

Concluding Panel Discussion: Financial Markets and the Real Economy in a Low Interest Rate Environment

Introductory Remarks

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Let me begin by thanking the Bank of Japan for hosting this conference and organizing such an inspiring program with high-quality papers on subjects of great interest both to central bankers and academics. I feel honored to have been given the opportunity to chair this panel discussion.

The issues that will be discussed here today are challenging and involve questions that most central bankers have considered and discussed during the last several years. One question is whether the overall low levels of interest rates have resulted in increased risk taking in the global financial system—that is, has there been a “search for yield” among investors? Another important question relates to the intensely debated issue of how monetary policy should deal with developments in asset markets and whether there is a trade-off between financial stability and real stability. In my remarks, I would like to describe my views on these issues, although it should be kept in mind that my remarks have a “home bias” in the sense that they do not deal with a post-bubble period such as that of Japan.

Concerning the suggested trade-off between financial and real stability, I think it is reasonable to assume that price stability in the long run promotes financial stability, for example, by improving the functioning of the price system and thereby reducing the risk of misallocated investment. This is not to say, however, that price stability is a guarantee of financial system stability.

One type of development that might cause difficulty is when structural factors dampen inflation and induce central banks to keep interest rates lower than would otherwise have been justified by, for example, the cyclical position of the economy.

It might be argued that there are some parallels between this description and recent developments in the world economy. Central banks have certainly kept interest rates low in recent years as inflation has been restrained. The low rates of inflation are, in

1. These remarks are written based on my introductory discussion given at the conference. The views expressed are my own and do not necessarily reflect those of the other members of the Executive Board of Sveriges Riksbank.

turn, probably due in part to structural forces such as the integration of emerging markets into the world trading system, which has put downward pressure on prices of manufactured goods. At the same time, prices of many kinds of assets have surged. Indeed, the low policy rates may have led investors to “search for yield” in other assets and markets, potentially with an under-pricing of risk as a result. However, taking a longer-term perspective, volatility in most markets has not been extremely low the last few years—in fact, there is only one market where volatility has been unusually low in recent years, and that is the money market.

Perhaps the area where the current low interest rate regime, outside of Japan, has had its most marked impact is in residential property prices, and given the attention it has received from policymakers, academics, and the general public, I would like to briefly comment on this. The rise in housing prices during the last 10 years has indeed been unprecedented in duration, magnitude, and synchronization across countries.² This has led some commentators to label it history’s first global housing bubble.³ Given the falling level and volatility of interest rates during the last few years, it is no wonder that housing prices have surged. But a number of important structural changes have occurred in the global housing finance market. The functioning of mortgage markets has improved, with, for example, technological advances, new instruments, and better risk pricing and risk modeling.⁴ However, important differences remain among domestic housing markets, and residential property markets are to a large extent local markets; thus, prices are heavily influenced by domestic factors such as developments in the real economy and structural differences among housing markets.

So, given the low inflation rates and surging asset prices, and again—this excludes Japan—what does this mean for the conduct of monetary policy? It can be claimed that the inflation-targeting framework that most central banks follow today, explicitly or implicitly, is—at least in principle—designed to deal with asset price developments and financial imbalances “automatically.” If policies are applied with a high degree of flexibility and the policy horizon is sufficiently long, it is in principle possible to take account of the full effects of financial imbalances accumulated over many years on inflation and the real economy.⁵

In practice, of course, this task is far from easy. Since it can be quite difficult to tell whether a financial imbalance is building up, let alone how and when it will unwind, it is inherently hard to incorporate these types of developments in a central bank’s conventional analyses and forecasts. Yet, even though they are difficult to translate into quantified forecasts, concerns about imbalances in asset markets must be addressed somehow. One way to do this could be to let them affect somewhat the timing of interest rate changes, for example, by starting a tightening cycle somewhat earlier than would be justified by conventional forecasts of inflation and real economic developments alone. It seems that this is essentially the way in which

2. See OECD (2005).

3. See, for example, *The Economist*, “In Come the Waves,” June 16, 2005.

4. See Committee on the Global Financial System (2006).

5. See, for example, Bean (2004) and White (2006).

central banks have tended to deal with, for example, the sharply rising housing prices in some countries.

This is, however, hardly the last word on this matter, and I suspect that the question of how monetary policy best should deal with asset price developments in practice will be on the agenda for quite some time yet.

One important channel through which monetary policy works is by shaping long-term interest rates, which in turn affect the level of economic activity. Regardless of whether a central bank conducts monetary policy in a traditional way (i.e., by adjusting the policy rate) or by a more unconventional method such as, for example, “quantitative easing,” shaping long-term interest rates has never been easy.⁶ In fact, the empirical support for the expectations hypothesis—the crucial link between a central bank’s instrumental rate and long-term interest rates—is rather mixed.⁷ And, of course, when it comes to long-term real interest rates, one can only hope for a temporary effect anyway, since in the really long run, monetary policy cannot affect real variables.

A further complication is that the monetary transmission mechanism may also have changed. Housing finance is at least one area where the lower interest rate environment potentially has had a rather substantial effect. As mentioned earlier, lower and less variable interest rates have increased the demand for housing loans, particularly the demand for adjustable rate loans.⁸ Hence, there has probably been a fundamental change in the way monetary policy works, with the household sector nowadays exhibiting more sensitivity to changes in the policy rate.⁹

In any case, it is quite likely that we must get used to a situation where domestic long-term real interest rates are largely determined in a global market. This may have implications for how we ought to look upon the interest channel of the transmission mechanism.¹⁰ If long-term real interest rates are determined in the global market, the central banks’ scope for affecting domestic real long-term yields—and hence economic activity—through monetary policy would be reduced. However, since our knowledge of the transmission mechanism in general is far from perfect, it is difficult to infer today what the final consequences for monetary policy will be.

These are but a few reflections before the discussion starts.

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6. See Bernanke and Reinhart (2004) for an overview of monetary policy strategies that do not target the policy rate.

7. See, for example, Thornton (2004).

8. See Committee on the Global Financial System (2006).

9. See Sellon (2002).

10. See Thornton (2005).

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Panelists' Remarks

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Let me thank the organizers of the conference for inviting me to speak today about the U.S. experience with low interest rates in 2003.

To set the stage, consider the economic circumstances in early 2003. The recession that began in the spring of 2001 and the recovery that began late that year deviated substantially from the average cycle since 1960 in the key dimensions of real GDP, real business fixed investment, and nonfarm payroll employment. In Figure 1, each of these dimensions is indexed to one at the trough of recessions prior to 2001 to create an average path of recession and recovery observed since 1960. The comparable paths around the trough in 2001 are shown in Figure 2, and quarters 4 through 6 after the trough correspond to late 2002 and early 2003.

In early 2003, the quality and durability of the recovery was in question. Real GDP had grown more slowly than in the average cycle. More striking, employment had failed to grow at all, creating the so-called "jobless recovery." Subsequent research has suggested that at least part of the anomalous behavior of employment at that time related more to changes in the trend participation rate and less to cyclical factors, but that determination was not possible at the time. Business fixed investment, a major driver of the U.S. expansion in the 1990s, continued to decline steeply after the recession's trough. The challenge was to determine whether the sluggish recovery in investment reflected "overhang" from the boom of the late 1990s, or a more fundamental retrenchment in sentiment or underlying opportunities.

Figure 1 Average of Cycles since 1960

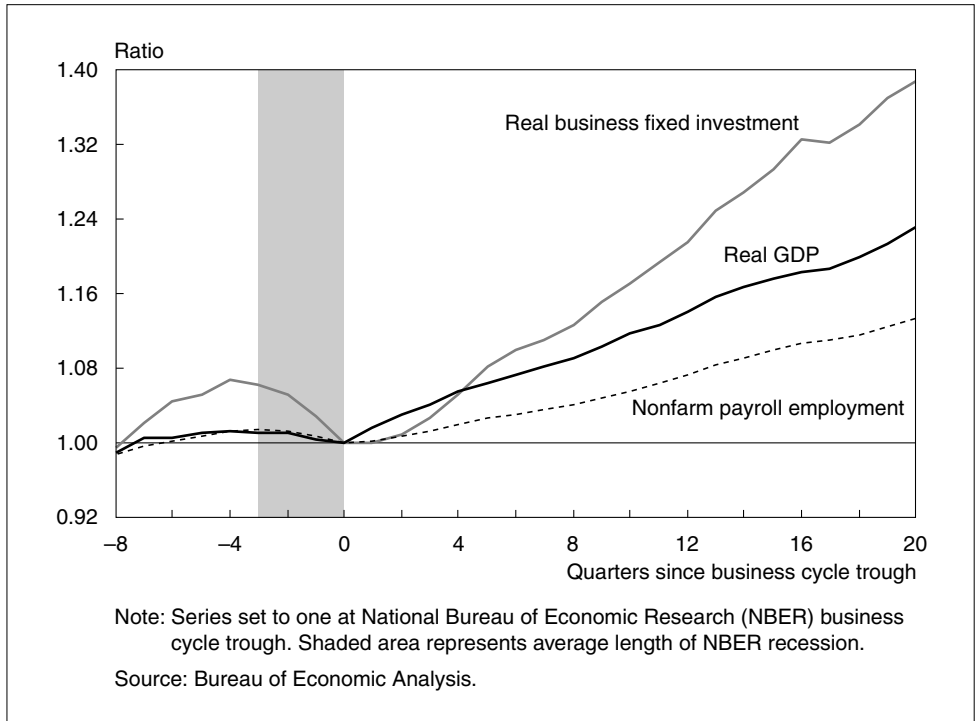
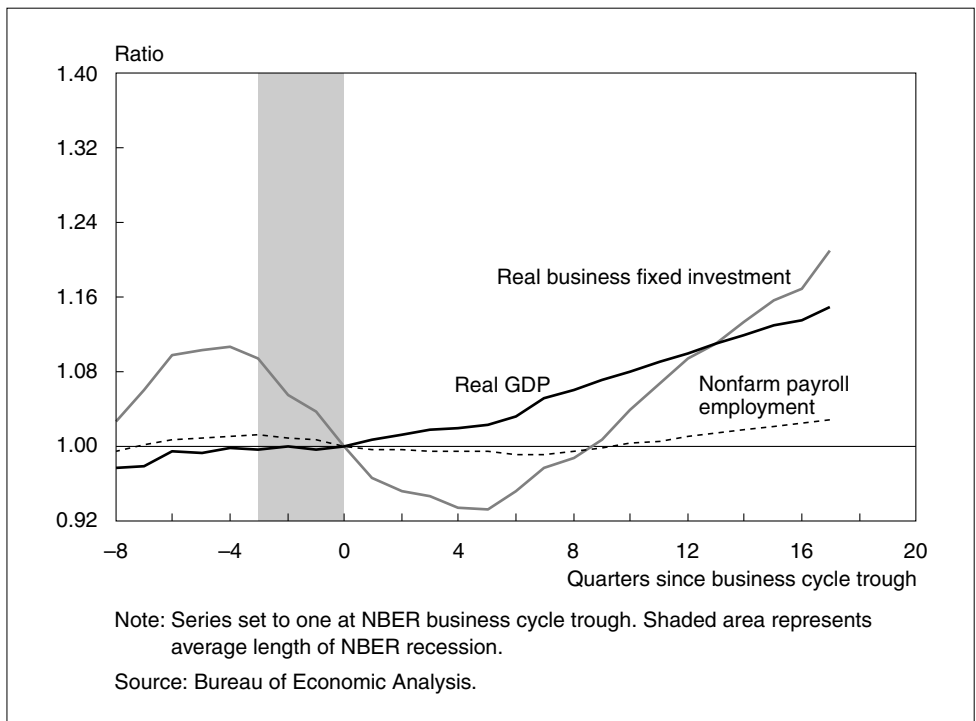


Figure 2 The Current Cycle



Inflation measured by the core personal consumption expenditure (PCE) deflator and the core consumer price index (CPI) ebbed after the 2001 recession, falling toward 1 percent. Figure 3 places the behavior of inflation measured by the core PCE deflator during this episode in the broader context of extensive disinflation in the 1980s and 1990s.

The Federal Open Market Committee (FOMC) of the Federal Reserve System had already responded very aggressively to economic weakness in 2001. As shown in Figure 4, the FOMC reduced the federal funds target from 6.5 percent at its mid-2000 peak to a low of 1.75 percent by the beginning of 2002.

What these data cannot fully convey is the substantial uncertainty faced by policy-makers in early 2003. A full year after the recession had ended, both employment and investment were below their levels at the trough and core inflation was falling. The unsatisfying economic performance occurred despite aggressive easing by the Fed and substantial federal fiscal stimulus. With the potential need for further monetary easing, the zero bound on interest rates appeared as a significant future constraint, even if some distance away. A related practical question was how monetary policy should best utilize the remaining distance between prevailing rates and the zero bound, should it prove necessary. In the event, the FOMC reduced its federal funds target twice more, in November 2002 and June 2003.

The developing academic literature on monetary strategies in the presence of low interest rates was influential in the face of this uncertainty. An important case study

Figure 3 Core PCE Inflation

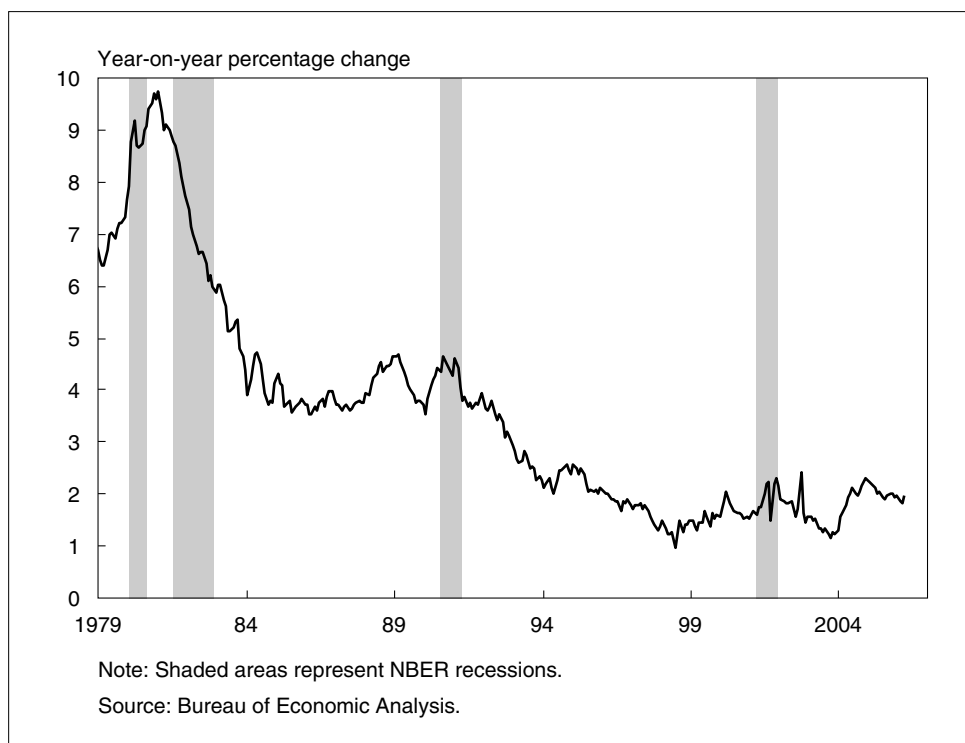
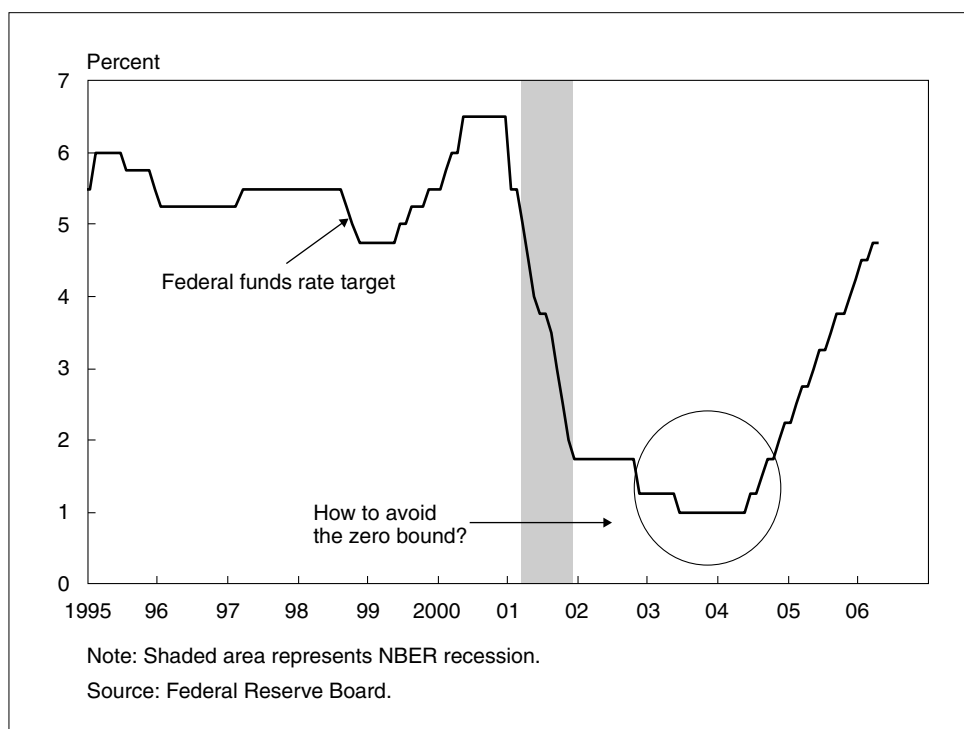


Figure 4 Monetary Policy Challenges

for the literature was the experience of Japan since its recession in 1991. One strand of research examined how an already slow economy would respond at low interest rates to more or less aggressive central bank interest rate reductions in the face of a negative shock, and, among other analyses, assessed the risks of slipping into a serious deflation. That work suggested the desirability of avoiding the zero bound. Another strand considered what policy options were available once the zero bound was reached.¹¹ That strand described how central bank actions to influence expectations of future policy could effect monetary policy easing in the presence of the zero bound.

The influence of this literature can be seen in the near-contemporaneous discussion of monetary policy issues by senior Fed officials Ben Bernanke and Vincent Reinhart in late 2003.¹² Bernanke and Reinhart noted that it was not necessary to wait until the policy rate had reached the zero bound before influencing expectations of future policy by choosing among various types of unconditional and conditional commitments. They also suggested an assisting role for open market operations as a means of demonstrating commitment to a communicated strategy.

The FOMC on August 12, 2003, incorporated forward-looking language into its post-meeting press release, often called the “statement,” in what I would describe as an implicit conditional commitment. Unlike the Bank of Japan around this time, the FOMC did not provide a quantitative description of the economic conditions it was

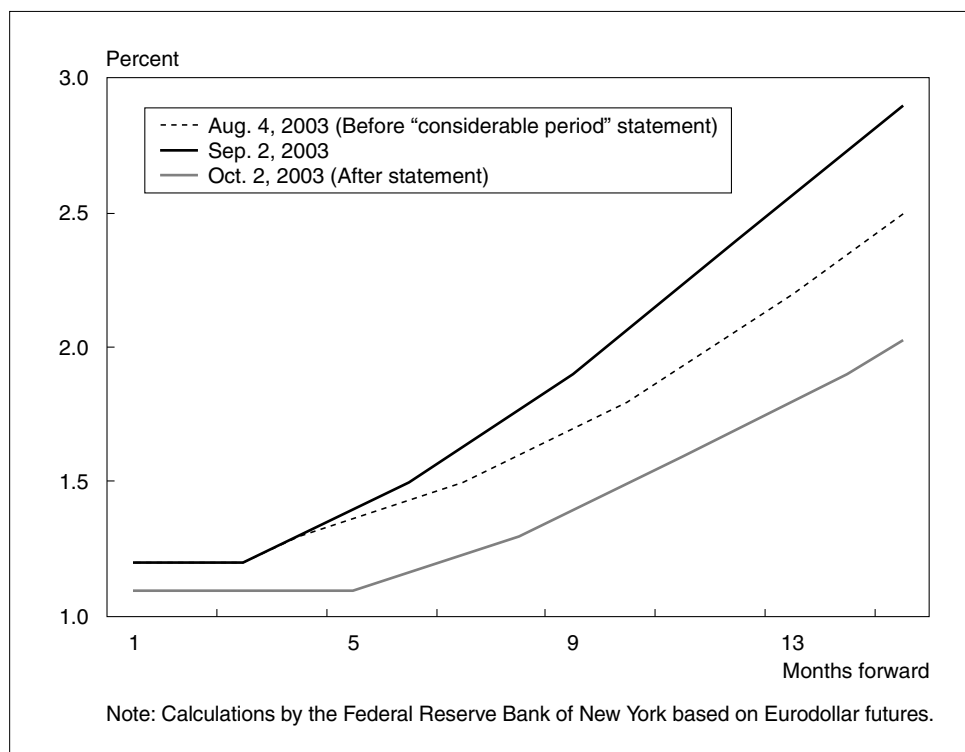
11. Most notably, Eggertsson and Woodford (2003).

12. See Bernanke and Reinhart (2004).

seeking to achieve. Rather, its statement highlighted the “risk of inflation becoming undesirably low” as the “predominant concern” of monetary policy “for the foreseeable future” and concluded that monetary policy accommodation “can be maintained for a considerable period.”¹³ Over time, the evolution of the language of this implicit commitment (“it [the FOMC] can be patient,” “at a measured pace”) evolved in line with the changing assessment of the risk of an unwelcome further fall in inflation.

The behavior of asset prices in those financial markets that can be interpreted as gauges of future expectations of monetary policy suggests that it took some time for market participants to absorb the FOMC’s implicit conditional commitment. When the Fed inserted the “considerable period” language into the August 12, 2003, statement, the federal funds futures curve initially forecast higher forward interest rates for a time, as shown in Figure 5, perhaps reflecting increasing signs of a more robust economic recovery. Measures derived from the Eurodollar market, depicted in Figure 6, provide additional context.¹⁴ The implied skewness measure derives from three-month to nine-month maturities of Eurodollar options and captures the implied difference in probability between a rise and a fall in short-term interest rates; a negative value signifies that the probability of a decline outweighs the probability of a rise in interest rates. The sharp rise from negative values of this measure in the summer of

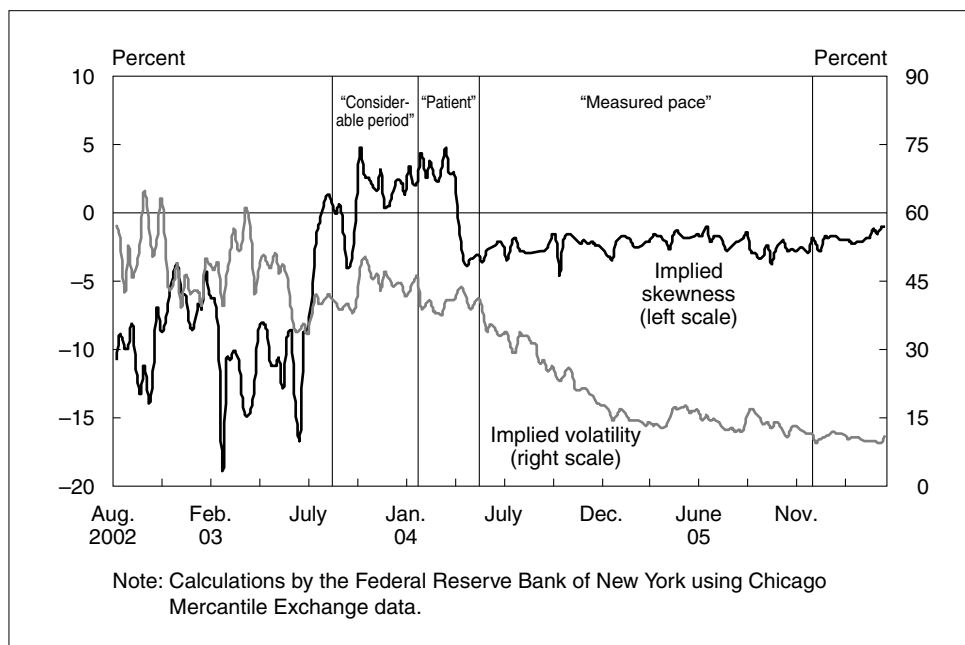
Figure 5 Expected Federal Funds Target Rate, Fall 2003



13. The August 12, 2003, and subsequent statements can be found at www.federalreserve.gov/fomc/.

14. I am grateful to my colleague Josh Rosenberg for bringing these measures to my attention and providing the computations for Figure 6.

Figure 6 Gauging the Stance of Monetary Policy



2003 suggests that market expectations were shifting from expectations of further easing to an assessment that the next move in short-term interest rates could just as likely be a rise or a fall, even before the August statement. Implied volatilities measured for the same instruments and maturities had begun to fall in early 2003, but initially rose after the August statement and remained elevated for a time thereafter. But with the repetition of the FOMC’s message in its subsequent statements, implied skewness eventually turned mildly negative and implied volatility began a steep decline—with much of the change occurring after FOMC statements had moved from “considerable period” to “measured pace.”

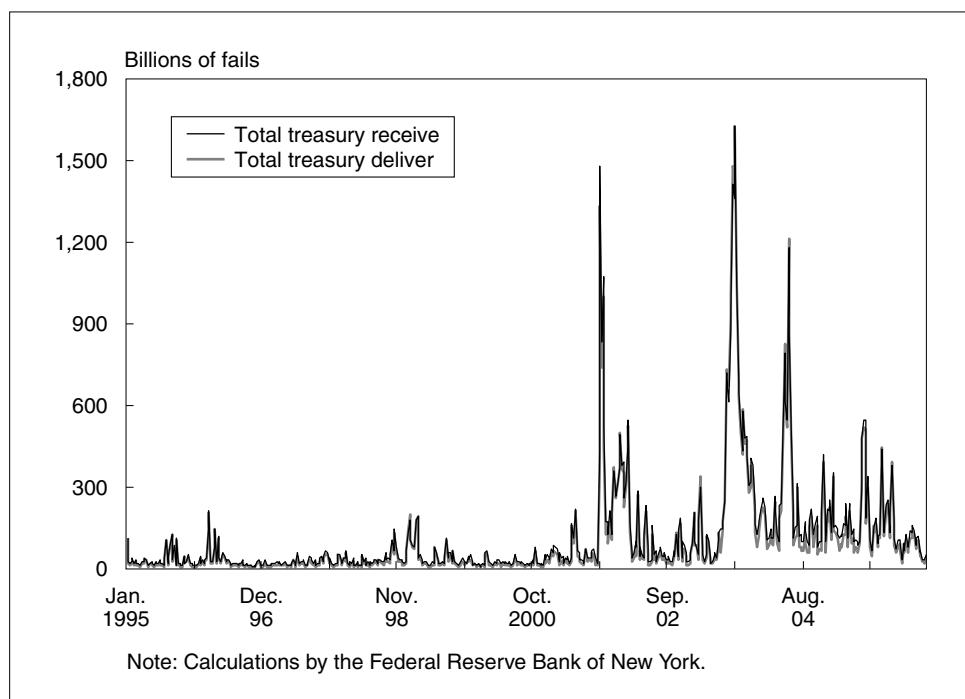
Another set of concerns in early 2003, reflected by Bernanke and Reinhart in late 2003, involved how well institutional arrangements in the financial markets might fare at very low short-term interest rates. The United States had not experienced short-term interest rates below 2 percent since the pre-inflationary period of the 1950s and early 1960s. Considerable transformation had occurred within the financial system in the intervening years. In the core markets of concern to central banks, the money market mutual fund industry had developed as a substitute for bank deposits and expanded substantially; the volume of securities lending and repurchase (repo) and reverse repo transactions in the U.S. Treasury securities markets had grown exponentially; and competition in the U.S. banking industry had intensified at all levels.

Analysis and some experience in 2003 suggested that financial markets and market infrastructures and arrangements were flexible enough to accommodate a return to very low short-term interest rates and thus should not be an impediment to pursuing an appropriate low interest rate policy. Consider money market mutual funds. By convention, the returns earned by money market mutual fund shareholders are

reduced by the amount of fees and expenses. A risk existed that as interest rates on the short-term investments made by money market mutual funds fell below 1 percent, money market fund shareholders would observe returns net of fees approaching zero and shift their assets from money market funds to bank deposits. The risk appeared low because (1) most money market funds had very low fees; (2) the convention on the treatment of fees could be changed to an explicit charge, if necessary; and (3) a scenario analysis of the impact of a major shift into deposits suggested that larger commercial banks and their holding companies would be able to manage the major consequence of an expansion of deposit liabilities, a reduction in capital ratios.

Actual experience in the Treasury markets provided a lesson in financial market adaptation to the low-rate environment. A marked increase in Treasury security settlement fails occurred in the summer of 2003, as seen in Figure 7. The repo and reverse repo markets are key funding markets for securities dealers and banks, and the Treasury market is the baseline for pricing U.S. dollar securities; thus, the settlement issues were of interest to the central bank. A securities seller typically fails to deliver securities because of an operational problem. Under almost any other circumstance, the seller can borrow the securities in the market and deliver them. However, if the cost of borrowing the securities approaches the rate of return on general collateral repurchase agreements, the seller becomes indifferent in choosing between a fail, where the seller forgoes the general collateral rate, and borrowing the securities.¹⁵

Figure 7 Treasury Fails



15. For a discussion of why securities settlement fails occur, see Fleming and Garbade (2005). For a description of the fails problem in 2003, see Fleming and Garbade (2004).

The incentive for fails increased substantially in the summer of 2003 as interest rates fell to very low levels, so that the gap between borrowing rates and general collateral rate was compressed, and technical factors associated with interest rate expectations increased the demand for borrowing. The result was a prolonged period of high settlement fails. The concern at the time was that persistent fails could create large counterparty credit risks and operational inefficiencies. A natural limit to the aging of fails results from high capital charges imposed on dealers after 60 days, but substantial risk could accumulate before then. When the problem was at its height, dealers innovated by creating a repurchase agreement with a stronger delivery commitment (the guaranteed-delivery special collateral repo). This innovation alleviated some market pressure, as did concerted industry efforts to clear the backlog and the auctioning of new Treasury securities.

A final concern was the impact on depository institutions of a prolonged period of low interest rates, especially since the maturity transformation involved in commercial lending occurs in the short end of the yield curve. In a normal business cycle, short-term interest rates are low when the economy is weak, but the yield curve typically becomes fairly steep. Flat yield curves tend to occur when the economy is expanding, and net interest margins remain large because banks assume more credit risk. Scenario analysis conducted by the Federal Reserve Bank of New York suggested that a prolonged period of low growth accompanied by very low interest rates and spread compression would put significant pressure on commercial banks. The pressures seemed greatest for smaller, more traditional institutions focused primarily on commercial lending, where margins were already thinning, while banks with a larger share of non-interest income in revenues would fare better. As in the case of mutual funds, it seemed likely that banks might cover the costs of collecting and managing deposits by raising deposit fees, if market interest rates were too low to allow banks to absorb those costs. Banks pursuing a traditional commercial lending franchise would also have the option to shift into other banking-related fee-based businesses.

How did the period of low interest rates come to an end? By the end of 2003, the economy showed signs of improvement, including growth in both employment and investment; inflation began to pick up by early 2004. The low growth, low interest rate scenario did not materialize. By mid-June 2004, the FOMC began to raise the federal funds rate target.

What lessons can be learned from the 2003 episode? These are my personal views.

First, the zero bound is a macroeconomic issue, a practical concern related to the ability of the central bank to offset a negative shock if interest rates are already low. It is an issue that is likely to stay with central bankers, at least in the background, as long as they are successful in keeping inflation rates low, a sort of dark lining to a silver cloud. With the policies undertaken in the summer of 2003, the FOMC avoided reaching the zero bound. In large part, this appears to reflect the FOMC's success in altering market expectations. Distinguishing how much of the overall macroeconomic impact to ascribe to monetary policy strategy and how much to the greatly delayed but ultimately emergent forces of recovery in place before 2003 is a subject for future research. However, without those pent-up natural forces of

economic recovery, it is possible that the monetary policy strategy might not have had the same short-run impact.

Second, the FOMC made important changes in the manner in which it communicated policy during this episode that persist to the present. A question to be resolved over time by future monetary policymakers and interpreted by monetary historians is the role of the specific innovations in the policy statement in 2003–04 within the FOMC's long-term advances toward greater transparency.

Third, institutional arrangements in the financial system can adapt to a low interest rate environment, but require timely engagement and coordination by financial market participants, something the central bank can encourage.

Finally, in my personal view, the 2003 U.S. experience of low short-term interest rates seems to support the case that central banks should aim for a low positive rate of inflation, rather than zero. Data alone cannot recall the very considerable uncertainty and concern about the efficacy of monetary policy at low short-term interest rates. The principal reason for targeting a low positive inflation rate is to stay safely away from the zero interest rate bound and the potential for deflation resulting from a severe negative shock. Moreover, research suggests that the economic costs of a low, positive rate of inflation are small.

Economic research has an important role to play in illuminating the question of low versus zero inflation. Central bankers would benefit from a concise description of the dynamics of the macroeconomy at very low short-term interest rates in order to understand the opportunities and risks in that setting. Such a description might in turn lead to a very practical addition to monetary policymaking techniques. If the concern about the zero interest rate bound is likely to recur sometime in the future given successful pursuit of the goal of low long-term inflation, central bankers would benefit from a clearer definition of deflation risk in terms of its consequences for real incomes and employment and a robust measurement of that risk. A definition and measurement of deflation risk would be especially helpful in communicating to the public a monetary policy strategy designed to combat deflation, if and when necessary.

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I. Introduction

I wish to thank the Bank of Japan for inviting me to this very interesting conference.

There are many reasons why central banks should understand monetary policy in a low interest rate environment, and one aspect of the problem is related to the zero bound on interest rates. This issue has received a lot of attention, particularly in Japan, and has been addressed by the previous panelist.

I will focus my remarks on a different issue, namely, the global decline of real interest rates in the last 15 years, its possible causes, and the problem that this may raise for the conduct of monetary policy, in particular, in the euro area.

II. A Few Facts and Questions

There are three facts I would like to focus on. First of all, nominal and real rates have declined since 1990 and, in particular, since 2000. Second, there has been a large increase in cross-country correlations of these rates, suggesting that these dynamics are driven by a global factor which is quite independent from local developments in real economic growth. Third, in 2004–05 we observed a resilience of the long-term nominal rate with respect to changes in the short-term rate in the United States and possibly elsewhere (this is what then-Federal Reserve Chairman Alan Greenspan called the “conundrum”).

Figure 1, which plots the *ex ante* (survey-based) 10-year real interest rates for Germany, the Euro area, Japan, the United Kingdom, and the United States since 1990, illustrates the decline in real rates and their cross-country correlation.

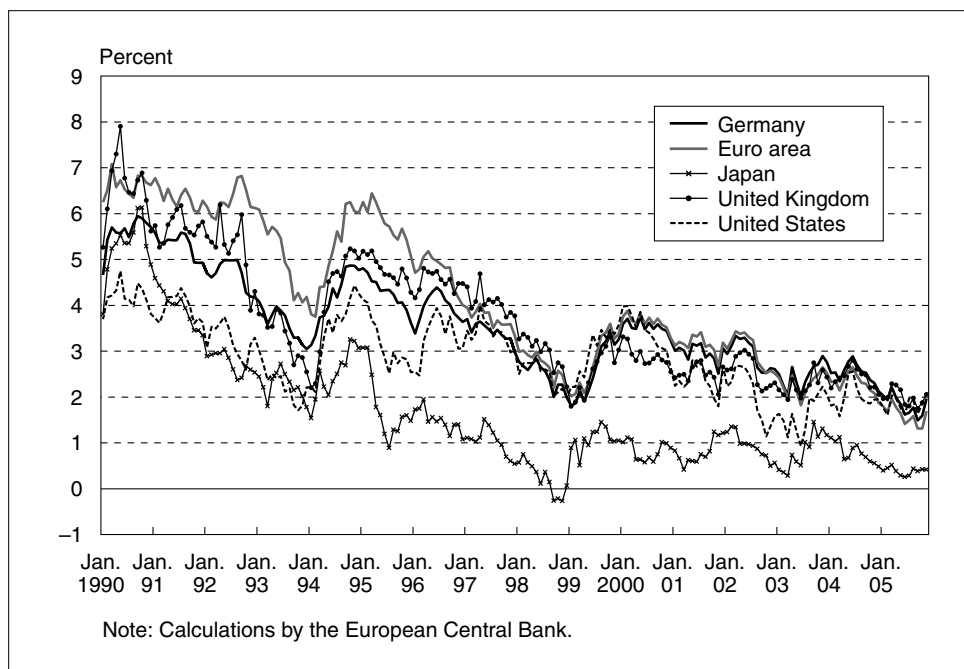
These facts have been extensively commented on in the policy and academic debate, but it is still difficult to develop an analysis that can account for all of them. Can we learn anything by looking at euro area developments within the global economy context?

Several factors have been discussed to explain declining long rates: declining risk premiums due to decreasing real (great moderation) and nominal volatility (monetary policy), global liquidity, or real global developments. As for global developments, the savings glut hypothesis has received particular attention.

It is very difficult to identify these factors separately.

Part of the difficulty is that in the period we are considering we have seen both a decline in the variability of output growth and inflation and a decline in the level of inflation. Estimated risk premiums capture all these phenomena, but are they driven by monetary policy, which has stabilized inflationary expectations, the decline of global inflation driven by increasing competition from emerging markets, or by the decrease in the volatility of exogenous shocks?

Figure 1 Survey-Based 10-Year Real Interest Rates



Estimates based on micro-founded models linking macroeconomic and financial factors typically find declining risk premiums for the euro area as well as for the United States, but these estimates are very uncertain and the extent of the decline varies across different specifications.¹⁶

Another problem with risk premium estimates is that they are difficult to interpret. Risk premiums are a black box, often capturing misspecification error, and they are very sensitive to the parametrization of the model. Again, are these estimates reflecting real or nominal uncertainty, smaller exogenous shocks, or more virtuous policy?

It is always a good idea to give the simplest explanation a chance. Therefore, I want to start from the hypothesis that the dynamics of the real rate reflect an equilibrium phenomenon.

III. The Real Equilibrium Rate and Heterogeneity in Real Developments

Does the decline in real rates in the United States, the euro area, and Japan reflect a decline in their equilibrium value?

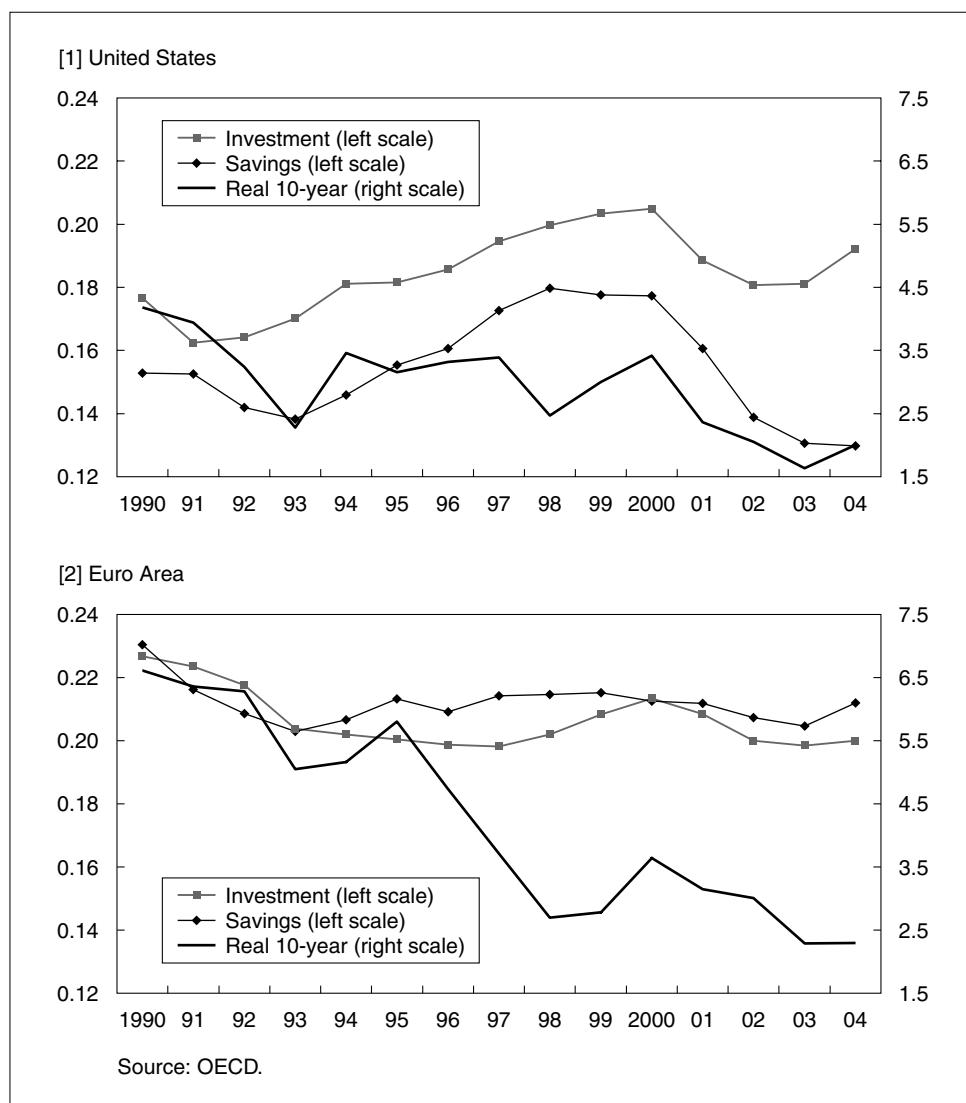
If yes, how is this possible given that the dynamics of real developments (output growth, savings, and investment) have been heterogeneous across countries? Figure 2 illustrates some aspects of the euro area and U.S. heterogeneity in real developments

16. For euro area estimates, see Carsten Detken's discussion in this volume (Detken [2006]).

by plotting the investment ratio (I/Y) and the savings ratio (S/Y) since 1990 against the real 10-year interest rate. Both areas have experienced a decline in the real interest rate, but while in the euro area we have seen a downward trend in the investment and savings ratios, in the United States the savings ratio has no clear trend, while the investment ratio points upward.

Is this a puzzle? Let us suppose that the demand for investment has been declining in Japan and Europe for autonomous reasons, either temporarily or permanently. In a closed economy, this downward shift would reduce equilibrium savings and interest rates only in these two blocs. In an open economy with capital mobility, on the other hand, if the decline is big enough to affect the global demand for investment, the global interest rate would also fall. However, there would be heterogeneous effects, as

Figure 2 Euro Area and U.S. Savings and Investment Ratios



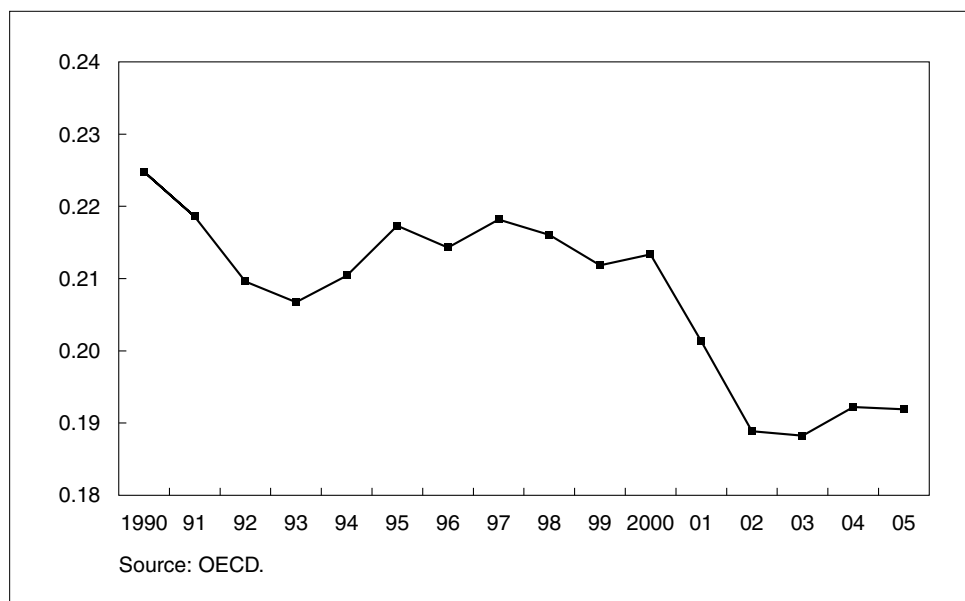
investment will fall more than savings in Japan and Europe, whereas it will be above savings in the rest of the world. Therefore, in this case, a declining global equilibrium real rate would be consistent with the observed growth differentials between the United States on the one hand and Japan and the euro area on the other. In this scenario, global growth would generally be below potential, since global demand driven by investment has decreased.

This is indeed what may have happened in the global economy. Figure 3 plots the OECD average saving-output ratio. Since the OECD is roughly a closed economy and roughly represents the world economy, the picture can be taken as describing the dynamics of the savings-investment equilibrium, and it shows that on the whole the latter has been declining over the period.

Yet actual world growth is quite robust, and this may seem to pose a challenge for the equilibrium explanation of declining real rates. However, world growth is robust mainly because of countries like China, which are mainly financing their investment with domestic savings. Investment demand originating in these countries is therefore not putting an upward pressure on interest rates; on the contrary, perhaps such countries are contributing to the downward pressure through high savings.

Although the savings glut hypothesis has received a lot of attention, I would like to stress the importance of declining investment as an alternative explanation: the observed dynamic of the real rate reflects an equilibrium phenomenon driven by declining global investment.

Figure 3 OECD Average Saving-Output Ratio



IV. Global Long-Term Rates

The next point I would like to make is that the influence of global factors on long-term yields has increased over time.

I will report the results from two panel regressions.

Let us first consider the benchmark regression of nominal long interest rates on short-term rates and estimate it for the panel of OECD countries:

$$I_{j,t}^L = \alpha_j + \beta I_{j,t}^S + \epsilon_{j,t}, \tag{1}$$

where $I_{j,t}^L$ represents nominal long-term and $I_{j,t}^S$ nominal short-term interest rates in country j at time t . The term α_j controls for country fixed effects. The coefficient β is common across countries and gives a measure of the average association of long and short interest rates across countries in the panel.

Let us then augment the benchmark regression by a measure of the global nominal long interest rate to estimate the contribution of the global factor to the determination of long-term interest rates in the OECD as a whole and in the subset of euro area countries. The global long-term interest rate, I_t^W , is constructed as a weighted average of countries' long-term interest rates.¹⁷

The regression equation is

$$I_{j,t}^L = \alpha_j + \beta I_{j,t}^S + \gamma_j I_t^W + \epsilon_{j,t}, \tag{2}$$

where γ_j is the country-specific effect of the global factor.

Regressions (1) and (2) are run for a group of countries, including the 15 largest OECD countries¹⁸ and a group including the largest euro area countries,¹⁹ for the full sample 1974–2004 and for the three subperiods 1974–83, 1984–93, and 1994–2004.

Results from the two panel regressions for the OECD and euro area panels are reported in Table 1.

Table 1 Regressions 1 and 2: Estimated β Coefficients

Country group and regression	1974–2004	1974–83	1984–93	1994–2004
OECD regression 1	0.8 (0.02)	0.6 (0.04)	0.6 (0.03)	0.8 (0.04)
OECD regression 2	0.5 (0.02)	0.5 (0.05)	0.5 (0.03)	0.2 (0.03)
Euro area regression 1	0.8 (0.03)	0.7 (0.1)	0.6 (0.1)	0.9 (0.06)
Euro area regression 2	0.4 (0.07)	0.4 (0.13)	0.3 (0.1)	0.2 (0.08)

Note: Standard errors in parentheses.

17. The weights for country-specific interest rates are derived by principal components.

18. Australia, Austria, Belgium, Canada, Finland, France, Germany, Italy, Japan, the Netherlands, New Zealand, Portugal, Switzerland, the United Kingdom, and the United States.

19. France, Germany, and Italy.

Clearly, the global factor has become increasingly important to explain interest rate dynamics. In particular, once the global factor is included, the effect of the country-specific short rate on the long rate becomes insignificant. This implies that a key element of the national monetary transmission mechanism has disappeared. Notice that this is true even before 2004–05 (the U.S. “conundrum” episode).

In these simple regressions, the global factor is just a weighted average. The question remains open as to whether this average captures a nominal common factor driven by inflation-stabilizing monetary policies or a real phenomenon, as I suggested earlier. To the extent to which our average captures a nominal factor, the world real interest rate would have to be adjusted by the global inflation premium. To quantify these effects is an important area of research for central banks.

V. Implications for Monetary Policy

To the extent to which low real rates and their decline over the last 15 years reflect an equilibrium phenomenon, there is no reason for concern for monetary policy. From the euro area perspective, the real cause of concern is what is behind the declining real rate, which, I conjectured, is decreasing investment.

Moreover, the increasing influence of global phenomena and the weakening of the link between short and long rates at the country level has at least two consequences for monetary policy. First, national monetary policy may have become less effective and, second, global links have increased the degree of uncertainty in the assessment of the stance of monetary policy at the national level, since the estimates of the equilibrium real rate are affected by factors that are determined at the world level.

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Masaaki Shirakawa
Bank of Japan²⁰

Between March 2001 and March 2006, a careful observer of the Japanese economy and financial markets would have seen many interesting developments under the quantitative monetary easing policy (QMEP) framework adopted by the Bank of Japan (BOJ), or more broadly, under a zero interest rate environment. Today, I will run through a list of what we saw in the Japanese economy and financial markets over this period as a basis for the discussion in this session. The views expressed here are solely my own and do not necessarily reflect the official views of the BOJ.

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20. Currently, Kyoto University.

I. The Japanese Economy since 2001

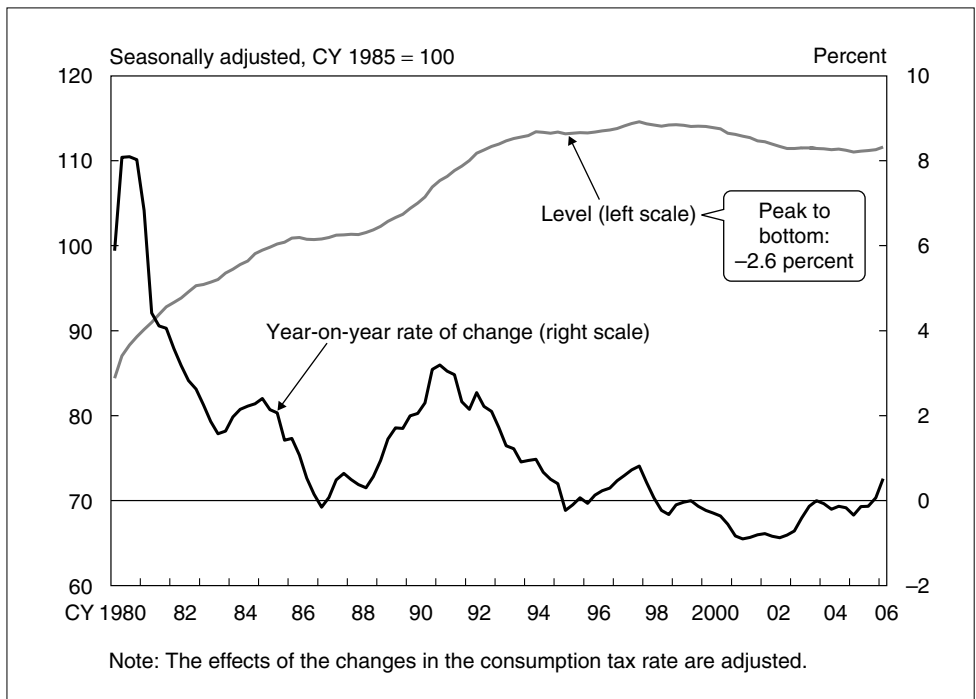
First of all, it is useful to briefly review how the Japanese economy has performed since 2001. I have chosen this year as a reference point because the bursting of the IT bubble worked as a common downside factor for the global economy, and hence the year presents us with a convenient starting point to compare the economies that were facing and not facing a zero lower bound of nominal interest rates.

The Japanese economy slipped into a downward cycle like other major economies in 2001. The slump was rather short-lived, however, and the Japanese economy began a gradual recovery in 2002. Although the average growth rate is by no means spectacular, this expansionary phase will become the longest expansion in postwar Japan if it continues beyond November 2006.

The momentum of the current recovery phase is now most evident in the profitability of Japanese firms. The profit to sales ratios of Japanese firms currently exceed the levels reached in the bubble years of the late 1980s. Reflecting the recovery, the output gap has closed, in contrast to the significant negative gap around 2002.

Turning to price developments, the consumer price index (CPI) emerged from a long declining trend at the end of 2005, and for the January–April 2006 period we saw a year-on-year increase of 0.5 percent (Figure 1). The actual decline was rather mild, however. The cumulative decline in the CPI over the seven years since the peak

Figure 1 Consumer Price Index



in 1998 was slightly below 3 percent, which I think is somewhat different from the widely cited view stressing the specter of deflation.

As for the growth patterns of major economies since the bursting of the IT bubble, the Japanese recovery has lagged behind the United States and the United Kingdom. It has been about as good as that of the euro area.

II. Why Did the Japanese Economy Not Fall into a Deflationary Spiral?

The most striking feature of this period was that, until quite recently, the Japanese economy recovered steadily under persistently declining prices, although the rate of decline was mild. I would say that this was another conundrum worth exploring. After all, from a viewpoint stressing the deadly combination of deflation and the zero lower bound of nominal interest rates, the Japanese economy was doomed to fall into a deflationary spiral: a vicious cycle of falling prices and stagnating economic activity.

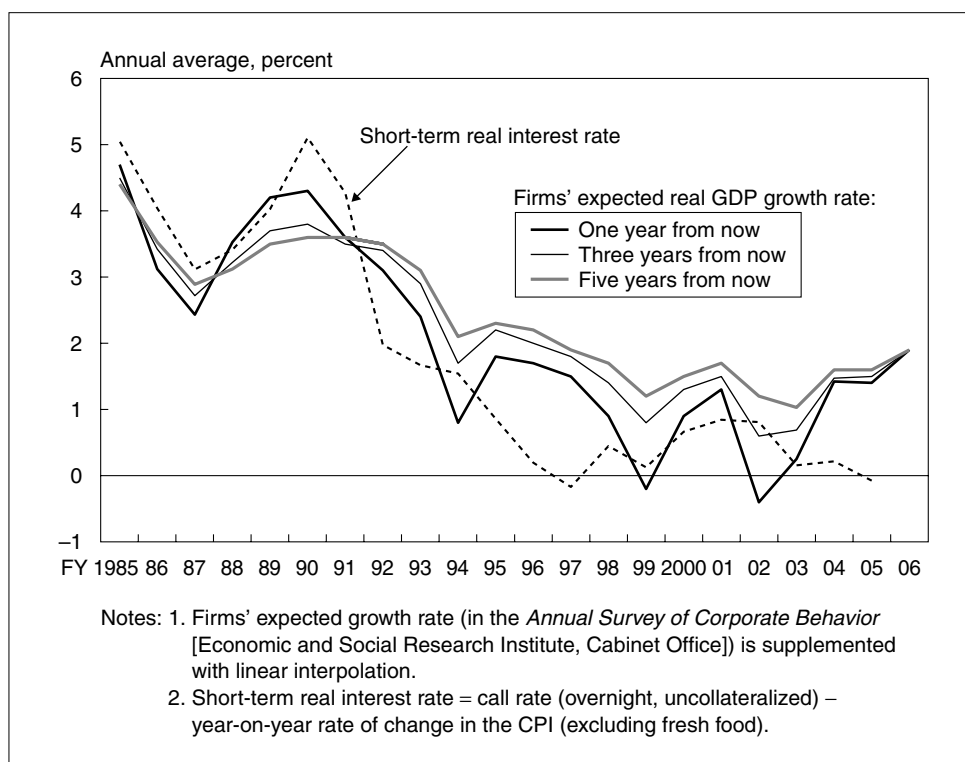
There are several possible explanations of this puzzle. First, as we can see from the graph of distribution of nominal wage changes,²¹ Japanese nominal wages were flexible, at least in recent years. The vicious cycle I have just mentioned may result from the downward rigidity of nominal wages: as prices fall, real wages and thus unemployment rise, which in turn exerts additional downward pressure on prices. In contrast, since 1998, the downward rigidity of nominal wages has not been observed in disaggregated data. Nominal wages in Japan are more flexible than in other major economies. Consequently, the increase in unemployment was relatively mild compared with the United States and the euro area during this period.

The second explanation focuses on the long-term expected growth rate, which fell only moderately. Surveys show that the long-term growth outlook of corporate executives was not depressed as much as their short-term growth outlook (Figure 2). Although there was an inflection in the medium- to long-term growth rate expected by corporate executives, it was not as severe as to push the expected medium- to long-term growth rates below market interest rates in real terms. In other words, we did not experience the unwelcome situation in which the natural rate was below the market real interest rate.

The third explanation focuses on the fall in the real exchange rate, which helped stimulate exports. Although the calculation is influenced somewhat by the base year, the real effective exchange rate of the yen has fallen 21 percent since 2001. Two-thirds of this fall is attributable to the differences in inflation rates, and the remaining one-third to the changes in nominal exchange rates.

21. See Kuroda and Yamamoto (2005).

Figure 2 Firms' Expected Real GDP Growth Rate and Real Interest Rate



III. The Role of Monetary Policy

The fourth explanation is that despite the zero lower bound of policy rates, monetary policy was effective in retrospect. Faced with the risk of deflation, the BOJ has experimented with various monetary policy measures, including quantitative easing.²² The quantitative easing framework consists of two distinctive elements: the provision of ample liquidity in excess of required reserves and a commitment to maintain it until the CPI inflation rate becomes positive on a sustainable basis.

The increase in the provision of liquidity was most useful when there were strong concerns about the stability of the Japanese financial system. Ample liquidity satisfied the liquidity demands of financial institutions, and helped maintain the stability of the financial system as well as sustain accommodative monetary conditions, which in turn contributed to preventing a contraction of economic activity. Given that most episodes of deflation in history were accompanied by financial turbulence or crises, I believe that we should give credit to the mitigation of concerns about the availability of liquidity.

22. For more details, see Baba *et al.* (2005) and the *Outlook for Economic Activity and Prices* released by the Bank of Japan on October 31, 2005 (available at <http://www.boj.or.jp/en/type/release/teiki/tenbo/gor0510.htm>).

Having said this, I should also note that stimulative effects suggested by simplistic monetary theories were not observed. After the adoption of quantitative easing, base money increased by more than 60 percent. Nevertheless, a corresponding increase in money supply was not observed, and nominal GDP and prices did not react.

In this context, some observers proposed that the BOJ should aggressively purchase long-term Japanese government bonds (JGBs) to supply liquidity to the market. The BOJ did, in fact, increase its purchases, but the motives and actions of its counterparties were not what most proponents had initially expected. Financial institutions could easily have sold JGBs in the market. The only reason for them to sell the bonds to the BOJ was that they could adjust the composition of their bond holdings smoothly without impacting market prices. In other words, financial institutions were looking for a service that would facilitate adjustment of their bond inventories, and in a sense, reserve balances provided such a service as a byproduct. Since the cost of carrying reserve balances was almost zero, it did not matter whether the balances were excessive or not, and as a result, there was no chance that the purchase would set in motion a rebalancing of portfolios.

Meanwhile, the second element of quantitative easing, a commitment to maintain the provision of ample liquidity until the year-on-year rate of change in the CPI became positive on a sustainable basis, was more effective in supporting the recovery.²³ The BOJ exited from this framework just after confirming that the year-on-year rate of change in the CPI increased to 0.5 percent.

The commitment based on actual CPI figures resulted in a flattening of the yield curve, especially in the short- to medium-term maturities (Figure 3 [1]). This flattening did not require huge excessive reserves. It was a product of the commitment to maintain the zero interest rate, and what was crucial was the market participants' belief in such a commitment.²⁴ It seems that the zero lower bound did not prevent the level and volatility of Japanese long-term interest rates from falling. There was a visible fall just after the bursting of the IT bubble, as in other major markets.

Furthermore, the commitment encouraged market participants to take on credit risks by flattening the risk-free yield curve, which resulted in a tightening of credit spreads (Figure 3 [2]). Actual lending rates to corporations could still fall even though the short-term interest rate fell to zero. Also, the lending attitude of financial institutions as perceived by firms, which is essentially a "shadow price" for lending, improved further (Figure 4).

One interesting comparison can be made between the recent Japanese experience and the U.S. experience in the Great Depression. It is evident that in Japan, the level of the yield curve was lower and credit spreads were tighter than in the United States.²⁵ Although it may be an exaggeration to say that monetary policy was effective after all, even in the face of a zero lower bound, the Japanese experience seems to suggest that we should reconsider the seriousness of the zero lower bound. This issue should not be dealt with in isolation or in absolute terms. Rather, it should be dealt with in context.

23. See Oda and Ueda (2005) for an empirical analysis of the commitment effect.

24. See Baba (2006) for an empirical analysis of the expected duration time of the zero interest rate.

25. See Baba *et al.* (2005).

Figure 3 Interest Rates and Credit Spreads

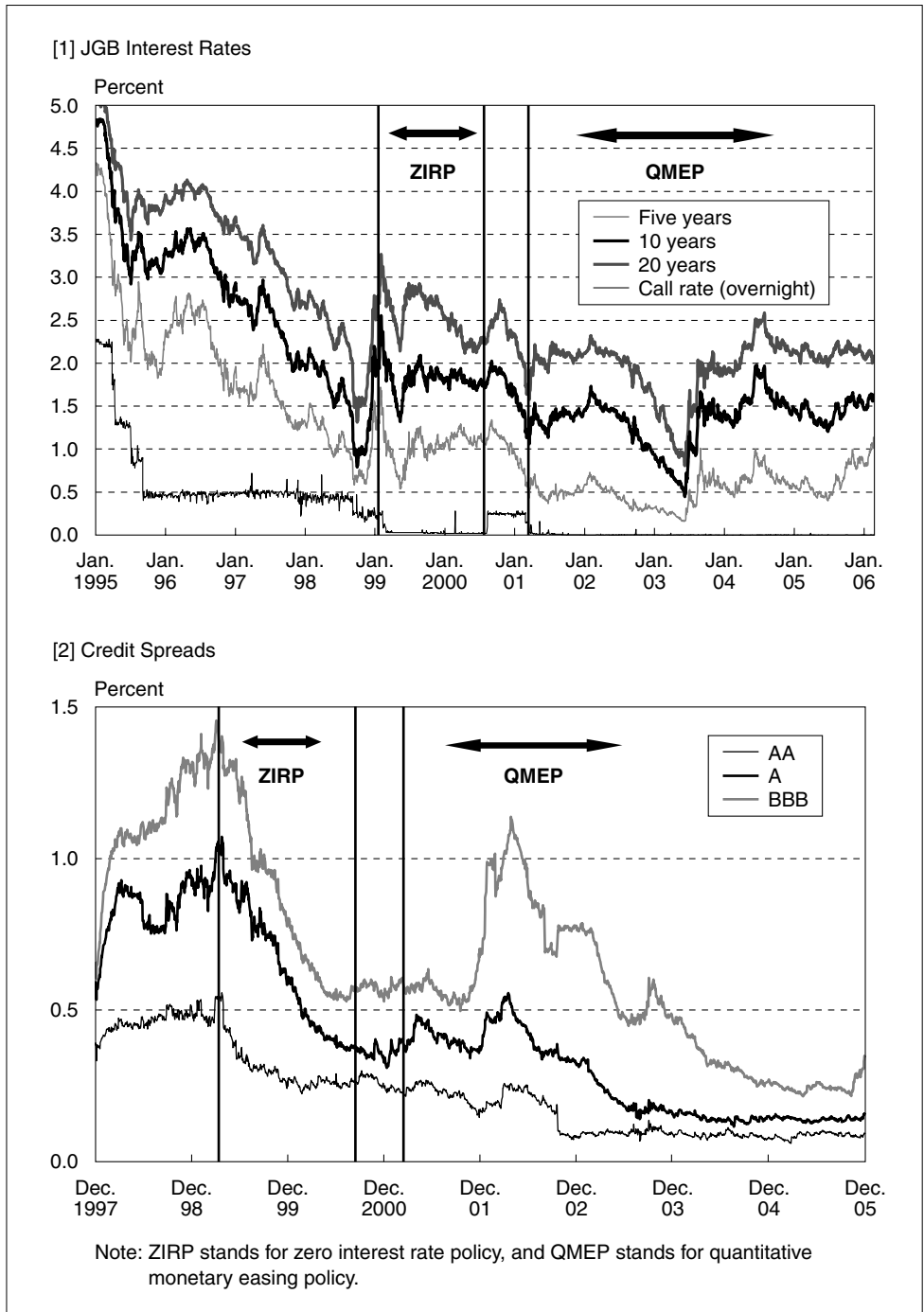
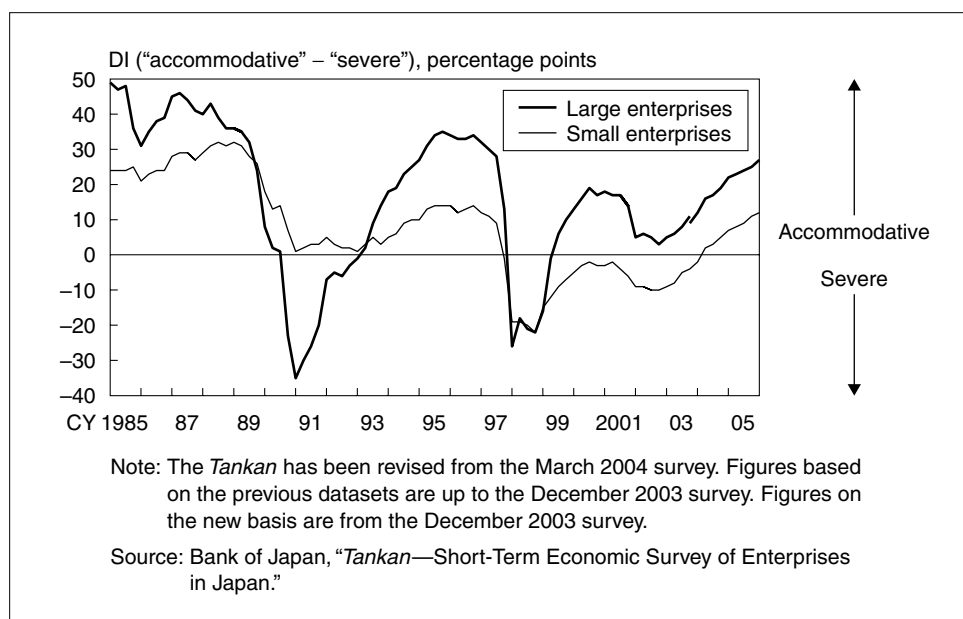


Figure 4 Lending Attitude of Financial Institutions as Perceived by Firms



IV. Some Policy Issues

I would like to flag and comment on issues with policy implications.

The first issue is what were the possible side effects of aggressive monetary policy that the BOJ adopted? In this regard, the loss of incentive to trade is often cited. Since the overnight call rate fell as low as 0.001 percent, interest revenue did not cover the transaction costs.²⁶ Thus, financial institutions would not trade even if funds in excess of working balance became available in their current account at the BOJ. Consequently, intermediation was impaired in the short-term funding market.

Increasing the liquidity supply will have net benefits after a certain point, especially in light of concern over the financial system. However, we observed an unusual situation in which more than enough funds were available at the aggregate level, but individual financial institutions had acute concerns about their ability to raise sufficient liquidity from the market at short notice. This created, so to speak, a self-fulfilling demand for liquidity. The commitment to continue the zero interest rate, which was the main source of the monetary easing effect, was only effective to the extent that market participants expected a sustained period of very low interest rates. However, a very low interest rate may not necessarily mean a zero interest rate—0.001 percent, for instance.

The tightening of the credit spread may also pose some difficult issues. Some may argue that if the root cause of the problem is excess capital stock, a prolonged

26. See “Money Market Operations in Fiscal 2003,” released by the Financial Markets Department of the Bank of Japan on August 31, 2004 (available at <http://www.boj.or.jp/en/type/ronbun/ron/research/data/ron0408a.pdf>).

tightening of the credit spread may eventually lead to a delay in needed adjustment and hence recovery, although it would help mitigate a large shock to the economy in the short run. The key is to identify where the possible side effects that I have just pointed out begin to outweigh the benefits.

The second issue is how the central bank should deal with the possible time-inconsistency problem in the commitment. Under the quantitative easing framework, the BOJ committed to continuing the zero interest rate in relation to the CPI, whose fluctuations were visible to everybody.

A mechanical reference to a higher rate of CPI change would have increased uncertainty in the market about the current level of policy rates. Thus, there are trade-offs. A central bank might be reluctant to adopt too specific a commitment in view of its incomplete understanding of inflation dynamics in the future. At the same time, the market might begin to harbor doubts about the commitment as developments unfold, if the hurdle for changing the course was set too high at the beginning.

In these instances, volatility will increase with greater uncertainty over the path of short-term interest rates, and undermine the effectiveness of the commitment. Since a binding commitment alone can become an effective policy tool, care must be taken when designing it in the first place.

The third issue is how much safety margin we should have to reduce the risk of falling into deflation. This may be paraphrased as the question of whether the Japanese economy would have followed a different path if the BOJ had cut policy rates more aggressively in the early 1990s. Not surprisingly, I am rather inclined to answer this question negatively.

I would argue that when the capital of financial and nonfinancial firms was eroded to a large extent, a small change in the interest rate would not have resulted in a large change in spending patterns at those firms. After the bursting of the bubble, capital losses in Japan for both land and stocks together amounted to more than three times nominal GDP (Table 1). This was really huge. These developments severely constrained the ability of Japanese firms to respond to challenges posed by ongoing globalization and the IT revolution. The result was stagnation of productivity growth which, I believe, is the most important factor in explaining Japan's "lost decade." Asset price deflation seems to have had far larger negative effects than the mild fall in the CPI of less than 3 percent.

In this regard, we can run a counterfactual simulation (Figure 5).²⁷ Monetary policy in Japan may have been perfect in terms of the Taylor rule, but what would have happened if the BOJ had cut policy rates more aggressively in the early 1990s, say,

Table 1 Capital Gain and Loss for Land and Stock as a Percentage of Nominal GDP

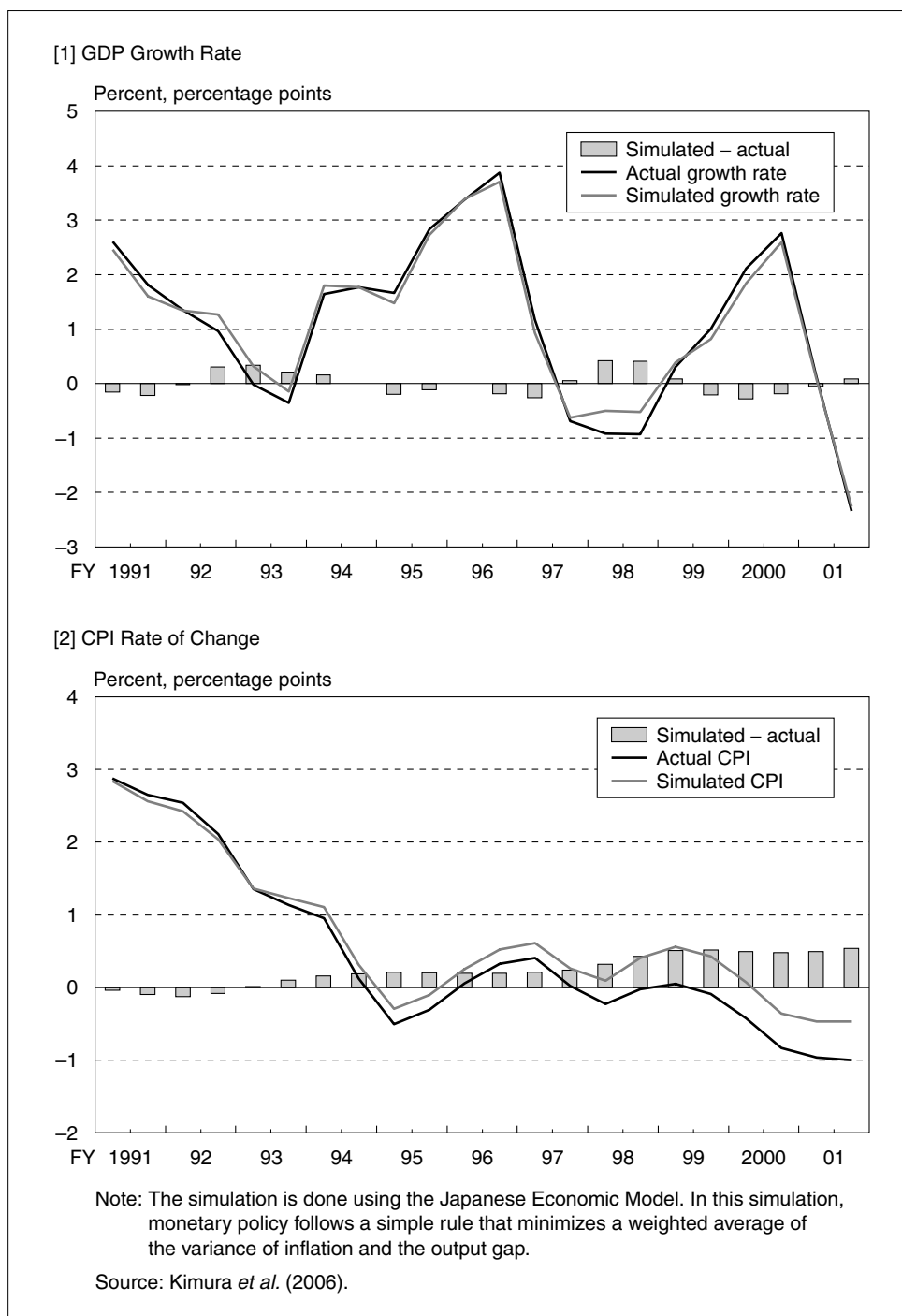
Percent

Land		Stock	
1986–90	365.3	1986–89	147.2
1991–2004	-260.0	1990–2004	-89.6

Note: The base years for the figures before 1995 and after 1995 are 1995 and 2000, respectively.

27. See Kimura *et al.* (2006).

Figure 5 Counterfactual Simulation



by lowering them another percentage point in the first half of the 1990s? The results show that overall economic performance would not have been very different from actual developments. This seems to underscore the view that unless capital positions of financial and nonfinancial firms are robust enough to be able to respond to stimulus from interest rate reductions, little can be expected of a policy that influences the yield curve, including the commitment to maintain a zero interest rate.

Japan's experience raises many interesting issues, when we think of deflation as well as monetary policy in a low interest rate environment. I believe that further study of our experience by both academia and central banks is needed.

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Comments

Bennett T. McCallum
Carnegie Mellon University

The conference organizers have arranged for an excellent set of panel speakers.

I will comment on their presentations in order, beginning with the remarks of Christine M. Cumming. Her discussion provides a nice overview of the period during which the Federal Reserve was concerned about the possibility of hitting the zero-lower-bound (ZLB) constraint. It seems to be an informative and accurate review, but there is one aspect of the experience about which my evaluation of the Fed's behavior is less positive than hers. I have in mind the communication strategy, beginning in 2003, by which the Fed sought to convey to the financial markets that it intended to keep policy easy for some significant amount of time into the future. That was a worthwhile intention, but unfortunately the Fed chose to implement it by making

“semi-promises” regarding future *values* of the federal funds rate. In other words, these values were expressed in an unconditional manner, rather than in conditional statements that would explain how the Fed would react to various specified conditions, if they occurred. The former type of procedure seems suboptimal for any sensible policymaker, public or private, for it commits the policymaker to actions that could be highly inappropriate if conditions turn out to differ from those expected. It is my impression that this way of communicating intentions regarding monetary policy in the future has created various difficulties for the Fed, of which the flap in May 2006 over a statement of Chairman Ben Bernanke’s is just the most recent example. Why does the Fed persist in its reluctance to make conditional statements? My guess is that one part of the reason is that conditional policy statements naturally pertain to differences between prevailing values of “target variables” (especially inflation) and the specific values targeted (desired). In this way, the Fed’s unwillingness to adopt an explicit objective (target value) for long-run average inflation leads to unfortunate consequences in terms of communicating its strategy, as well as in other ways. This is, of course, a point of view frequently expressed by academics.

Next, Lucrezia Reichlin’s interesting charts present some striking facts about interest rates in the United States, the United Kingdom, the euro area, and Japan, with a major conclusion being that there has been a substantial fall in real interest rates over the years 1990–2006. I had not thought about these facts, and am glad to have them called to my attention. My initial reaction is, however, to recall that if nominal interest earnings are taxed, a fall in expected inflation will produce a fall in measured real interest rates if taxes are ignored, even if there is no change in after-tax real rates. Consider, for example, that nominal 10-year rates for the United States were approximately 9 percent in 1990 and 4 percent in 2006, whereas real rates are reported as 4 and 2 percent for these dates in her Figure 1. Thus, expected inflation rates were 5 and 2 percent, respectively, if Figure 1 neglected taxes, as I am assuming. But if nominal interest is taxed at a rate of 40 percent, then the after-tax yield in 1990 was $9(1 - 0.4) - 5 = 0.4$ and the after-tax yield in 2006 is $4(1 - 0.4) - 2 = 0.4$, that is, the same. More generally, recognition of taxes implies that there may have been much less change in the relevant (after-tax) real rates of interest over the period than is suggested in the discussion. Whether this is relevant to the matters at hand, I am not certain.

Finally, I will comment at slightly greater length on Masaaki Shirakawa’s spirited and authoritative review of the policy of the Bank of Japan (BOJ) during the period of quantitative easing. As it happens, I have some different perceptions that, as a panelist, it is my duty to mention. Of course, I was glad to hear an upbeat and optimistic report, but surprised by its tendency to sound as if the Japanese economy had been thriving in recent years. This tone is probably due in part to the fact that his review begins with March 2001, when the economy had already been in a slump for about eight or nine years, so it correctly reports considerable improvement. If that figure of eight or nine years sounds like an exaggeration, I recall that there was much concern about Japan’s slow growth and high unemployment expressed at the IMES Seventh International Conference on October 26–27, 1995, and also that there were many expressions of great concern among participants and speakers at the Jackson Hole conference of the Federal Reserve Bank of Kansas City in August 1996.

I was not at the IMES Ninth International Conference held in July 2000, when the entire program focused on the role of monetary policy under low inflation and was designed to begin the process of drawing lessons from the Japanese experience. But my impression is that at the time most BOJ economists and officials were optimistic that the BOJ had done almost everything it could to bring the economy out of its slump.²⁸ The slump continued, of course, and subsequently the quantitative monetary easing policy (QMEP) was introduced in 2001, together with the commitment that the overnight call rate would be kept at zero until consumer price index (CPI) prices were rising. To me, it seems likely that if these steps had been taken in 1996, rather than 2001, the duration of the Japanese slump might have been considerably shorter, perhaps only five or six years, instead of 13 or 14. Shirakawa has presented some reasoning (and simulation results) that disagree with this judgment, but I am not entirely persuaded. Instead, I think that the expectational effects of the 2001–06 policy actions would have been greater if they had not been preceded by years of BOJ statements to the effect that such actions would probably not be effective.

There is one other pessimistic point that I feel compelled to bring up. Shirakawa has reported that Japan's output gap is now positive, that is, output is slightly above its "potential" level. To me that seems surprising, so I have looked at a recent and relevant BOJ publication, "The New Estimates of Output Gap and Potential Growth Rate," by Hara *et al.* (2006). It contains an important item, that the *structural* unemployment rate is now estimated to be about 3.7 percent, almost twice as high as over 1975–91. The major increase in this estimated structural unemployment rate occurred between 1992 and 2002, the same period as the rise in the actual unemployment rate. If that increase was not actually structural, but instead was induced by a low rate of growth of nominal demand, then the new output gap measure would be conceptually incorrect and the economy not yet back to potential. (The possibility of such an estimation error is mentioned by Hara *et al.* [2006, p. 9].) Furthermore, the situation would be even worse in this regard if the major fall in labor force participation rates between 1996 and 2005 (i.e., from 63 percent to 60 percent) was itself induced by weak demand, rather than demographic trends. In short, despite the analytical disaggregation and detrending steps taken by the BOJ authors, I have some concerns about the validity of the new measure of the output gap. I hope that these concerns are misguided.

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28. It should be noted that the Ninth International Conference included a paper by Oda and Okina (2001) which contained a careful and extensive discussion of the potential effectiveness and risks of various policy actions that could have been considered by the BOJ. I would agree with Beebe (2001), however, in his suggestion that Oda and Okina may have overestimated the risks to the BOJ of more aggressive action while underestimating the potential benefits. On the other hand, I am pleased to acknowledge that in July 2001 Okina encouraged consideration of an expansionary policy stance involving purchases of foreign exchange, the strategy that I consider to have been most promising. On this matter, see McCallum (2003).

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Maurice Obstfeld
University of California at Berkeley

Rather than commenting separately on each of these excellent presentations, I am going to look at three themes that have also been major themes of the papers at the conference. My points will, I think, be closely related to the ideas that have just been heard from the panelists. The topics I would like to cover are, first, the issues of communication: inflation targeting by central banks, and Japan's exit from the quantitative monetary easing policy (QMEP). Second, the possible effects of quantitative easing and the zero interest rate policy on credit spreads in the financial sector. Finally, the issue of conundrums regarding long-term real interest rates. I apologize if my observations seem somewhat disjointed, but I do want to try to bring together some of the disparate strands of the discussion we have had over the last couple of days.

Christine M. Cumming stressed the evolution of the Federal Reserve's communication strategies in an environment of feared deflation and a feared approach to the zero bound in the United States. And indeed, the power of communication was also a major theme of the paper by Gauti B. Eggertsson and Benjamin Pugsley on the "mistake of 1937." Earlier today, I was struck by our discussion of the possible "mistake of 2000" by the Bank of Japan (BOJ)—and naturally there was disagreement on whether the restrictive monetary shift in that year should be considered a mistake: the high-tech bust of 2001 was not foreseen. Unfortunately, Masaaki Shirakawa's presentation covers the period that starts more or less in 2001; although you can see the 2000 episode in the figures, it is not taken up in his narrative. In my opinion, exiting from the zero interest rate policy in 2000, with deflation still underway, must be counted as a mistake. True, the immediate measured effects on output were not the disastrous ones we see in the 1937 U.S. episode, but I think that the policy signal sent in 2000 might well have slowed down, by several years, the recovery that we now seem to be seeing in Japan.

Cumming also referred to the importance of a positive inflation target rather than an inflation target of zero. Her argument is one that has often been made; for example, Summers (1991) recommends maintaining a buffer of safety to reduce the chance of hitting the zero bound. But there is another important reason for the central bank's having a well-understood tolerance for some positive inflation. Simply put, that tolerance increases the bank's credibility in taking measures and making announcements in situations of unwelcome ongoing deflation. In that connection, I believe it is important to consider the evolution of the BOJ's thinking on inflation over the last few years. The developments have been important and positive.

I think it is fair to say that, prior to quite recently, the BOJ did not have a publicly stated and operationally meaningful interpretation of its mandate of “price stability,” unlike some other central banks. It is very significant, and this is a development that Kunio Okina referred to in his discussion this morning, that in March 2006 the BOJ’s Policy Board finally, and for the first time to my knowledge, put forward a fairly precise definition of “price stability.” That step, had it been taken earlier, might have hastened the exit from Japan’s deflation. This wording is available in the Minutes of the Monetary Policy Meeting on March 8 and 9, 2006. The entire document is of immense interest, but here I will refer only to its Attachment 2. A key statement is the following: “It was agreed that, by making use of the rate of year-on-year change in the consumer price index to describe the understanding, an approximate range between zero and two percent was generally consistent with the distribution of each Board member’s understanding of medium- to long-term price stability.”²⁹ To specify such a range of nonnegative inflation rates so precisely is a major departure for the BOJ. And I think it will prove a valuable tool in its management of expectations going forward, for reasons I have spelled out in previous years’ panels at this conference.

There are, however, two unfortunate accompaniments to the presentation of this new thinking. Those qualifications may well have blunted the primary message. First of all, in the same attachment, there is the repetition of a statement the BOJ had made several times before, a nonoperational definition of price stability as “conceptually, a state where the change in the price index without measurement bias is zero percent.” That interpretation is not terribly useful as a guide to policy, and also suggests that positive inflation is not to be tolerated over the medium term.

Also included earlier in the minutes is a discussion of various views on the nature of price stability among Policy Board members. The worrisome component is the assertion that because Japan has had very low inflation for some time, the definition of “price stability” should entail a lower inflation rate than would pertain elsewhere. This view misses the point that deflation can be problematic, and is analogous (though even less defensible) to asserting that a period of lower growth such as Japan has experienced necessarily should lower the path of potential output.

In sum, there has been some progress in communicating a quantitative measure of price stability, but with ambiguities in communication that could cause trouble later on. The BOJ also has reserved the option of revising this indicative inflation range down the road. That action gives a degree of flexibility, but at the cost of weakening the anti-deflation commitment.

Let me turn to a second topic, the apparent effects of quantitative easing and zero interest rates in compressing financial-sector risk premiums. I found the discussion at the conference, in Shirakawa’s presentation as well as in the papers by Naohiko Baba and Jun Pan and Kenneth J. Singleton, quite illuminating. These papers suggest strongly that one of the mechanisms through which quantitative easing may have worked is in supporting a very shaky financial system. Now, as has been pointed out by

29. Bank of Japan (2006, p. 61).

a number of participants, this may also have had costs in terms of resource allocation, moral hazard, and so on. It also could be, however, that the factor really compressing credit spreads was regulatory forbearance, not zero interest rates, and that the end of that forbearance had something to do with the rise in risk premiums, such as we see, for example, in the paper by Pan and Singleton.

In line with this latter interpretation, Kazuo Ueda referred yesterday to the “risk bubble” and the end of government protection of bank debt. Considering Shirakawa’s comparison in his remarks of the higher credit spreads in the United States in the 1930s with the low ones in Japan more recently, those in the United States may well have been higher because there were not the same sorts of protections and expectations of bailout that there have been in Japan. This seems a fruitful area for future research.

I would like to add to this discussion the following hypothesis. Aside from its other negative effects, regulatory forbearance and official support of troubled institutions may have actually compromised the credibility of anti-inflation policy, and again prolonged the period of deflationary pressures in Japan. In combating inflation, the BOJ must be prepared to raise interest rates, perhaps sharply. To do so presupposes a resilient financial system. In a situation where a financial system is not resilient, a central bank must be more worried than otherwise about inflation down the road; and that is the case even in a situation where currently there is deflation. So I would hazard a guess that the excessively prolonged financial restructuring period, aside from the direct effects that may have occurred in credit markets, also had a very direct effect on the BOJ’s attitude toward future inflation and toward the way the market viewed measures that it was taking. Again, this is a hypothesis that could be testable in some way, and it would be interesting to look at it empirically.

The final topic I want to take up is that of conundrums, and of low real interest rates, and of the effectiveness of monetary policy. This was highlighted in Lucrezia Reichlin’s presentation, and it has also been discussed in the papers at this conference. I find fascinating the idea that in a globalized environment, national monetary policy may become less effective. This is apart from reasons having to do with the zero bound, which has been the focus of much of our discussion both at this and at previous conferences.

This is again an empirical hypothesis. It is certainly true that there is greater financial globalization, with stronger linkages among long-term real interest rates, and that to fully explain real interest rates in any of the major industrial areas we need to look to global factors. But I question whether this means that monetary policy has become ineffective or even less effective than previously. Certainly over the long term, real interest rates will contain an important global component, and this global component of the interest rate reflects integration with the world capital market and the process of financial trade from which come international gains from trade. But this does not mean that monetary policy, in the short to medium term, cannot engineer short-term deviations from world rates due to both price rigidities and also to the segmentation of national goods markets. Even though *financial* markets are much more closely integrated than in the past, *goods*-market segmentation is still a very important factor. Even in a closed economy, long-term real interest

rates will be determined by the forces of thrift and productivity, which we do not believe are functions of monetary policy. So if we think about an open economy where the long-term real interest rate is a global phenomenon to a large extent, we still have only the short term to work with. But that is not necessarily much of an impediment provided that there is enough segmentation among goods markets to allow substantial real exchange rate fluctuations. These we still see in the data. So I look forward to more discussion of this point, and to more rigorous empirical and theoretical thinking about it.

I would like to introduce another conundrum into the discussion—one related to long-term interest rates—and in that way to tie into the discussion in both my presentation and that of Fabrizio Perri earlier today. The conundrum relates to the global imbalances. The pictures that Reichlin showed us indicated that the gaps between long-term real interest rates in the major countries are relatively small. Japan is a bit lower than the rest, maybe by 100 or so basis points, but the gaps are fairly narrow, and there is almost none between the United States and the euro area.

If we think that to a first approximation, long-term real interest differentials reflect expected real exchange rate changes, then we need to ask the question whether the real exchange rate changes implicit in these real interest differentials are consistent with the elimination of the very large global imbalances that we see today. I would argue that the answer is no, unless these imbalances are to be eliminated extremely gradually, so gradually that resources have time to move between sectors and between countries in a way that obviates the standard sorts of transfer problems and thus most of the need for real exchange rate adjustment. It is a major question whether the greater depth of financial markets indeed will allow for a much more gradual adjustment of very large imbalances than we would have thought possible in the past—this is an argument that Alan Greenspan³⁰ has made—or whether, on the contrary, they will allow an excessive expansion of these imbalances leading ultimately to some sort of reversal and crisis. The question is open. It is related to the issue of low real interest rates, in the sense that higher rates down the road will certainly accentuate the imbalances and make them harder to reduce gradually.

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30. Greenspan (2004).

I. Discussion among Panelists

Against Bennett T. McCallum's review on unconditional statements, Christine M. Cumming explained that statements by the Federal Reserve Board (FRB) about inflation risks could be interpreted as a sort of "inferred conditional commitment." She stated that two interesting questions were "What did the market ultimately infer from the statements about the FRB's actions?" and "How long did it take it to settle on an inference?" Concerning Maurice Obstfeld's discussion of the relationship between long-term real interest rate differentials and the global imbalances, Cumming remarked that grasping how the adjustment process of global imbalances would work became more difficult each year, given the magnitude of the imbalances and their growth.

In response to McCallum's question, Lucrezia Reichlin answered that the real interest rates shown in her presentation were calculated using a survey-based measure of headline inflation that would be subject to tax effects. In response to Obstfeld's question about the effectiveness of monetary policy, Reichlin explained that, at least empirically, her regression results suggested that the transmission channel through the term structure seemed to have become less effective. She then pointed out the fact that, in contrast to the nominal convergence, real convergence had not been observed across countries, and suggested that something might be learned from this real heterogeneity. Finally, in connection with monetary policies, Reichlin stressed the importance of accurate estimation of the equilibrium real interest rates, and noted that all the issues discussed in relation to the international environment became sources of uncertainty about equilibrium rates.

With regard to McCallum's comments, Masaaki Shirakawa made it clear that although the Japanese economy had returned to a sustained growth path under price stability, such a judgment did not mean he was optimistic about the long-run trend of Japan's economic activity. Then he explained that within the new framework adopted in March 2006, the Bank of Japan (BOJ) carefully assesses economic conditions based on a two-perspective approach. One is to examine, as regards economic activity and prices one to two years in the future, whether the outlook deemed most likely by the BOJ follows a path of sustainable growth under price stability. The second is to examine, over the longer term, risk factors that significantly affect economic activity and prices when they materialize even if the probability is low. Shirakawa also stressed the importance of deflation in asset prices, which had severely affected the real economy, not only through the demand side but also through the supply side. Although Shirakawa admitted the difficulty of measuring the exact size of the output gap, he argued that the output gap measure recently estimated by the BOJ has closed, which was quite consistent with some alternative measures, such as the BOJ's *Tankan* survey. With regard to price stability, Shirakawa noted that the BOJ had a clear mandate to attain price stability over a medium- to long-term horizon. Then he explained that, given the large uncertainty around the Japanese economy, it was quite natural for each Policy Board member to have a different view about the consumer

price index (CPI) inflation rate corresponding to price stability, so the BOJ decided to disclose the distribution of the Policy Board members' views. Regarding the role of the quantitative monetary easing policy (QMEP) to address the banking problems, the panel chairperson, Stefan Ingves, emphasized the importance of financial stimulation as the first-best solution when the problems were serious, especially at an early stage. Shirakawa agreed with Ingves, but also remarked that we should explore the channel through which quantitative easing could affect the real economy.

II. General Discussion among Participants

A. Reflections on Monetary Policy in a Low Interest Rate Environment

Regarding the effectiveness of monetary policy in a low interest rate environment, Hans Genberg (Hong Kong Monetary Authority) suggested that the decreasing effects of interest rate policies could be interpreted differently. Since central banks communicate their policy intentions well ahead of time, the economy will have already reacted by the time the interest rate decision is actually implemented. It would then appear as if the policy action did not have much of an influence. In this connection, Genberg conjectured that when a central bank starts to focus on a particular policy instrument, this variable will have less and less influence on the ultimate objective of the central bank's policy. On similar grounds, José Luis Malo de Molina (Banco de España) claimed that by reducing uncertainty and enhancing investment, monetary policy could be made effective even under globalization.

Reichlin responded that the apparent decrease in the effectiveness of monetary policy could be the result of the fact that inflation expectations were anchored. In that case, monetary policy might be actually effective. Reichlin noted, however, that we should still worry about the effectiveness unless central banks successfully guided the real interest rate close to the neutral interest rate.

Jan Marc Berk (De Nederlandsche Bank) asked about the consequences of a low interest rate environment on the development of money and credit. Andrew Filardo (Bank for International Settlements) pointed out that far too little is known from the historical record about the range and relative effectiveness of *all* the options open to monetary policymakers when short-term interest rates are at zero but before the economy gets caught in a liquidity trap.

Toshihiko Fukui (Bank of Japan) remarked that the quantitative easing framework implemented by the BOJ showed visible effects in stabilizing the financial system and creating and maintaining a very accommodative environment that supported the recovery of Japanese firms. He noted, however, that the portfolio rebalance channel, as one of the potential transmission channels of the quantitative easing, remained to be questioned. McCallum commented that the effects of the quantitative easing were more attributable to the expectation channel than the portfolio rebalance channel, although he stated that the latter channel had more or less worked through a substantial amount of purchase of long-term Japanese government bonds. Filardo commented that the monetary policy transmission mechanism, especially the portfolio rebalance channel, was effectively jammed by various nonmonetary problems, such as the deep

structural problems in the financial system that arguably were prolonged by regulatory forbearance; it was conceivable that more aggressive central bank actions could have further weakened the resolve of regulatory bodies to deal with the root causes of these structural problems. Keimei Kaizuka (Chuo University) stated that the structural change in the Japanese labor market was an important example of a factor that made Japanese monetary policy more difficult to implement.

B. Communication Policy by Central Banks

Against McCallum's critical review of unconditional statements by the Fed, Glenn D. Rudebusch (Federal Reserve Bank of San Francisco) argued that, in principle, there was nothing wrong with producing unconditional forecasts. He claimed that unconditional forecasts would actually be preferable to the conditional forecasts currently produced by many central banks, conditioned on an unchanged interest rate path. He then stressed the importance of central banks' clear explanation to market participants about the meaning of unconditional forecasts, based on the FRB's experience. Shirakawa agreed with Rudebusch, saying that although he had some sympathy with forward-looking language, central banks should not go too far. He noted that forward-looking language could become misleading if it was understood as an unconditional statement, while it tended to become meaningless if its conditional nature was emphasized too much, because too much emphasis on the conditionality tended to make the statements somewhat meaningless.

Kazumasa Iwata (Bank of Japan) remarked that the effectiveness of the FRB's forward-looking language might have been complemented by market participants' recognition of the FRB's implicit expression of price stability, which was indicated as 2 percent of the CPI in the transcript of the Federal Open Market Committee (FOMC) meeting in 1996. He then explained that the BOJ's new framework for the conduct of monetary policy, which was adopted at the Monetary Policy Meeting on March 8 and 9, 2006, consisted of three parts: (1) a disclosure of the understanding of medium- to long-term price stability; (2) an examination from two perspectives, examining economic activities and prices one to two years in the future and examining various risks in the longer term; and (3) a disclosure of the outline about the current view on monetary policy in the *Outlook for Economic Activity and Prices*. He then stated that the first component meant a kind of provision of common knowledge, which enhanced the BOJ's transparency and the coordination with market participants' views. He also explained that, in the most recent outlook, the Policy Board members took into account market participants' views regarding the future course of the policy interest rate in making economic forecasts.

Kiyohiko G. Nishimura (Bank of Japan) explained that the important background for the BOJ's new framework was a high degree of uncertainty over the Japanese economy that included not only the uncertainty expressed as a fat tail in a distribution, but also the uncertainty in a distribution itself, which had been argued by Frank Knight. He clarified that it was the fundamental reason why the BOJ took its two-perspective approach. He then explained that the BOJ decided to disclose each Policy Board member's view on price stability, because the collective wisdom was considered superior to any one particular view under this kind of uncertainty. Finally,

he mentioned that the BOJ's understanding of price stability might change due to possible changes in the Japanese economy in the future.

C. Remaining Conundrums

Genberg asked about the reasons for the increased cross-country correlations of nominal and real interest rates. Reichlin responded that there were several explanations including anchored inflation expectations, the decreased inflation risk premium, and global factors such as competition effects coming from emerging countries. She added that the explanations related to monetary policy seemed convincing, whereas there was little empirical evidence pointing to a huge competition effect.

Filardo remarked on the implications of financial globalization for the increased correlation of interest rates. In a small open economy, trying to raise interest rates above the prevailing rates in the world or to cut rates below the prevailing rates could lead to a policy dilemma, because of the resulting financial inflows or outflows. The options might be best characterized as a "damned if you do and damned if you don't" situation. Filardo argued that even the G-3 countries would not remain completely immune to such pressures in an increasingly globalized world.

Ulrich Kohli (Swiss National Bank) agreed with Obstfeld that there remained "another conundrum" on the consistency between the correlation of long-term interest rates and movements in real exchange rates. Kohli pointed out, however, that the preclusion of transformation possibilities between outputs in Obstfeld's model might have distorted its quantitative implications. Obstfeld responded that he ignored several factors in his model because his purpose was a short-term analysis.

Kenneth J. Singleton (Stanford University) stressed the role of the inflation risk premium in the movements in the real interest rate. He pointed out that both Reichlin and Obstfeld implicitly assumed that the inflation risk premium was constant and the same across countries in their arguments. Singleton argued that a consideration of the risk premium could resolve "another conundrum" suggested by Obstfeld, that is, rationalizing the departures of exchange rate movements from interest rate differentials on an expected basis. Singleton commented that the next question to be addressed would be the macroeconomic story behind the risk premium. Obstfeld responded that it would still be questionable whether the implied exchange rate paths were consistent with sustainable current account adjustment even if the risk premium was considered in his model.

