

STRATEGIES *for* MONETARY POLICY



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CHAPTER EIGHT

**MARKET FEEDBACK
EFFECTS OF CENTRAL
BANK OPERATIONS UNDER
AN INFLATION-TARGETING
REGIME**

Scott Minerd

Central bank inflation-targeting policies have been largely successful, resulting in important positive macroeconomic outcomes, among which is an extended period of well-anchored inflation expectations. These efforts, however, have had significant financial market implications that may ultimately make the central bank's objectives more difficult to achieve. In short, central banks, and the Federal Reserve in particular, have become a victim of their own success. To a significant extent, the term structure of interest rates is driven by inflation expectations. Successful inflation targeting has resulted in a yield curve that is relatively flat and stable, which is reducing the central bank's ability to use market rates as a feedback signal.

THEORIES ON THE TERM STRUCTURE
OF INTEREST RATES

Traditionally, there are several theories that explain the term structure of interest rates. The first of these theories is the liquidity preference hypothesis, which states that risk-averse investors demand a premium for holding instruments with longer maturities and

bearing interest rate risk that generally causes the yield curve to be upward sloping. Under the preferred habitat theory, different investor types have different maturity preferences and need a premium to shift away from their preferred position in the term structure. Another related theory, the segmented markets theory, states that supply and demand dynamics differ for different maturities, given largely independent investor bases for each point on the yield curve.

Finally, there is expectations theory, which under “pure expectations” theory states that the long-term interest rate is simply the current expectation for future short-term rates, while a looser definition allows for some yield premium that compensates for the risk associated with uncertainty regarding levels of future interest rates. This risk premium related to uncertainty over future rates can be further decomposed into two factors: uncertainty about real neutral short-term rates and uncertainty about inflation.

A THOUGHT EXPERIMENT ON INFLATION EXPECTATIONS

To address the way in which inflation targeting by central banks potentially distorts the feedback signal of the yield curve, let us conduct a thought experiment in which we assume that only expectations theory explains the term structure of interest rates. Furthermore, let us assume that the expected real neutral rate remains constant, so that the primary driver of changes in the term structure is changes in expected inflation.

Making such an assumption is of course a simplification but is not wildly out of step with reality. Over the past forty years long-term interest rates, as represented by the yield on 10-year Treasury securities, have fallen largely because disciplined monetary policy has brought down realized inflation, which in turn has driven down inflation expectations (see figure 8.1). The result is that long-term rates have slowly converged onto long-term inflation expectations.

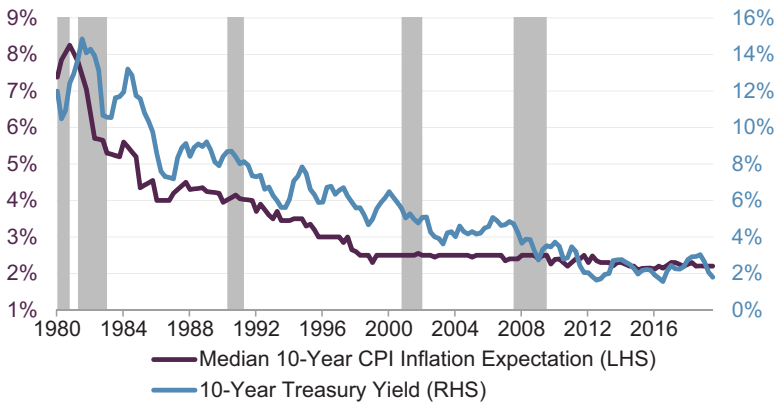


FIGURE 8.1. Long-Term Rates Have Fallen as Inflation Expectations Have Declined: Inflation Expectations and 10-Year Treasury Yield
 Sources: Guggenheim Investments and Haver Analytics. Data as of September 30, 2019.

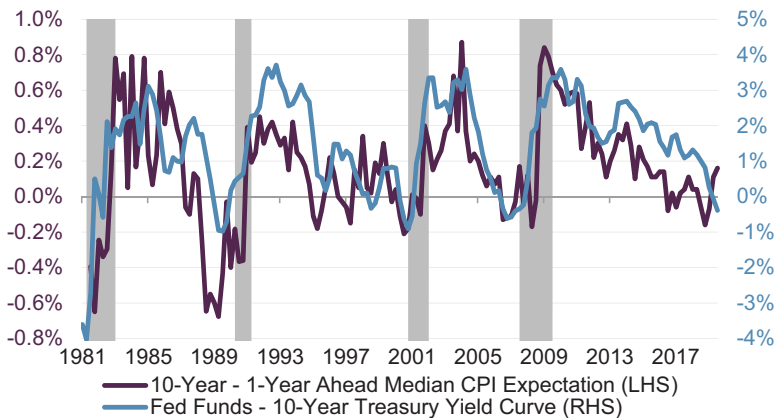


FIGURE 8.2. Inflation Expectations Are a Major Determinant of the Yield Curve: Inflation Expectations and the Yield Curve
 Sources: Guggenheim Investments and Haver Analytics. Data as of September 30, 2019.

Similarly, the shape of the yield curve is further driven by inflation expectations (see figure 8.2). Changes in long-term inflation expectations relative to short-term inflation expectations have exhibited a high correlation with yield curve shape in recent decades: as expectations of long-term and short-term inflation converge, the yield

curve flattens, and when longer-term inflation expectations rise relative to near-term expectations, the curve steepens.

These relationships demonstrate that although a number of factors influence the yield curve, inflation expectations play a major role in determining both the level and the shape of the curve. This fact is particularly relevant given that out of the previously mentioned factors that can influence the yield curve, monetary policy has the greatest influence over long-run inflation expectations.

CONSEQUENCES OF INFLATION TARGETING

In the era of inflation targeting, the Federal Reserve has succeeded not only in maintaining a low rate of inflation but also in reducing market expectations of future changes in inflation. A first-order effect of this reduction in expected inflation changes has been a consistently lower level of volatility across the term structure of interest rates (see figure 8.3). Put another way, in a world where inflation expectations become well anchored at the target rate of 2 percent over a longer horizon, interest rates become more stable

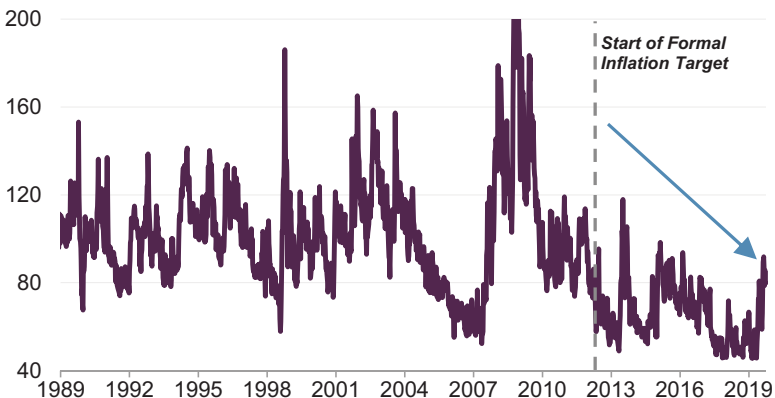


FIGURE 8.3. Volatility of Interest Rates Has Fallen under Inflation Targeting: Merrill Lynch Option Volatility Estimate (MOVE) Index

Sources: Guggenheim Investments and Bloomberg. Data as of September 27, 2019.

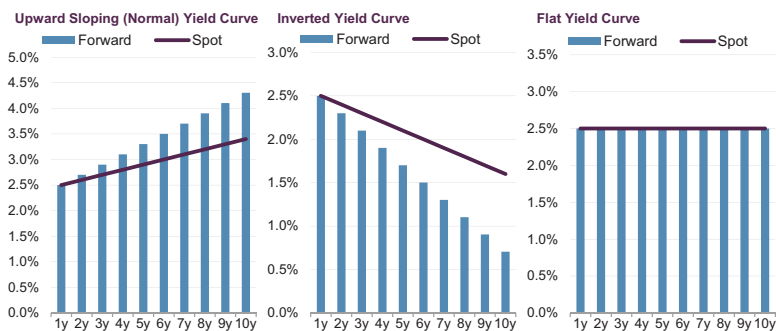


FIGURE 8.4. Classic Illustration of Spot and Forward Curves

Source: Guggenheim Investments. Data is for illustrative purposes and not actual historical data.

around the 2 percent target. Reduced volatility of interest rates has generally been perceived as a positive development by financial market participants. Many argue that reduction in interest rate uncertainty has allowed for a compression in risk premia across a broad array of markets—from equity to credit to real estate, making capital more affordable.

In our thought experiment where the term structure is driven by inflation expectations, the result of successful inflation targeting is the anchoring of inflation expectations across both short and long time horizons, causing forward rates to converge with spot rates and the yield curve to flatten (see figure 8.4).

This theoretical result is supported by the data. We can observe that periods in which the dispersion of inflation forecasts is high tend to be associated with a higher term premium while periods of low forecast dispersion are generally associated with a lower term premium (see figure 8.5). As the inflation target becomes increasingly credible, long-term inflation expectations converge with short-term expectations, and less of a premium is needed for the uncertainty of not achieving the inflation target. This convergence of inflation expectations results in a flat yield curve at a level consistent with the targeted inflation rate.

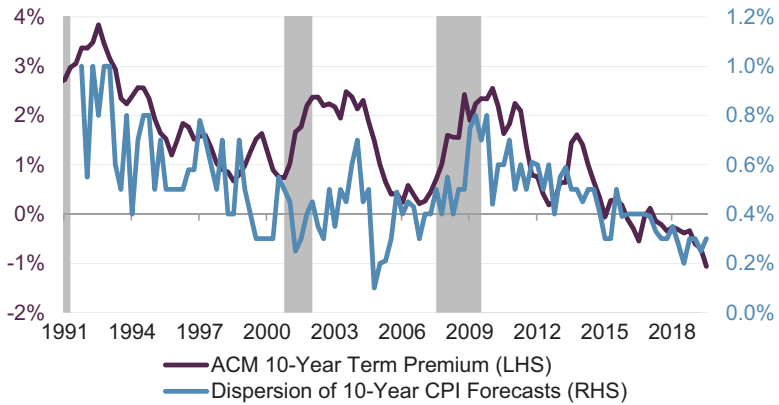


FIGURE 8.5. Stable Inflation Expectations Also Help Explain Lower Term Premium: 10-Year Term Premium and Inflation Forecast Dispersion
Sources: Guggenheim Investments and Haver Analytics. Data as of September 30, 2019.

In a world where inflation expectations are well anchored at the 2 percent target rate, any temporary overshoot in inflation will be viewed as transitory, and the yield curve will adjust to reflect any deviation from the long-term objective. For example, if short-term rates were to rise to reduce current inflation, and if that increase was viewed as temporary, there would be an offsetting impact on the term structure of interest rates based on the expectation that rates will on average be consistent with 2 percent, causing long-term rates to fall and the yield curve to invert. Similarly, when short-term rates are reduced to raise short-term inflation, forward rates will adjust upward to provide an average rate consistent with the targeted inflation rate (see figure 8.6). This would explain why a modest increase in short-term rates could lead to a premature yield curve inversion.

FROM THOUGHT EXPERIMENT BACK TO THE REAL WORLD

We started this thought experiment by assuming that inflation expectations are the only influence on the term structure of inter-

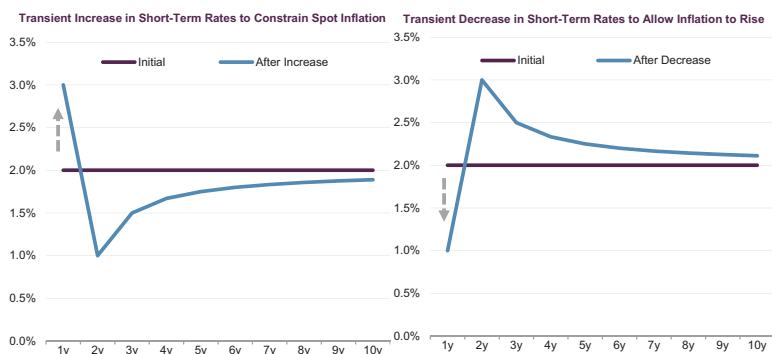


FIGURE 8.6. Effects of Changes in Short-Term Rates on the Term Structure with Anchored Inflation Expectations

Source: Guggenheim Investments. Data is for illustrative purposes and not actual historical data.

est rates. Thus, uncertainty about inflation leads to a premium for long-term yields, and uncertainty—and the term premium for long-term yields—are greatly reduced if not entirely eliminated if inflation expectations are successfully anchored, resulting in a flat yield curve.

Stepping out of the vacuum of our thought experiment and back into the real world, we can see that anchored inflation expectations also affect other investor behavior factors that have been theorized to influence the yield curve. For example, if the yield curve has little slope and uncertainty about future rates is low, investors will have less of a preference for different points on the yield curve, thus muting the impact of habitat preference. This dynamic is precisely what we have witnessed in recent years, as record low-term premia signal reduced uncertainty about future interest rates, resulting in a flattened yield curve.

Similarly, we have seen how inflation targeting has served to reduce the volatility of interest rates. If volatility of interest rates is low, then less of a liquidity premium is required by investors as compensation for holding longer-term securities such as

notes and bonds relative to shorter maturity securities such as Treasury bills, since interest rate risk associated with uncertainty and volatility has been reduced. Therefore, the impact of liquidity preference is lessened, which further reinforces a flatter term structure.

MARKET FEEDBACK EFFECTS OF MONETARY POLICY

Historically, the shape of the yield curve has been an important signal reflecting the market's perception of monetary policy accommodation or restrictiveness. Successful inflation targeting is leading to reduced volatility in long-term rates. With reduced volatility, the ability for long-term rates to signal changes in inflation expectations and the stance of monetary policy is greatly diminished. At the same time, short-term rates are sidelined from providing a market feedback signal, given current policy in which the overnight rate is pegged. Therefore, market participants must look elsewhere for market signals to evaluate the appropriate target of the nominal short-term rate consistent with price stability.

One such alternative signal is monetary aggregates. For example, the growth rate of "true" money supply (currency in circulation plus savings and demand deposits) has reliably slowed in the lead-up to recessions (see figure 8.7). However, this relationship may not be precise enough to guide policy on its own.

Given reduced interest rate volatility, another indicator that has become an important reflection of market perceptions for future Fed policy action is a broader composite of financial conditions, incorporating corporate bond spreads, equity valuations, and the value of the dollar (see figure 8.8). Financial conditions are a relatively strong real-time indicator of nominal growth and may be a guide to future Fed policy as the market perceives a reaction function to financial stress.

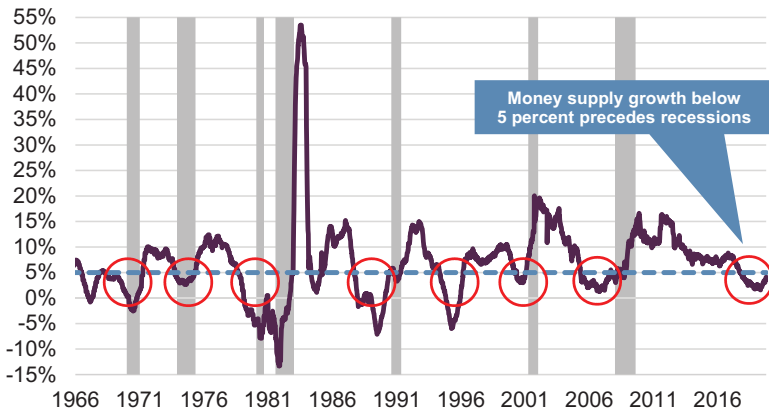


FIGURE 8.7. The Slowdown in Money Supply Growth Warrants Attention.: True Money Supply (Currency in Circulation + Savings and Demand Deposits), Year-over-Year% Change

Sources: Guggenheim Investments and Bloomberg. Data as of September 30, 2019.

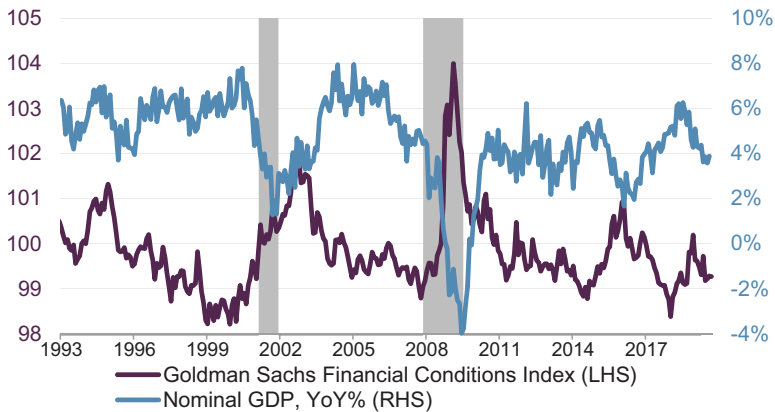


FIGURE 8.8. Broad Financial Conditions Are an Important Signal: Financial Conditions and Nominal GDP Growth

Sources: Haver Analytics and Guggenheim Investments. Data for FCI as of September 30, 2019; for GDP as of August 31, 2019.

Although monetary aggregates and financial conditions provide useful information to market participants, both fail to provide contemporaneous feedback about the degree of monetary accommodation or restrictiveness relative to the Fed's mandate of full employment and price stability on a real-time basis.

IMPLICATIONS AND RECOMMENDATIONS

This analysis has shown how anchored inflation expectations at 2 percent have led to a significantly flatter yield curve at relatively low interest rates. As noted earlier, a short-term overshoot of the inflation target should have little effect on long-term interest rates and increase the likelihood of a yield curve inversion associated with what would otherwise be viewed as a relatively modest increase in rates. Earlier yield curve inversions should lead to shortened rate hike cycles, a dynamic we may be currently witnessing. With shorter rate hike cycles ending in lower rates, efforts to normalize interest rates and escape zero lower bound constraints are becoming more challenging.

At the same time, anchored inflation expectations result in muted volatility of interest rates. Depressed volatility reduces the efficacy of the market signals provided by changes and levels of interest rates, making the setting and timing of appropriate monetary policy adjustments more difficult. Additionally, muted volatility along with a relatively flat yield curve has the unintended side effect of increasing investor complacency, encouraging "reach-for-yield" behavior and compression of risk premia, which increases malinvestment and encourages speculative behavior on the part of investors. These factors heighten the risk of financial instability in the event of exogenous shocks to the system or a cyclical business downturn.

The success of the current inflation-targeting policy regime virtually ensures that interest rate management will be a less effective policy tool going forward, given the proximity to the zero lower

bound and the muted feedback mechanism to signal changes in the real economy. This suggests that previously unconventional tools, such as quantitative easing and forward guidance, will remain permanent and necessary features of the monetary policy tool kit. Unfortunately, these unconventional policy tools come with the side effect of further exacerbating instability in financial assets, raising the prospect of more severe boom-bust cycles that damage long-term growth potential.

Well-anchored inflation expectations generally are a positive condition of a healthy economy and a reflection of the Fed's successfully meeting at least one of its dual mandates. The downside of this successful anchoring, however, has dampened market volatility and reduced the efficacy of market feedback. The best solution to this problem may well be to allow more volatility in short-term rates through revised open market operations policy or setting a wider fed funds target range. This would allow short-term rates to more accurately reflect changes in the market demand for credit and reserves. More volatility at the short end of the yield curve would provide a contemporaneous market signal, which would reflect the degree of monetary restrictiveness or accommodation relative to the real economy. Such an approach would remove subjectivity around the appropriate target rate and decrease the risk of unintended errors in monetary policy.

GENERAL DISCUSSION

UNIDENTIFIED SPEAKER NO. 1: I want to address Mickey's point about adding the NGDP [nominal GDP] line to the summary of economic projections. Mickey, I think that's a very good idea. Jeff Frankel's got an article coming out in the *Cato Journal* on that same topic and making the same recommendation. I wanted to ask you a question, because once you think about that, you think about what the value is. And in December, of course, with the rate hike, some people think it was unwarranted. And in January, Powell decided to give a signal of patience, and now there's not going to be any more rate increases. If that NGDP growth target had been in that SEP [Summary of Economic Projections] statement, and if the growth target had been specified, let's say at 5 percent (3 real growth and 2 inflation), they would have seen that the actual growth rate in nominal GDP around that time was pretty much on target, which would have meant no rate increase. And they could project that in the future. And if they have a rule, or at least a quasi rule, that they want to have about 5 percent, it seems like it would lead to more certainty with respect to the conduct of monetary policy. I wondered what you thought about that?

MICKEY LEVY: Jim, I agree. But there are a couple other reasons why you would want to use nominal GDP. One is that it's the broadest measure of economic activity that the Fed's monetary policy affects. Real GDP is derived from nominal, from which they subtract quality-adjusted inflation. The BEA [Bureau of Economic Analysis] estimates of quality adjustment are complex and involve judgment. The Fed must convince itself and the public that its primary role is not to manage the real economy.

In December 2018, the Fed's Policy Statement and Powell's press conference conveyed different information and were inconsistent with how the subsequent minutes of the meeting

suggested the Fed members were debating, and they were also inconsistent with the Fed's forecast. This inconsistency would have been avoided with the suggestions I have made on the revamped SEPs and separate risk assessments on inflation and the real economy. It is important that the Fed's forward guidance is easy to understand by markets.

PETER FISHER: I want to thank you all. I think it's been lovely observations in the comments from all four of you. I want to especially compliment Scott for bringing up the awkward thought of volatility being helpful. And I have two lessons of my own from that to share. But I think the most fundamental one is I think if the Fed is trying to stabilize the real economy, then financial variables have to be the shock absorber. And to try to stabilize them both is to do too much.

Now, I at least had the lesson when I managed the fed funds rate, I remember consciously choosing that I had to allow a certain amount of volatility, otherwise the fed funds market wouldn't work. And I probably didn't have a big enough range. But I also remember being challenged by Alan Greenspan once for uttering the thought that we should try to manage the whole yield curve, do something like an Operation Twist, say. And his observation to chide me was, "But then we'd just be looking at ourselves in the mirror."

LEVY: Okay, Peter, that's why they should also not try to manage the stock market and respond excessively to corrections.

UNIDENTIFIED SPEAKER NO. 2: A little bit of more of a philosophical question. As you can guess from my accent, I grew up under a government dictatorship, so I don't like when authorities have too much power. And today at lunch, we were reminded that rules are better than authorities. So, I have a philosophical question. Would it make more sense if the Federal Reserve would vote once a year or whenever on setting up the rules, but not continuously adjusting interest rates? Let it set up rules that

adjust the interest rate, and the Federal Reserve votes on changing the rules but not directly changing the interest rate?

LEVY: It is very important to have rules-based guidelines for the conduct of monetary policy. As Rich Clarida told us this morning, the Fed should assess the data to see if it is consistent with the Fed's forecast and that monetary policy is on track for achieving its long-run objective. The quarterly forecast should not be changed. But the Fed has evolved into becoming a little too fickle, a little too short term oriented, both on economic fluctuations and financial fluctuations. It is not allowing interest rates or exchange rates to fluctuate naturally, and this harms the system and affects the Fed's credibility.

SCOTT MINERD: I'd like to respond to the gentleman. I tend to think that the more we can allow for contemporaneous market feedback in prices, the more it reduces the risk of policy errors based on, for instance, changes in r^* and other things, which are very difficult to measure. And I think that the idea of having a targeted interest rate regime, whether it's a corridor system or even our current system, is failing to allow us to observe how restrictive monetary policy becomes. And I think our most recent incident occurred in the fourth quarter, where we saw short-term rates reaching IOER [interest rate on excess reserves] as the Federal Reserve was shrinking its balance sheet. And ultimately the market went into a tantrum, because it perceived that it was too much. But if short-term rates had been allowed to rise further, perhaps the central bank would have been more aware of the fact that quantitative tightening was perhaps having a bigger effect on the impact of restrictiveness within the markets than it was measuring because of the regime where IOER tends to try to suppress the rise in rates.

UNIDENTIFIED SPEAKER NO. 3: I wanted to respond to, or maybe push back a little bit on, this issue of dysfunctionality that Mickey raised. I mean, I think it's certainly true that the relationship

between the Fed and the markets does seem a bit sort of dysfunctional at times. But some relationships just sort of have dysfunctionality built into them, and it doesn't mean the relationship isn't valuable and enjoyable in other ways. It seems to me sort of the relationships—I'm speaking as an economist who works in financial markets. It seems to be the relationship just has this dysfunctionality built into it, because the Fed is uncertain about the state of the economy. It knows that there are some signals in financial market prices about the state of the economy. And it also knows that the transmission of its policies goes through the financial markets and, therefore, broader financial conditions are what affects the economy. And so it's kind of inevitable that the Fed pays close attention to market developments. But it's equally inevitable that the market pays close attention to the Fed, right? Because what the Fed does affects all the prices that people or instruments of people are trading. And so, you know, I think some of the suggestions you make are kind of useful, and possibly the Fed at times may communicate too much or may communicate in confusing ways. But sometimes when people in the markets complain about the Fed, what they're really complaining about is the Fed has done something, which has meant they've lost some money. And you know, nobody likes losing money.

LEVY: It's very natural for the markets to respond to everything the Fed says and does, just as it's natural for the Fed to look at the markets. But it is striking that the markets have come to perceive that the Fed's role is to manage the real economy. This is emphasized in the Fed's communications that focus on the real economy and some off-handed remarks about the stock market by FOMC [Federal Open Market Committee] members. When we consider how the Fed tries to extract information from markets, we must ask whether the stock market provides value-added insights about the economy and inflation above what is provided

by hard data and anecdotal evidence from CEOs of companies and all the Fed's models. The answer is usually no.

I also emphasize that the Fed relies very heavily on forward guidance, even though nobody knows how it works or how it can work predictably. The Fed also maintains a very large balance sheet, and has changed its explanation for what its balance sheet accomplishes. This is awkward. Yet despite any understanding of the effects of the balance sheet, markets respond when the Fed mentions it. If the Fed would set out to simplify the monetary policy process, it would be better able to achieve its dual mandate with more clarity.

JOHN TAYLOR: So, one of the principles that's come out of research over the years of looking at good rules or strategies for central banks is they rarely include financial variables on the right-hand side. And I think one of the reasons for that is that it adds volatility to whatever they're doing, because there's volatility in markets, which some of you have said is just great. But the point is, there's lots of reasons why just research and models suggest you shouldn't be reacting but doing things the market reacts to. And with this forward guidance, the Reifschneider-Williams approach, it doesn't react. It's basically a rule, which is pretty specific, and it doesn't react to the markets. It's taking advantage of the reaction of the markets to the Fed; term structure of interest rates, for example, is part of that. But I take it your message is from people who are involved in markets is much the same. As much as you can, if there's any kind of a rule or strategy that you're thinking about, it's best not to include the financial variables in that, or at least not very much. At least dampen them. That's what I understand all of you saying, some way or the other. I don't know if that's correct. Certainly, Scott's point of letting the markets work some more is consistent with that. Laurie is consistent with that. George is consistent with that. So it seems to me that's kind of the message.

MINERD: John, I think one of the comments that Mickey made a minute ago is that people think the Fed is managing the real economy, they're responsible for it. I would go a step further as a market participant, and other people around me and the way they behave and talk, they seem to behave in a way that indicates that they think that the Fed has responsibility for managing the markets, which I find very troubling, because obviously I don't see that in the Fed mandate. But I think that the abundance of communication, which may have actually been totally 100 percent necessary during the financial crisis, has changed the perspective of a lot of market participants to think that the Fed has more power than it actually does and has a responsibility that it doesn't have.

JOHN COCHRANE: This was great. I want to expand on your remarks and put it in the context of our big question, the strategies for monetary policy. If we have another financial crisis—*when* we have another financial crisis—it will dwarf everything we've talked about today regarding 2 to 3 percent inflation and r^* and u^* and so on. The Fed has in fact taken on a mandate of financial stability. As Laurie reminds us, however, its tools are a little limited. The link between short-term interest rates and asset prices, even if the Fed wanted to use that, is tenuous at best. How do short-term rates affect risk premiums? Who knows where that comes from.

Scott and Mickey, I think, said that the Fed should talk differently. But the Fed's ability to influence things by talking is even less than its ability to influence things by short-term interest rates.

The Fed is, in fact, running financial markets. The question is, should it go further? Not through its interest rate and monetary policy, through its regulatory arms—its stress tests, “macroprudential” efforts, using the whole Dodd-Frank architecture. Should the Fed be managing the credit cycle and trying to make

sure we don't have booms and busts, responding to credit conditions by its regulatory tools? If it thinks there's too much bubble in real estate loans, well, should it clamp down on real estate loans?

I think this is very dangerous. That is, it is the big question about what is the Fed going to do, quite apart from monetary policy. The last time it tried to prick a bubble in asset markets was 1928, and that didn't work out so well.

It is not possible nor advisable to make sure that nobody ever loses money again and no big bank ever fails again. The Fed is not allowing competition and innovation in the banking system. As I think about it, the only answer to this is lots and lots more capital, and then we can let institutions lose money. Otherwise, the next crisis will come. It will be worse than the last one.

LEVY: John, regarding one of your points, since 2010 the Fed has dramatically elevated its priority on financial stability without defining it clearly or what is the Fed's role is in macroprudential risk management, and what tools it has at hand. Also, the Fed emphasizes its transparency, but frequently changes how it interprets past events and policies. It has been very unclear about why the monetary policy transmission mechanism has failed to work, why QE2 and QE3 failed to stimulate faster nominal GDP growth, why the money multipliers have fallen, why money velocity has declined. Good research on this and an open discussion would be very instructive in anticipation of the next recession or crisis, rather than repeating the pat answer, "Oh, we had to do what we did or the economy would have slumped."

LAURIE HODRICK: I'm going to have to jump in on that one. I want to thank both Johns [Cochrane and Taylor] for fairly characterizing my remarks today. One of the main points I was trying to make is that when you look at the channels by which Fed policy can or can't affect firm valuations, it's very clear what the role of uncertainty is. It's not just about the level of uncertainty but also

about increases in aggregate uncertainty. Again, while there may be disagreement on this panel, I would argue that an increase in uncertainty is a bad thing. Therefore, a well-disciplined policy that sticks to its knitting, that stays where it belongs, that's clear about what it is, is going to reduce aggregate uncertainty. And that again, if you look at the channels from corporate finance in terms of where Fed policy affects valuation for the firm and then is aggregated into the market, reducing uncertainty is going to enhance firm valuations.

GEORGE SHULTZ: The Fed, I believe, made some mistakes in the last crisis, which I hope they don't repeat, but they probably will. The first mistake was to be part of the bailout mania. When you bail people out, you give the signal that accountability is gone; that is, if you screw up, you don't pay a price. That's devastating and wrong. And if you take the view that this is going to be an orderly bankruptcy, orderly bankruptcies work out all right. Take AIG, for instance. It's a perfectly good insurance company that had this other investment asset that went sour. What you're really doing is bailing out Goldman Sachs and some others that invested in it. It would be better to let an orderly bankruptcy take place and let people who made a bad investment take the penalty. That's the way it should work. Then, they went before Congress, the Treasury, and the Fed together, and they said, "The sky is falling. We need a gigantic amount of money to bail out these securitized mortgages." And everybody knew there was no way they could do it because nobody had the slightest idea how to put a value on them. So they got the money, but they actually used it to bail out big banks, and some of them were forced to take the money by regulatory threats. That was a misuse of the power given to a regulatory agency, and when you do that, you undermine your credibility and you undermine trust. Trust is the coin of the realm. So there were a lot of mistakes made, I think, that I hope won't be repeated.