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LOST DECADE IN TRANSLATION:  
DID THE US LEARN FROM JAPAN'S POST-BUBBLE MISTAKES?

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Lost Decade in Translation: Did the US Learn from Japan's Post-Bubble Mistakes?

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**ABSTRACT**

In 1991, the Japanese economy ended a historic expansion and entered a period of stagnation that has yet to abate. Nine years later, the US economy ended a similarly historic expansion. There were many similarities in the two countries' expansions: asset price bubbles, a real investment boom, easy monetary policy, and improvements in government finances. In the wake of bursting bubbles, the Japanese banking system was insolvent and monetary policy was too tight, problems not evident in the US post-bubble period. But the US has worse fiscal and current account imbalances than Japan had at the same stage in the post-bubble era.

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## 1. Introduction

In 1991, the Japanese economy ended a historic expansion and entered a period of stagnation that has yet to end, although the current recovery is encouraging. Japan's "lost decade" was marked by slow growth, falling prices, and persistent financial system dysfunction. This sad tale is made more poignant by Japan's extraordinary economic performance in the four decades that preceded the collapse of the bubble economy in the early 1990s. Indeed, during the 1980s Japan was seen as a model to be emulated, and nationalistic voices in the US worried about being eclipsed by the Japanese.<sup>1</sup>

While the 1990s were a lost decade for the Japanese economy, they were a triumph for the US economy. Following the shallow recession of 1990-1991, the US economy boomed, picking up steam in the latter half of the decade. The boom ended in 2000, and despite the growth recovery that began in 2002 there are lingering concerns about the proper course of fiscal and monetary policy. As the US economy stumbled in 2000, a number of commentators noticed some uncomfortable similarities between the end of the US boom and the end of Japan's boom a decade earlier.<sup>2</sup> The concerns about emulating the Japanese were inverted from the envy of the late 1980s to a sense that the US may not have learned enough from Japan's mistakes.

In this paper, we look closely at the similarities and differences between the ends of the two booms, Japan's in 1991 and the US' in 2000. We begin by analyzing macroeconomic similarities and differences, with results that are both reassuring and discomfiting for the United States. We then turn to a detailed comparison of monetary policy, and we show that the Federal Reserve was far more aggressive after the end of the US boom than the Bank of Japan was a decade earlier. So far, this aggression seems to have worked: the US economy seems to have avoided, perhaps very narrowly, a fall into deflation. Nonetheless, the US economy faces challenges in the coming years that in some ways are more daunting than those faced by Japan in the early 1990s.

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<sup>1</sup> This tendency was exemplified by Michael Crichton's best-selling xenophobic mystery-thriller *Rising Sun*, published (ironically) in 1992.

<sup>2</sup> See, for example, Krugman (2001) and DeLong (2002).

## 2. Macroeconomic similarities: too close for US comfort?

In this section, we look closely at how the US and Japanese economies behaved as boom turned to bust. Our method is to examine comparable time series from the two countries, in each case converting calendar time to business cycle time: for the Japanese data, we look at ten year windows around the business cycle peak of the second quarter of 1991, while for the US data the analysis is centered on the cyclical peak in GDP of the fourth quarter of 2000.

Figure 1 illustrates the similarities in overall GDP growth. In the decade before the cyclical peaks, the US economy grew a cumulative 38%, while Japan grew 48%. Neither country saw a GDP decline in the year after the peak, though growth fell sharply (from 3.4 to 1.0 percent in Japan, from 3.7 to 0.5 percent in the US). But two years after the end of the boom, US growth was recovering, while Japanese growth stayed low, with the economy growing a mere 12% cumulatively in the decade after the 1991 peak.

In Figure 2, we set real investment and real GDP equal to 100 in the peak year. The figure shows that in both countries, boom and bust were led by real investment: investment grew much faster than GDP in the years before the peak, and plunged in the years following the peak. Two years after the peak, the US and Japanese experiences were remarkably close, but in year 3 real investment in the US picked up, a year earlier than the investment recovery in Japan.

The best-known similarity between the Japanese and US booms is the extraordinary bull market that accompanied fast GDP growth in both countries. But as illustrated in Figure 3, the timing and magnitude of the stock market booms are quite different. The Nikkei peaked a full six quarters before the peak in GDP, while in the US the GDP and stock market peaks were close to contemporaneous, with the S&P 500 peaking just one quarter before the GDP peak. More importantly, though, the broad Japanese stock market rose higher faster, and fell farther (so far), than did the US market. Looking at troughs and peaks in the stock market rather than in GDP, the Nikkei grew 275% in the five and a half years before its peak in 1989Q4, while the S&P 500 grew “only” 225% in the six years preceding its peak in 2000Q3. After the Nikkei peaked, it plummeted 38% in a year, helping to bankrupt much of the Japanese banking sector in the process and contributing to the end of the GDP boom. The drop in the S&P 500 was

similar in magnitude but slower, falling over 40% before bottoming out (for now) in 2003Q1 and then recovering. It is sobering to note that, as illustrated in Figure 3, the Nikkei also bottomed out roughly two years after the GDP peak before staging a comeback, yet to this day it stands at a fraction of the level reached at the end of 1999.

In addition to the stock market bubble, Japan experienced a property market bubble in the late 1980s, which continues to affect balance sheets (especially of banks) today. Did the US experience a similar bubble? Probably not. International comparisons of property markets are difficult to do, and for the US and Japan there are no broad time series which are internationally comparable. With that caveat, Figure 4 shows the overall urban land price index for Japan, together with two measures of housing prices in the US (all indices are divided by the country's GDP deflator). The Japanese experience is unambiguous: a vertiginous climb followed by a steep collapse which has yet to stop. The first US index is the repeat-sales index from the US Office of Federal Housing Oversight, which shows no trend at all in the pre-peak years but a very sharp move upward since the peak, growing 18% since 2000. The second index is a constant-quality index produced by the US Census Bureau; this index also shows no trend in the pre-peak years and a more modest climb since 2000, rising just 8% in three years. McCarthy and Peach (2004) argue persuasively that the latter index is more appropriate for evaluating whether there is a bubble in the housing market, a hypothesis they reject.<sup>3</sup> Whichever price index is superior, it is clear that US property prices experienced nothing like the bubble that Japanese land prices did.

On growth and asset markets, then, the US post-boom experience looks superior to Japan's. But other comparisons are more worrying. Figure 5 illustrates the fiscal positions of the two countries, using comparable figures for the primary surplus and net government debt as a share of GDP.<sup>4</sup> As the chart illustrates, both countries were in

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<sup>3</sup> The McCarthy-Peach argument is that the repeat-sales index fails to control for quality upgrading in the housing stock, which they argue has been substantial.

<sup>4</sup> As Broda and Weinstein argue persuasively elsewhere in this volume, the gross debt figures often cited as an indicator of the fiscal position of the Japanese state hugely overstate the extent of the net financial claims by the private sector on the government. The data used here are from the OECD. The definition of primary surplus is the general government surplus excluding debt interest payments.

excellent fiscal shape as the boom peaked, with primary surpluses of 3 to 4 percent of GDP. These surpluses evaporated rapidly as the economy slowed, and the paths are remarkably similar, although the US fiscal deterioration (-7.3 percentage points of GDP in three years, from 4.1 to -3.2) was sharper than Japan's (-5.5 percentage points of GDP). The US looks significantly worse, however, when comparing the level of debt: as the boom peaked, Japan's net debt had been falling sharply for years and was less than 13% of GDP, while in the US the fiscal consolidation had gone less far, leaving debt at 43% of GDP at boom's end.

As the economies slowed in both the US and Japan, the fiscal policy response was remarkably similar. Figure 6 shows the change in the cyclically-adjusted budget deficits, a standard measure of fiscal stimulus, for both countries. The US and Japan both shifted quickly from fiscal consolidation in the last years of the boom (especially the US) to substantial stimulus, on the order of 1% of GDP in the first year after the GDP peak to almost 3% of GDP in the following year. In both the US and Japan fiscal stimulus slowed, but remained positive, in the third year after the boom.

While the US looks worse with respect to government debt, the biggest negative comparison has to do with foreign indebtedness. Figure 7 illustrates the current account, depicting the well-known fact that Japan persistently runs surpluses while the US deficit has soared in recent years. Such a large US current account is not sustainable, and adjustment is likely to be a substantial policy challenge in the coming decade (see, for example, IMF 2004).

### **3. A detailed look at monetary policy**

We now turn to a detailed look at the similarities and differences between the Bank of Japan's policies since the onset of its recession in 1991 and the response of the Federal Reserve to the recession that began in the first quarter of 2001. The analysis focuses initially on the three and a half years following the two countries' respective business cycle peaks. There are two reasons for concentrating on this period. First, there is broad agreement that the first half of the 1990s was a critical time for the Japanese economy, for it was during this period that what might have been a normal cyclical downturn became the beginning of its decade-long stagnation. And second, because the

three-and-a-half year window for the U.S. takes us up through the present time (mid-2004), it is only over this period that we can compare Japanese monetary policy to actual Federal Reserve policy. A subsequent subsection discusses post-1994 monetary policy in Japan, comparing it to what the Fed *might* have done, had it faced continuing deflationary pressures.

### *Monetary policy in the early stages of the recessions*

The overall contours of monetary policy in the early stages of the two countries' recessions are similar. As shown in Figure 8, short-term nominal rates were rising in the two years leading up to the peak, and generally falling in the years following the peak. In both countries, a period of rapid rate reductions was followed by a period of more gradual rate cuts. The overall level of interest rates was consistently one to two percentage points higher in Japan than in the U.S., however — at least until Japan's call rate was cut to 50 basis points (½ percent) in 1995, four years after that country's cyclical peak.

Higher inflation can, to some extent, explain Japan's higher level of nominal interest rates — at least during the period surrounding the peak level of economic activity. As shown in **Figure 9**, Japan's inflation rate rose rapidly in 1990, and by the peak of the expansion core CPI inflation reached nearly three percent. Inflation then began a rapid decline, reaching zero by early 1995, four years after the peak.<sup>5</sup> In the U.S., meanwhile, inflation remained relatively quiescent, and the core PCE deflator remained in the 1–1½ percent range throughout both the expansion and the recession. Inflation finally began to drift down in 2003, two years following the business cycle peak. Even though inflation only began its decline *after* the recession was officially over (at least according to the NBER), its pronounced downward trend raised the specter of Japanese-style deflation in the U.S.

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<sup>5</sup> The measure of Japan's core CPI used in this analysis is constructed by subtracting the food and energy price contributions (the food and energy price sub-indexes, multiplied by their weights) from the overall CPI. Very similar pictures are obtained using alternative price indices. Inflation as measured by the implicit GDP deflator, for example, exhibited a similar pattern, although the increase in 1990 was somewhat less pronounced. The decline in the GDP deflator was somewhat more severe, registering a –1 percent year-over-year change in the second quarter of 1995.

Taking inflation into account accentuates the differences between the two countries' monetary policies as measured by the real short-term interest rate. Figure 10 plots a simple, *ad hoc* gauge of real interest rates in Japan and the U.S.: the difference between the nominal overnight interest rates and the previous year's core inflation rate. As shown in the figure, the rise and subsequent fall in inflation attenuated both the rise in the real rates prior to the peak, and the decline in the real rate as the economy entered the recession. Consequently, the Bank of Japan's policies of tightening in 1989 and 1990, and easing after 1991, were not as aggressive as the path of nominal interest rates would suggest. Indeed, because the Bank of Japan's rate reductions from mid-1992 to mid-1995 barely kept pace with the decline in the inflation rate, the real rate of interest (at least as gauged by lagged inflation) remained within a relatively narrow 1½–2 percent range for a period of three years. In contrast, because the impact of the Federal Reserve's 2001 rate cuts on the real rate was not offset by disinflation, the real federal funds rate fell to virtually zero by the end of the year. After 2001, however, the Fed's more measured rate cuts only sufficed to overcome the decline in inflation, and as a result the real federal funds rate did not fall appreciably below zero.

*Was Japan's disinflation of the early 1990s anticipated?*

The path of Japan's inflation-adjusted call money rate depicted in Figure 10 suggests that delay in cutting short-term interest rates very likely contributed to the severity of the recession, at least in its early stages. But an important issue arising in this context is the extent to which Japan's disinflation of the early 1990s was anticipated. The question is crucial for assessing the contribution of monetary policy to the economic downturn: to the extent that the disinflation was *unanticipated*, it would not have translated into higher *ex ante* real rates of interest; a monetary policy that seemed too tight *ex post* would have seemed less so at the time. By the same token, to the extent that the disinflation was anticipated, it would have increased *ex ante* real interest rates, and increased the likely contribution of monetary factors to the recession's severity and duration. In this case, the failure to cut interest rates more aggressively would have represented a serious policy mistake.



It is no coincidence that the same issue arises in assessing the role of monetary factors in the Great Depression of the 1930s in the U.S., and the question generated a lively debate between Hamilton (1987, 1992) and Cecchetti (1992).<sup>6</sup> With a decline in the overall price level of five percent in 1930, the problem of disinflation was obviously much larger than it was for Japan in the 1990s. Nonetheless, the three percentage point decline in Japan's inflation rate during the critical 1991–95 period was of sufficient magnitude to make a difference between a neutral and an accommodative policy stance.

Since no universally-accepted measure of inflation expectations exists, it will never be possible to provide the definitive answer to the question of whether Japan's disinflation was anticipated. But the evidence from statistically-based and consensus forecasts reported below indicates that during the first two years of the recession inflation was somewhat lower than anticipated. By mid- to late-1993, however, disinflation had become firmly embedded in both statistical and market forecasts.

The statistical model used to forecast inflation is simply a regression of the four-quarter inflation rate on lagged inflation, and current and lagged estimates of the output gap. The question then becomes what to use for the output gap — a very difficult issue, in light of what appears to have been a break in trend output growth in or around 1991. As discussed Kuttner and Posen (2004), what one assumes about the evolution of potential output is critical to any assessment of monetary policy, especially during this period.

Clearly, in order to approximate what expectations were likely to have been at the time, the estimate of the output gap used as an input must be based on information comparable to what observers would have had available contemporaneously. For this reason, many procedures commonly used to calculate potential output proxies, such as the Hodrick-Prescott (HP) filter, are inappropriate, as they use information from the entire sample. As a result, measures of potential output derived from these procedures tend to turn down well in advance of the onset of the recession. This tends to reduce the

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<sup>6</sup> According to the chronology of the National Bureau of Economic Research, the U.S. experienced two recessions in the 1930s: one lasting from 1929Q3 through 1932Q4, and a second lasting from 1937Q2 through 1938Q1.

measured severity of the recession, and exaggerate the magnitude of the preceding business cycle peak.<sup>7</sup>

Instead, we construct an output gap proxy as the difference between the logarithm of real GDP and a linear trend fitted to the logarithm of real GDP, recursively estimated over a rolling, 40-quarter window. In a crude but nonetheless plausible way, this procedure captures the idea that observers initially likely expected the downturn to be transitory, but revised down their assessment of trend real GDP growth gradually as sluggish growth persisted.<sup>8</sup> This pattern is consistent with the behavior of the consensus private-sector forecasts for year-over-year real GDP growth displayed in **Figure 11**: those forecasts stubbornly in the 2½–4 percent range until the end of 1993, when they were finally revised sharply downward.

Figure 12 depicts our estimate of the *ex ante* real call money rate in Japan from 1990 to 1995. For comparison, the figure also shows the call rate minus the four-quarter lagged inflation rate (also plotted in Figure 10), and the *ex post* real rate. Not surprisingly, all three capture the overall downward trend in real interest rates, and consequently the three look quite similar at first glance. There are, however, some important differences in the *timing* of the real rate reductions. One key difference is that both the *ex ante* and the *ex post* measures exceed the simple difference between the nominal rate and lagged inflation by 1–1½ percentage points between mid-1992 and mid-1995. This is of course a natural consequence of the fact that in an environment of rapidly-falling inflation, lagged inflation is a poor proxy for inflation expectations.

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<sup>7</sup> Kuttner and Posen (2004) point out that applying the HP filter in this way would lead one to conclude that trend growth began to turn down in 1988, and that the output gap remained *positive* until well into 1993.

<sup>8</sup> This idea is captured more precisely by the unobserved-components specification used by Posen (1998), and Kuttner and Posen (2001), which yields an estimate of potential output broadly similar to that obtained from the recursive trend. All of these statistical methods are based on the questionable assumption that output reverts to potential over horizons normally associated with business cycles, however, and none captures the underlying microeconomic determinants of the nation's productive capacity. Thus, it is fair to say that the output gap proxy used in this analysis captures the decline in Japan's trend growth rate, but fails to provide an explanation for the slowdown. A more extensive discussion of alternative approaches to estimating the output gap can be found in Kuttner and Posen (2004).

A more subtle difference occurs in 1992 when there was a relatively large,  $\frac{3}{4}$  percentage-point between the *ex ante* and *ex post* measures. This gap indicates that some of the disinflation over this period was indeed unexpected, and consequently the real rate of interest was not as high as *ex post* measures would indicate. (It was higher than indicated by the difference between the nominal rate and lagged inflation, however.) This gap between the *ex ante* and *ex post* real interest rates narrowed in 1993; in the third quarter of that year both were close to  $2\frac{1}{2}$  percent, suggesting that the disinflation had by then become largely anticipated. This pattern is reflected in the consensus private-sector forecasts in **Figure 13**, which show a systematic overprediction of inflation up until late 1993.

The overall conclusion to be drawn from this analysis is that while the disinflation was to some extent unanticipated in the early stages of Japan's recession, by late 1993 disinflationary expectations were likely to have been pretty firmly entrenched. This conclusion holds both for private-sector survey expectations, and for econometric forecasts designed to mimic expectations that observers might have formed at the time. As a result, *ex ante* real interest rates were in all likelihood somewhat higher than the simple difference between nominal rates and lagged inflation would have indicated. In this light, the Bank of Japan's decision to leave the call money rate unchanged at  $2\frac{1}{4}$  percent through all of 1994 and the first quarter of 1995 seems all the more surprising. By keeping the call rate unchanged even as inflation expectations fell, the Bank of Japan (BoJ) effectively allowed the stance of monetary policy to become slightly tighter — a decision which could very well have contributed to the further weakening of economic conditions.

In this dimension too, the Federal Reserve's policy over the 2001–03 period provides a revealing basis for comparison. Figure 14 displays the *ex ante* real federal funds rate for the U.S., using inflation forecasts computed in a procedure analogous to that used for Japan; also plotted are the *ex post* real funds rate, and the difference between the nominal funds rate and lagged four-quarter inflation that was plotted in Figure 9. As the figure clearly shows, from the beginning of the easing cycle in January 2001 up through mid-2002, there is virtually no difference between the various measures of the real interest rate; with so little change in the inflation rate over this period, all three

gauges tell basically the same story. The picture changes a little as inflation begins to decline in 2003, however. Now, with the Fed's rate cuts not quite keeping up with the pace of disinflation, the *ex post* real rate rises from the neighborhood of zero to as much as 0.7 percent. But this disinflation was to some extent unanticipated, at least on the basis of our simple forecasting model. Consequently, the rise in the *ex ante* real rate of interest is smaller, and goes no higher than 0.4 percent. In any case, the differences between *ex ante* and *ex post* rates are dwarfed by the magnitude in the decline in the real interest rate, however measured.

*What if the BoJ had acted like the Fed?*

As demonstrated above, the stance of monetary policy in Japan, as measured by the real overnight interest rate, was considerably less expansionary than it was in the U.S. at a comparable stage in the downturn. The question remains, however, as to how expansionary policy *should* have been in light of economic conditions as perceived at the time.

A definitive answer to this question would, of course, require using a fully-articulated quantitative model to evaluate the Japanese economy's likely response to counterfactual interest rate paths. Such an undertaking is beyond the scope of this paper, however, and in any case the results from this kind of exercise would inevitably be sensitive to the assumptions underlying the model. The approach we take instead is to evaluate the BoJ's monetary policy using empirical reaction functions — essentially asking how the BoJ's policy during this period compared with its “normal” reaction to output and inflation, and with the reaction of the Federal Reserve if it had faced a similar set of economic conditions.

This method has been a popular one in discussions of Japanese monetary policy: see, for example, Ahearne et al. (2002), Okina and Shiratsuka (2002), Taylor (2001), Jinushi et al. (2000), McCallum (2000, 2003), and Bernanke and Gertler (1999) to name a few. The approach is not without its hazards, however, and conclusions drawn from it are often sensitive to exactly how potential output is estimated, as discussed in detail in

Kuttner and Posen (2004). But as discussed above, one major pitfall can be avoided simply by not using a retrospective method, like the HP filter, to estimate trend output.<sup>9</sup>

With this in mind, we use the recursively-estimated trend method described above to estimate potential output; thus, the output gap and inflation expectations used as inputs in the reaction function are mutually consistent, and as argued above, plausibly correspond to policymakers' real-time assessment of economic conditions in Japan. This procedure yields an output gap proxy that works well in our inflation equation, and yields forecasts similar to the private-sector survey expectations.

The specific form of the reaction function used for the comparisons below is

$$(1) \quad i_t^* = \bar{i} + \alpha(y_t - y_t^*) + \beta\pi_t^e$$

where  $(y_t - y_t^*)$  and  $\pi_t^e$  are, respectively, our estimates of the output gap and four-quarter-ahead expected inflation. The equilibrium real interest rate and the target inflation rate are both absorbed into the intercept term,  $\bar{i}$ . Estimated versions of equations like (1) typically also include a partial adjustment mechanism in order to capture central banks' apparent preference for interest rate smoothing. For our purposes, however, the inclusion of a lagged interest rate term would only obscure the underlying policy response to output and inflation, so in the results below we display only the path of the desired, or target nominal interest rate,  $i_t^*$ .

**Figure 15** displays the Japanese call money rate, and the target interest rate path implied by (1) for two sets of parameters. One uses the reaction function parameters reported by Ahearne et al. (2002) for Japan, which put very little weight on the output gap: specifically,  $\alpha = 0.05$  and  $\beta = 2.31$ .<sup>10</sup> As shown in the figure, this configuration of parameter values tracks BoJ policy quite well over this period, even without the partial adjustment mechanism. Rates were actually cut slightly more aggressively than implied by the rule in 1992. The BoJ deviated in a contractionary direction when it left interest rates unchanged in 1994, however; application of the rule would have led to a nominal rate of virtually zero by the first quarter of 1995. (The BoJ did eventually reduce the call

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<sup>9</sup> Okina and Shiratsuka (2002), for example, use the full-sample HP filter, and consequently conclude that BoJ policy deviated very little from a conventional reaction function.

<sup>10</sup> Kuttner and Posen (2004) reported parameter estimates for Japan that are very similar to those of Ahearne et al. (2002).

rate to zero, but not until the second quarter of 1999.) Thus by the standards of the estimated reaction function, the BoJ's failure to cut rates in 1994 is hard to explain.

Also plotted in **Figure 15** is the path of the overnight interest rate implied by (1), but with the parameters reported in Clarida et al. (2000) for the Federal Reserve for the 1979Q3 to 1996Q4 period (i.e., with Paul Volcker and Alan Greenspan as Fed Chairmen):  $\alpha = 0.93$  and  $\beta = 2.15$ . The difference between this and the path given by the BoJ's estimated reaction function is striking: had the overnight rate been set according to the Fed's policy rule, it would have been reduced to zero by mid-1993, and remained there at least through 1995. It is also interesting to note, however, that prior to 1992, the rate implied by the Fed's rule is somewhat *higher* than the rate actually set by the BoJ, and the rate implied by the estimated BoJ rule.

The source of these differences is, of course, the larger weight on the output gap in the estimated Fed rule: 0.93 versus 0.05. This is consistent with the findings of Jinushi et al. (2000), who argued that the BoJ in the late 1980s shifted its emphasis to managing the exchange rate and asset prices, and as a result appeared to lose sight of its core macroeconomic objectives. It consequently tended to *under-react* to output fluctuations — not only relative to the Fed, but also compared with the BoJ's own response in the pre-bubble period. It is this shift in policy objectives, therefore, that potentially explains the weak response to the collapse in the early 1990s, and the failure to head off the excesses of the late 1980s.

The Federal Reserve's response to the 2000–01 recession, on the other hand, turns out to have followed the rule estimated by Clarida et al. (2000) quite closely. Figure 16 depicts the rule's implied federal funds rate path, along with the actual nominal funds rate. The most conspicuous deviation from the rule comes in 2002, when the Fed cut rates more sharply than it would have had it followed the rule mechanically. The Fed did not, however, cut rates quite as quickly in the first and second quarters of 2003 as the rule would have suggested. But the deviation between the implied and actual funds rate over this period is only on the order of 50 basis points, and by September the gap between the two had closed.

*Japanese monetary policy since 1994, compared with what the Fed might have done*

Three and one half years after their respective business cycle peaks, the monetary policy landscapes in Japan and the U.S. were similar, at least superficially. At the end of 1994, short-term interest rates in Japan stood at 2¼ percent, well above the zero lower bound, and roughly where they had been since late 1993. And in mid-2004, the federal funds rate was 1 percent, and had been at 1¼ percent or less for one and a half years.

Underlying economic developments in the U.S. and Japan had already begun to diverge sharply by this point, however. After two quarters of modest growth in mid-1994, the Japanese economy contracted in 1994Q4 and 1995Q1. Consequently, the BoJ allowed the call rate to fall to ½ percent over the April to September 1995 period. In the U.S., on the other hand, the sustained, highly expansionary stance of monetary policy seems to have had a significant economic impact. Three consecutive quarters of robust GDP growth, along with several months of rapid employment growth, seem finally to have put to rest as of summer 2004 any concerns about the recovery's sustainability. And after having fallen consistently for two full years after the business cycle trough, core inflation has shown signs of increasing. Consequently, in June 2004 the Federal Reserve began the process of raising the funds rate target from the 1 percent level it had reached in June of the previous year. Thus, monetary policy in the U.S. is headed in an entirely different direction from that in Japan in 1995.

It is impossible to know, of course, what the Federal Reserve would have done had economic conditions continued to deteriorate, as they did in Japan. But in mid-2003, it was not at all clear that robust growth was going to resume in the U.S., and there seemed to be a very real, albeit small, probability that deflation would also become a problem. It is, therefore, informative to compare the BoJ's post-1994 policy with what the Fed might have done in response to an intensification of deflationary pressures.

Following its last round of rate cuts in mid-1995, BoJ policy went through what might be characterized as three distinct phases.<sup>11</sup> The first is a nearly three-year period of stasis, in which the call rate remained at or near ½ percent. This period included a

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<sup>11</sup> This account of BoJ policy draws heavily on section 3 of Kuttner and Posen (2004).

modest recovery in 1996, a renewed recession in the summer of 1997, and various domestic financial breakdowns as well as the onset of the Asian financial crisis in the fall of 1997. While the BoJ did provide several emergency injections of liquidity to the banking system during this period, it did not change the call rate, much less introduce any unconventional monetary policy measures.

This first phase ended in late 1998 and early 1999 with the reduction in the call rate to first to  $\frac{1}{4}$  percent, and then to virtually zero.<sup>12</sup> This second phase, the so-called Zero Interest Rate Policy (ZIRP), is characterized by the BoJ's initial, tentative efforts to influence expectations of the path of future policy. Specifically, the minutes of the Policy Board meeting of April 9, 1999, released a month later, stated that "it was important to maintain the current decisive easy stance of monetary policy, firmly underpinning economic activity until deflationary concerns were dispelled." Also under ZIRP, the BoJ initiated outright purchases of short-term government securities, and expanded the range of government securities eligible for repo operations.

The BoJ's highly expansionary setting of short-term interest rates may, however, have been counteracted by the statements of senior officials — especially by those of then-BoJ Governor Hayami. In the most well-known of these, a speech given on March 21, 2000, Hayami contended that Japan's deflation was beneficial, or at least benign, and argued strenuously against policy measures intended to combat it. In reference to an explicit inflation target, Hayami stated that "such a proposal is tantamount to artificially creating inflation ... at any cost," and warned that "inflation is most likely uncontrollable, once triggered."

The ZIRP phase of BoJ policy came to an abrupt end on August 11, 2000, when, in apparent contradiction to its stated policy, the BoJ increased the call rate target to  $\frac{1}{4}$  percent. The Policy Board cited the "improvement of the economy" as a factor in its decision, but said nothing about deflationary pressures. Long-term JGB rates fell steadily during the six months following the rate hike, suggesting a further decline in inflation

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<sup>12</sup> While not literally a zero call rate target, the ZIRP was implemented by way of a new guideline for money market operations that called for the Bank of Japan to "provide more ample funds and encourage the uncollateralized call rate to move as low as possible."



expectations. In fact, Kuttner and Posen (2004) identify this as the most distinct of several “deflation scares” occurring over the 1996-2003 period. And Orphanides (2004) likens the BoJ’s August 2000 rate increase to the Fed’s disastrous policy tightening of 1937, which is widely blamed for extinguishing the incipient recovery that was taking place at the time.

The BoJ reversed itself in early 2001 with the reduction of the call rate, in two steps, to zero. On March 19, the BoJ announced a change in the main operating target to the outstanding balance of current accounts (i.e., total reserves), initiating the third, “quantitative easing” phase of monetary policy. The central element of this policy was the introduction of a gradually-increasing target for current account balances, along with a steady expansion in the range of assets eligible for purchase by the BoJ. But perhaps more importantly, the policy change was accompanied by the announcement that “the new procedure will be kept in place until the CPI registers a stable zero percent or increase year-on-year.” The specificity of this statement makes it a much more explicit effort to influence expectations than the less-precise “until deflationary concerns were dispelled” statement that accompanied the ZIRP. After a three-year delay, a false start, and a reversal, the BoJ was finally on a path towards what might be described as “unconventional” monetary policy.

Many of the anti-deflation policy measures contemplated by the Federal Reserve in 2003 turned out to be quite similar to those that were eventually adopted by the BoJ. But unlike the BoJ, senior Fed officials floated proposals for unconventional monetary policy measures very early on. In fact, public consciousness of the issue was raised as early as November 2002, in a speech by Federal Reserve Governor Ben Bernanke provocatively titled “Making Sure ‘It’ Doesn’t Happen Here” (Bernanke (2002)).

With year-over-year core CPI inflation still running at a 2 percent annual rate, deflation was hardly an imminent danger when Bernanke made his speech. Nonetheless, the speech forcefully articulated the view that monetary policy was not, in fact, powerless once the short-term nominal interest rate reached zero, and that the central bank still had a number of tools at its disposal. The specific tools mentioned in the speech included expanding the monetary base, targeting interest rates farther out the yield curve, and

instructing the Open Market Desk to purchase privately-issued securities. Some of these policy options were also mentioned as possibilities in a subsequent speech by Federal Reserve Chairman Alan Greenspan (Greenspan (2002)).

While the Fed did not commit publicly to any specific course of action, the evolution of Federal Reserve officials' thinking over the course of 2003 could be gleaned from FOMC statements, officials' speeches, and from published reports. Perhaps the most telling policy shift came at the May 6, 2003 meeting. Although the FOMC left the funds rate target unchanged, it departed from its conventional balance of risks assessment and stated that "the probability of an unwelcome substantial fall in inflation, though minor, exceeds that of a pickup in inflation from its already low level." By acknowledging that the FOMC was prepared to act to prevent further disinflation, the statement had a strong impact on expected future short-term rates. This was reflected in the bond rates: although yields did not fall immediately, in the five weeks following the FOMC's statement, the yield on 10-year Treasury notes fell by more than 50 basis points.<sup>13</sup>

While repeating its concern about an "unwelcome fall in inflation," the announcement accompanying the August 12, 2003 FOMC provided an even stronger hint about future policy, stating that policy accommodation could "be maintained for a considerable period." This statement did not, however, have the same effect on long-term interest rates as the May 6 announcement — in fact, the 10-year Treasury yield *rose* in the weeks following the meeting — perhaps because of uncertainty regarding exactly what was meant by a "considerable period."

Other hints of the FOMC's intentions also emerged from press reports, such as that of Ip (2003). According to that article, senior Fed officials had largely discarded as unworkable some of the more interventionist proposals, such as the direct targeting of long-term interest rates, as impractical. Ip reports that the more conventional of the unconventional policy options, such as quantitative measures and the commitment to a

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<sup>13</sup> Much of this decline was reversed in June, after the FOMC cut the funds rate target by a less-than-expected 25 basis points. A further rise in long-term interest rates occurred immediately

future path of interest rates, were reportedly still under active consideration by the FOMC.

Ip's report turns out to have been largely consistent with the thinking of FOMC members, as outlined in Bernanke and Reinhart (2004). The FOMC appears to have been leaning towards an approach entailing a conditional commitment to keeping the funds rate low for an extended period of time, combined with quantitative measures of some sort — a strategy quite similar to what the BoJ eventually adopted in 2001. But perhaps because it had learned from the Japan's experience, the Fed was prepared to implement a vigorous anti-deflation policy into place much more quickly than the BoJ. Moreover, this intention was consistently backed up by statements and speeches by Fed officials emphasizing the seriousness of the deflation threat (however small), and pledging to do whatever was necessary to prevent it. In these respects, the contrast with BoJ policymakers' statements on the topic could not be starker. One lesson that seems *not* to have been learned by the Fed, however, is that statements intended to affect expectations of future policy are most effective when they are specific — hence the mixed reaction to the FOMC's "considerable period" statement of August 2003.

#### **4. Conclusions**

The popular U.S. attitude toward Japanese economic performance has moved from fearful envy in the late 1980s, to smug superiority in the late 1990s, to a nervous "there but for the grace of God go I" feeling in the new millenium, as the U.S. boom ended in ways that seemed all-too-similar to the beginning of Japan's "Lost Decade" in 1991. In this paper, we have looked more closely at the analogies between the Japanese and U.S. experiences. Our conclusions for the U.S. are somewhat reassuring: the U.S. recovery from post-boom-recession seems more solid than Japan's, and the problems in Japan that resulted from imprudent bank lending during an asset price bubble are absent in the U.S. More worrying, however, are the U.S. fiscal and current account imbalances, which are currently far larger than Japan's were at a comparable stage.

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following Greenspan's congressional testimony on July 15 (Greenspan (2003)), which was widely viewed as discounting any imminent implementation of unconventional policy measures.

A major difference between Japan and the U.S. is in the response of monetary policy. We have shown that Fed policy as boom turned to bust was far more aggressive than Bank of Japan policy was a decade earlier, and its decisive response may have helped the U.S. economy recover more quickly than Japan's did. The attention within the Fed to Japan's experience, as seen in Ahearne et al (2002), may be evidence that the FOMC did indeed translate Japan's lessons into a useable form.

An important question left unaddressed in this paper is *why* Japanese policymakers in general — and the BoJ in particular — responded so slowly and so erratically in the face of deteriorating economic conditions. Theories abound, but none provides an entirely satisfactory explanation. The simplest of these is that the BoJ behaved appropriately given the information it had available at the time, but was caught off-guard by the severity and speed of the disinflation. This may explain part of the delay in the early stages of the recession, but, as argued above, this story becomes less convincing after 1993.

One candidate explanation emphasizes the conflict between the BoJ and the Ministry of Finance, and attempts to explain suboptimal policy as the result of a noncooperative game between the two institutions. BoJ policymakers have, at various times, voiced concern that aggressive central bank purchases of JGBs would “erode fiscal discipline” (see, e.g., Hayami (2000)). In this case, monetary policy may have been distorted in an attempt to use it as leverage against the Ministry of Finance.<sup>14</sup>

A second candidate explanation focuses on the BoJ's independence, which was formally granted in April, 1998. (Posen (2003) argues that the BoJ achieved a large degree of *de facto* independence far earlier.) Conventionally, central bank independence is seen as a means to eliminating the problem of inflation bias — not as a source of *deflationary* bias. But as pointed out by Eggertsson (2003), the familiar time inconsistency problem of Barro and Gordon (1983) also applies in a deflationary environment, as it means any promise to create above-target inflation would not be

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<sup>14</sup> To our knowledge, no one has as yet developed a model that delivers this result under assumptions relevant to the Japanese case. The general outlines of such a model would presumably be similar to those of Nordhaus (1994) or Dixit and Lambertini (2003).

credible. A related hypothesis, advanced by Cargill (2001), is that the fear of losing its newly-won independence kept the BoJ from pursuing a more expansionary policy, thus falling into an “independence trap.”

The explanation favored by Posen (2003) is simply that BoJ policies were constrained by a rigid adherence to certain economic doctrines — ideas which, while appropriate (or at least not damaging) under normal economic conditions, became obstacles to the pursuit of more expansionary policy. One such doctrine is that because monetary policy transmission occurs exclusively through the overnight interest rate, other measures would be ineffective. Another is the “liquidationist” view that that low interest rates would retard the process of structural reform of the public sector, and creative destruction in the private sector.<sup>15</sup>

Which of these explanations best accounts for the conduct of Japanese policy in the 1990s remains unsettled, as does the extent to which more decisive monetary policy would have lifted the Japanese economy out of its recession. But if there is a fundamental lesson to be learned it is that monetary policy should not neglect output stabilization in its pursuit of inflation stabilization.

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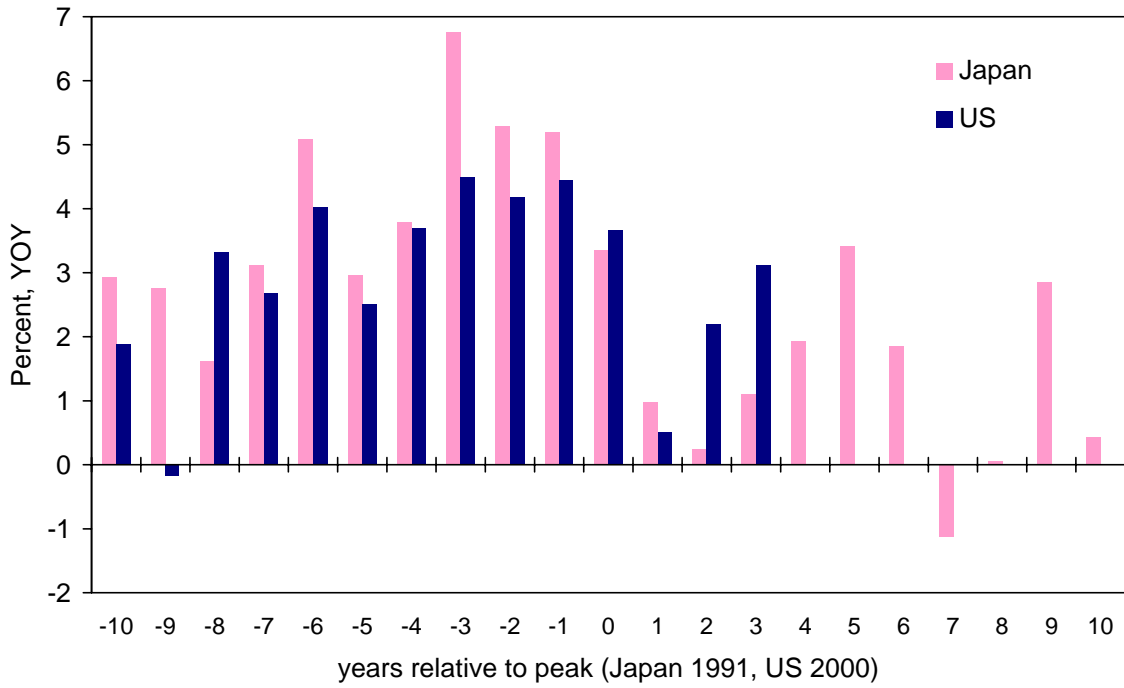
<sup>15</sup> Ample evidence of both can be found in the published statements and speeches of BoJ officials; see Posen (2003) for references.

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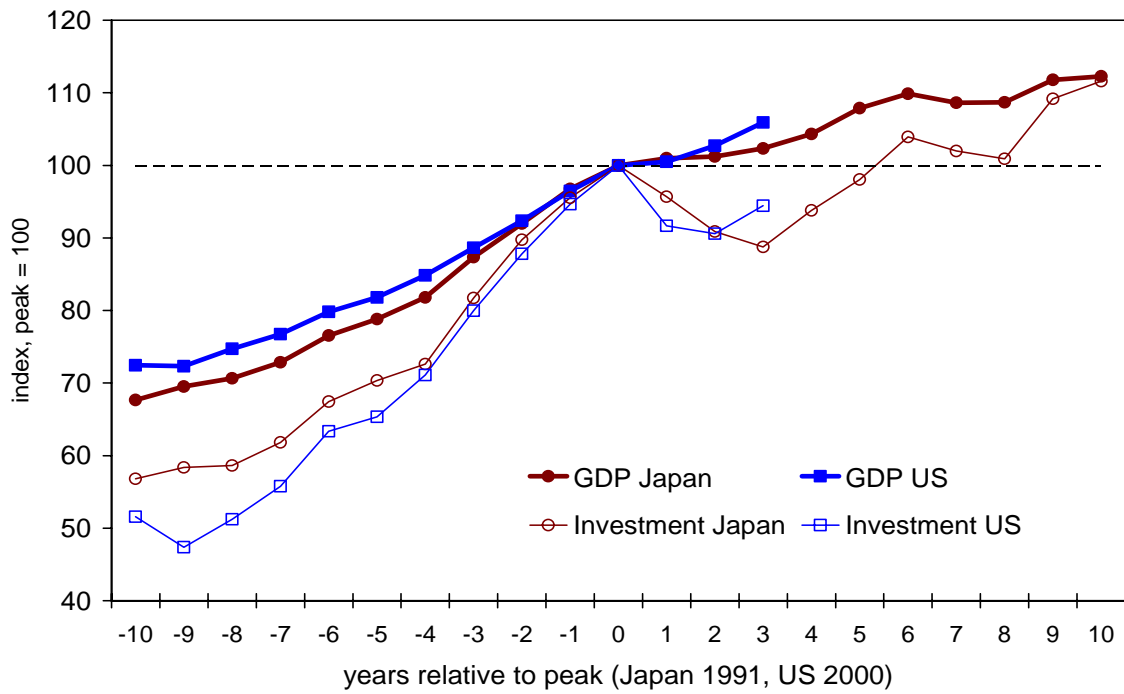
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**Figure 1: Real GDP growth**



Sources: US and Japanese national accounts.

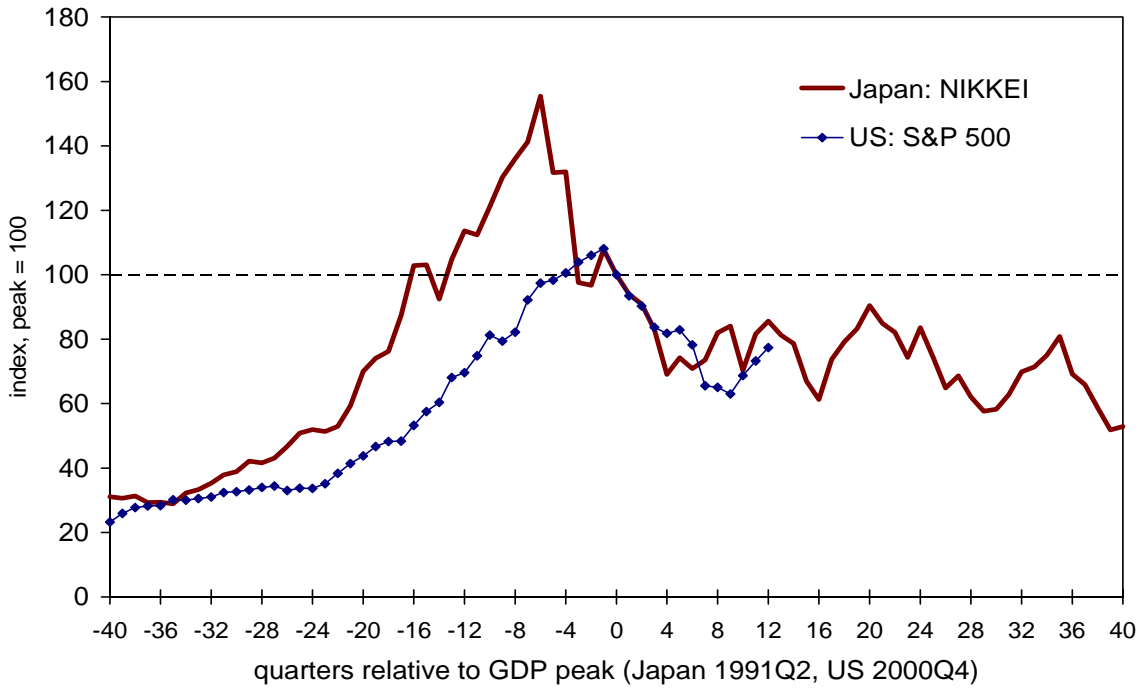
**Figure 2: GDP and investment**



Sources: US and Japanese national accounts.

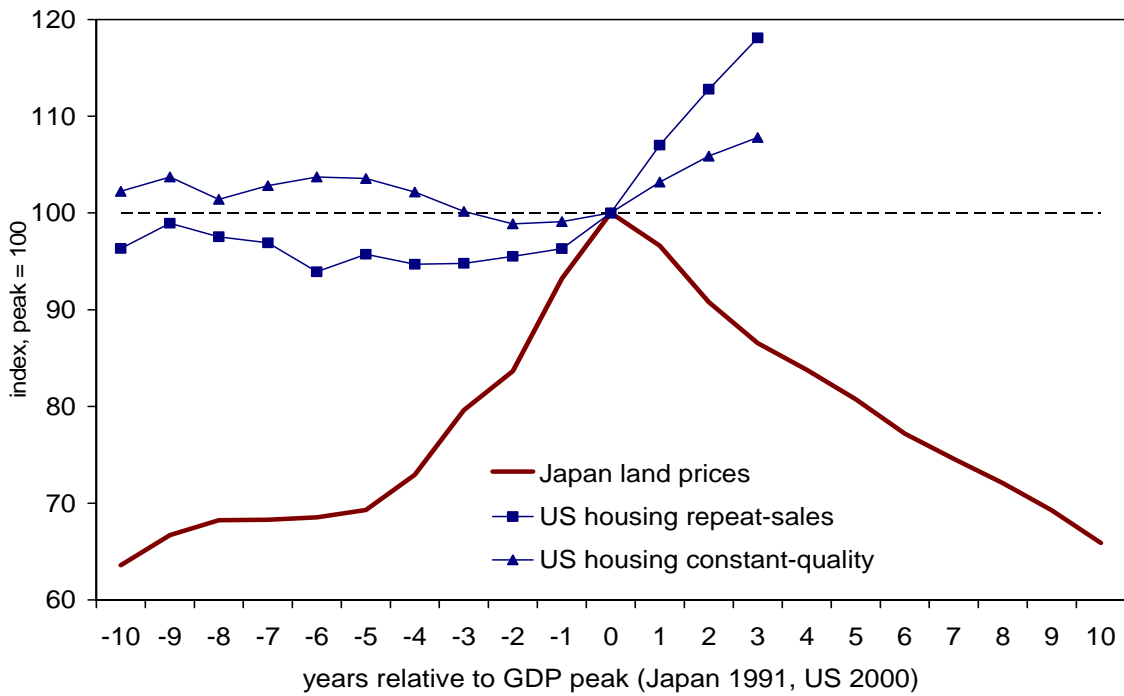


**Figure 3: Stock markets**



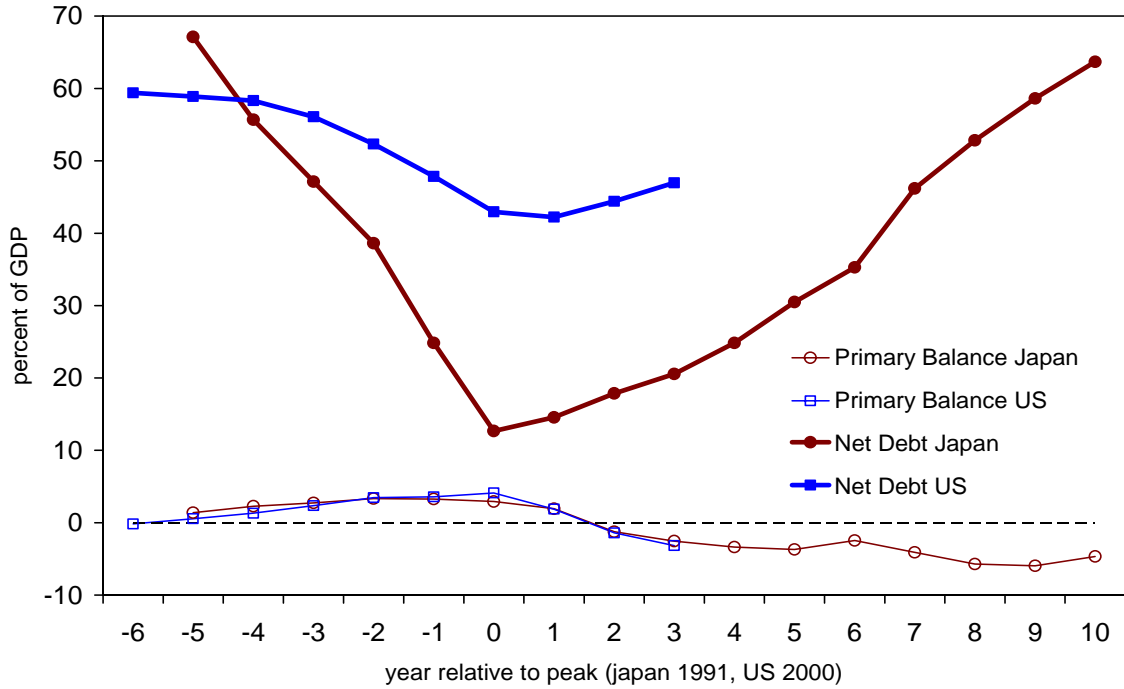
Sources: Federal Reserve Bank of New York databases.

**Figure 4: Relative price of real estate**



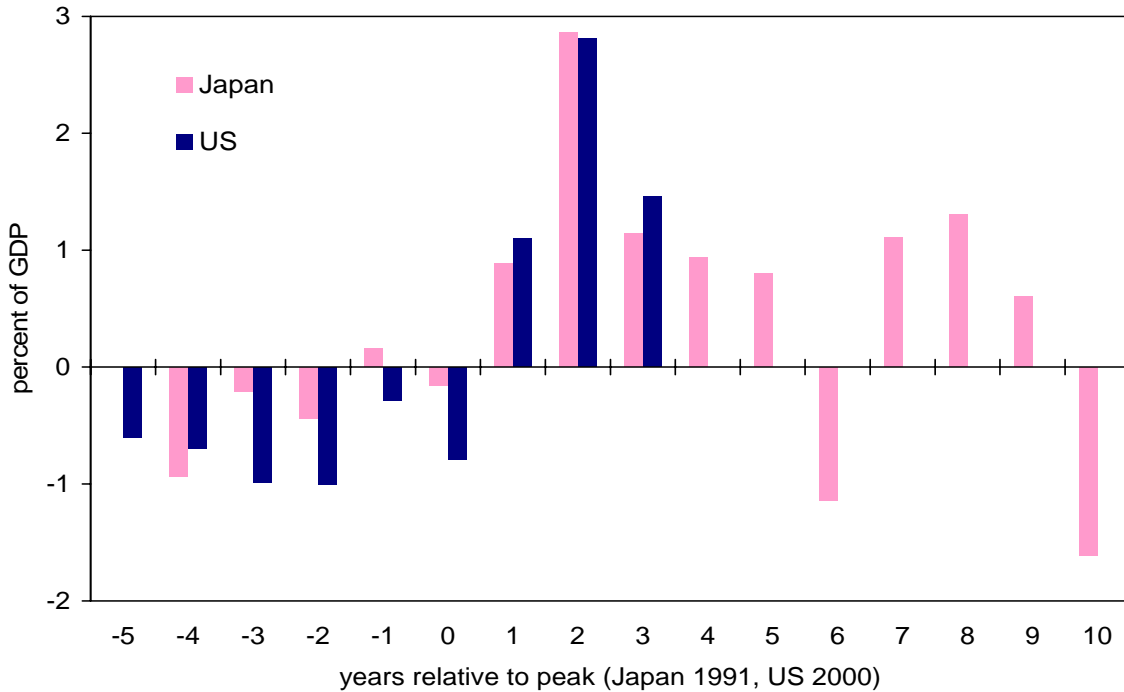
Sources: US Office of Federal Housing Oversight, US Census Bureau, and Japan Real Estate Institute.

**Figure 5: Government debt and deficit**



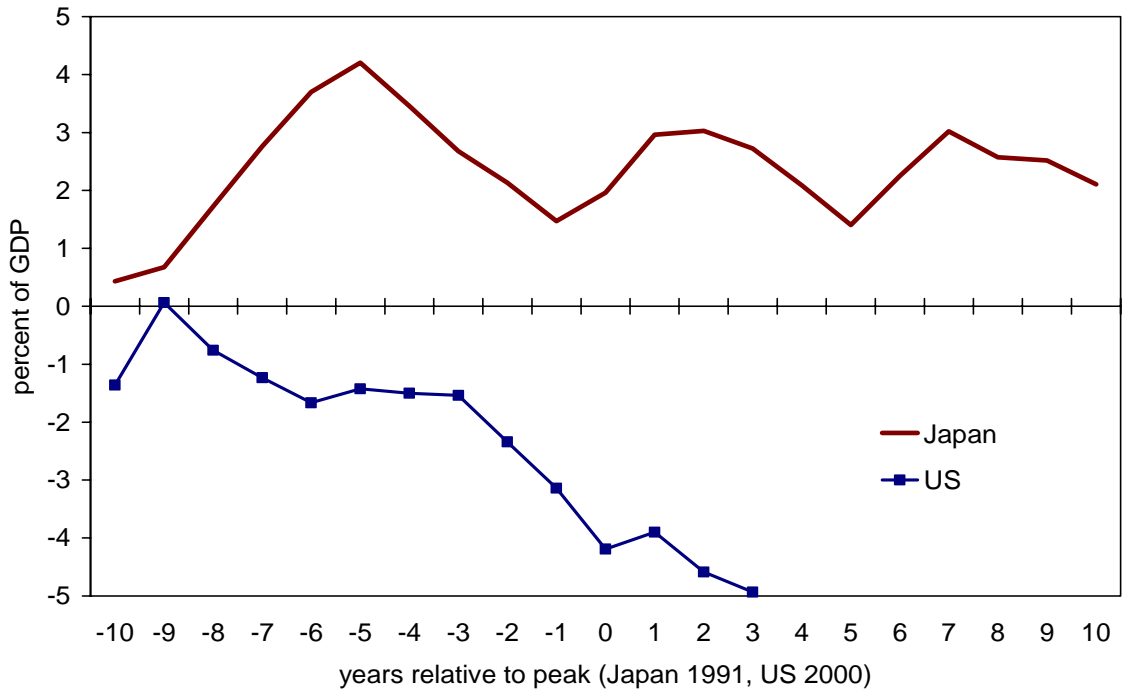
Source: OECD Economic Outlook, Annex Tables 30 and 34.

**Figure 6: Fiscal stimulus (change in structural deficit)**



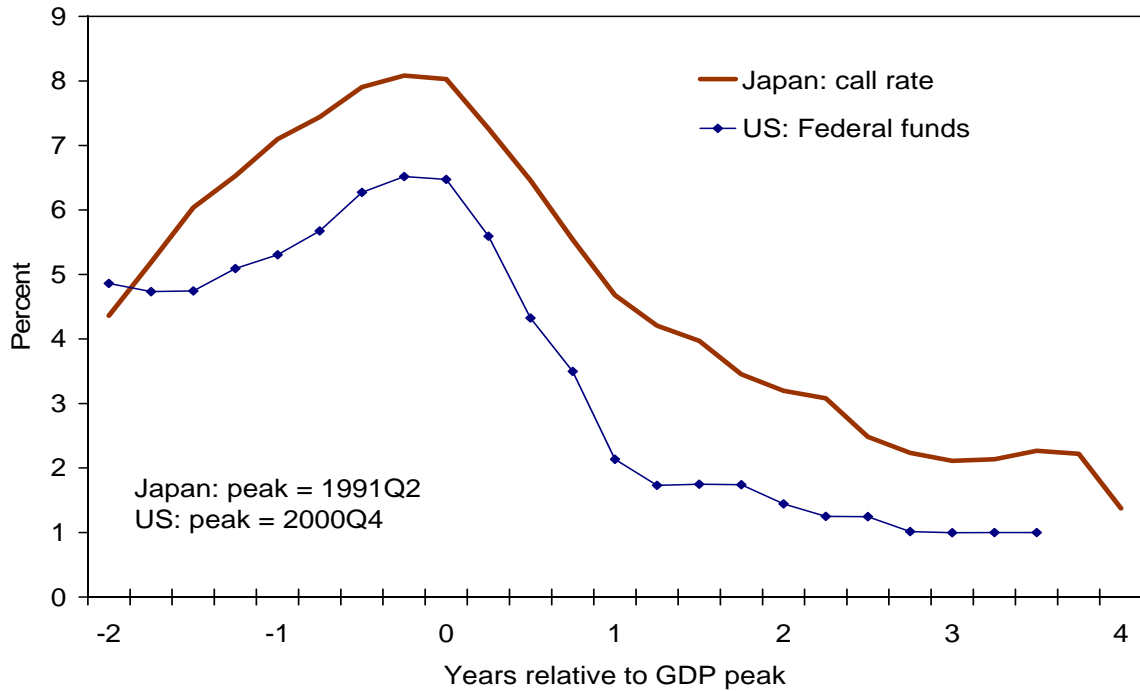
Source: OECD Economic Outlook, Annex Table 26.

**Figure 7: Current account balance**



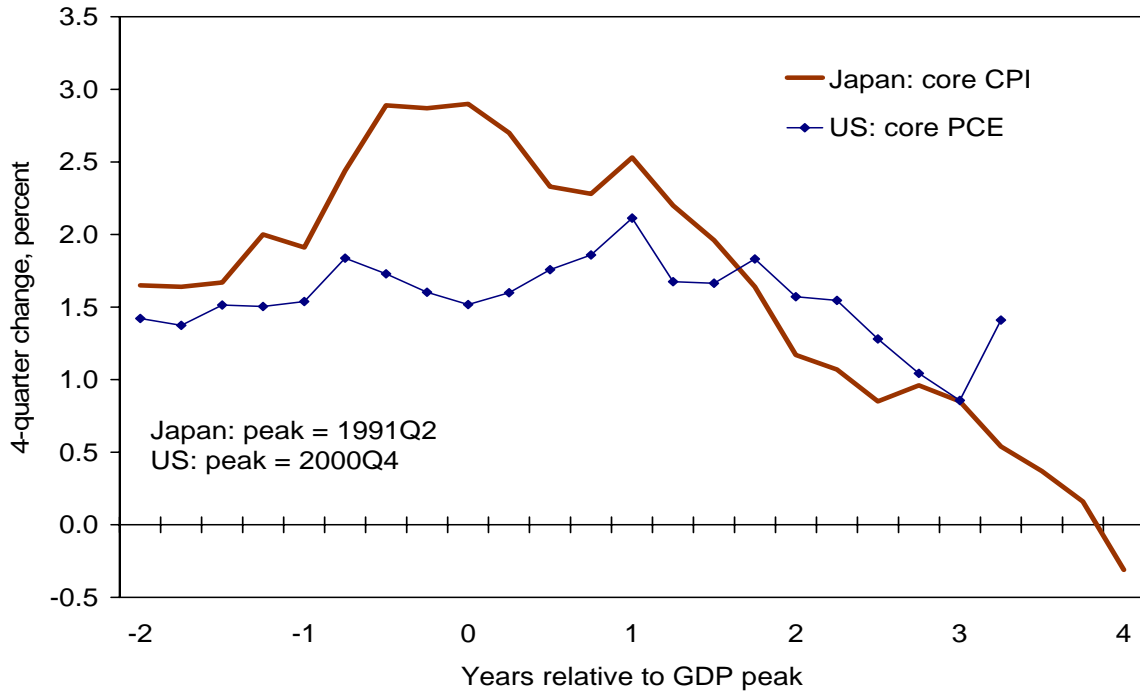
Sources: US and Japanese national accounts.

**Figure 8: Nominal short-term interest rates in Japan and the U.S.**



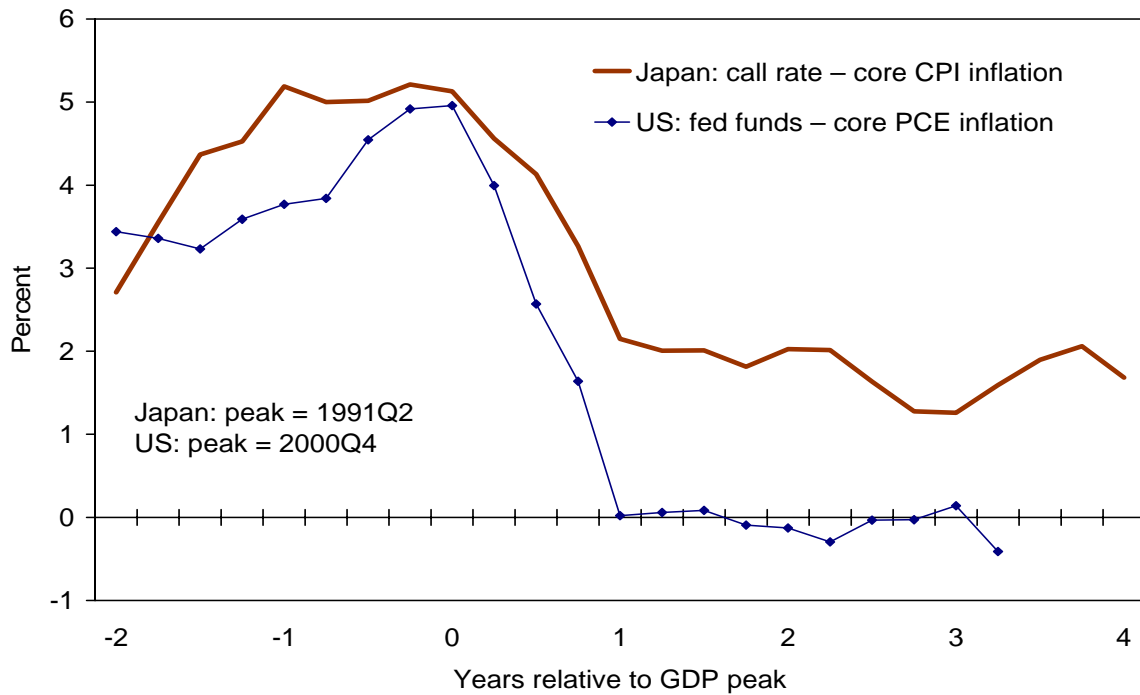
Sources: Bank of Japan, and Board of Governors of the Federal Reserve System.

**Figure 9: Inflation in Japan and the U.S.**



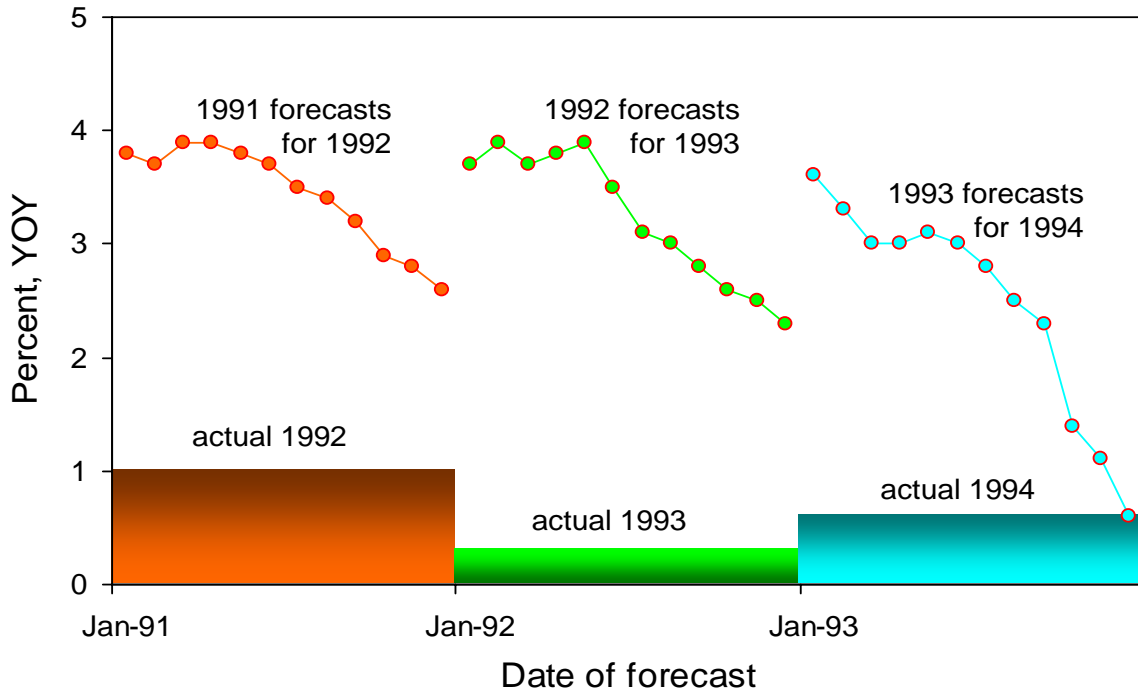
Sources: Statistics Bureau of the Ministry of Public Management, Home Affairs, Posts, and Telecommunications; and the Bureau of Economic Analysis. Japanese core inflation is calculated by FRBNY staff, removing the effects of changes in taxes, energy, and food prices.

**Figure 10: Real interest rates in Japan and the U.S.**



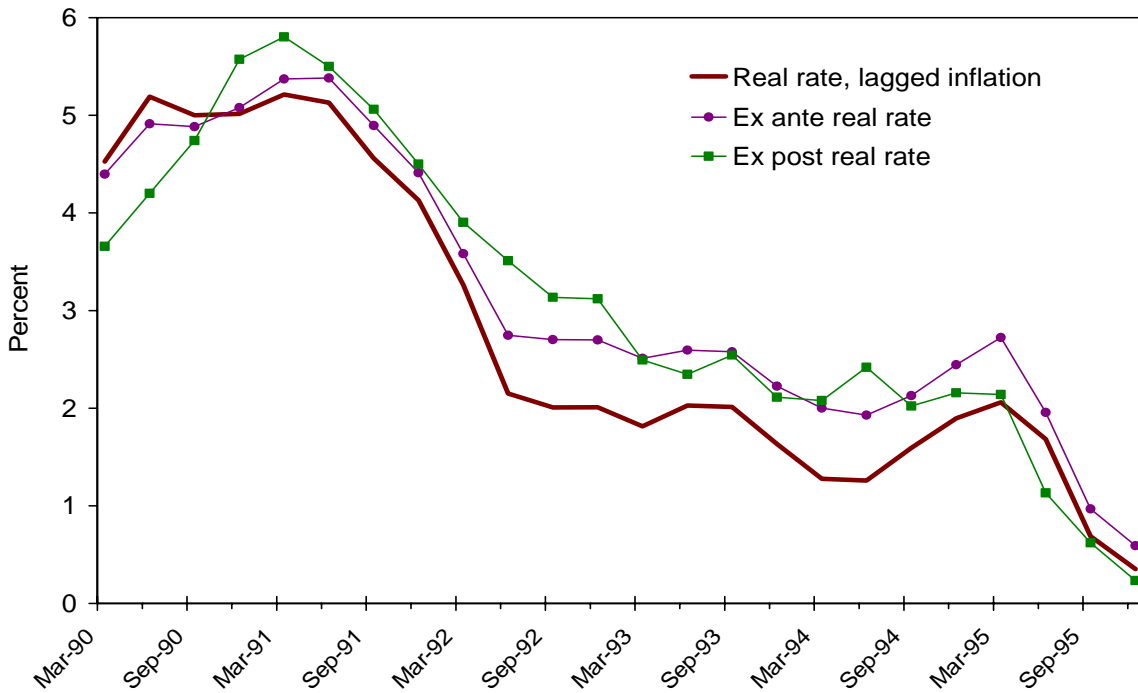
Sources: Same as those for figures 9 and 10, and authors' calculations as described in the text.

**Figure 11:** Consensus real GDP growth forecasts, Japan



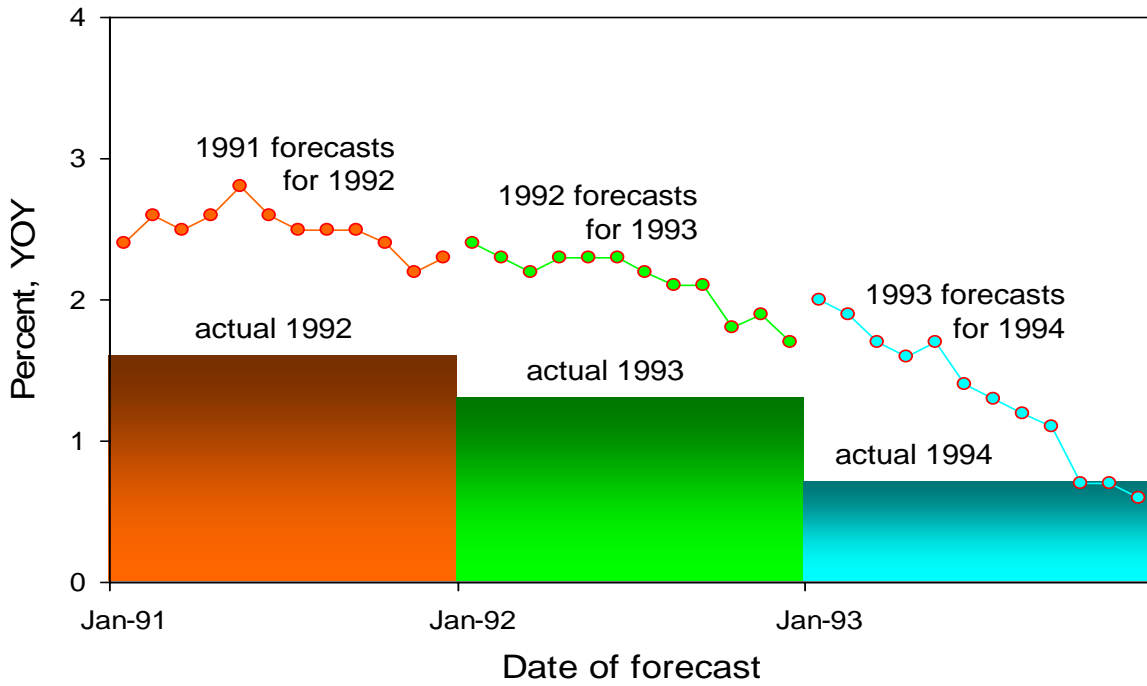
Sources: Consensus Economics Inc., and Economic and Social Research Institute.

**Figure 12:** Alternative real interest rate measures, Japan



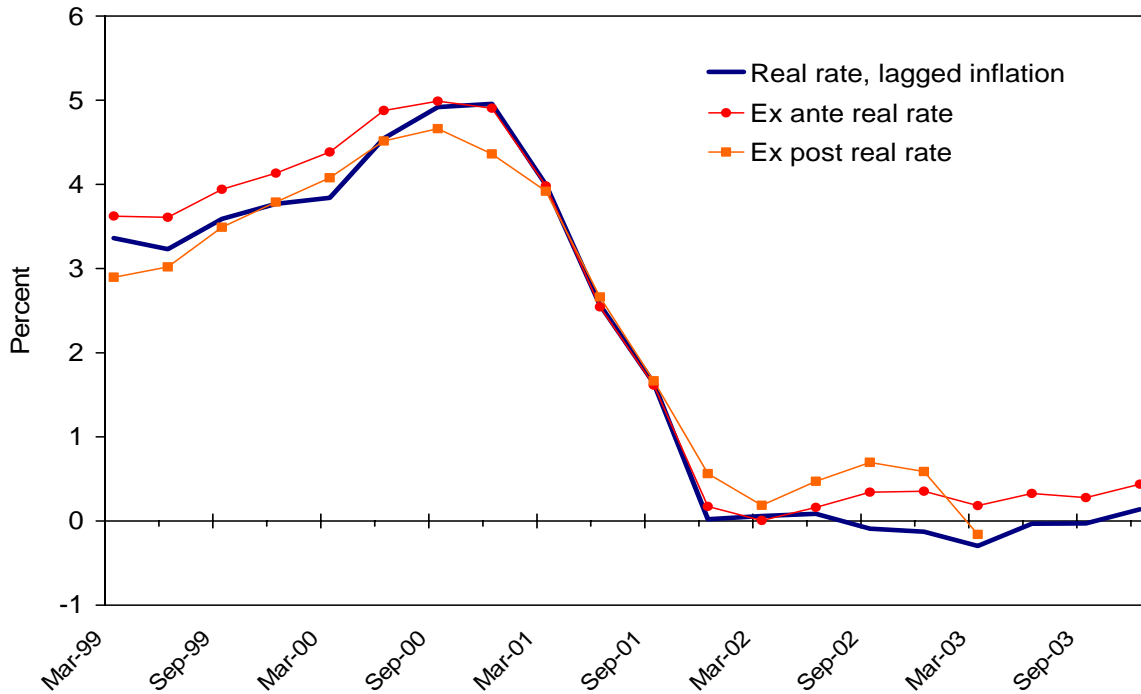
Sources: Same as those for figures 9 and 10, the Economic and Social Research Institute, and authors' calculations as described in the text.

**Figure 13: Consensus CPI inflation expectations, Japan**



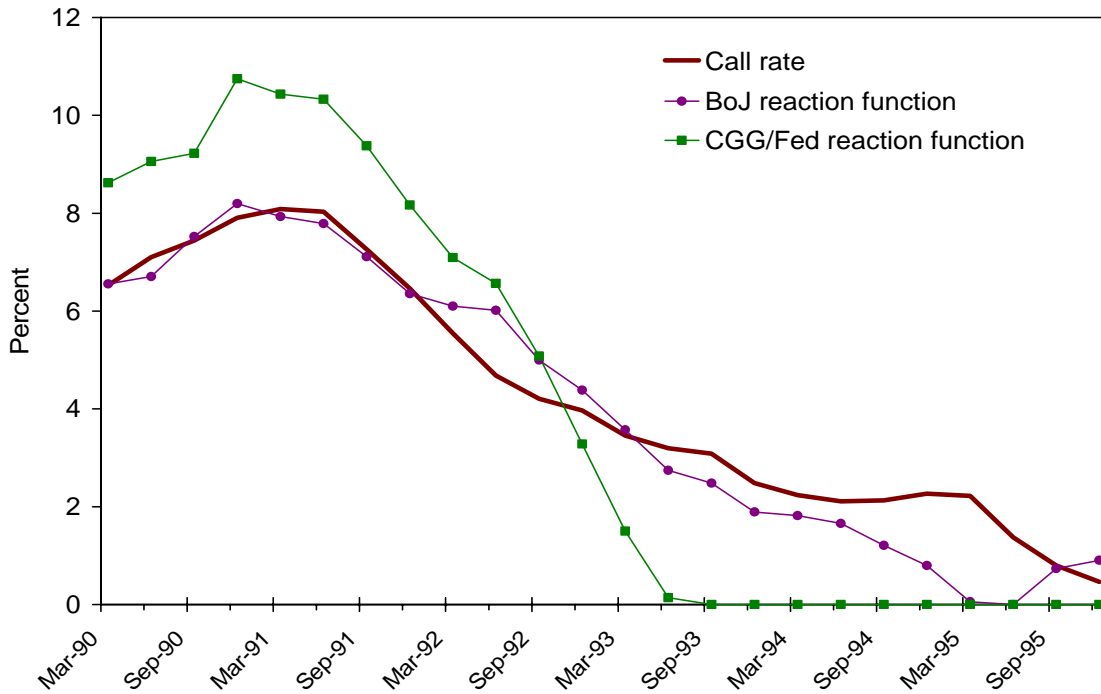
Sources: Consensus Economics Inc., and Statistics Bureau of the Ministry of Public Management, Home Affairs, Posts, and Telecommunications; and the Bureau of Economic Analysis.

**Figure 14: Alternative real rate measures, U.S.**



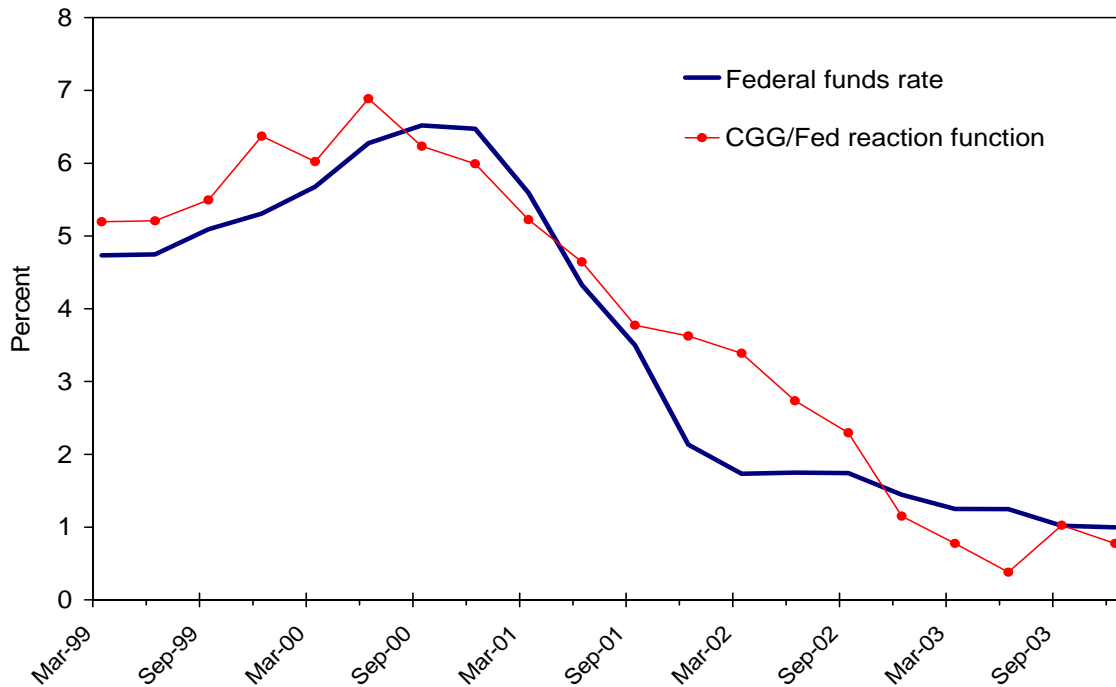
Sources: Board of Governors of the Federal Reserve, Bureau of Economic Analysis, and authors' calculations as described in the text.

**Figure 15:** Implications of alternative monetary policy reaction functions, Japan



Sources: Same as those for Figure 12, and authors' calculations as described in the text.

**Figure 16:** Implications of Clarida-Gali-Gertler rule for the U.S.



Sources: Same as those for figure 14, and authors' calculations as described in the text.