Housing and Monetary Policy

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My remarks focus on the relationship between monetary policy and the recent turmoil in the markets for housing, housing finance, and beyond. I begin with a review of the period leading up to the crisis. I then use this review as a basis for discussing the role of monetary policy in resolving such crises and preventing future crises.

A Great Moderation of the Housing Cycle

When you look back over the past half century in the United States you see a remarkable secular change in the housing cycle. Most importantly, the volatility or average size of the fluctuations in residential construction declined. The change occurred in the early 1980s. For example, compare two periods, the first before the early 1980s and the second since the 1980s. In the earlier period the standard deviation of residential investment relative to trend was around 13 percent; in the later period it was 5 percent, and this includes the most recent fluctuation which is much larger than the average since the early 1980s. Without the current cycle the reduction would be even larger.

In my view this decline in volatility was largely due to an improved monetary policy, and it is closely related to the Great Moderation of the volatility of real GDP and inflation which many researchers have attributed to monetary policy. Compared to the earlier period, monetary policy has been much more responsive since the early 1980s to changes in inflation and real GDP. It has also been much more predictable and systematic in its response. This has been documented using the Taylor rule, where the response coefficient to inflation has increased from less than one to greater than one and where the response coefficient to real output has also increased. These higher and more predictable responses have helped tame inflation and have kept it steadier, thereby reducing the boom-bust cycle and the resulting large swings in interest rates that had caused the volatile housing.

There are other possible explanations, including the argument that housing became less impacted by a given change in the federal funds rate due to securitization and deregulation of deposit rates. However, my estimates of the effect of changes in the federal funds rate on housing show no evidence of such a shift between these two periods. Moreover, no other explanation that I am aware of has the timing so precise. Hence, although this subject will be debated for a long time, I think there is convincing

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evidence that Federal Reserve policy makers were responsible for this important improvement.

Recent Developments

However, a careful review of interest rate decisions shows that in some years they did not correspond so closely to such a policy description. During the period from 2003 to 2006 the federal funds rate was well below what experience during the previous two decades of good economic macroeconomic performance—the Great Moderation—would have predicted. Policy rule guidelines showed this clearly. There have been other periods during the Great Moderation where the federal funds rate veered off the typical policy rule responses—in particular during the fall of 1998—but this was the biggest deviation, comparable to the turbulent 1970s.

Many have argued that these low interest rates—or the provision of large amounts of liquidity that they required—helped foster the extraordinary surge in the demand for housing. As the *Economist* recently put it, "By slashing interest rates (by more than the Taylor rule prescribed) the Fed encouraged a house-price boom…." With low money market rates, housing finance was very cheap and attractive—especially variable rate mortgages with the teasers that many lenders offered. Housing starts jumped to a 25 year high by the end of 2003 and remained high until the sharp decline began in early 2006.

The surge in housing demand led to a surge in housing price inflation which had already been high since the mid 1990s. The housing inflation rate measured by the OFHEO price index reached 10 percent at an annual rate in the fourth quarter of 2004 and remained over 10 percent for two years; measured by the Case-Shiller index, housing inflation surpassed 20 percent during parts of this period. This jump in housing price inflation then accelerated the demand for housing in an upward spiral. With housing prices rising rapidly, delinquency and foreclosure rates on sub-prime mortgages also fell, which led to more favorable credit ratings than could ultimately be sustained. As the short term interest rate returned to normal levels, housing demand rapidly fell bringing down both construction and housing price inflation. Delinquency and foreclosure rates then rose sharply, ultimately leading to the meltdown in the subprime market and on all securities that were derivative from the subprimes.

It is important to address these arguments systematically. There were, of course, good reasons stated at the time for the prolonged period of low interest rates, most importantly the risk of deflation following the experience of Japan in the mid 1990s. Nevertheless with the passage of time we can better understand the ramifications of this policy, and thereby learn lessons for the future.

A Counterfactual Scenario

The classic methodology for investigating such questions is a "counterfactual scenario." What would have happened if an alternative path for the federal funds rate were followed? To answer this question one needs an economic model that describes how

monetary policy—in particular the federal funds rate—affects housing. Ultimately one needs an international econometric model with endogenous (rational) expectations in which residential investment in each country is a function of interest rates, including short term and real long term interest rates, as in the Taylor (1993) multi-country model for example. For the purposes of this policy panel I took a more straightforward approach. I estimated a simple housing starts equation with the federal funds rates as the explanatory variable. The equation was estimated with quarterly data over the nearly 50 year period from the second quarter of 1959 to the second quarter of 2007. The model shows a strong, statistically significant effect of the federal funds rate on housing starts which occurs with a lag. The interest rate elasticity is similar to those found in more complex models such as Topel and Rosen (1988); the semi-elasticity is about -8.3. (The estimated semi-elasticity was -8.9 in the post 1984.1 period and -8.6 in the pre-1984.1 period.)

I simulated this model under two assumptions: (1) the federal funds rate follows its actual path and (2) the federal funds rate follows a Taylor rule, smoothed to have the 25 basis point increment adjustments used by the Fed in recent years. Figure 1 shows the two paths for the federal funds rate.

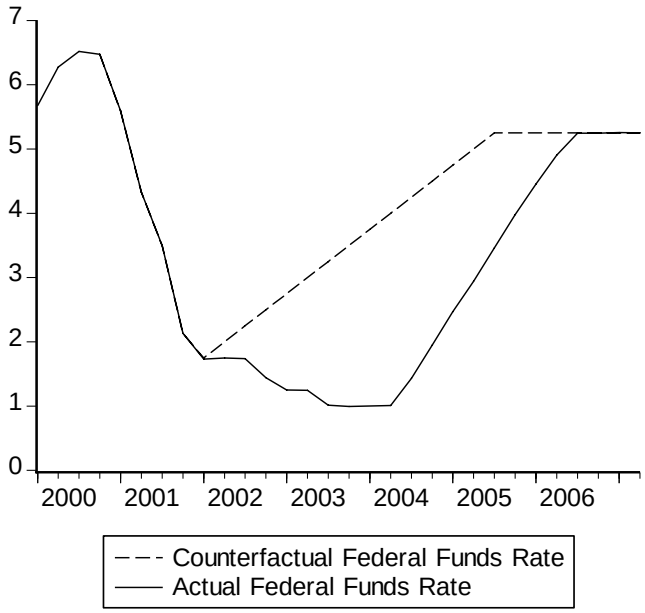


Figure 1

Observe that the actual and the alternative paths depart in the second quarter of 2002 and merge again in the third quarter of 2006. I emphasize that this is only one of many ways to carry out such a counterfactual exercise. Here I use the CPI as the measure of inflation and assume response coefficients of 1.5 and .5 on inflation and real GDP, respectively. I found that using a similar, but unsmoothed, path reported by Poole (2007) gives similar results. It would also be possible to bring the counterfactual path all the way down to one percent and then raise it faster than the actual path. The most important alterative would be to simulate the counterfactual with a feedback rule rather than this fixed path in which case the interest rate would not have risen all the way to 5.25 percent.

Figure 2 shows the results of the simulations using the counterfactual scenario in Figure 1 and compares these with the historical data. The simulations begin in the fourth quarter of 2000; during the period when the policy is on the rule, the simulation path tracks historical data on housing starts very closely. When the paths depart one sees how the housing boom continued with the actual interest rates (labeled dynamic simulation), but that there would have been a much smaller increase in housing starts with the counterfactual simulation of a higher federal funds rate. Hence, a higher federal funds rate path would have avoided much of the housing boom, according to this model.

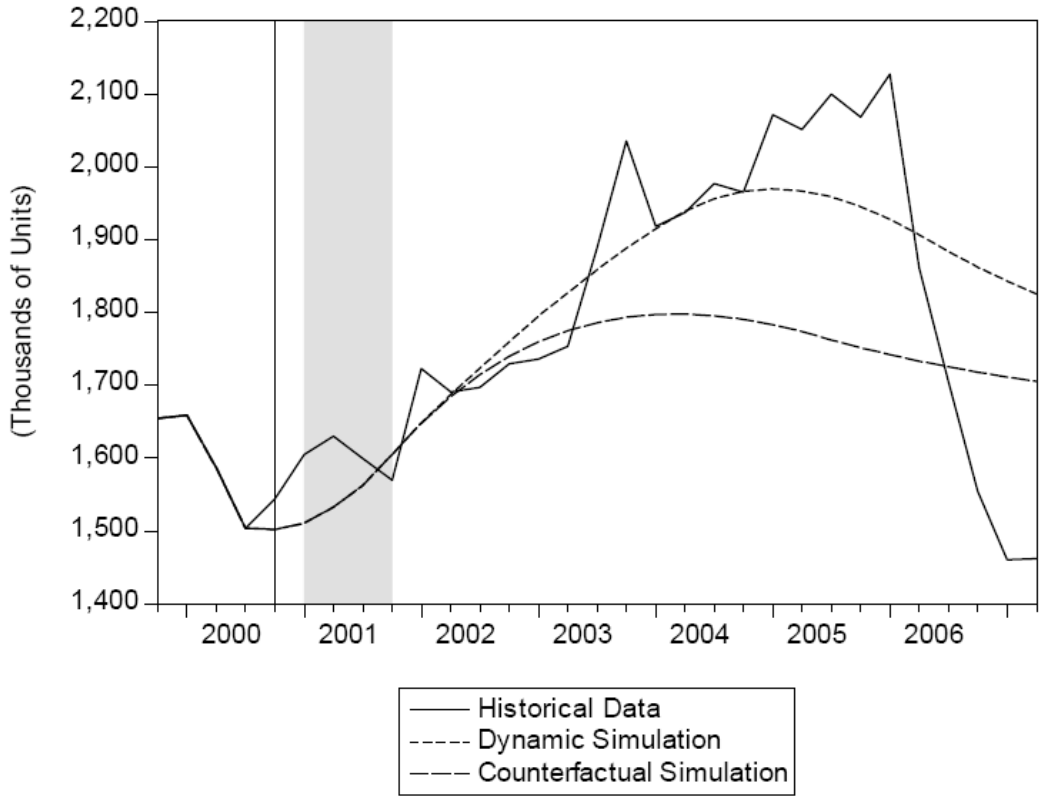


Figure 2

The analysis also suggests that the reversal of the boom and thereby the resulting market turmoil would not have been as sharp, although the model does not predict as abrupt an end to the housing boom as in the historical data when the federal funds rate is on the actual path. However, such sharp falls frequently occur at the end of booms because of rapid changes in housing inflation expectations. In fact, there is a close interactive relation between housing price inflation and housing construction (technically, two-way Granger causality). Placing housing inflation directly into the housing starts equation, and adding a simple equation to explain housing inflation, helps explain more of the decline as shown in Figure 3, but psychological factors (a Shiller swoosh) still seem to have been at work as the boom ended.

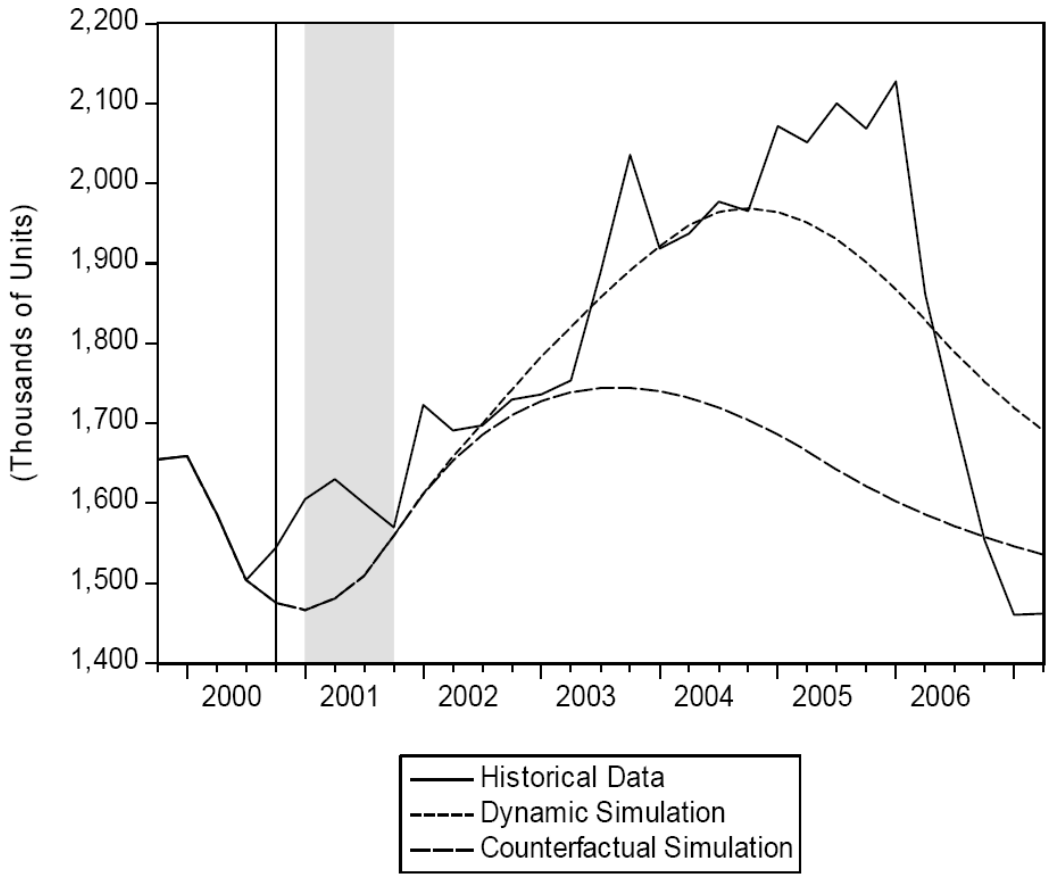


Figure 3

Long Term Interest Rates

A complicating factor in reviewing this period is that long term interest rates did not increase as much when the federal funds rate rose as would be expected from past experience during the Great Moderation. A larger increase in long term rates would clearly have mitigated the housing boom even with the actual path of the funds rate.

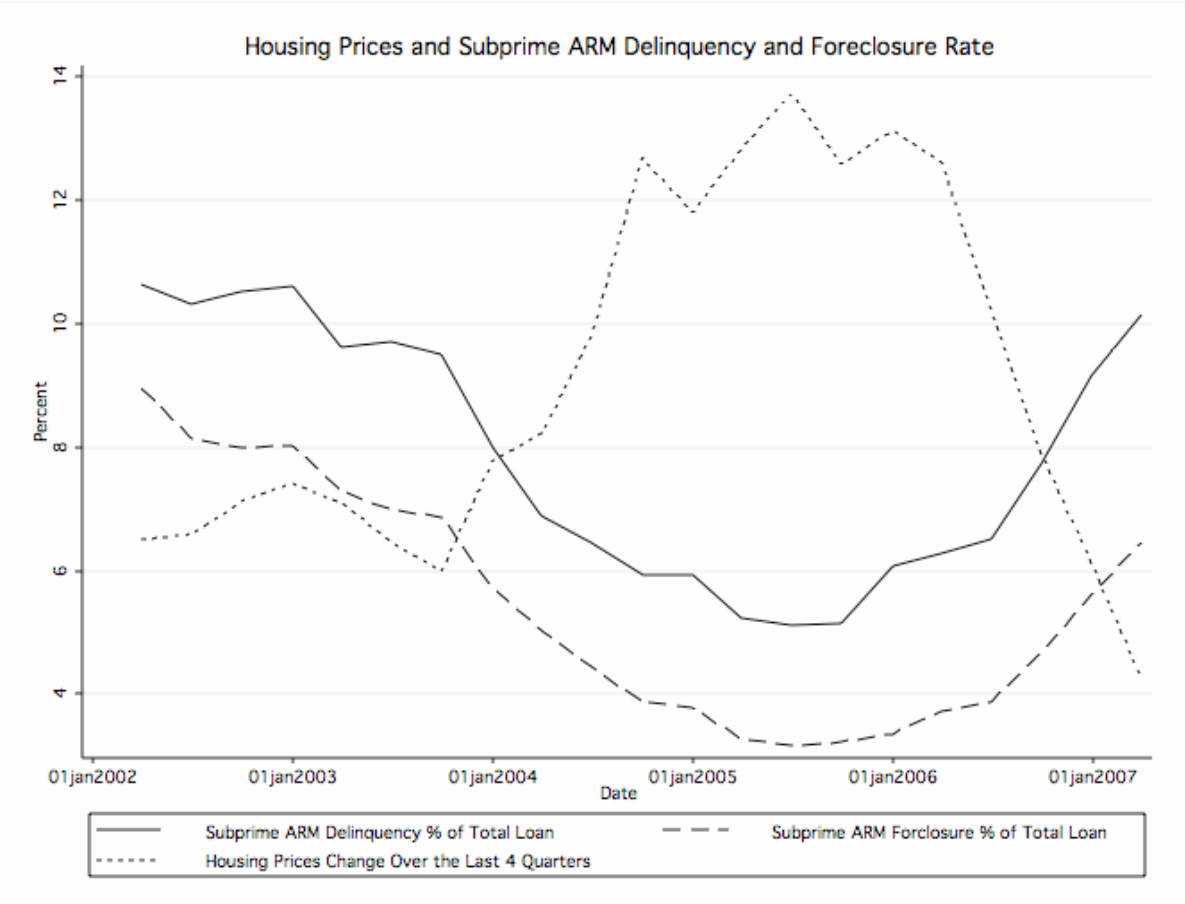
One of the explanations for this unusual behavior of long term interest rates was that global saving was very high driving down real long term interest rates. However, while saving rates were high in some countries during this period, the global saving rate was not. According to IMF data, global saving was 21 percent of GDP in 2003-2005 compared with 25 percent in early 1970s.

Another explanation for the low long-term interest rates was that they were a direct consequence of the large deviation from the typical short-run interest rate responses. Long term interest rates respond to changes in expected future short term rates; if the period of low interest rates was interpreted as evidence of a change in the response of policy to changes in inflation, then these interest rate expectations could have declined because of the policy decisions at the short end of the term structure. Indeed,

policy rules estimated during the 2003-2005 period show a large downward shift in the responsiveness of the federal funds rate to inflation. The responsiveness appears to be at least as low as in the late 1960s and 1970s. As discussed in Smith and Taylor (2007), this could have led investors to believe that there was a longer run change in policy which would have reduced the response of long term interest rates. A key lesson here is that large deviations from business-as-usual policy rules are difficult for market participants to deal with and can lead to surprising changes in other responses in the economy.

Delinquency and Foreclosure Rates in the Subprime Market

The extraordinary housing inflation during this period is also closely related to the problems in the sub-prime mortgage market. While the low interest rates increased the supply of funds to the mortgage market, there is evidence that the high housing inflation led to a marked reduction in delinquency and foreclosure rates. Figure 4 shows the inverse relationship in the case of sub-prime adjustable rate mortgages.



Source: Mortgage Bankers Association and OFHEO

Figure 4

Such a relationship is not a new phenomenon as Figure 5 shows. The delinquency rate in Figure 5 covers all of kinds of mortgages (prime/subprime, fixed and adjustable-rate mortgages). Regressions controlling for other factors reveal a similar correlation.

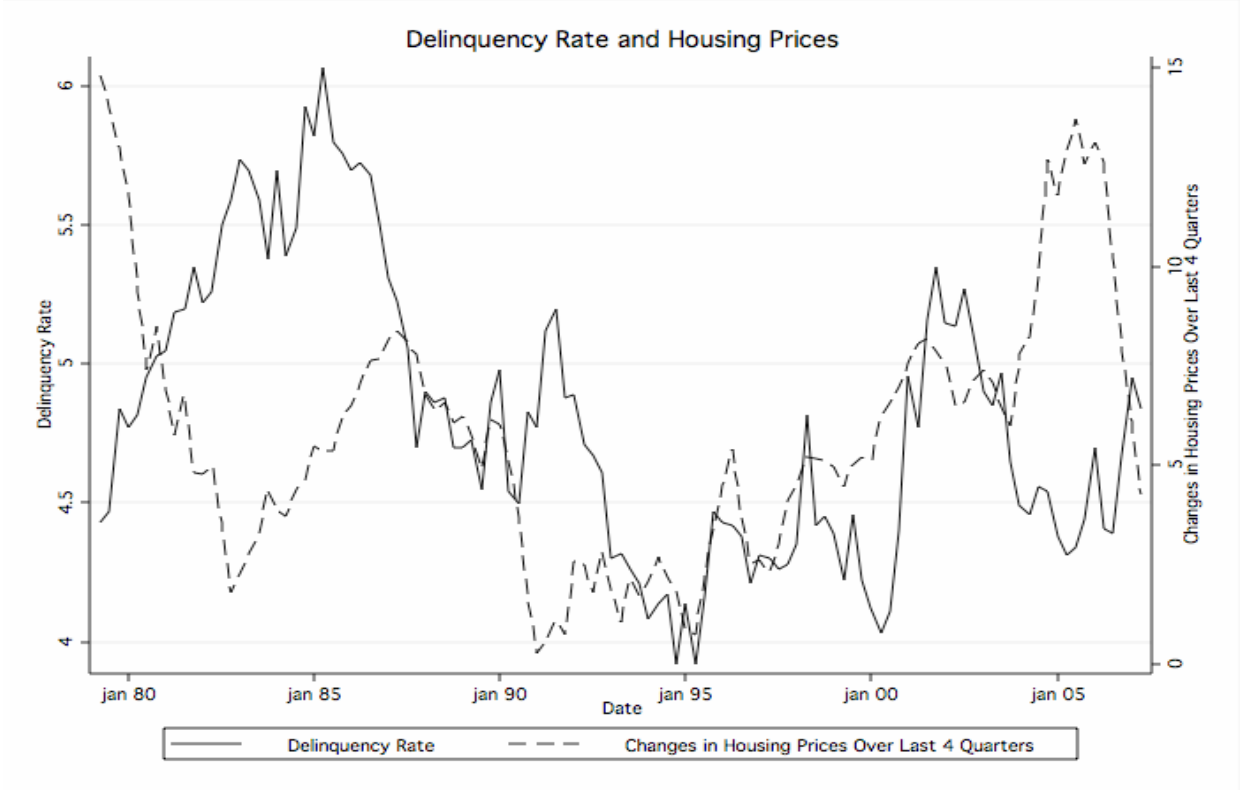


Figure 5

Observe, however, that as housing inflation began to fall, the relatively low delinquency and foreclosure rates reversed sharply. But before the reversal many mortgages and mortgage backed securities were issued with credit ratings that reflected the unusually low delinquency rates. Only later were the credit ratings reduced. Assessing the risk was particularly difficult when such mortgages were packaged into securities that combined other types of risk profiles. Automatic underwriting programs which look at the cross section of a population to calibrate delinquency and foreclosure probabilities could easily have missed the time series effects of the change in inflation for newer markets such as subprime adjustable rate mortgages. Hence, people purchased these securities not knowing the risk that they entailed. Pricing these securities was difficult with the unusually high inflation rates in the housing markets, but eventually the risk premiums adjusted to reflect the reality. For example, the Markit ABX Index of securities consisting of subprime mortgages securitized during the second half of 2006 has fallen from about 82 to 38 since February of this year.

A final and very important part of background for the policy discussion concerns the spread of the turmoil in the subprime market to other markets. It appears that much of this spread is based on fundamentals, or the perception of fundamentals, rather than the broader type of contagion we saw in the 1990s. The indices of option-adjusted spreads of

asset-backed securities and corporate bonds of comparable ratings (either BBB or A) are shown in Figures 6 and 7. The spread between U.S. Treasuries and emerging market debt is shown in Figures 8 and 9. Clearly economic policies in emerging market countries have improved greatly since the 1990s and deserving a great deal of the credit are central bankers, many of whom are at this conference, including Governors Yilmaz of Turkey, Toukan of Jordan, Al-Shabibi of Iraq, Al-Sayari of Saudi Arabia, Meirelles of Brazil, Redrado of Argentina, Mboweni of South Africa, and Mohan of India.

Lessons Learned

What are the monetary policy implications of this review? First, stay with the systematic, predictable, principles-based policy that has worked well for most of the Great Moderation period. That is, adjust the short term interest rate according to macroeconomic developments in inflation and real GDP and be wary of adjustments based on other factors.

Second, provide all the funds that banks want to hold at the short end of the market at the current policy rate. This accommodates fluctuations in the demand for cash and deposits at the central bank and is fully consistent with the first recommendation of not adjusting the target interest rate unless the macroeconomic situation changes. This is the open market policy that has been used recently, especially on August 9 and 10, and that was used to a much greater degree during the days around 9/11.

Following these two principles predictably is the best way to avoid moral hazard and convince people that there is no "put" in which the central bank is expected to bail out individual investors. If investors understand and believe that the policy is to adjust interest rates only if macroeconomic trends change, then they will know that the Fed will do nothing else to help them out if their own risky investments turn out to be losers. If the current slump in the housing market, or in the commercial paper market, is causing GDP and/or inflation to fall markedly, then a cut in the federal funds interest rate would be fully consistent with these principles.

Third, there is more that can be done to make such a policy approach clear. For example, the Fed could publish its balance sheet on a daily basis, or at least the "Fed balances" that banks hold at the Fed. That way market participants can determine immediately how much of an increase in the demand for such balances is being accommodated by the Fed. The information that is currently posted on the size of repos is not sufficient to figure out the cash demand in the money markets because of other factors affecting the supply. The information provided about daily "Fed balances" in the 2001 report on open market operations (Kos (2002), pp. 21-25) is an example of the usefulness of such data during periods of market turbulence. Publishing daily data in real time would increase clarity and transparency.

Fourth, there are other direct actions that should be undertaken in the current situation including insisting on accountability for mortgage originators and improving the supervision of "off-balance" sheet operations such as conduits. If there are plans for

banks to take on some of the asset backed commercial paper and pull off some of the questionable backing, then this could be made more transparent as well.

Finally, on the international dimension, as I mentioned earlier, emerging market countries with their large reserves and other improvements in policy have not been affected very much by the current crisis. Fortunately the IMF has not had to provide funds and we can hope that this relatively fortunate situation continues. If the situation changes I hope that the IMF adheres to its new Exceptional Access Framework which provides the same kind of predictability to its lending decisions as I am arguing has been and is essential for central bank decisions.

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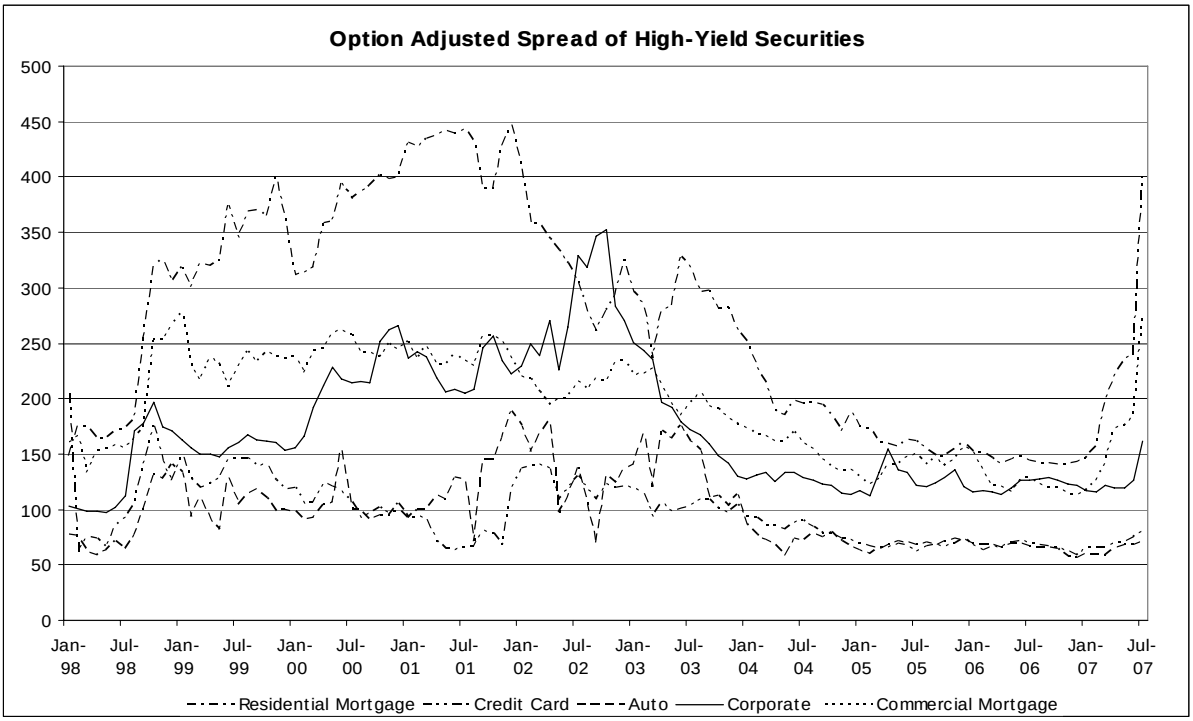
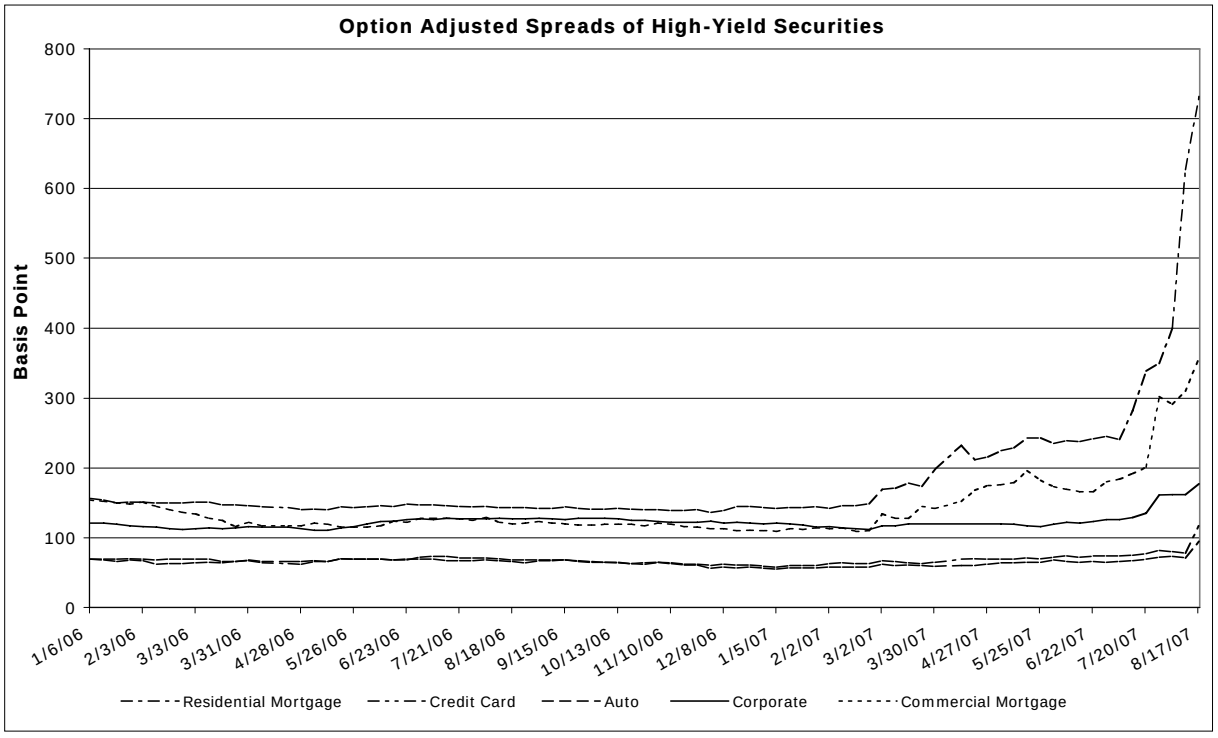


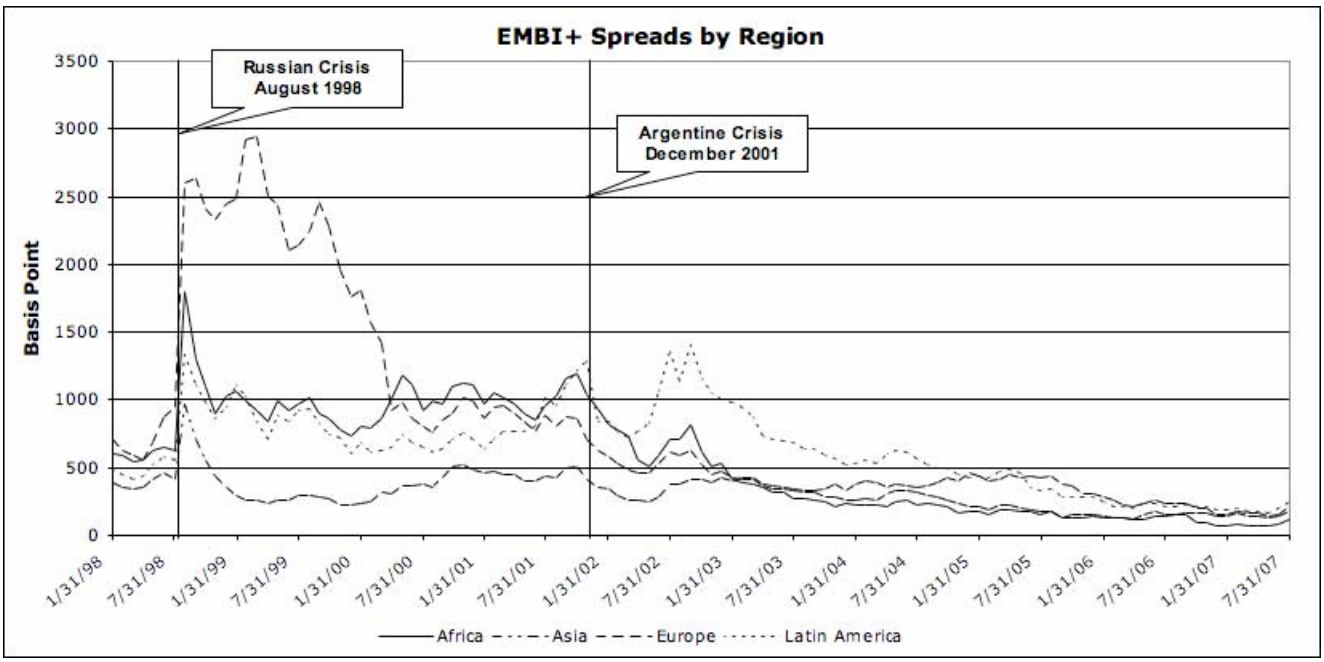
Source: Merrill Lynch

Figure 6



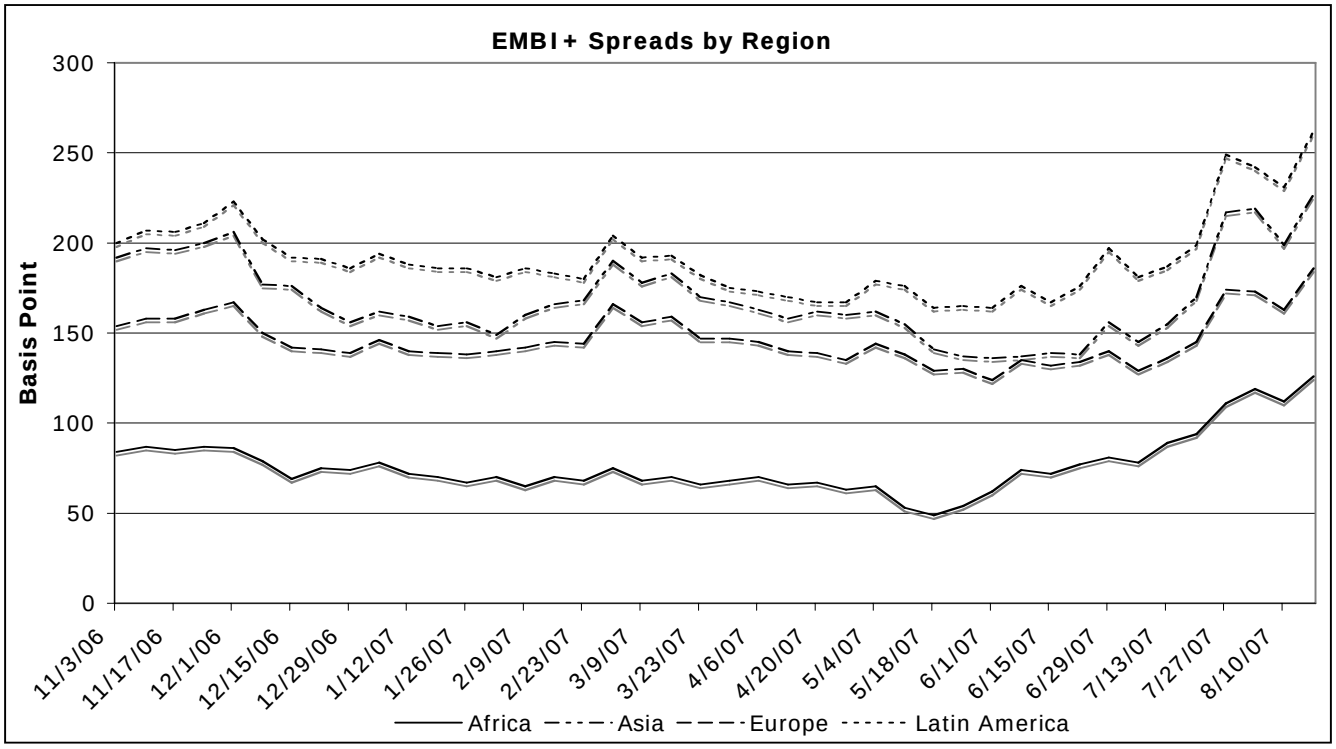
Source: Merrill Lynch

Figure 7



Source: JPMorgan

Figure 8



Source: JPMorgan

Figure 9