



***Revisiting Monetary Policy in a
Low Inflation Environment:
Remarks at the Federal Reserve Bank of
Boston's 55th Economic Conference***

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I'd like to welcome everyone to the second day of our conference. As has been mentioned already, this is in some sense a retrospective. The first conference on monetary policy in a low inflation environment was held in Vermont in October of 1999. I would note that several speakers we will hear from today also provided comments at that gathering 10 years ago, and I am pleased to have them back in New England to see if a decade of relevant data has influenced their thinking on the topic.*

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

[Slide 2] At that conference, Alan Blinder was on the policy panel, a place he finds himself again today. He said at the time that it was of some interest that the conference was being held at the U.S. Federal Reserve, and not in Japan or Europe. One might attribute the location to unusually good forecasting prowess evidenced by our Research Director, Jeff Fuhrer, who was actively engaged in organizing the earlier conference as well as this one.

The earlier conference took place under very different economic circumstances. It was held in the midst of the period that I believe Jim Stock named “the Great Moderation,” reflecting the reduced volatility we were seeing in unemployment and inflation. There was a growing sense of confidence that severe business cycles had been tamed, as policymakers better understood and calibrated fiscal and monetary policy. At the time of the conference, the unemployment rate was 4.1 percent and the core inflation rate was 2.1 percent.¹

Despite the propitious economic environment at the time, I will say that participants at the conference said quite clearly that monetary policy in a low inflation environment would be quite challenging.

[Slide 3] Perhaps the best summary of this concern was provided those ten years ago by Kazuo Ueda, who is on the policy panel again this time. His summary of policy when the zero bound was hit was that “it will be a lot more painful than you can possibly imagine.” Unfortunately, his comments have been accurate and prophetic – and quoted rather prominently of late.

Perhaps, as well, they were more true in Japan than anywhere else in the world. At the time of our first conference on this topic, many participants were expecting the Japanese deflation to be quickly eradicated and the country to be “on the mend.” Now, more than a

decade later, Japan continues to combat deflation with its policy still running up against the zero lower bound.

Other participants at the earlier conference for the most part viewed Japan as an anomaly, and seemed to think that the likelihood of others ending up in Japan's predicament was quite low. Unfortunately, that probability seems to have shifted, and we now face a world where Japan, Europe, and the U.S. are challenged by the need to conduct monetary policy with short-term interest rates close to zero.

All in all, there was some disagreement over how effective alternate policies could be, but there was a sense that there was little reason not to try them, should circumstances merit it.

[Slide 4] Figure 1 highlights just how different this so-called Great Recession has been. The chart shows the percent employment change from the peak of employment in post-war recessions. The scale of the job loss during this recession, shown by the black line, is sobering.

[Slide 5] Another feature of this Great Recession involves the significant difficulties within financial institutions and financial markets, and the contributions of those difficulties to the economic downturn. While at the earlier conference there was due concern about the banking and financial systems, I think it fair to say that the role that financial institutions and markets can play in aggravating the business cycle was not fully appreciated. A challenge that remains is how best to incorporate financial market developments in our economic models, as much of the modeling only rather poorly captures the role of financial intermediation.

[Slide 6] It goes without saying that the circumstances surrounding this conference are very different than those of ten years ago. Unfortunately at today's conference, unlike ten years ago, we find unemployment at 9.6 percent, core CPI inflation well below 2 percent, and short-

term interest rates bound by zero. Japan is still fighting deflation. So the problems faced by policymakers in the United States and abroad are no longer just matters of academic debate.

Today I would like to briefly discuss how we should, in my opinion, interpret some of the data and experience we have seen since that prior conference. In particular, I would like to draw some observations from the Japanese experience, and from the Federal Reserve's Large-Scale Asset Purchase (LSAP) Program.

The Case of Japan

[Slide 7] Japan is the one industrialized country that has faced the zero bound and deflation problem for well over a decade. I would note several points we can draw from Japan's battle with deflation.

- First, while the Japanese stock market and real estate markets peaked in 1990, and were substantially off their peak prices in the middle of the 1990s, the core inflation rate remained low but definitely positive (as shown in Figure 2). While every such situation is unique, the conditions *in Japan* that moved a low-inflation environment to one of actually falling prices were monetary and fiscal tightening, and also deferring the process of addressing significant problems in the financial sector.
- [Slide 8] Second, it is worth noting that Japan and Europe and the United States are facing substantial challenges in monetary policymaking, in part because of lingering

financial problems. Because the transmission of monetary policy occurs through the banking system, impaired banking systems and financial markets greatly complicate the conduct of monetary policy.

- Third, the fact that Japan is *still* battling deflation highlights how pernicious deflation can be, and how difficult it is to counteract once it has been firmly established.

[Slide 9] It is important to note that Japan has significantly altered monetary and fiscal policy to try to address its deflation problems. For fiscal policy, as shown in Figure 3, Japan has more than tripled its debt-to-GDP ratio since the early 1990s, as the government has tried to ignite the economy with more expansionary fiscal policy.

[Slide 10] Similarly, the Bank of Japan has more than tripled the size of its balance sheet since 1990, to try to combat deflation – as shown in Figure 4.

[Slide 11] These expansionary monetary and fiscal policies no doubt prevented deflation from being a much more severe problem than it nonetheless has been. Concerns expressed at our earlier conference, and many economic models, highlighted a risk of a strong deflationary spiral, given the significant slack in the Japanese economy. Thankfully, policy did prevent this severe outcome. However, it was not sufficient to prevent a *low but persistent degree* of deflation. This experience may indicate that a gradual response may not be as effective as a more active response to arrest deflationary pressures – before they become embedded in thinking that can affect household and business spending.

From a policy perspective I take several lessons from the Japanese experience. First, should deflation occur, it can be quite difficult to overcome. Second, insuring against the risk of deflation may be much cheaper than waiting until it has occurred and then trying to address it. Finally, financially fragile economies may be particularly vulnerable to negative impacts from premature austerity measures.

Monetary Policy Lessons from the LSAP Program

[Slide 12] Now I would like to touch on some lessons for monetary policy from the LSAP program. As you know, after reaching the zero lower bound in rate-setting and seeing continued problems in economic outcomes, the Federal Reserve made a policy decision to purchase large quantities of government-backed securities in the secondary market, in its Large Scale Asset Purchase or “LSAP” program. Because such programs are relatively new phenomena in the United States, it was difficult to predict with precision how the economy would react.² Without good historical experience to rely on, and because we are operating at the zero bound for the first time in post-war history, it is important to use the evidence we have to draw out a better understanding of LSAP programs and related channels.

There are many potential impediments to accurately measuring the effects of the LSAP program. First, it is difficult to isolate the impact of the program from other relevant changes such as shifts in fiscal policy, changes in policies of major trading partners, or developments in supervisory or regulatory policies that can have an impact on financial markets. Second, these programs have been operating when many economic and financial variables are outside their normal ranges. Thus, the impact of the program may differ depending on economic and financial conditions prevalent during their operation. Third, to the extent that policy changes are

anticipated, the effect of a policy change may be difficult to measure with any degree of certainty.

[Slide 13] Despite these challenges, many researchers have begun to evaluate the policy channels that are impacted by an LSAP program.³ While there is much work to be done, and the sample of U.S. experience is fairly limited, allow me to provide my own take on the evidence that is currently available.

[Slide 14] Figure 5 shows the impact on mortgage rates of the announcements of the LSAP program – when it was first announced and at the March FOMC meeting when the parameters of the initial program were detailed.

Since the initial program focused on purchases of mortgage securities, one might expect the largest impact to be on mortgage rates. Mortgage rates that had been trading at 6 percent prior to the announcements declined to roughly 5 percent. Empirical event studies that try to correct for possible confounding events tend to find an impact on mortgage rates in the range of 25 to 100 basis points. Thus, I think the empirical evidence supports the view that an LSAP program can influence the market rate of the asset being purchased. Certainly the impact may be influenced by the economic and financial conditions at the time of the announcement and purchase. The scale of the program should be sensitive to the prevailing conditions, and the size of the program would need to vary to accomplish a particular interest rate outcome.

[Slide 15] An LSAP program will be most effective if it not only influences the rates on assets being purchased, but also influences rates on other assets with similar characteristics. For example, purchases of mortgage securities are likely to influence the price and yield of other long-term securities that may also be held by investors looking for long-term assets. As the rate

on MBS securities falls, some investors will look to buy these other assets, and the increased demand will bid up their prices and push down their rates.

[Slide 16] Indeed, as Figure 6 highlights, other long-term rates did fall with the LSAP announcements. Both long-term Treasury and corporate bond rates fell with the announcements. Several studies have concluded that the cross-correlation is relatively high, indicating that a broader array of long-term rates will be influenced by an LSAP program. Thus, the precise focus of the program's asset buy may be less critical than the broader fact that the central bank is purchasing long-duration securities, and that rates on all long-duration securities will be impacted by the program. Lower long-term rates should stimulate demand for assets influenced by the cost of borrowing long – such as investments by businesses, and home and car purchases by consumers.

[Slide 17] Another channel that LSAPs may influence involves conveying the likelihood that short-term rates will remain low. While the Federal Reserve has used language referencing “an extended period” in the FOMC minutes for some time, the markets interpretation of that period is likely to be influenced by actions taken.

[Slide 18] Indeed, as Figure 7 shows, prior to the LSAP program announcements the three-year Treasury rate had been trading above 2 percent. Since the announcements, the three-year Treasury rate has been below 2 percent – and more recently has been trading closer to the rate on shorter-term Treasuries. As of Wednesday of this week, the one-year Treasury was trading at 0.22 percent, the two-year was trading at 0.37 percent, and the three-year was trading at 0.57 percent. This compression of rates is consistent with market participants anticipating that low rates are likely to continue for quite some time. Of course, not only Treasury securities are

influenced by expectations of policy; rates on other securities of short to medium term are likely to be lower as well.

[Slide 19] Another area that is potentially impacted by an LSAP is foreign exchange. This is a mechanism that received significant attention at our earlier conference.

[Slide 20] Since exchange rates are determined by a variety of policies, both here and abroad, the empirical relationship may be difficult to detect. This is particularly true for the dollar exchange rate, where the precautionary demand for dollars can cause large movements in the exchange rate as investors look to park funds in dollars during periods of economic turbulence. Nonetheless, one might think that the exchange rate would be influenced by policies to reduce domestic interest rates as investors move funds to countries yielding a higher return. As Figure 8 highlights, the relationship with the LSAP and exchange rates is not visually compelling, but nonetheless this is a channel worth studying and better understanding.

[Slide 21] Another potential channel involves bank lending. As large corporations issue long-term debt at attractively low rates, they become less dependent on loans or lines of credits from banks. As larger firms move to capital markets for financing, it should free up bank balance sheets to allow a focus on those firms that really depend on banks for financing. The strength of this channel needs to be explored more thoroughly.

Concluding Observations

[Slide 22] This conference, more than 10 years after our earlier conference on the topic, has benefitted from the additional experience that countries around the world have had, in the interim, with monetary policy in a low inflation environment. I would summarize by saying that clearly, conducting monetary policy in a low inflation environment is difficult – and particularly

so when that low inflation environment also includes wrenching financial difficulties and stubbornly high unemployment rates. At our earlier conference there was probably too little appreciation of the potential challenges, and too low a weight placed on how a low inflation environment could be hampered by the zero lower bound on short-term interest rates.

While it may be too early to draw *firm* conclusions about monetary policy at the zero bound for short-term interest rates, I would like to draw some tentative conclusions.

- First, a policy of gradually adjusting monetary and fiscal policy, as conducted in Japan after deflation first occurred, may not be as effective as an active policy response taken before deflation has become embedded in the economy. Of course, it should depend on the given situation and incoming data.
- Second, while monetary policy may have difficulty fully offsetting a severe shock when the zero bound is hit, there are still important channels for monetary policy to use to mitigate the negative shocks.
- Third, it is not a coincidence that in Japan, the United States, and Europe these economic problems have been encountered in conjunction with banking and financial market problems. Analysis of monetary policy with the zero bound needs to more richly capture the aspects of the *financial* sector that are major contributors to economic difficulties.

- Finally, we all recognize that conducting unconventional monetary and fiscal policy at the zero bound requires political will. This of course must be factored into any analysis of policy options.

Thank you, and I look forward to the rest of today's discussion on this crucial topic.

NOTES:

¹ The inflation rate was 2.1 percent in October 1999 as measured by the year over year change in the core CPI, and 2.56 percent as measured by the overall CPI.

² In the discussion paper entitled "Flow and Stock Effects of Large-Scale Treasury Purchases," Stefania D'Amico and Thomas B. King of the Federal Reserve Board's Division of Monetary Affairs note that "During the crisis of 2008, policymakers took a number of extraordinary steps to improve the functioning of financial markets and stimulate the economy. Among the most important of these measures, in terms of both scale and prominence, were the Federal Reserve's purchases of large quantities of government-backed securities in the secondary market, conventionally known as the Large Scale Asset Purchase—or "LSAP"—programs. The LSAPs included debt obligations of the government-sponsored housing agencies, mortgage-backed securities (MBS) issued by those agencies, and coupon securities issued by the U.S. Treasury, and they collectively amounted to \$1.7 trillion over a period of about 15 months—the single largest government intervention in financial-market history. Given the unprecedented size and nature of these programs and the speed with which they were proposed and implemented, policymakers could have had, at best, only a very rough ex ante sense of their potential impact."

³ See for example "Large-Scale Asset Purchases by the Federal Reserve: Did They Work?" by Joseph Gagnon, Matthew Raskin, Julie Remache, and Brian Sack; Federal Reserve Bank of New York Staff Reports, no. 441, March 2010.

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55th Annual Economic Conference

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October 1999 Conference

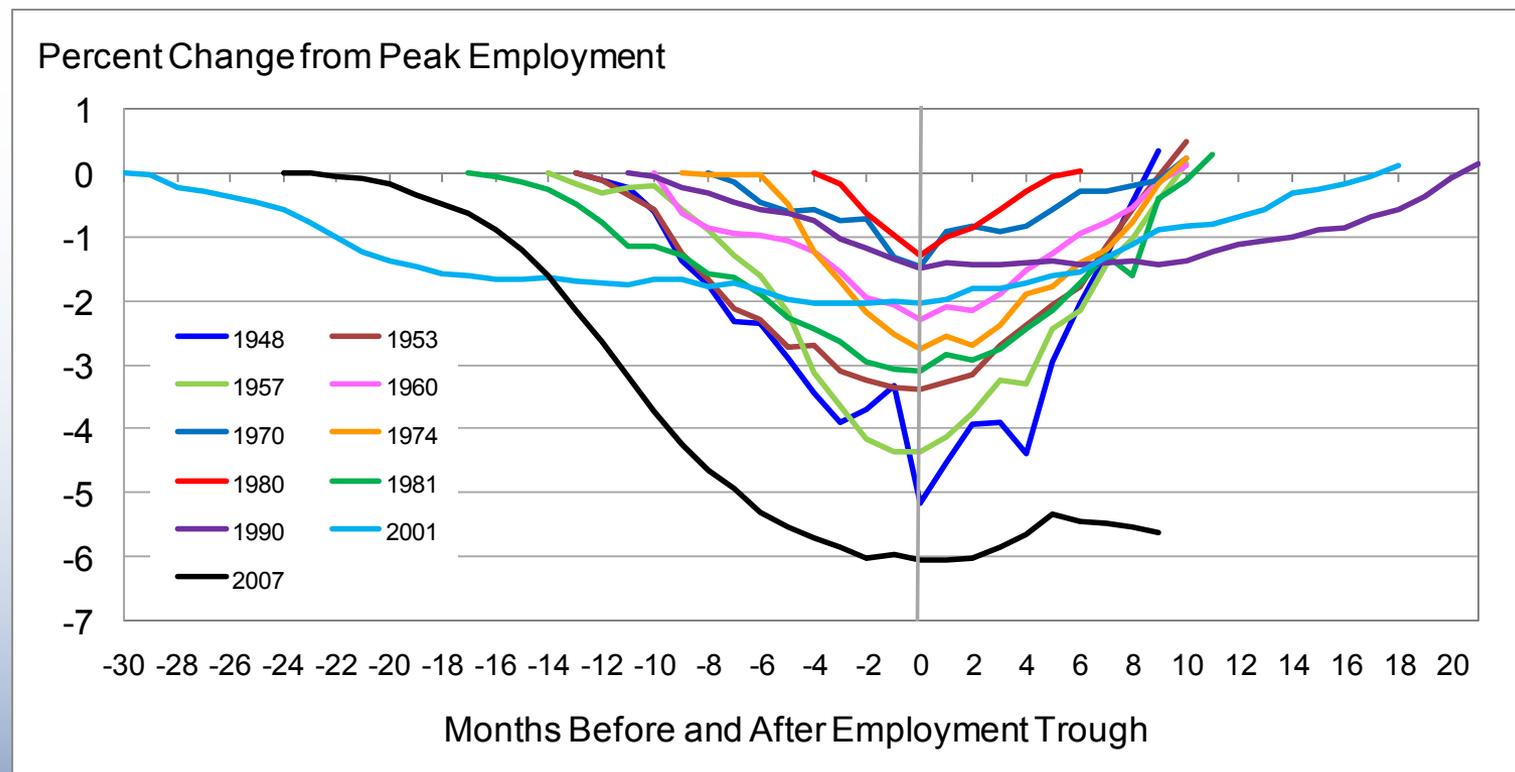
- Alan Blinder noted it was interesting that the Fed, rather than the BOJ or Euro area, was hosting such a conference
- Very different economic circumstances
 - Great Moderation – growing confidence that volatility and severe business cycles had been tamed
 - Unemployment was only 4.1%
 - Inflation was 2.1%

General Observations from that Conference

- Monetary Policy would be challenging if the zero bound for short-term rates was hit
 - Kazuo Ueda: “It will be more painful than you can possibly imagine”
 - But several participants noted Japan was on the mend
- Hitting the zero bound was thought likely to be rare
- Some disagreement on how effective alternative policies would be – though little reason not to try

Figure 1

Employment Change in Post World War II Recessions



Source: BLS / Haver Analytics

Financial Matters

- Another feature: difficulties within financial institutions and markets, and their contributions to the downturn
 - Earlier conference: due concern about banking and financial markets, but their role in aggravating the business cycle not fully appreciated
 - A challenge: how best to incorporate financial market developments in economic models

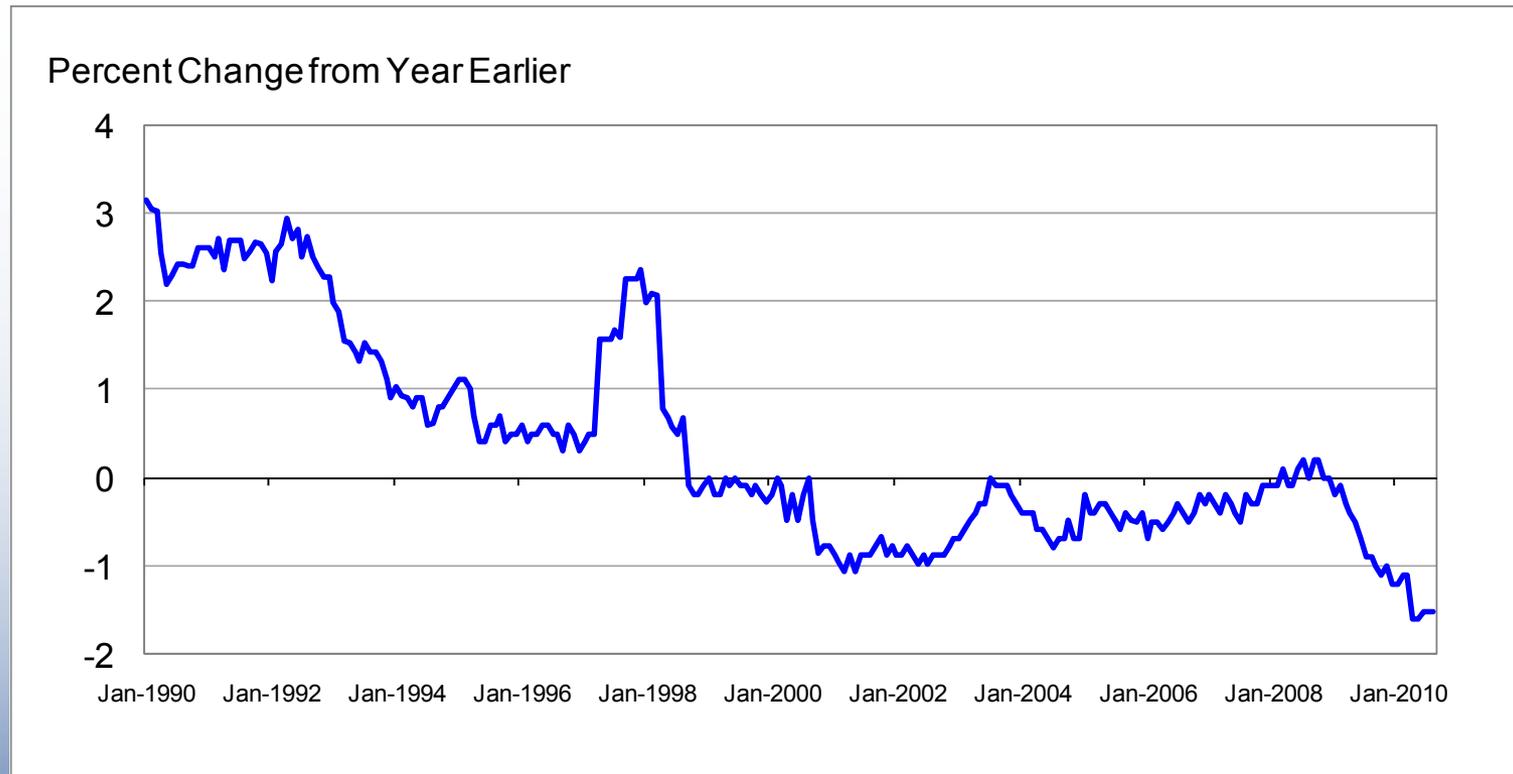
Circumstances of this Conference are Quite Different

- Instead of Great Moderation we are recovering from the Great Recession
- Japan is still fighting deflation a decade later
- Japan, US, Euro area have all dropped interest rates dramatically
- US has persistently high unemployment rates, inflation well below 2%, and lingering financial headwinds
- No longer an academic discussion

Figure 2

Japan's Core Consumer Price Index

January 1990 - August 2010



Source: Ministry of Internal Affairs and Communications / Haver Analytics

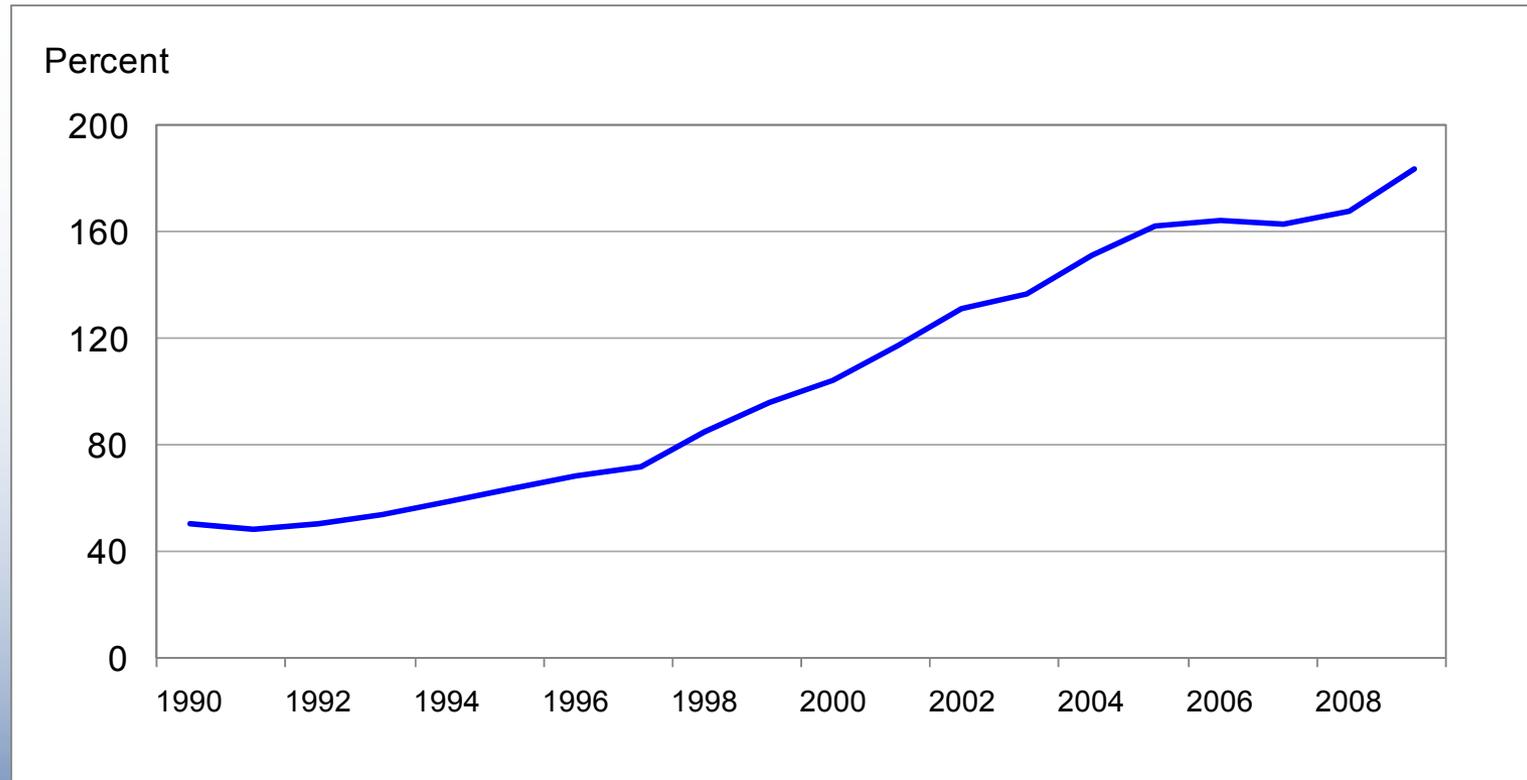
Observations on Japan's Battle with Deflation

- Core inflation initially low but positive
 - Then monetary and fiscal tightening; delay in addressing financial sector problems
- Monetary policymaking challenges due to lingering problems in banking system, financial markets
 - Transmission occurs through the banking system
- Deflation is pernicious; difficult to counteract once firmly established

Figure 3

Japan's Government Debt as a Percentage of GDP

1990 - 2009

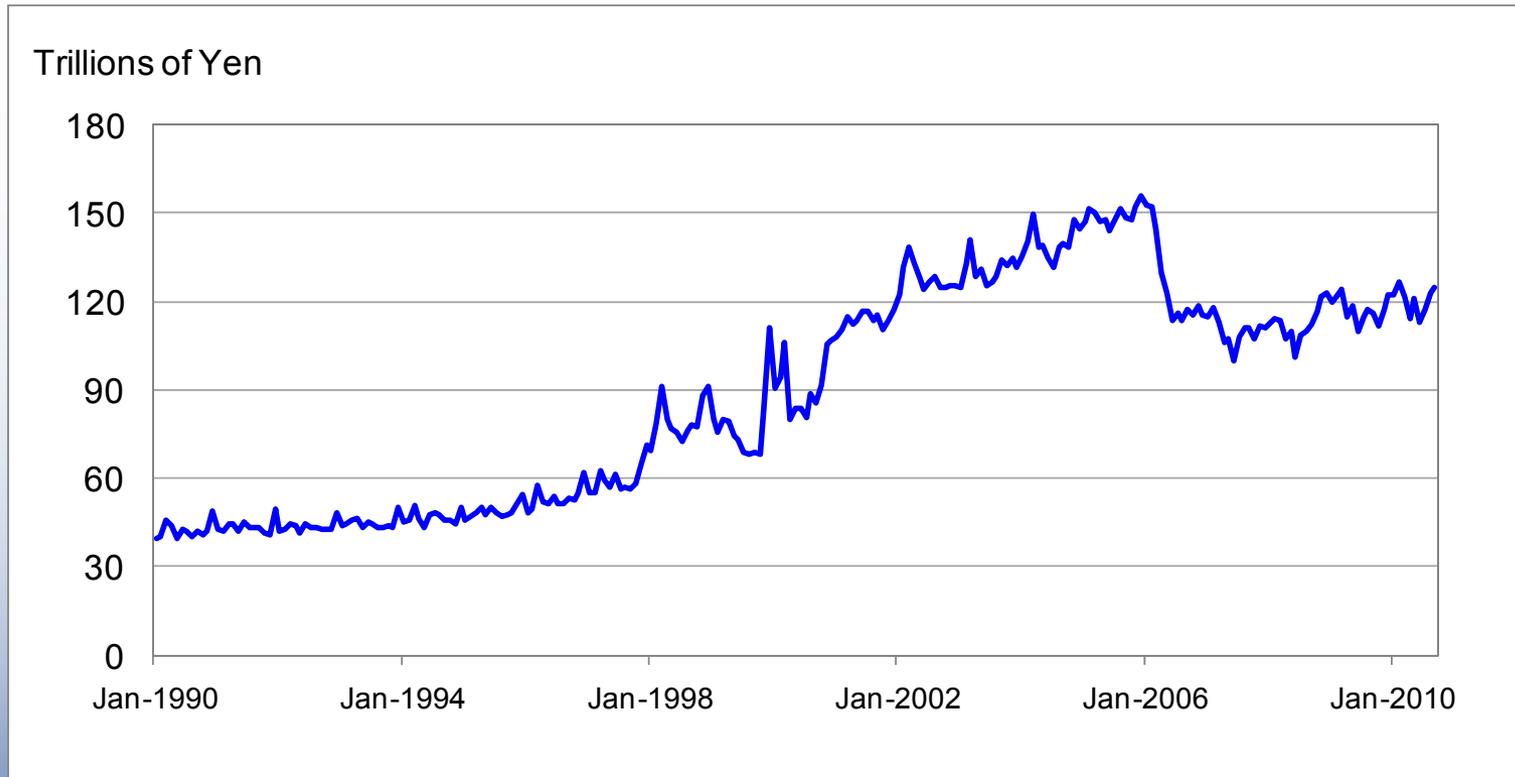


Source: Bank of Japan, Cabinet Office / Haver Analytics

Figure 4

Bank of Japan Total Assets

January 1990 - September 2010



Source: Bank of Japan / Haver Analytics

Implications of Japanese Experience

- Good news – no evidence of deflation spiral
- Bad news – deflation has been difficult to overcome
 - Debt/GDP expanded significantly
 - BOJ did expand balance sheet significantly
- Policy implication – Prevention may be easier than cure
- Take out insurance against disinflation/deflation risk – it may be cheaper in the long run
- Fragile economies may be particularly vulnerable to negative impact from premature austerity

Lessons from the LSAP Program

- Important to use the evidence we have, to develop a better understanding
- Many potential impediments to accurately measuring effects
 - Difficult to isolate the impact
 - Economic and financial variables outside normal ranges
 - Effect of anticipation of policy changes

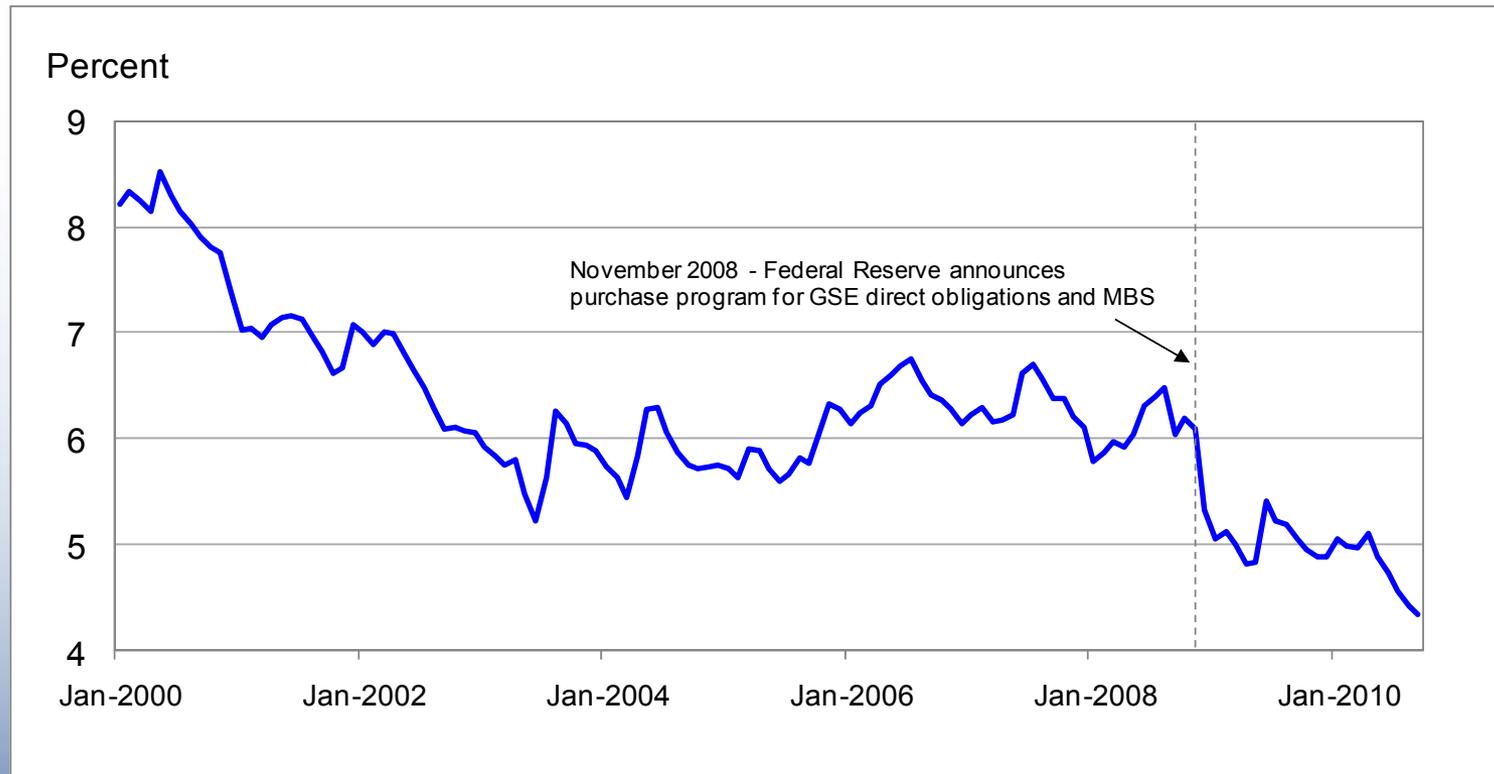
LSAP Channels

- **LSAP can successfully reduce long-term rates...**
- Cross-correlation of assets implies other rates will fall
- Does signal intent to keep rates low – medium term Treasuries did move
- Exchange rate channel may be important
- Lending channel – firms with access to markets leave banks, providing more capacity for banks to focus on bank-dependent customers

Figure 5

Rate on 30-Year Fixed-Rate Conventional Mortgage

January 2000 - September 2010



Source: FHLMC / Haver Analytics

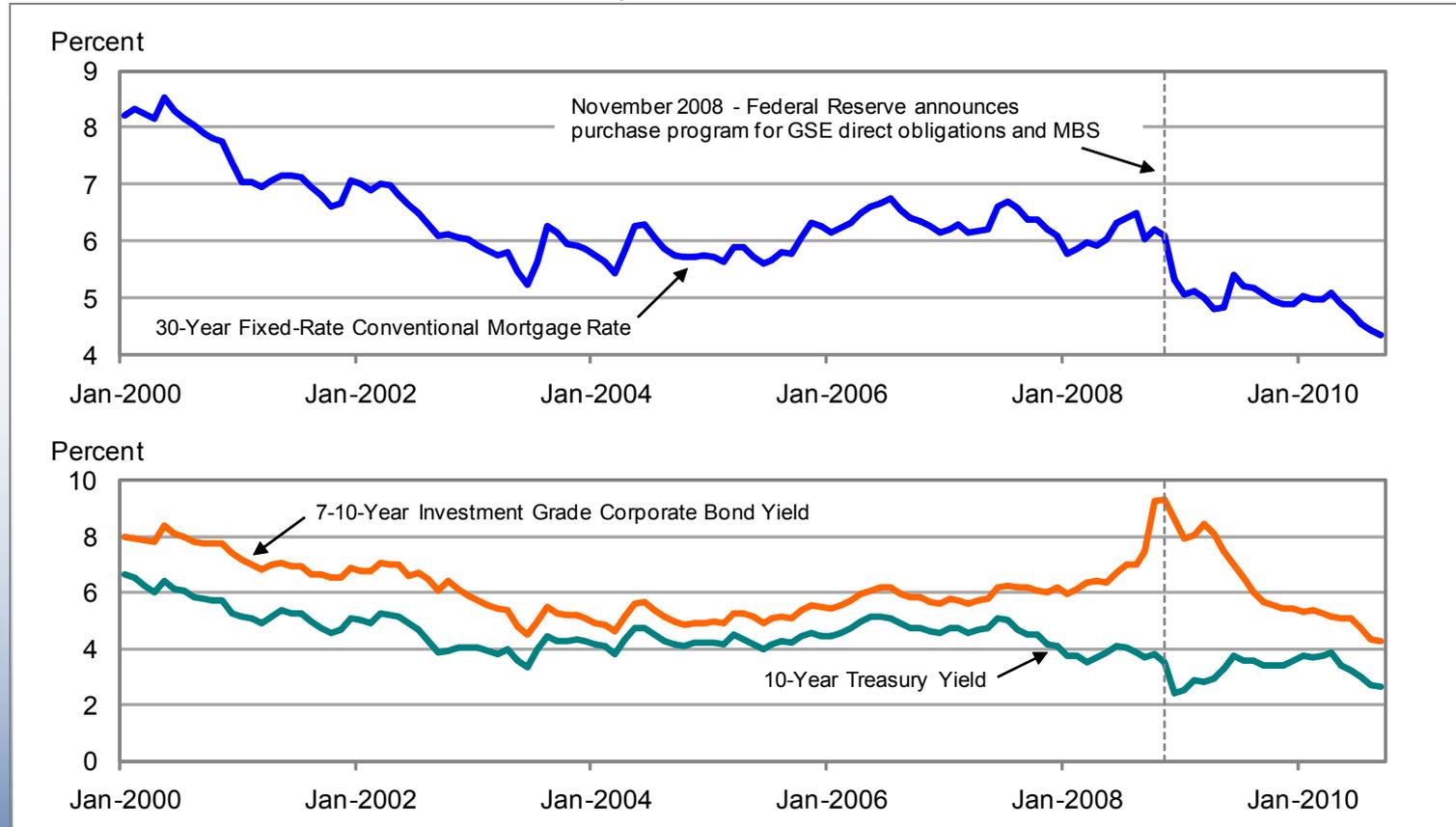
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Figure 6

Mortgage Rates, Treasury Yields, and Corporate Bond Yields

January 2000 - September 2010



Source: FHLMC, Federal Reserve Board, Bank of America-Merrill Lynch / Haver Analytics

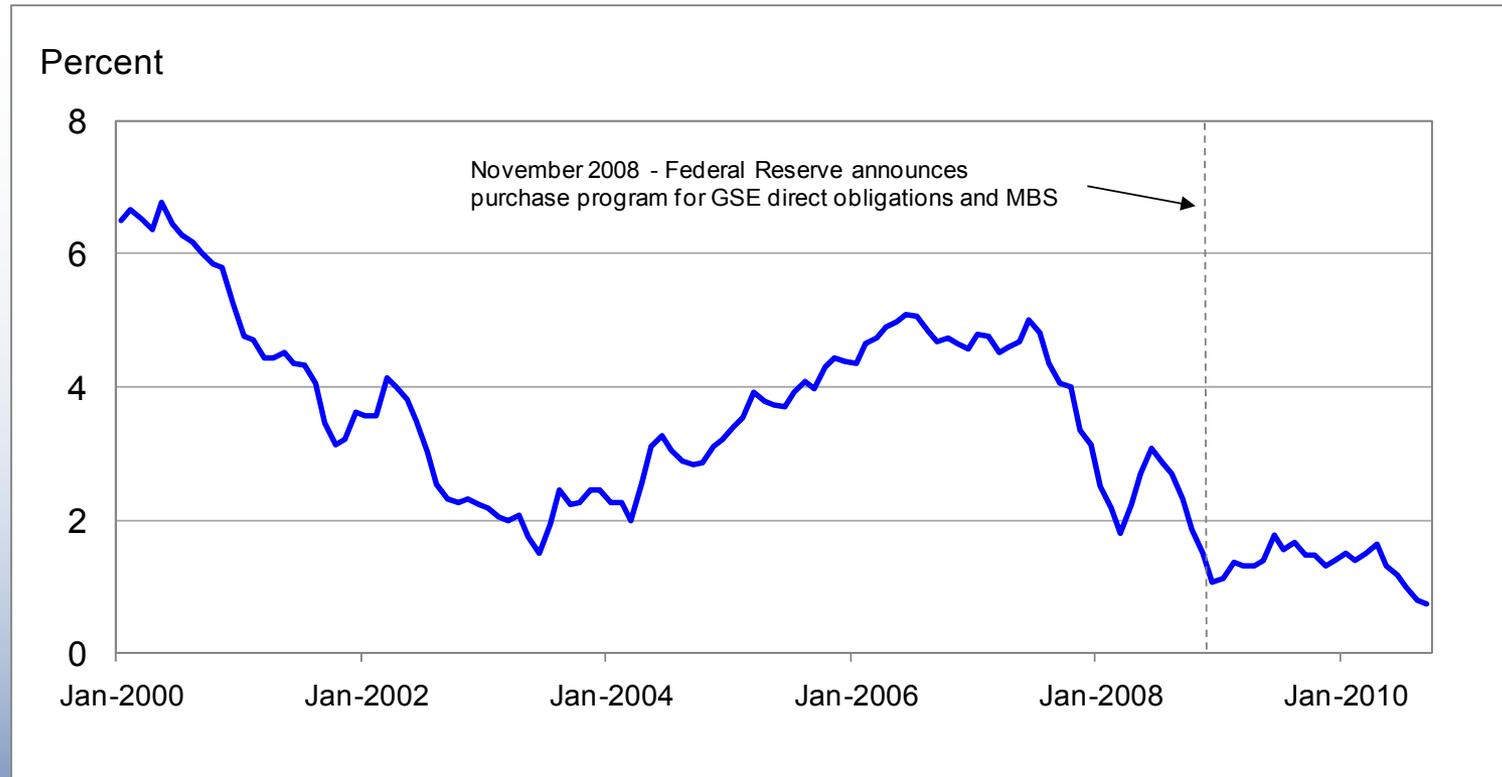
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Figure 7

Three-Year Treasury Yield

January 2000 - September 2010



Source: Federal Reserve Board / Haver Analytics

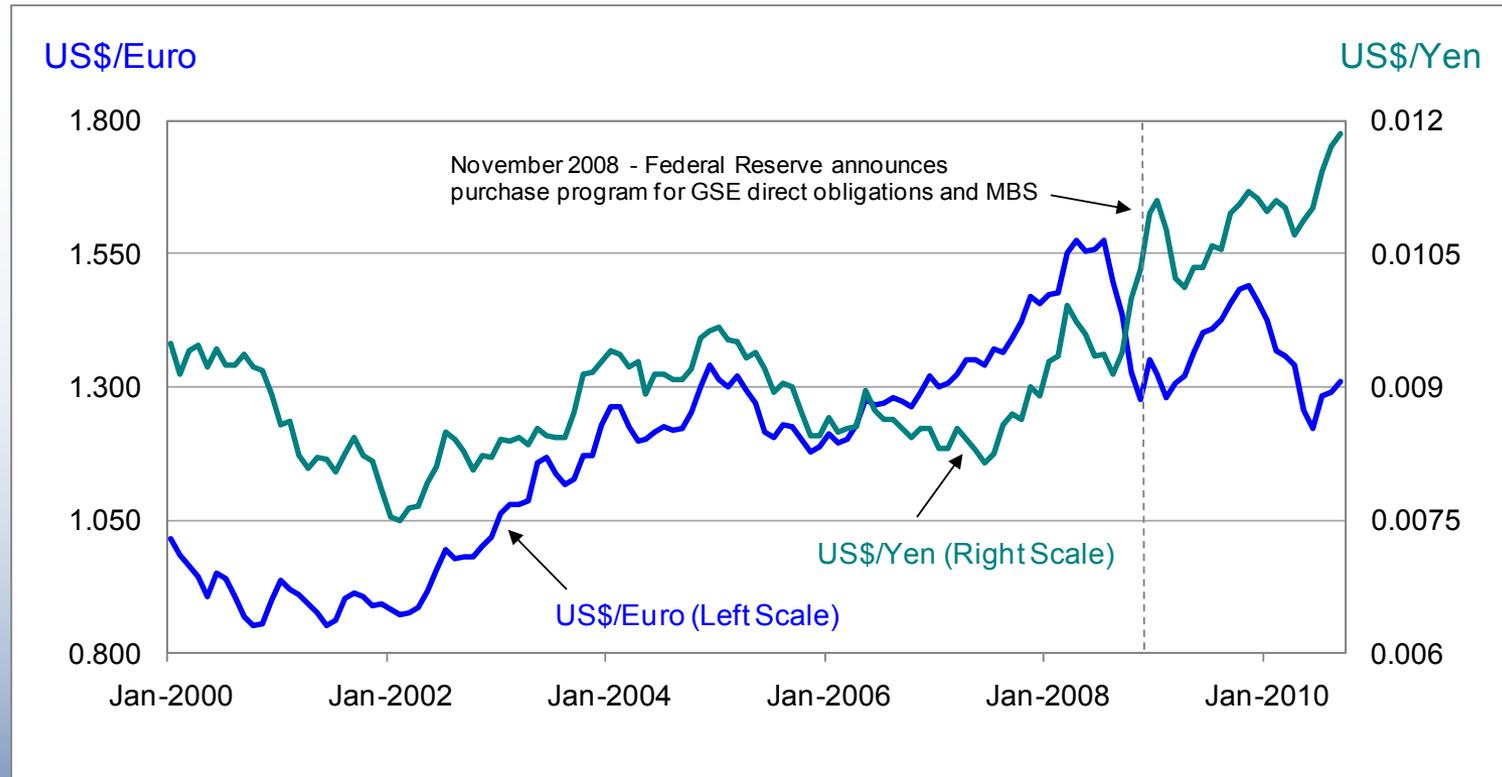
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Figure 8

Exchange Rates: US Dollar vs Eurodollar and Japanese Yen

January 2000 - September 2010



Source: Federal Reserve Board / Haver Analytics

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Concluding Observations

- Clearly, difficult – more than was appreciated in 1999
- Gradual response may not be as effective as a more active one, before deflation becomes embedded
- Monetary policy challenged; but there still are important channels for monetary policy to use
- Role of banking and financial market problems – major contributors
- Political will – a key consideration