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### 3. Overview of Japan's Monetary Policy Responses to Deflation

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Japan's experience with low or zero interest rate policy (LIRP or ZIRP) and quantitative easing policy (QEP) can be best understood from the perspective of the "bubble economy" of the late 1980s and its subsequent collapse.<sup>2</sup> As shown in Exhibit 1, land and stock prices soared in Japan between 1985 and 1989, but since then have reversed their gains: Average land prices are still well below their 1985 level, and in 2008, equity price also have dropped well below their 1985 level. In addition, the nominal and real foreign exchange value of the yen rose significantly between the mid-1980s and the mid-1990s, diminishing the competitiveness of Japanese exporters. As a result, after growing nearly 5 percent per year between 1985 and 1990, Japan eked out a mere 1.5 percent average growth rate over the next five years. (See Exhibit 2.) Growth continued to decline over the remainder of the 1990s, which eventually became known as Japan's lost decade.

Japan has undergone three recessions since 1990 and another is likely underway. The first recession lasted from February 1991 through October 1993. In response to this economic slowdown, the Bank of Japan (BOJ) cut its policy rate target for the uncollateralized call money rate (the solid black line in Exhibit 2), to 2 percent by 1994.

With the benefit of hindsight, many outside observers argued that a faster and more aggressive policy response would have forestalled many of Japan's economic problems. Although the Bank of Japan's policy rate fell sharply and, at least early in the period, government spending increased (see Note 8 on Japanese fiscal policy), these changes were not enough to boost growth for an extended period nor were they successful in avoiding the deflation that emerged later in the decade (as shown by the dotted green line in the top panel).

In late 1995, the BOJ lowered its policy rate to 50 basis points, thus entering the first period of low interest rate policy (LIRP). By then, the Japanese economy had already begun to recover from the recession and by 1996, four-quarter GDP growth was above 3 percent. Despite the rebound in growth and very low policy rates, inflation remained very low at around ½ percent.<sup>3</sup>

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<sup>2</sup> We define LIRP as a policy regime in which the policy rate is greater than zero and less than or equal to 0.5 percent, ZIRP as a policy regime in which the policy rate is zero, excluding QEP. QEP as implemented by the BOJ is defined later in this note, but in general it is a policy regime in which an alternative "quantitative" policy target is adopted that requires liquidity injections beyond what would be necessary to drive the overnight interbank interest rate to zero. The BOJ adopted QEP from March 2001 to March 2006.

<sup>3</sup> The rise in inflation from early 1997 to early 1998 owed almost entirely to an increase in the consumption tax.

However, Japan's recovery did not last. By early 1997, real GDP growth began to slow. The government raised the consumption tax from 3 to 5 percent in 1997 in an effort to restore fiscal health, contributing to a decline in consumption just before the Asian financial crisis hit. As the economies of all of its regional trading partners ground to a standstill, the Japanese economy fell into a deep recession.

With its policy rate already quite low, the BOJ veered away from traditional monetary policy measures to try to stem the crisis. (A detailed time line of the BOJ's monetary policy actions is attached.) In November 1998, the BOJ extended commercial paper repo operations from 3 months to 1 year and established a temporary lending facility to support firms' financing activities. These measures did not keep bank lending from falling. The outstanding amount of bank credit (the top panel of exhibit 3) fell 21 percent between the fourth quarter of 1998 and the second quarter of 2005.

With the economy still in recession, the Bank of Japan lowered its policy rate to zero in February 1999, entering the period of zero interest rate policy (ZIRP). At the time, the Bank promised to continue the easy stance of monetary policy until deflationary concerns abated. In October 1999, the Bank began outright purchases of short-term government securities and expanded its repo operations to include two-year government securities.

By late 1999, real GDP growth had become solidly positive, and by the end of 2000, growth topped 3 percent. The recovery was led by exports and coincided with East Asia's rebound from financial crisis. Notwithstanding the pickup in economic growth, deflation became more firmly entrenched in 1999 and 2000. Despite its promise to maintain its policy stance until inflation returned, the BOJ exited ZIRP in August 2000, raising the policy rate to 25 basis points in response to a seemingly solid economic recovery. The move was criticized widely at the time, and, again with the benefit of hindsight, almost certainly was a mistake. The interest rate hike was small, but it took place in the context of falling equity prices and the collapse of the high-tech boom. The Japanese economy fell back into recession, as its exports were relatively dependent on technology products and so too, were its major trade partners. The recession lasted until January 2002.

In March 2001, with the economy in recession and prices falling at faster rates than before, the BOJ cut its policy rate back to zero. Along with this move, the BOJ announced its quantitative easing policy (QEP). QEP consisted mainly of three pillars:

- 1.) To change the BOJ's operating target to the outstanding current account balances held by financial institutions at the BOJ;
- 2.) To maintain the policy until the core consumer price index (ex. food prices) stopped falling on a year-on-year basis;
- 3.) To increase purchases of long-term Japanese government bonds.<sup>4</sup>

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<sup>4</sup> QEP policy is defined in "Effects of Quantitative Easing Policy: A Survey of Empirical Analyses," BOJ Working Paper, No. 06-E-10.

The BOJ proceeded to gradually expand the target for outstanding current account balances held at the BOJ from ¥4 trillion (almost 1 percent of GDP) initially to ¥10-15 trillion in December 2001 and continued to ratchet the target up to ¥30-35 trillion (about 6 percent of GDP) from March 2004 through March 2006. (See Note 5 as well.) As shown in the middle panel of Exhibit 3, the Bank of Japan's measures during QEP considerably boosted their balance sheet. One of the most striking aspects of QEP was the sharp increase in M1 at the beginning of the period; M1 increased 32 percent between April 2001 and April 2002.<sup>5</sup> The growth in M1 slowed after April 2002, however. Moreover, growth of M1 did not extend to broader definitions of money; the growth rate of M2 actually slowed during the QEP period.

With the announcement of QEP, the BOJ increased its outright purchases of long-term government bonds to ¥400 billion per month. By August 2001, it raised this limit to ¥600 billion, and by February 2002, monthly purchases rose to ¥1 trillion. Between March 2001 and March 2004 (the peak) the BOJ's holdings of all government securities grew 73 percent to ¥100 trillion (20 percent of GDP). Their holdings of Japanese long-term government bonds peaked in August 2004 at ¥67 trillion (about 13 percent of GDP).

During the same period, the BOJ expanded the range of instruments that could be used as collateral and in September 2002, the BOJ announced that it would purchase ¥2 trillion (0.5 percent of GDP) of stocks from banks, which it did by early 2004. In 2003, the BOJ began direct purchases of commercial paper, amounting to ¥1 trillion. During QEP, lower long-term rates as well as these other measures may have helped banks write off their bad loans and restore their balance sheets.

Despite pronouncements by the BOJ, there was considerable market uncertainty about the length of time that the BOJ would maintain its policy. (Note 5 provides further details on the BOJ's communication strategies during this period.) In October 2003, in an attempt to convince markets of its commitment to QEP, the BOJ clarified that it would keep the policy in place until inflation became positive on a 12-month basis and was forecasted to remain positive thereafter. The BOJ maintained QEP until March 2006, when it discontinued the policy in the context of sustained solid GDP growth. As the current account balances held at the BOJ were unwound (these are liabilities on the Bank's balance sheet), the BOJ rapidly shrank the asset side its balance sheet. Total assets of the BOJ, which had peaked at ¥155 trillion in December 2005, reached a post-QEP low of ¥100 trillion in July 2007. The decrease was equal to 11 percent of GDP. Over this period, BOJ holdings of long-term government bonds fell 19 percent and holdings of bank stocks fell 9 percent. The BOJ raised the overnight rate 25 basis points in June, 2006.

Despite the solid economic performance that led the BOJ to end QEP, core inflation remained negative. Indeed, headline inflation did not turn positive until early this year, when the contribution from energy and food price increases became overwhelming. Japan is quite likely to return soon to deflation, as inflation excluding

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<sup>5</sup> It is interesting to note that the growth rate of Japanese M1 during the early part of QEP is similar to the growth rate of M1 in the United States between October 2007 and October 2008.

food and energy never rose meaningfully above zero and the recent fall in commodity prices is likely to pass through, at least somewhat, into core inflation.

In response to the more recent financial crisis, the BOJ has taken steps to ensure ample liquidity provision, enacting several policies reminiscent of its policies under QEP. As liquidity pressures increased in both the government bond and the corporate financing markets, it expanded the types of Japanese government bonds it would accept in repo operations and increased the size and frequency of commercial paper repo operations. In addition, the BOJ along with the Ministry of Finance agreed to stop selling bank stocks still held on their balance sheet until financial markets stabilized. Finally, on October 31 the BOJ lowered its policy rate 20 basis points to 0.3 percent. However, following the rate cut, Governor Shirakawa made several statements highlighting the risks of moving the policy rate lower and the limited benefits of doing so. Nevertheless, our forecast and that of many outside observers is for Japan to return to ZIRP at some point over the next 6 months.

Exhibit 1

**Collapse of the Bubble**

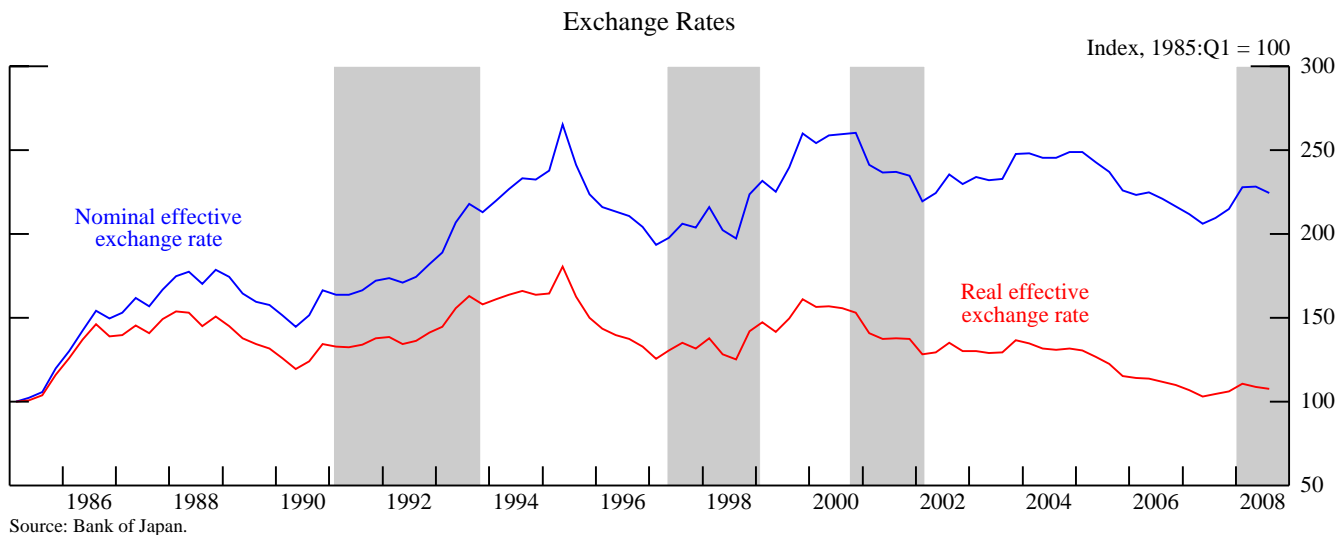
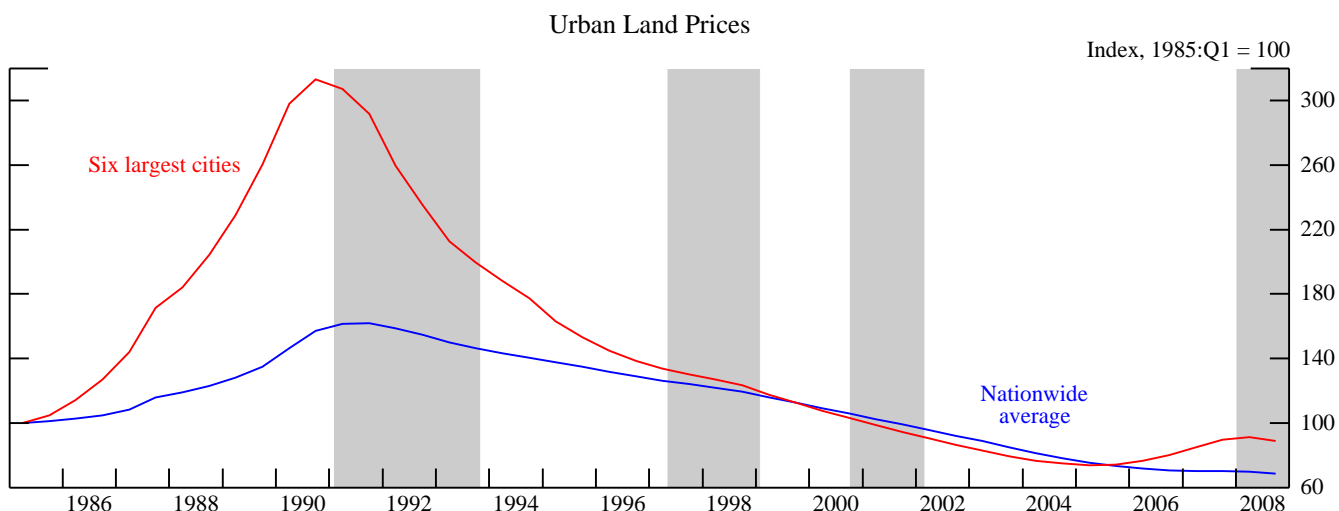
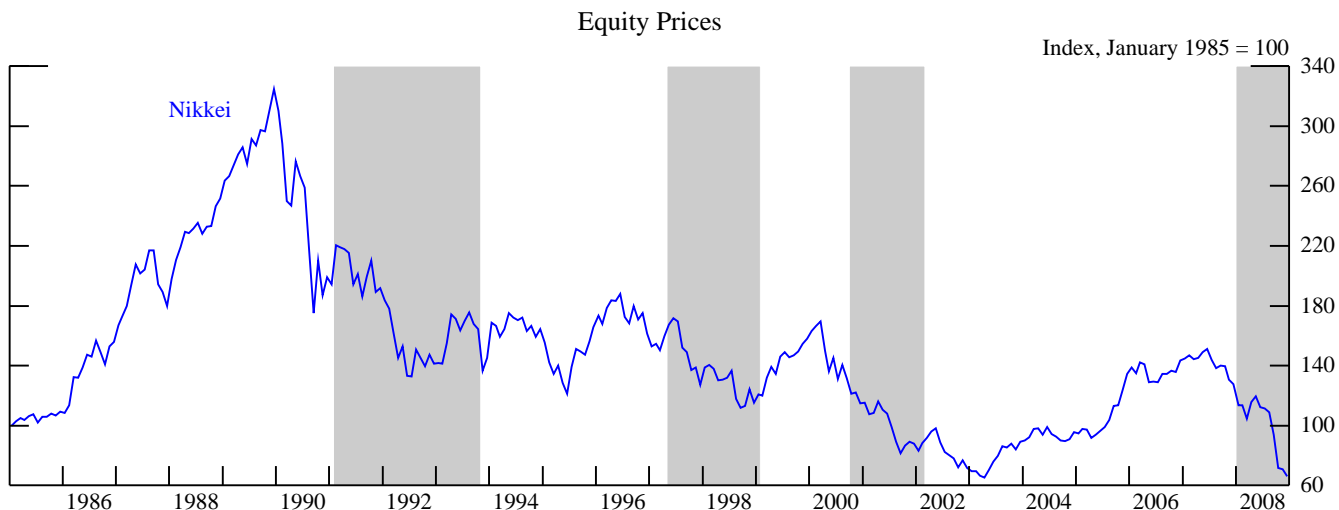
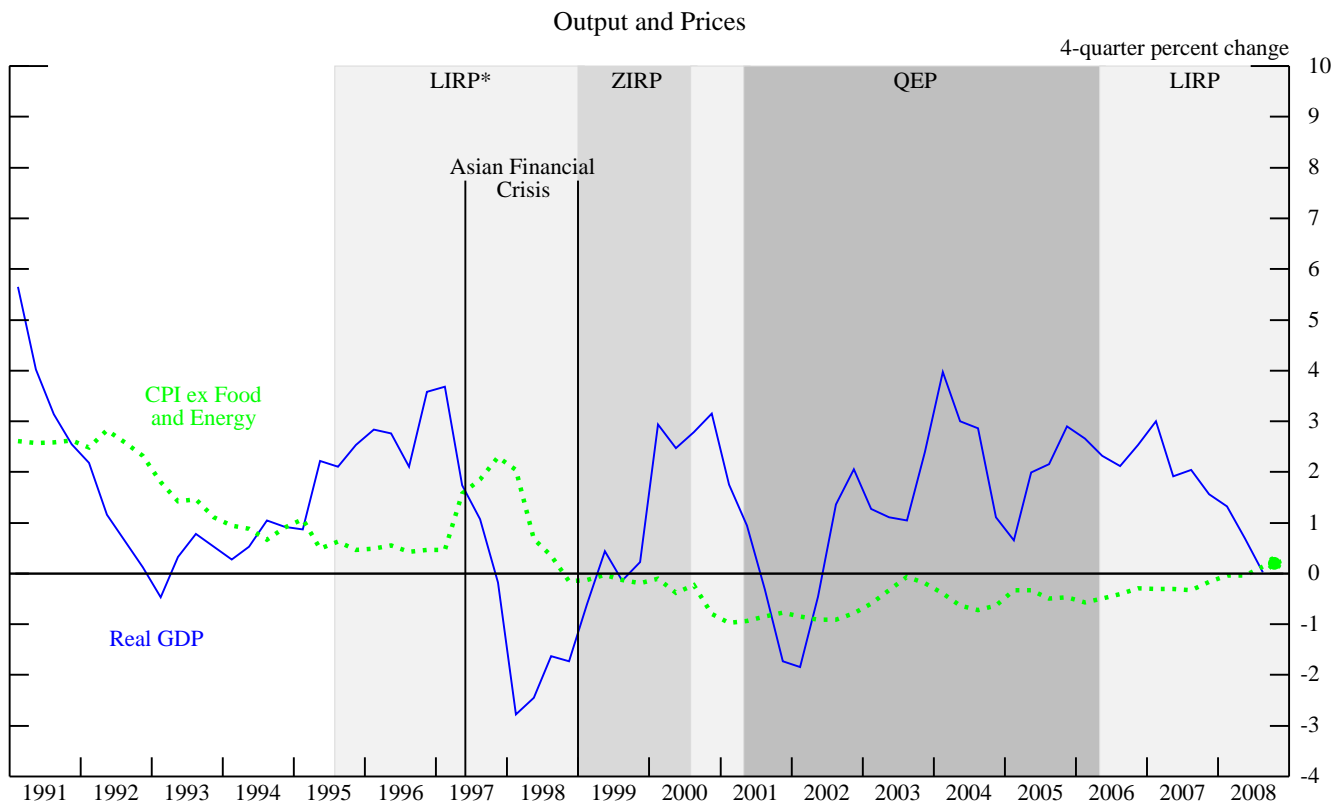


Exhibit 2

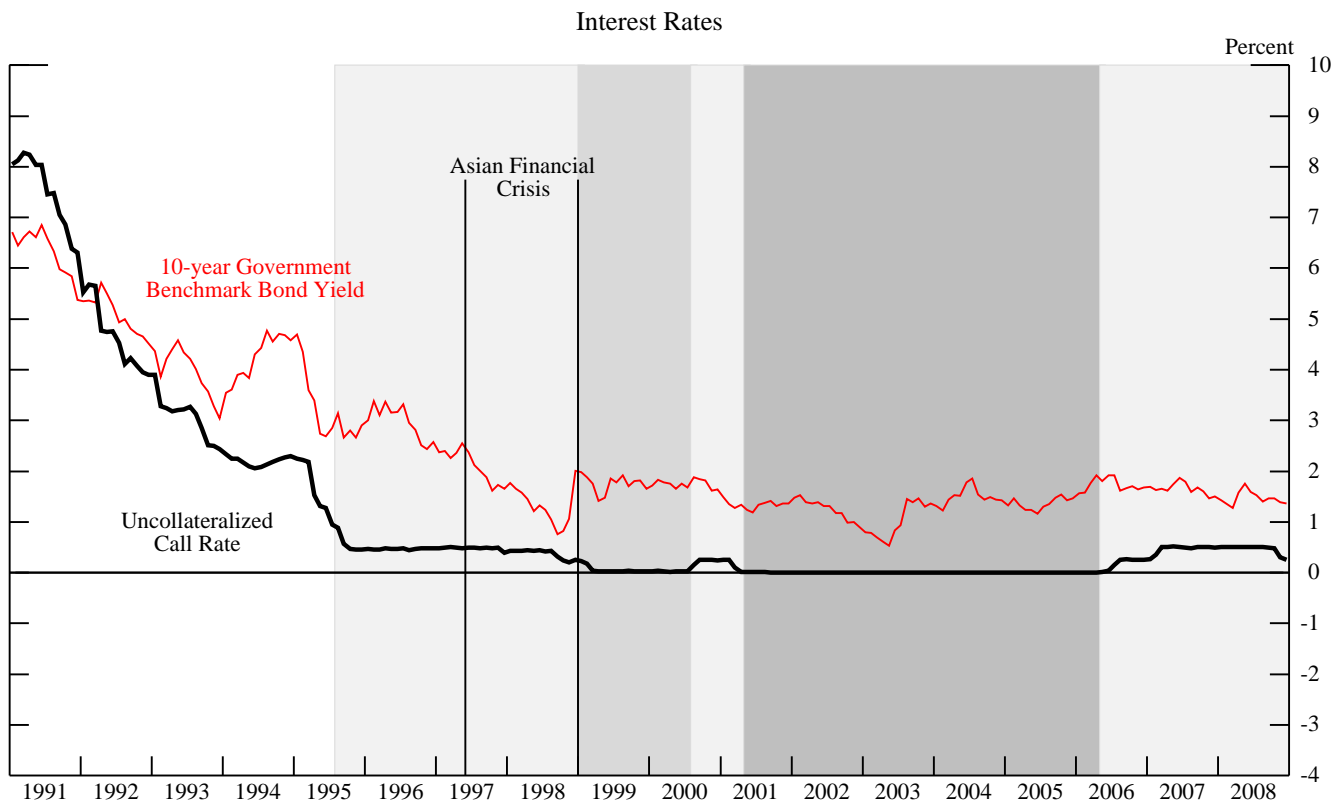
**Monetary Policy , Growth, and Inflation**



\*LIRP: Low Interest Rate Policy; ZIRP: Zero Interest Rate Policy; QEP: Quantitative Easing Policy.

\*\* Solid dot represents 12-month rate of inflation for October.

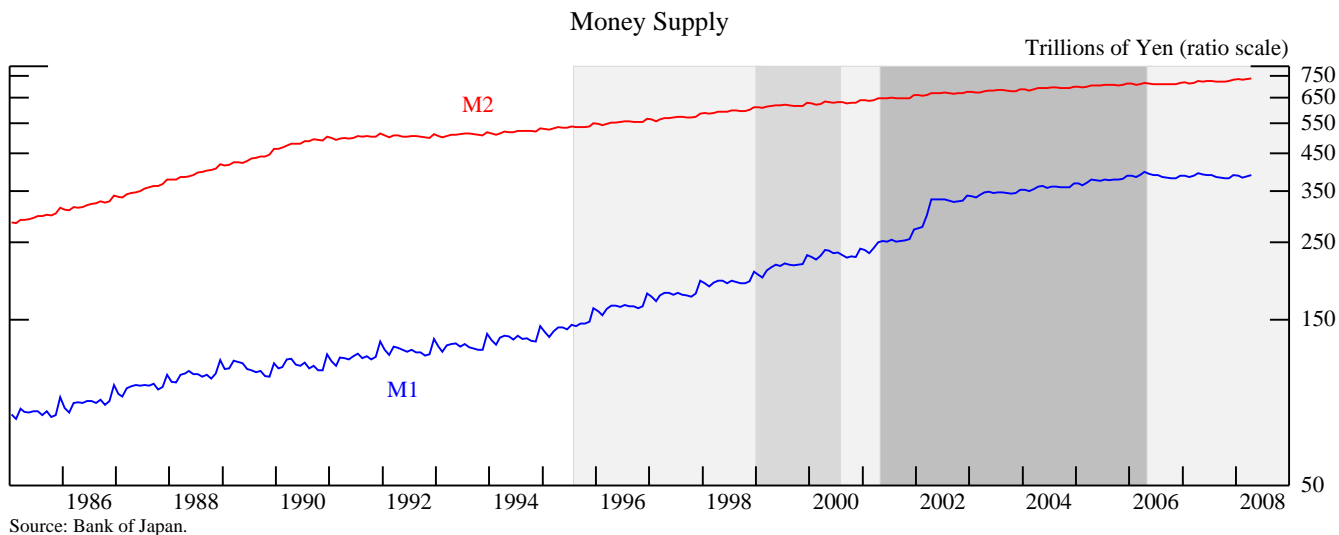
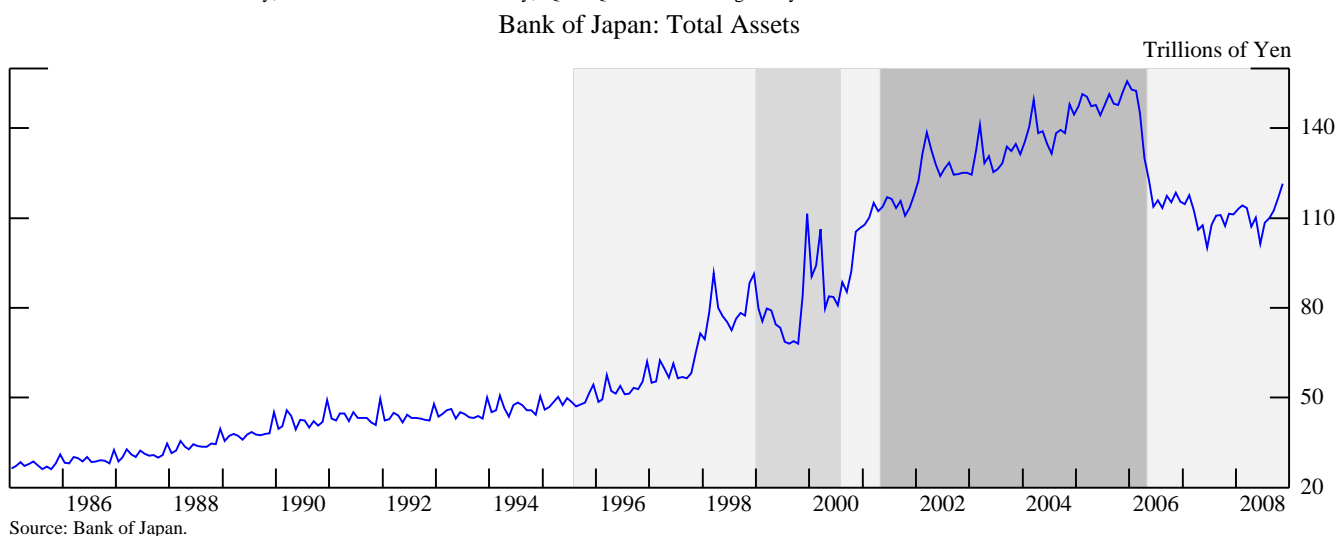
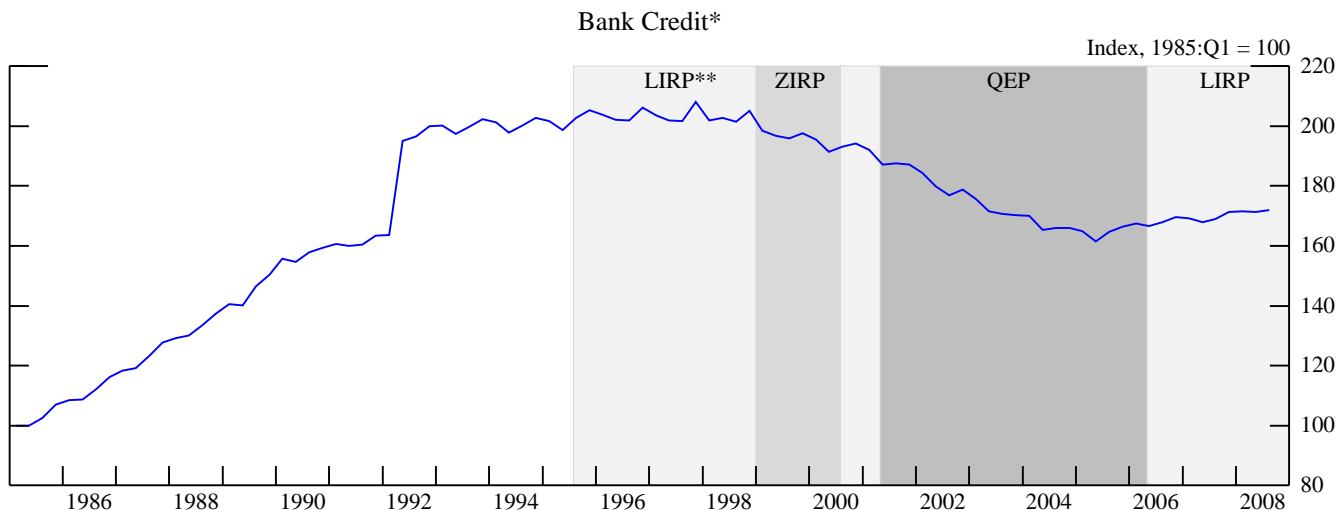
Sources: CPI: Ministry of Internal Affairs and Communications; Output, Cabinet Office.



Sources: Call Rate: Assoc. of Call & Disc Companies/Nihon Keizai Shinbun; Government Benchmark Rate: Japan Securities Dealers Association.

Exhibit 3

Money and Credit



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**A Timeline of the Bank of Japan's Monetary Policy Decisions**

Monetary Policy Meetings	Interest Rates		Target Outstanding Current Account Balances at BOJ	Other Policy Actions
	Target Uncollateralized Overnight Call Rate	Official Discount Rate		
January 16, 1998	Maintain on average slightly below the official discount rate of 0.5 percent.	0.5 percent		
September 9, 1998	0.25 percent	0.5 percent		
November 13, 1998	0.25 percent	0.5 percent		(1) Extend commercial paper repo operations from 3 months to 1 year. (2) Establish a temporary lending facility to support firms' financing activities.
February 12, 1999	Introduction of Zero Interest Rate Policy (ZIRP); aim to guide rate as low as possible.	0.5 percent		
September 21, 1999	0.0 percent	0.5 percent		Promise to continue the current easy stance of monetary policy until deflationary concerns subside.
October 13, 1999	0.0 percent	0.5 percent		(1) Begin outright purchases of short-term government securities. (2) Add two-year government securities for repo operations. (3) Utilize a full range of measures against the Y2K problem.



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	Target Uncollateralized Overnight Call Rate	Official Discount Rate		
August 11, 2000	End of ZIRP -- returns to 0.25 percent	0.5 percent		(1) Convert the discount window to a Lombard-type facility, allowing pre-approved banks and securities firms to obtain overnight central bank credit on request within the limits of their collateral, with the loans renewable up to a number of days determined by the BOJ Governor. (2) Will increase outright operations of short-term government securities (no amount specified).
February 9, 2001	0.25 percent	0.35 percent		
February 28, 2001	0.15 percent	0.25 percent		
March 19, 2001	0.0 percent (in effect)	0.25 percent	¥5 trillion (previously ¥4 trillion at time of announcement)	(1) Change the operating target for money market operations, from the uncollateralized overnight call rate to the outstanding balance of banks' deposits at the BOJ. (2) Maintain this policy until the core consumer price index (excluding fresh food) shows inflation of zero or more (on a year-over-year basis) (3) Increase the amount of its outright purchases of long-term government bonds from ¥400 billion per month if the BOJ considers that to be necessary for providing liquidity smoothly
August 14, 2001	0.0 percent (in effect)	0.25 percent	¥6 trillion	Raise outright purchases of long-term government bonds to ¥600 billion per month.

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	Target Uncollateralized Overnight Call Rate	Official Discount Rate		
September 18, 2001	0.0 percent (in effect)	<b>0.10 percent</b>	<b>"above" ¥6 trillion</b>	Increase the maximum time period for its Lombard-type facility from 5 to 10 business days during the current reserve period (through October 15).
December 19, 2001	0.0 percent (in effect)	0.10 percent	<b>¥10-15 trillion</b>	(1) Increase the monthly amount of outright purchases of long-term JGBs to ¥800 billion per month. (2) Will increase the amount of commercial paper it purchases under repurchase agreements (3) Will broaden the range of instruments that can be used as collateral for open market operations to include asset-backed commercial paper, mortgage loans, and real-estate backed securities
February 28, 2002	0.0 percent (in effect)	0.10 percent	<b>Can move above ¥20 trillion through March 31, whatever amount necessary</b>	(1) Increase the monthly amount of outright purchases of long-term JGBs to ¥1 trillion per month. (2) From March 1st to April 15th, the end of the March reserve maintenance period, the Bank will apply the official discount rate to the Lombard-type lending facility on any business day, no restrictions on duration.
September 18, 2002	0.0 percent (in effect)	0.10 percent	¥10-15 trillion	Will purchase ¥2 trillion worth of stocks from banks between now and September 2003 at the current market price.
October 30, 2002	0.0 percent (in effect)	0.10 percent	<b>¥15-20 trillion</b>	(1) Increase the monthly amount of outright purchases of long-term JGBs to ¥1.2 trillion per month. (2) Will extend maturities for bills purchased in bill purchasing operations from six months or less to a year or less.

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	Target Uncollateralized Overnight Call Rate	Official Discount Rate		
December 17, 2002	0.0 percent (in effect)	0.10 percent	¥15-20 trillion	(1) Will accept a broader range of loans on deeds as eligible collateral. Loans on deeds with original maturity of more than five years and up to ten years will be accepted as eligible collateral. In addition, collateral value ratios will be raised for loans on deeds with original maturity of three years and less. (2) Relax standards for asset-backed commercial paper as eligible collateral (ABCP); until end of March 2005, the ABCP guaranteed by the Bank's counterparty financial institutions will be accepted as eligible collateral and be eligible for Bank's market operations to purchase commercial paper under the repurchase agreement.
March 25, 2003	0.0 percent (in effect)	0.10 percent	<b>¥17-22 trillion from April 1st</b>	Increase purchase of stocks from banks to ¥3 trillion from ¥2 trillion.
April 8, 2003	0.0 percent (in effect)	0.10 percent	¥17-22 trillion	Will examine buying asset-backed securities in the future. In particular, the BOJ will consider outright purchases of commercial paper backed by accounts-receivable held by small- and medium-sized enterprises.
April 30, 2003	0.0 percent (in effect)	0.10 percent	<b>¥22-27 trillion</b>	Include loans to Industrialization Revitalization Corporation as eligible collateral for the BOJ's open market operations.

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	Target Uncollateralized Overnight Call Rate	Official Discount Rate		
May 20, 2003	0.0 percent (in effect)	0.10 percent	¥27-30 trillion	
June 11, 2003	0.0 percent (in effect)	0.10 percent	¥27-30 trillion	Will begin direct purchase of asset-backed securities in late July. Will initially limit total purchases to ¥1 trillion, commercial paper must have an A-1 rating and longer-term securities must be BB or higher.
October 10, 2003	0.0 percent (in effect)	0.10 percent	¥27-32 trillion	Extension of the maturity of the purchase of Japanese government securities with repurchase agreements.
October 10, 2003	0.0 percent (in effect)	0.10 percent	¥27-32 trillion	Enhancement of monetary policy transparency -- presenting the basic thinking on the conduct of monetary policy and the evaluation of the developments of the economy and prices in amore timely and lucid manner.
October 10, 2003	0.0 percent (in effect)	0.10 percent	¥27-32 trillion	Clarification of QEP policy. Commitment to maintaining zero interest rates until a return to positive inflation.

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	Target Uncollateralized Overnight Call Rate	Official Discount Rate		
April 9, 2004	0.0 percent (in effect)	0.10 percent	¥30-35 trillion	Introduction of the securities lending facility to provide the markets with a secondary source of Japanese government securities.
May 20, 2005	0.0 percent (in effect)	0.10 percent	¥30-35 trillion	The BOJ may allow current account balances to fall below target.
March 9, 2006	0.0 percent (in effect)	0.10 percent	¥30-35 trillion	Exits QEP.
July 1, 2006	0.25 percent (in effect)	0.40 percent		
February 1, 2007	0.5 percent (in effect)	0.75 percent		
October 1, 2008	0.3 percent (in effect)	0.50 percent		