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Bank of Japan

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## **Central Banking: Before, During, and After the Crisis**

*Remarks at  
A Conference Sponsored by the Federal Reserve Board and  
the International Journal of Central Banking*

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## **Introduction**

The global financial crisis and the bubbles preceding it pose mounting issues for a central bank. The Bank of Japan was the first central bank among advanced countries to confront those issues in the postwar period. Japan's experience intellectually stimulated academics and policy makers overseas, which led to the Bank being flooded with policy proposals, including highly experimental ones. With the exception of just a few cases, however, the low growth in Japan following the bursting of a bubble was often simply interpreted as a unique episode caused by a failure to implement bold policy measures in a prompt manner. As many of you may recall, there was an oft-quoted paper coauthored by a number of Federal Reserve economists entitled "Preventing Deflation: Lessons from Japan's Experience in the 1990s" that was released in 2002.<sup>1</sup> This paper argued as follows (Chart 1).

"our sense is that much of the failure of monetary loosening to support asset prices and to boost the economy owed to offsetting shocks rather than to a genuine breakdown of the monetary transmission mechanism. .... there is little evidence that the transmission channels of monetary policy were so diminished as to have obviated the benefits of faster and sharper monetary easing in the 1991-95 period."

At that time, I found that such a view on the effectiveness of monetary policy was too sanguine.

Several years later, the housing and credit bubbles burst, this time in Europe and the United States, triggering a financial crisis. Developments in real GDP for the United States, after U.S. housing prices peaked and again after a large-scale financial crisis occurred in the form of the Lehman shock, reveal surprisingly similar trends shared with Japan (Charts 2 and 3).<sup>2</sup> The same can be said of the two countries' policy responses, including the virtually zero

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<sup>1</sup> For more details, see the following.

Ahearne, Alan, Joseph Gagnon, Jane Haltmaier, Steve Kamin, and others, "Preventing Deflation: Lessons from Japan's Experience in the 1990s," International Finance Discussion Papers, No.729, Board of Governors of the Federal Reserve System, June 2002.

<sup>2</sup> For the deleveraging process after the bursting of bubbles, see Masaaki Shirakawa, "Deleveraging and Growth: Is the Developed World Following Japan's Long and Winding Road?," Lecture at the London School of Economics and Political Science (Co-hosted by the Asia Research Centre and STICERD, LSE), January 10, 2012.

interest rate policy and the expansion of central banks' balance sheets (Charts 4 and 5). When the Bank of Japan was striving to devise new policy measures, not to mention the zero interest rate policy, quantitative easing, a policy commitment regarding the future level of interest rates, and -- as referred to today -- credit easing, little did I imagine that the Federal Reserve would adopt similar measures within such a short span of years. I have become painfully aware of the need to more closely study each of the countries' experiences over the past quarter-century, and to draw true lessons that could be applied to future policy conduct.

Relevant topics for discussion range widely from monetary policy to regulation and supervision, payment and settlement systems, and so on. In my remarks today, I will raise several points with particular focus on the role of the central bank in maintaining macroeconomic stability at each of three phases: before, during, and after the financial crisis.

### **I. Before the Crisis: Financial Imbalances and Monetary Policy**

I would like to start from issues relevant in the periods preceding financial crises, focusing on the role of monetary policy. Conventional wisdom tells us that price developments serve as a trigger for changes in monetary policy. In fact, without exception, central banks pay attention to output gaps and inflation expectations, which have an impact on future inflation developments. In retrospect, however, when we look back at how bubbles were formed and then developed into financial crises, the most significant imbalance that destabilized the macroeconomy emerged on the financial front instead of the price front. The financial imbalances took the form of a sharp and significant rise in asset prices and credit expansion associated with increased leveraging and maturity mismatches. Financial imbalances ultimately created a tremendous shock to financial institutions and the financial system, and led to a sharp and significant contraction of economic activity. While such acute pains wore off as a result of aggressive policy measures taken by the governments and central banks after the crisis erupted, the chronic affliction of low growth associated with balance-sheet repair remains. This experience has revealed the fact that the economy was not able to avoid a prolonged period of stagnant growth even though aggressive monetary easing was adopted in a prompt manner after the bursting of bubbles. In this sense, policy

priority should be placed on ex-ante measures to restrain a buildup of financial imbalances instead of ex-post measures to clean up the mess after a bubble bursts.

Regarding ex-ante policy measures to address financial imbalances, some argue that, based on Tinbergen's rule and Mundell's assignment principle, the authorities should assign monetary policy to price stability while tasking regulatory and supervisory measures with the challenge of addressing financial imbalances. However, such a policy assignment can be effective only when the two policy objectives of price stability and financial system stability are independent from each other. A series of events in recent years have made it clear that the two policy objectives are not independent. When a macroeconomic environment including prices becomes stable, economic entities become more sanguine about risks and increase their appetite for risk-taking. Furthermore, with the growing expectation that a low interest rate environment will continue under price stability, financial institutions increasingly get involved in "search for yield" activity by increasing leverage and mismatches in their assets and liabilities with respect to maturities and currencies (Chart 6). When such imbalances grow beyond a certain threshold, they threaten the stability of the financial system and consequently that of the real economy and prices.

Many central banks, including the Bank of Japan, were aware of the financial imbalances in the periods preceding financial crises. The most troublesome thing for central banks was the fact that inflation rates did not rise, or remained low, during the buildup of imbalances, which was ironic given their traditional emphasis on price stability (Chart 7). At least in the case of Japan, when inflation rates remained low amid high economic growth, those who tried to justify an interest rate hike needed to defeat the strong counterargument that was predicated on what later became known as "the arrival of the new economy." The continuation of a low interest rate environment is one cause of financial imbalances. In particular, if the central bank commits itself to asymmetric conduct of monetary policy -- more specifically, if it does not lean against a bubble so long as prices are stable but instead intervenes aggressively after the bursting of bubbles --, the situation could get worse through the following channels. First, this kind of put option-type monetary policy engenders more risk-taking by financial institutions. Second, if monetary policy focuses narrowly on price stability alone and successfully engenders an extended period of a stable

macroeconomic environment, it will further boost various economic entities' expenditure and risk taking. Even though monetary policy itself leads to a combination of high growth and low inflation, on the surface, it is difficult to distinguish such a case from the arrival of the new economy. If the central bank continues with monetary easing without a proper diagnosis, this boosts the economy and accelerates the accumulation of financial imbalances under seemingly continued price stability, resulting in a correspondingly larger shock after the bubble bursts. This could be referred to as "a paradox of price stability."

Needless to say, it is inappropriate to blame only monetary policy for an accumulation of financial imbalances that are in fact formed through a much more complicated mechanism. In this regard, nobody disagrees with the claim that regulations and supervision play important roles in addressing financial imbalances, and that macroprudential perspectives are crucial. So, what about the argument that the authorities should assign regulatory and supervisory measures to financial imbalances? My answer is simple: we need to employ appropriate monetary policy in tandem with regulations and supervision. It does not seem promising to address financial imbalances only through macroprudential measures and regulations without monetary policy responses. This is just like endlessly bailing out water that is overflowing from a bucket without turning off the tap.

## **II. During the Crisis: The Importance of the Lender of Last Resort Role**

Now I would like to move on to the next phase: the midst of the crisis. In this phase, the essential role of the central bank is to act as the "lender of last resort." The time-honored importance of the lender of last resort function has also been demonstrated by the aggressive measures taken by central banks in the midst of the recent crisis, which proved to be very effective in preventing a sharp drop in economic activity. Taking the examples of quantitative easing by the Bank of Japan, credit easing by the Federal Reserve, and the three-year LTRO by the European Central Bank, the effectiveness of all these measures essentially hinges on these central banks' role as the lender of last resort.

In association with the lender of last resort function, I would like to stress the importance of policies regarding payment and settlement systems (Chart 8). Only the central bank is able to issue currency that private economic agents can accept without conditions. Therefore,

in a financial crisis where the credibility of counterparties is undermined, the role of the central bank becomes extremely important. In the midst of the crisis, it is crucial that financial institutions and investors manage the counterparty risk by controlling not only the amount of exposure at the end of the day but also that of intraday credit. In the past twenty years or so, it has been the role of the central bank, as a bank of banks, to make various efforts to improve the safety and efficiency of payment and settlement systems. Such efforts have led to the introduction of real-time gross settlement, delivery versus payment, and simultaneous settlement of foreign exchange (Chart 9). Without such efforts made by central banks, the Lehman shock could have induced a complete termination of financial transactions. If I am asked what the most significant contribution by central banks is in terms of securing economic and financial stability in the past quarter of a century, I could point to their unceasing efforts to improve payment and settlement systems.

### **III. After the Crisis: The Effects and Limits of Aggressive Monetary Policy**

Lastly I would like to discuss the role of monetary policy in the aftermath of the financial crisis -- specifically, when the economy has overcome acute pains but still suffers from chronic affliction of low growth associated with balance-sheet repair (Chart 10). When taking monetary easing steps, it is essential to conduct a careful analysis of their intended benefits as well as unintended costs. While aggressive monetary easing is definitely needed after the bursting of bubbles, its side effects and limits should also be taken into consideration. Although there is no universal conclusion to such cost and benefit analysis for monetary easing, as it depends on countries and phases, I would like to call attention to the following four aspects, which have not been paid sufficient attention in traditional arguments made before the recent crisis.<sup>3</sup>

The first is the burden of balance-sheet repair. Even with monetary easing, economic entities with excess debt neither increase expenditures nor embrace more risk taking until their debts are reduced to an appropriate level. Monetary easing only mitigates pains associated with balance-sheet repair. Moreover, employing this mitigator for a prolonged time comes with costs, as it reduces incentives to lessen excess debt and causes delays in

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<sup>3</sup> As for quantitative analysis of the effect of various policy measures adopted during the period of quantitative easing in Japan, please see Hiroshi Ugai, "Effects of the Quantitative Easing Policy: A Survey of Empirical Analyses," *Monetary and Economic Studies* Vol.25, No.1, March 2007.

balance-sheet repair, which ultimately is necessary for economic recovery. Needless to say, the effect of low interest rates is extended to those economic entities that have not suffered any damage to their balance sheets. If they bring forward future demand to the present by taking advantage of a low interest rate environment, this leads to an increase in aggregate demand. As balance-sheet adjustment continues for a long period of time, however, the amount of future demand that could be brought forward gradually diminishes even in a low interest rate environment. The above-mentioned cost of reducing incentives to lessen excess debt is not only an issue for private economic entities but also for the government. Once the increased level of government debt is perceived to be unsustainable, this threatens both price stability and financial system stability, as in the case of the European debt problem.

The second aspect is the impact of low interest rates on the supply side of the economy. If low interest rates induce investment projects that are only profitable at such interest rate levels, this could have an adverse impact on productivity and growth potential of the economy by making resource allocation inefficient. While central banks have typically conducted monetary policy by treating a potential growth rate as exogenously given, when the economy is under prolonged shocks arising from balance-sheet repair, we may have to take into account the risk that a continuation of low interest rates will affect the productivity of the overall economy and lower the potential growth rate endogenously.

The third aspect is the impact on financial intermediaries. The effect of monetary easing usually materializes when firms and households increase their expenditures, induced by low interest rates. Within that process, we should bear in mind that there are financial intermediaries and financial markets that connect monetary policy conducted by the central bank with firms and households. Once such intermediaries stop functioning properly, we can no longer expect to see a successful transmission of monetary easing. Maturity transformation is an important intermediation function of banks, which benefit from the spread between short- and long-term interest rates. Monetary easing widens this spread and increases the interest margins of financial intermediaries. This is one of the monetary transmission mechanisms that enhance the stimulative effect on the economy through the banking sector. Beyond a certain threshold, however, further monetary easing could

instead squeeze the margins and discourage financial intermediation, resulting in lower efficiency in resource allocation and lower growth potential in the long run. A similar problem arises for institutional investors in the form of a negative spread -- that is, investment returns on assets fall below the promised return on long-term liabilities.

The fourth aspect is the international spillovers of monetary easing and the feedback effect on a country's own economy. When the domestic economy is in the process of balance-sheet repair, the effect of monetary easing tends to materialize in the form of a search for yield activities by global investors and the depreciation of foreign exchange rates, instead of increased expenditures by domestic private economic entities. If emerging economies become the destination of a search for yield activities by global investors, monetary easing in advanced economies, combined with an inflexible foreign exchange rate policy in emerging economies, is likely to lead to expansion in emerging economies and a rise in international commodity prices.<sup>4</sup> Even though such a rise in commodity prices is affected by globally accommodative monetary conditions, individual central banks recognize that the fluctuation in commodity prices is an exogenous supply shock and focus on core inflation rates which exclude the prices of energy-related items and foods. The resulting reluctance of individual central banks to counter rising commodity prices, when aggregated globally, could further boost these prices. From a global perspective, such a situation represents nothing more than a case where a hypothetical "World Central Bank" fails to satisfy the Taylor principle, which ensures the stability of global headline inflation (Chart 11). While it is understandable that central banks would pursue the stability of their own economies in the conduct of monetary policy, it is increasingly important to take into account the international spillovers and feedback effects on their own economies.

### **Concluding Remarks: Monetary Policy Challenges for the Future**

So far I have raised points relevant to discussing central banking in terms of three phases -- before, during, and after the financial crisis. In closing, I would like to offer a change in perspective by pointing out future challenges for central banks as organizations.

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<sup>4</sup> As to the background of international commodity price developments and its policy implications, please see Report of the G20 Study Group on Commodities under the chairmanship of Mr. Hiroshi NAKASO, November 2011.

The first is the framework of monetary policy. In this regard, a consensus is already emerging. Most central banks of the advanced economies are now conducting policy with the aim of maintaining price stability in the medium to long term, regardless of the difference in the label attached to their monetary policy framework. Furthermore, it has also become apparent that an excessive focus on short-term inflation development may ultimately result in larger swings in the economy through the buildup and inevitable correction of financial imbalances. The Bank of Japan is probably not alone in trying to incorporate its view on financial imbalances -- in other words, the macroprudential perspective -- into the conduct of monetary policy. The remaining issue here is to weave such a desirable framework into the political foundations of central bank independence, which is the cornerstone of economic stability and prosperity. It is relatively straightforward to hold the central bank to account for hitting or missing a certain inflation number. In that sense, the spotlight accorded to specific levels of inflation has been a *quid pro quo* for entrusting an important slice of economic policy to a technocratic institution. In contrast to this, macroprudential considerations are much more nebulous -- containing more elements of art rather than science -- and will inevitably test the limits of democratic deference to the conduct of monetary policy.

The second, and related, challenge is to strengthen the decision-making processes and economic analyses at central banks. Good decision making and research supporting a central bank are the real foundation of its independence. The recent crisis has revealed that we miss many important points when we look at the economy only from traditional macroeconomic perspectives. We need to make efforts to avoid falling into this trap and to break free from the habit of groupthink. It is essential to develop an institutional culture in which a variety of information vital to decision making in monetary policy -- related to the macroeconomy, financial markets, and financial institutions -- is fully utilized in a well-balanced manner.

# Central Banking

## Before, During, and After the Crisis

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Governor of the Bank of Japan

## Introduction:

Some Recollections of Bubbles and Subsequent Crises

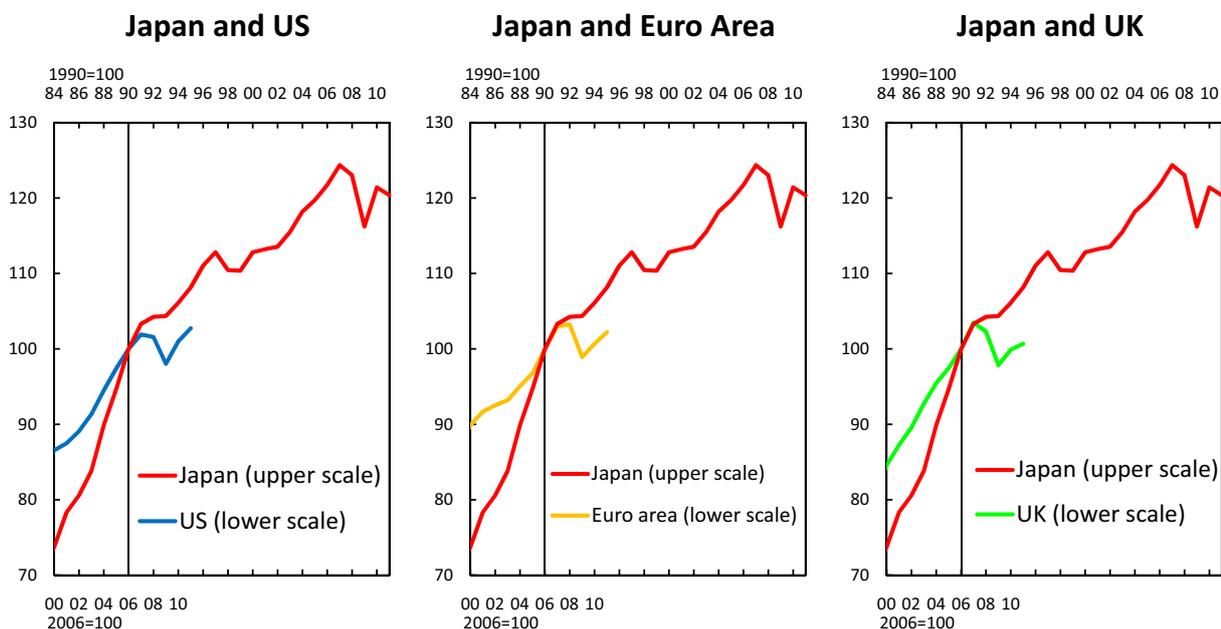
## “Preventing Deflation: Lessons from Japan’s Experience in the 1990s”

..... our sense is that much of the failure of monetary loosening to support asset prices and to boost the economy owed to offsetting shocks rather than to a genuine breakdown of the monetary transmission mechanism. The “financial headwinds” associated with the collapse of asset prices probably did, to some extent, hinder the ability of monetary policy to boost activity. .... Even so, **there is little evidence that the transmission channels of monetary policy were so diminished as to have obviated the benefits of faster and sharper monetary easing in the 1991-95 period.**

Ahearne et al. (2002), FRB International Finance Discussion Papers, No. 729

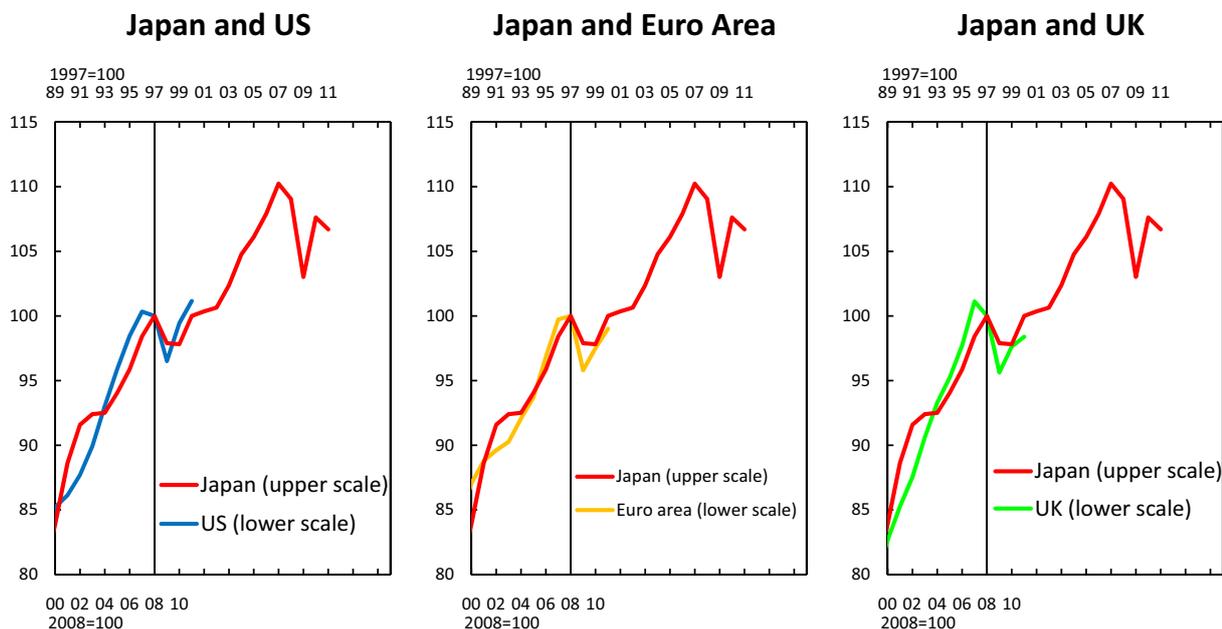
## Developments in Real GDP after Real Estate Prices Peaked

Japan: 1990-, United States: 2006-



## Developments in Real GDP after Financial Crises

Japan: 1997-, United States: 2008-



Sources: BEA; Eurostat; ONS; Cabinet Office; Haver

## Policy Measures in Japan and the United States

Date shows the period when each policy measure was initially introduced.

	BOJ	FRB
Extremely low interest rates	Feb. 1999 Introduction of ZIRP (In 1995, O/N rate declined to below 0.5%)	Dec. 2008 FF rate: 1% → 0-0.25%
Guidance about future interest rates	Apr. 1999 ZIRP commitment conditional on the state of economy	Aug. 2011 Improvement in transparency and predictability
Providing funds to wider range of counterparties	Feb. 2001 The bill purchasing operation conducted at all branches (providing longer-term funds to a wider range of counterparties including local financial institutions)	Dec. 2007 TAF (providing longer-term funds to a wider range of counterparties)
“Quantitative Easing”	Mar. 2001 Change in the operating target to the outstanding balance of the current accounts at the BOJ	Nov. 2010 Purchasing further longer-term Treasury securities <sup>1</sup> (promoting a stronger pace of economic recovery and helping to ensure price stability)
“Credit Easing” Purchases of risk assets	Stocks held by financial institutions (Oct. 2002) ABS and ABCP (Jun. 2003)  CP and corporate bonds (Dec. 2008)  ETF and J-REIT (Oct. 2010)	AMLF (Sep. 2008, providing funds to MMMF) TALF (Nov. 2008, meeting the credit needs of households and small businesses) CPFF (Oct. 2008, providing funds to CP issuers)  Agency bonds and Agency MBS (Nov. 2008, improving private credit market conditions)

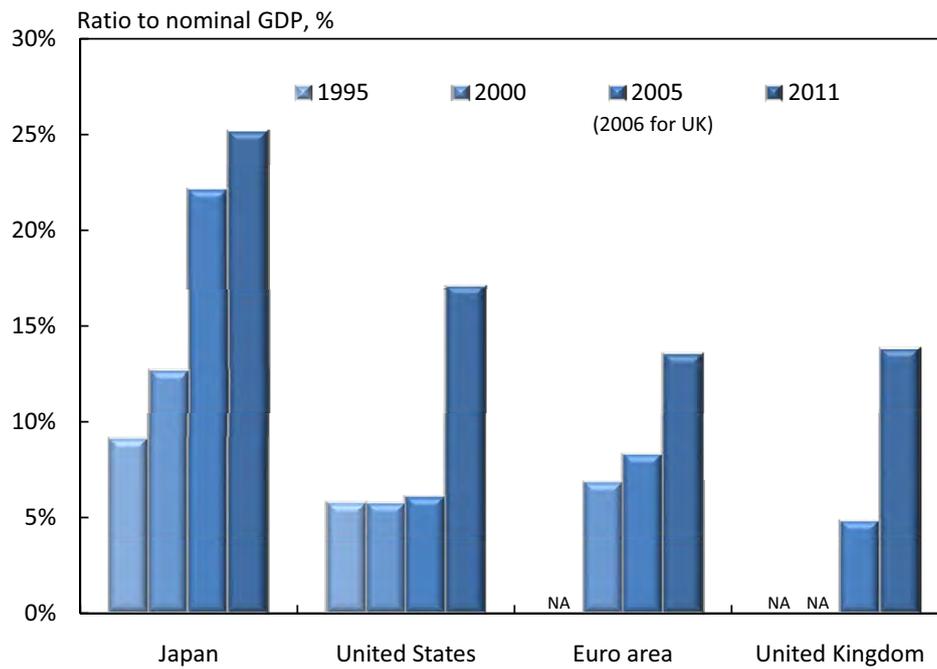
Note 1 : Purchases of longer-term Treasury securities were first decided in Mar. 2009 to improve private credit market conditions.

(Abbreviation)

ZIRP: Zero Interest Rate Policy. TAF: Term Auction Facility. AMLF: ABCP Money Market Mutual Fund Liquidity Facility.

TALF: Term Asset-Backed Securities Loan Facility. CPFF: Commercial Paper Funding Facility.

## Ratios of Monetary Base to Nominal GDP



Sources: BEA; FRB; Eurostat; ECB; ONS; BoE; Cabinet Office; Bank of Japan; Haver

**Before the Crisis:**  
Financial Imbalances and Monetary Policy

### (Conventional Wisdom)

Triggers for changing monetary policy: Price developments

### (During the Bubble Period)

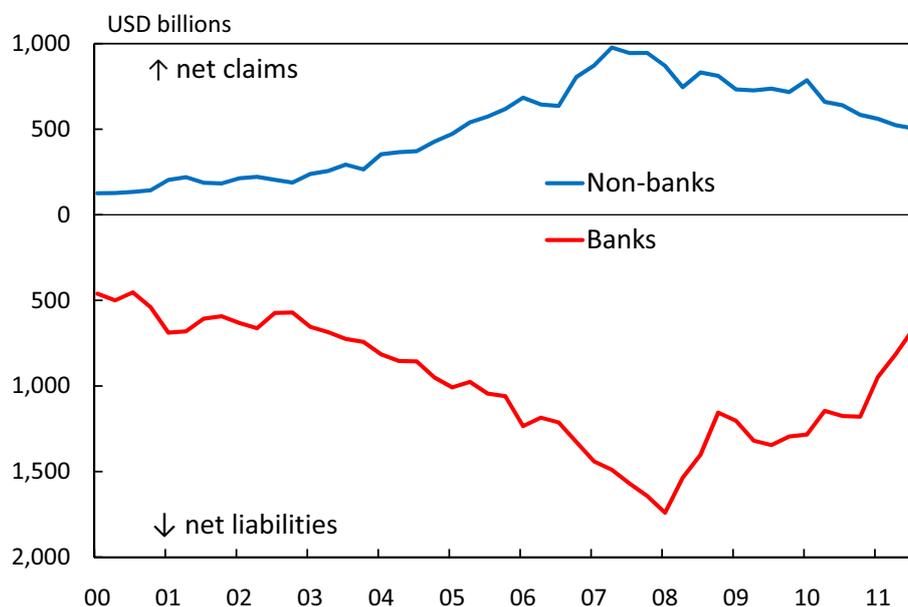
The most significant imbalance emerged on the financial front instead of the price front.

- Importance of ex-ante measures to address financial imbalances
- Policy assignments of price stability and financial system stability
- These two objects are not independent from each other

### Growing Financial Imbalances

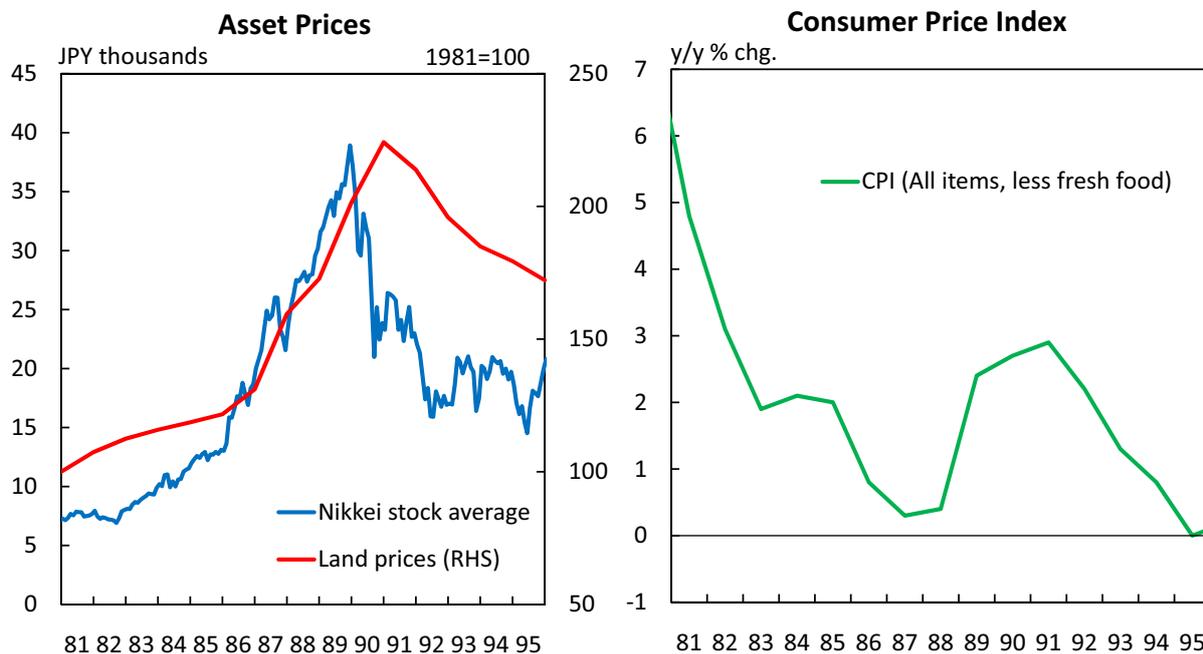
Increases in leveraging, maturity mismatch, and currency mismatch

#### Net US dollar-denominated foreign positions of European banks, by counterparty sector



## Japan's Experience in the Bubble Period

During the buildup of financial imbalances, CPI inflation rates remained low, at 0.3 percent in 1987 and 0.4 percent in 1988



Sources: Nihon Keizai Shimbun (Nikkei); Ministry of Land, Infrastructure, Transport and Tourism; Ministry of Internal Affairs and Communications; Haver

## Central Bank's Commitment to Asymmetric Monetary Policy

( CB does not lean against a bubble so long as inflation rates are stable, but instead intervenes aggressively after the bursting of bubbles. )

- Put option-type monetary policy engenders more risk-taking.
- Price stability and continuation of low interest rates may encourage risk taking and amplify financial imbalances (paradox of price stability).

## Policy Assignments of Price Stability and Financial System Stability

- Regarding financial imbalances, we need to employ appropriate monetary policy in tandem with regulations and supervision.



# During the Crisis: The Importance of the Lender of Last Resort Role

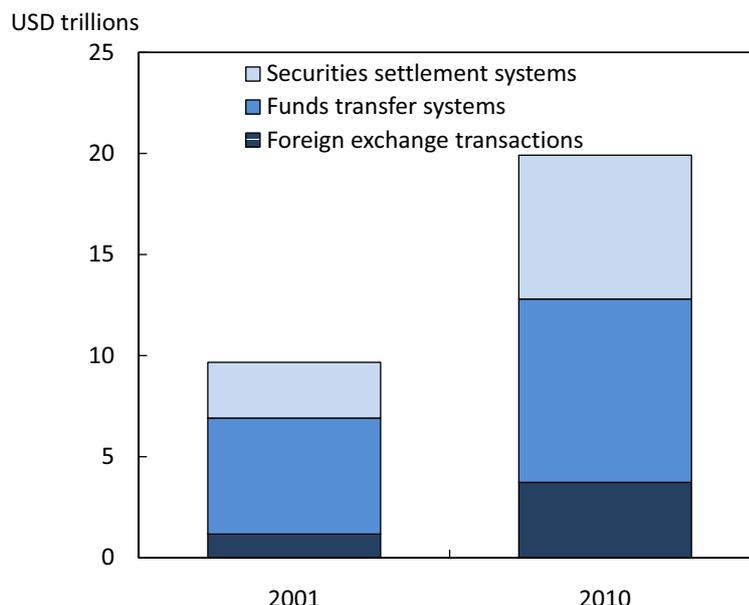


## During the Crisis: The Importance of the Lender of Last Resort Role

### The Essential Role of a Central Bank During a Crisis Is “the Lender of Last Resort”

- The effectiveness of quantitative easing by the Bank of Japan, credit easing by the Federal Reserve, and LTRO by the ECB all hinge on these central banks' role as the lender of last resort.

## Payment Value in Major Economies



Notes: 1. Average daily value.  
 2. Figures for securities settlement and funds transfer systems are those of CPSS member economies as of 2001.  
 3. Figures for foreign exchange transactions are those of economies covered by BIS Triennial Survey.  
 Sources: BIS *Statistics on Payment, Clearing and Settlement Systems in the CPSS countries*;  
 BIS *Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity*

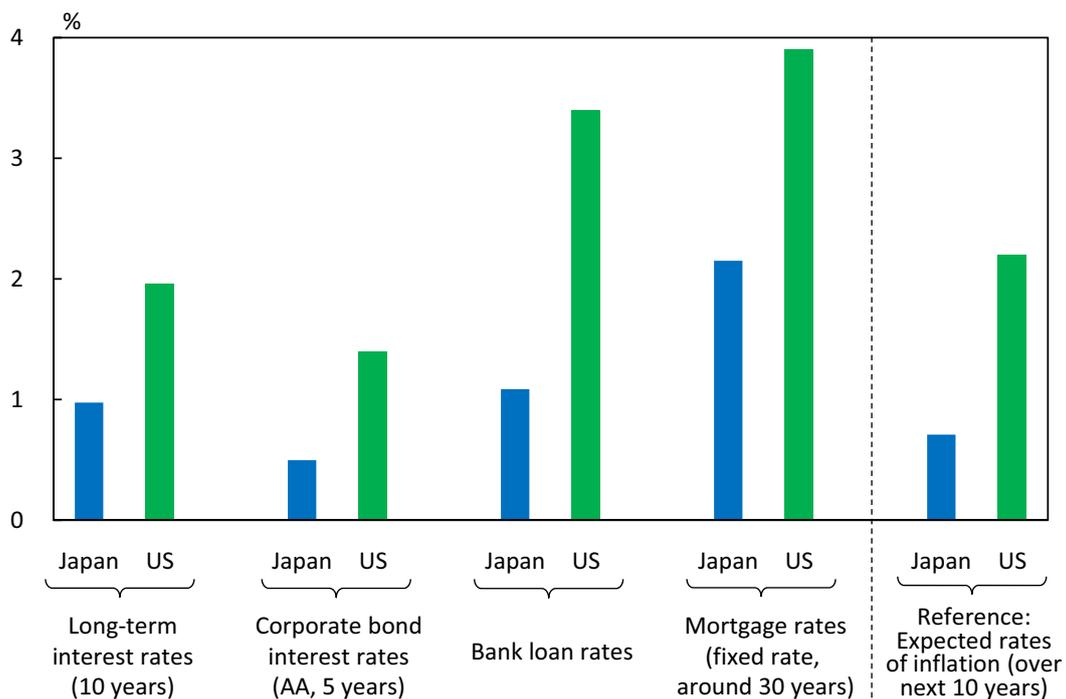
## Developments to Improve Payment and Settlement Systems

	Developments in G10 countries
1970s - 1980s	Introduction of <b>electronic networks</b> in payment and settlement systems
1990s - early 2000s	Introduction of <b>RTGS</b> (Real Time Gross Settlement) in central bank payment systems
1990s - early 2000s	Introduction of <b>DVP</b> (Delivery vs. Payment) in major securities settlement systems
2002 onwards	Introduction of <b>PVP</b> (Payment vs. Payment) for the settlement of foreign exchange transactions through CLS (Continuous Linked Settlement)

# After the Crisis: The Effects and Limits of Aggressive Monetary Policy

After the Crisis: The Effects and Limits of Aggressive Monetary Policy Chart 10

## Financial Conditions in Japan and the United States



Notes: 1. Long-term interest rates, corporate bond interest rates, and mortgage rates are the averages of 2012/Q1.

2. Loan rates and expected rates of inflation are those of 2011/Q4.

Sources: Bloomberg; Japan Housing Finance Agency; Freddie Mac; Bank of Japan; FRB, Consensus Forecasts

- Aggressive monetary easing is definitely needed after the bursting of bubbles.
- Its side effects and limits should also be taken into consideration.

### 1. Burden of Balance-sheet Repair

The effect of easing on economic entities with excess debt

- Low interest rates mitigate the pain.
- However, low interest rates discourage incentives to lessen excess debt.

The effect of easing on economic entities without excess debt

- Economic entities bring forward future demand to the present.
- However, the amount of future demand to be brought forward gradually diminishes as balance-sheet adjustment continues over a protracted period of time.

## 2. Impacts on the Supply Side of the Economy

- Low interest rates may induce investment projects that are only profitable at such interest rate levels.
- A continuation of low interest rates could have an adverse impact on productivity and growth potential of the economy due to the inefficiency of resource allocation.

## 3. Impacts on Financial Intermediaries

- Maturity transformation through short-term funding and long-term investing is an important intermediation function of banks.
- Monetary easing widens spreads between short- and long-term interest rates, and enhances the stimulative effect on the economy through the banking sector.
- Beyond a certain threshold, however, further monetary easing could squeeze margins and have a negative impact on financial intermediaries.

## 4. International Spillovers of Monetary Easing and the Feedback Effect on a Country's Own Economy

- For individual central banks, the rise in international commodity prices is diagnosed as an exogenous supply shock.
- Do the optimal policies of individual banks with domestic-centric perspectives ensure the optimal policy of a “World Central Bank”? (Fallacy of Composition)

### Policy Reaction Function of a Hypothetical “World Central Bank”

Taylor principle ( $\alpha > 1$ ) does not hold.

$$\left( \begin{array}{c} \text{Global short - term} \\ \text{interest rate} \end{array} \right) = \alpha \times \left( \begin{array}{c} \text{Global headline} \\ \text{CPI inflation} \end{array} \right) + \beta \times \left( \begin{array}{c} \text{Global} \\ \text{output gap} \end{array} \right) + \gamma$$

Sample period	Estimated parameters	
	$\alpha$	$\beta$
Jan.2000-Dec.2007 (before crisis)	0.90*	0.51*
Jan.2000-Dec.2010 (including crisis)	0.11	0.57*

Notes:1. \* denotes statistical significance at the 1 percent level.

2. “Global short-term interest rate” is the weighted average of the interest rate in each country, with its corresponding GDP used as a weight. The global output gap is defined as the percentage difference between the global GDP and its HP-filtered trend. The data source of the global GDP is from the World Economic Outlook of the International Monetary Fund, while that of the global headline CPI is from the International Financial Statistics.

**Concluding Remarks:**  
**Monetary Policy Challenges for the Future**

### 1. The Framework of Monetary Policy

- Need to incorporate the macroprudential perspective into the conduct of monetary policy.
- However, it is much more nebulous than accountability for hitting or missing a certain inflation number.
- Macroprudential considerations will test the limits of democratic deference to the conduct of monetary policy.

### 2. Strengthening the Decision-making Process and Economic Analyses

- Real foundation of a central bank's independence.
- Need to break free from the habit of groupthink.
- Need to develop an institutional culture in which a variety of information about the macroeconomy, financial markets, and financial institutions is fully utilized in a well-balanced manner.