushion the fallout. Finally, policymakers might falsely identify a bubble and tighten inappropriately.

Of course, central bankers face considerable uncertainty when trying to meet their traditional inflation and output objectives too. Monetary policy must be forward looking, and the economic outlook is always cloudy. Policymakers have to make informed judgments about factors influencing growth and inflation; why can’t they do the same regarding potential misalignments of asset prices from fundamentals? Much depends not only on their ability to detect bubbles in real time, but also on how effective tighter monetary policy can be in checking speculative excesses, and what the costs of that tighter policy will be to inflation and output objectives in short run.

As already noted, most estimates suggest that the sensitivity of house prices to interest rates is not terribly high. That’s one reason most studies find that monetary policy was not a prime cause of the housing boom. But it also implies that if policymakers had decided to lean against the boom, they would have had to lean very hard indeed. They might have had to tighten a lot to dent the optimism and make an appreciable difference in the decisions of households and investors, and the adverse effects on inflation and output of such a tightening would have been considerable. In 2002–2003, in particular, when the economy was struggling to recover and inflation was quite low and seemed to be slowing further, a tightening of the magnitude sufficient to have defused the growing exuberance in housing might have torpedoed the recovery and raised the risk of deflation.

At other times, though, a little monetary policy preemption might be warranted. A lot depends on the nature of the shock driving the asset price bubble. If it is primarily a financial shock—overly lax underwriting standards and financial innovations, interacting with soaring asset prices—there may be more of a pre-emptive role for monetary policy to play. IMF model simulations suggest a monetary policy that aims to tighten against those kinds of speculative excesses, by more than traditional inflation/output objectives would warrant, might be preferable to the “wait-and-clean-up-after” strategy.16 But if the shock that gets the asset bubble started is accelerating productivity, it may be best for monetary policy to stick to its traditional output/inflation focus. The problem is, it’s devilishly hard to tell in real time what kind of shock is driving the asset bubble, because the symptoms are virtually identical—rapid credit growth, broad-based exuberance, robust investment, soaring asset prices, and subdued inflation. Yet different shocks call for different policy responses. No two bubbles are the same, which is why early-warning indicators are not fool-proof, and why there is no golden rule for monetary policy (i.e., always lean against these kinds of conditions, always ignore these). In the end, it comes down to judgment, and balancing risks.

Finally, monetary policy is a pretty blunt tool. There may be other, more precision-guided weapons better able to excise an asset bubble. For example, policymakers might try to “talk down” building asset bubbles, reminding people of the risks and thereby helping investors arbitrage these bubbles away. Here too, though, there is still the problem of identifying bubbles in real time. Also, it’s not clear that this type of “talking restraint” would do any good, without being backed up by tighter monetary policy. Better still might be an enhanced role for regulatory policy; closer supervision of financial intermediaries, focusing more on the systemic risks they pose, and countercyclical capital requirements are examples of the kinds of responses that might be more finely tuned to curbing speculative excesses—especially the potentially most pernicious kinds related to the financial system—without creating as much collateral damage as monetary policy.

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16Faras, ibid.
Notes

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