

IMES DISCUSSION PAPER SERIES

A Macprudential Perspective in Central Banking

Shigenori Shiratsuka

Discussion Paper No. 2011-E-3

IMES

INSTITUTE FOR MONETARY AND ECONOMIC STUDIES

BANK OF JAPAN

2-1-1 NIHONBASHI-HONGOKUCHO

CHUO-KU, TOKYO 103-8660

JAPAN

You can download this and other papers at the IMES Web site:

<http://www.imes.boj.or.jp>

Do not reprint or reproduce without permission.

NOTE: IMES Discussion Paper Series is circulated in order to stimulate discussion and comments. Views expressed in Discussion Paper Series are those of authors and do not necessarily reflect those of the Bank of Japan or the Institute for Monetary and Economic Studies.

A Macprudential Perspective in Central Banking

Shigenori Shiratsuka*

Abstract

This paper explores a policy framework for central banks from a macroprudential perspective, to pursue price and financial system stability in a consistent and sustainable manner. Triggered by the recent financial crisis, fundamental reform of the financial system is advocated to establish more stable foundations for supporting sustainable growth in the global economy. Achieving higher stability purely by more stringent microprudential regulations tends to result in lower efficiency in financial intermediation. Crises are fundamentally endogenous to the financial system and arise from exposure to common risks among financial institutions, underpinned by complicated incentives at both the micro and macro levels. In that context, macroprudential policy is often pointed out as a missing element in the current policy framework in order to strike a balance between the efficiency and stability of the financial system as a whole. Pursuing both price and financial system stability in a consistent and sustainable manner requires combination of monetary and prudential policies, especially macroprudential policy. To that end, this paper proposes to extend constrained discretion for monetary policy, proposed as the conceptual basis for flexible inflation targeting, to overall central banking, encompassing monetary and macroprudential policies.

Keywords: Macroprudential policy; Procyclicality; Financial imbalances; Asset-price and credit bubble; Constrained discretion.

JEL classification: E58, G28

* Institute for Monetary and Economic Studies, Bank of Japan (E-mail: shigenori.shiratsuka@boj.or.jp)

This paper was prepared for the PEO Structure Specialist Meeting on “Macro-financial Linkages and Financial Deepening” in Osaka, September 11-12, 2010. The author thanks Akira Kosaka, Helen Chan, Robert Deckle, Toshiki Jinushi, Kazuo Ogawa, Kunio Okina, participants of the two PEO Structure Specialist Meetings in March and September, 2010, and staff at the Bank of Japan for their comments. Views expressed in this paper are those of the author and do not necessarily reflect the official views of the Bank of Japan.

I. Introduction

In this paper I explore a policy framework for central banks from a macroprudential perspective, to pursue price and financial system stability in a consistent and sustainable manner.¹ Here, I emphasize the importance of a “macroprudential perspective,” not just “macroprudential policy” itself in a policy framework for central banks. That is because achieving the stability of the entire financial system needs to bring together contributions not only from financial regulation and supervision but also from macroeconomic policy, particularly monetary policy.²

Financial crises are generally preceded by a period of a benign economic and financial environment with a prevailing euphoric sentiment. Behind the scenes, financial imbalances are built up, typically seen as an asset-price and credit bubble,³ and the subsequent unwinding of such imbalances produces significant adverse effects, potentially leading to prolonged economic stagnation.⁴ Once the economy enters a downturn, the harmful effects of a bubble emerge, exerting stress on the real side of the economy and the financial system due to the unexpected correction of asset prices. Such financial crisis developments are fundamentally endogenous to the financial system, especially arising from exposure to common risks.

Prior to the recent crisis, the global economy enjoyed seemingly steady growth with low and stable inflation, which was referred to as “great moderation.” The

¹ According to Clement (2010), the origin of “macroprudential” can be traced back to the late 1970s, in the context of work on international bank lending carried out by the Euro-currency Standing Committee (currently Committee on the Global Financial System, CGFS) at the Bank for International Settlements (BIS). Since then, that term has always denoted concerns over financial system stability and its link to the macroeconomy, although the specific focus has changed over time.

² Shirakawa (2009c) points out that “liquidity” and “macroprudence” are the two most important keywords in examining the lessons from the crisis and measures to prevent a recurrence. He then emphasizes the importance of a macroprudential perspective in various areas related to central bank policy, including monetary policy.

³ As explained later, an economy-wide bubble is generally characterized by three things: not just a rapid rise in asset prices, but also the overheating of economic activity, and massive expansion in monetary aggregates and credit. To clarify such an understanding about a bubble, I use the term “asset-price and credit bubble” in this paper.

⁴ The term “financial imbalances” is used in a vague manner, but it basically describes unsustainable developments in the financial system, typically observed as substantial and persistent deviations of various financial variables from the long-term historical trends.

prolonged boom in the global economy coexisted with low policy interest rates, elevated asset prices across broad asset classes, and unusually low short-term volatility in financial markets. In retrospect, under such circumstances, the financial system on the whole took excessive risk in the form of the expansion of leverage and the extension of maturity mismatches.

The recent crisis shed light on crucial deficiencies in the regulatory and supervisory framework in maintaining the stability of the financial system as a whole. Before the crisis, mainly from a microprudential perspective, it was thought that financial system stability could be achieved by assembling sound financial institutions with adequate capital and liquidity positions as well as proper risk management. Based on our experience under the recent crisis, however, the soundness of individual financial institutions does not necessarily assure the stability of the financial system as a whole. Crises are fundamentally endogenous to the financial system and arise from exposure to common risks among financial institutions, underpinned by complicated incentives at both the micro and macro levels.⁵

There are a lot of arguments calling for more stringent regulations, such as minimum regulatory requirements significantly stricter than the existing Basel rules to ensure the quality and quantity of overall capital in the global banking system.⁶ Achieving higher stability just by more stringent microprudential regulations, however, tends to result in lower efficiency in financial intermediation as a basis for economic growth. In addition, the higher regulatory burden is likely to produce incentives for regulatory arbitrage. To harness the benefits from globalization and technological progress in the financial system, while limiting its inherent instability, we need additional and supplementary policy tools to balance the efficiency and stability of financial system as a whole. Such measures need to be designed so as to serve as a shock absorber, instead of a transmitter of risk to the broader economy, thus functioning as an automatic stabilizer of boom-and-bust cycles.

⁵ Shirakawa (2009b) emphasizes the importance of analyzing the incentives of financial institutions from the viewpoints of the macro- as well as micro-level.

⁶ Regarding the recent policy discussions on financial regulatory reform, see the Financial Stability Board (2010b). The Basel Committee on Banking Supervision (2010c, d) presents the details of global regulatory standards on bank capital and liquidity requirements.

In that context, macroprudential policy is often pointed out as a missing element in the current policy framework.⁷ To enhance the robustness of the entire financial system, macroprudential policy needs to identify and dampen systemic risk, which is likely to disrupt the function of the financial system, thereby destabilizing the macroeconomy. Macroprudential policy thus focuses on two key externalities in the financial system: procyclicality in an intertemporal dimension as well as spillover effects in a cross-sectional dimension.⁸ Procyclicality concerns an intertemporal amplification mechanism within the financial system as well as between the financial system and the macroeconomy. Spillover effects concern a cross-sectional amplification mechanism through a complex network of various types of financial institutions, comprising not only commercial banks but also other market-based financial intermediaries and institutional investors.⁹

The recent crisis fundamentally challenged the dichotomy between monetary and prudential policies. Before the crisis, monetary and prudential policies were deemed separable and were better allocated to different policy authorities. Monetary policy focused primarily on the macroeconomic goal of low and stable inflation, while prudential policy put emphasis on maintaining the soundness of individual financial institutions, thereby reducing systemic risk. At the moment, however, there seems to be increasing arguments to support the view that pursuing the two objectives, price and financial system stability, in a consistent and sustainable manner requires combination

⁷ The Group of Thirty Working Group on Macroprudential Policy (2010) provides a comprehensive review on macroprudential policy, such as the definition, necessity, tools, and implementation. It should be noted that a big practical challenge still lies ahead concerning how to make a macroprudential policy framework operational. Research on macroprudential policy is still in an early stage to provide an analytical underpinning for such a policy framework, in contrast to research on monetary policy. For an overview of research on macroprudential policy, see, for example, Galati and Moessner (2010).

⁸ A cross-sectional dimension of the externalities in the financial system is also used in a slightly different manner. Borio (2003), for example, points out that a macroprudential approach to financial supervision has implications for the design of the framework with respect to both the time dimension (procyclicality) and the cross-sectional dimension (addressing common exposures across financial institutions).

⁹ The recent policy discussions seem to narrow down the issues on spillover effects through the financial system to those on systemically important financial institutions (SIFIs). It should be noted that spillover effects need to be examined from the broader perspective of a cross-sectional amplification mechanism in the entire financial system, including the working of the “shadow banking system.”

of monetary policy and microprudential and macroprudential policies with close cooperation among related policy authorities.¹⁰ In addition, once financial distress materializes, the boundary between monetary and prudential policies becomes extremely ambiguous, as evidenced by the unconventional monetary policy responses at major central banks.¹¹

Given the close interaction between monetary and macroprudential policies, it is crucial for central banks to consider an overall policy framework for central banking, encompassing both policies. In that regard, I propose a framework of constrained discretion for central banking to pursue price and financial system stability in a consistent and sustainable manner. Such policy framework extends constrained discretion for monetary policy, proposed as the conceptual basis for flexible inflation targeting, to overall central banking, thereby providing central banks with a basis for implementing monetary and macroprudential policies in a compatible, systematic, flexible, and accountable manner.¹²

This paper is structured as follows. Section II reviews the basic concept of an asset-price and credit bubble, as a symptom of financial imbalances in the run-up to a crisis. Section III presents a selective review of the current discussions on designing macroprudential policy tools in addressing two key externalities in the financial system: intertemporal procyclicality and cross-sectional spillover effects. Section IV explores how to design a policy framework for central banks from a macroprudential perspective, with special emphasis on the interactions between monetary and macroprudential policies. Section V concludes the paper.

¹⁰ Shirakawa (2009a) argues that central banks need “one large toolkit” to achieve the two inseparable long-term objectives, price and financial system stability. Yellen (2009b) also points out the importance of reexamining the previous understanding of separation between monetary and financial regulatory policies.

¹¹ In response to the outbreak of the recent financial crisis, the U.S. Federal Reserve has naturally taken credit-easing measures to intervene aggressively in the credit products markets and related markets. Such policy responses can be regarded as extension of conventional measures for liquidity provision to commercial banking system to a broader range of the financial system, or the shadow banking system. For the details, see discussions in Shiratsuka (2010).

¹² See, for example, Bernanke *et al.* (1999) for the details on the constrained discretion for monetary policy as a conceptual basis for flexible inflation targeting.

II. An Asset-price and Credit Bubble

In this section, I will discuss the nature of an asset-price and credit bubble, which plays a crucial role in amplifying the boom-and-bust cycle in asset prices and credit through macrofinancial linkages. As I mentioned earlier, financial imbalances, associated with an asset-price and credit bubble, are built up under benign financial and economic conditions, including low and stable inflation. The subsequent unwinding of such imbalances, after the burst of an asset-price and credit bubble, produces significant adverse effects, potentially leading to long-lasting economic stagnation and the risk of falling into a deflationary spiral.

A. The nature of an asset-price and credit bubble

While the term “bubble” is used differently among people, I follow Okina, Shirakawa, and Shiratsuka (2001) and define it by three symptoms for financial and macroeconomic variables: a marked increase in asset prices, an expansion of monetary aggregates and credit, and an over-heating of economic activity (Figure 1).

In that regard, it is important to note that an asset-price and credit bubble is generally a euphoric phenomenon, not a rational bubble. A rational bubble, as modeled in Blanchard and Watson (1982), assumes that economic agents correctly recognize the economic fundamentals. Euphoria, in contrast, corresponds to excessively optimistic expectations with respect to future economic fundamentals, which lasted for several years and then burst.

When looking back at Japan’s experience in the late 1980s, or the “bubble period,” measured inflation was relatively moderate, and expectations that low interest rates would continue over time were generated, making economic agents’ expectations extremely bullish with respect to the future (see Figure 2 for Japan’s financial and economic environment).¹³ During the bubble period Japan faced difficulty in evaluating *ex ante* whether it was the arrival of a new era or simply euphoria.¹⁴ As

¹³ Okina, Shirakawa, and Shiratsuka (2001) define the bubble period as the four years from 1987 through 1990, based on the criteria of the coexistence of three fundamental symptoms for an asset-price and credit bubble: a marked increase in asset prices, an expansion of monetary aggregates and credit, and an over-heating of economic activity.

¹⁴ If an increase in asset prices is caused by a rational bubble, an evaluation of economic fundamentals

described by Okina, Shirakawa, and Shiratsuka (2001), the intensified bullish expectations were certainly grounded in several intertwined factors: progress in financial liberalization, the aggressive behavior of financial institutions, the introduction of the capital accords, protracted monetary easing, taxation and regulations biased toward accelerating the rise in land prices, overconfidence and euphoria, and overconcentration of economic functions on Tokyo as an international financial center.¹⁵

If the intensified bullish expectations that previously supported a bubble are left unchecked, the expansion and subsequent burst of a bubble will become more intense, affecting the real economy directly or, by damaging the financial system, indirectly. Excessive optimism and self-confidence in the Japanese economy induced businesses to build up “three excesses”: financial debt, employment, and production capacity (Figure 3). When the asset-price and credit bubble burst, the ensuing adjustments of such “excesses” were all the more painful and prolonged. Although mild deflation of less than 1 percent per annum attracted public attention, it was asset-price deflation, which continued at an annual rate of close to 10 percent for more than 10 years, that exerted the most significant adverse pressure on the Japanese economy (Figure 4).¹⁶ In retrospect, land prices were a common and significant risk factor for the financial sector and nonfinancial business sector during the bubble period in Japan.¹⁷

will remain unaffected. On the contrary, euphoria is certainly associated with a recognition that economic fundamentals have shifted upward. Such a difference between a rational bubble and euphoria is crucially important in considering the implications of asset-price fluctuations on monetary policy.

¹⁵ Okina, Shirakawa, and Shiratsuka (2001) point out that, in retrospect, a wide range of industries had exposure to the common risk of skyrocketing commercial land prices during the bubble period. For example, the high profitability of computer-related industries at that time was primarily a result of large computer-related investments by financial institutions. Such investments, triggered by financial globalization and the progress of technological innovation, were also closely related to a rise in asset prices. Under such circumstances, the economy tended to be influenced by an asset prices more than generally thought.

¹⁶ Okina and Shiratsuka (2004) pointed out that the Bank of Japan (BOJ) had to conduct monetary policy amid a significant and unforeseen slowdown in potential growth, which differed significantly from a standard stabilization policy around a stable growth trend.

¹⁷ Okina, Shirakawa, and Shiratsuka (2001) point out that, during the bubble period in Japan, loosening external financing constraints and seemingly rising productivity and profits in many sectors were interconnected and became amplified through rising asset prices, especially land prices.

B. Financial structure and credit expansion

As noted earlier, an asset-price and credit bubble has three fundamental symptoms: a marked increase in asset prices, an expansion of monetary aggregates and credit, and an over-heating of economic activity. Among those three symptoms, an expansion of credit and monetary aggregates is directly linked with a build-up of financial imbalances.

In that context, Figure 5 plots the overall asset size of the private financial sector relative to nominal GDP in Japan and the United States. That figure illustrates two things. One is the delivery channel of credit in the financial intermediation process, and the other is the amount of credit.

First, focusing mainly on the composition of financial intermediaries, the figure clearly shows that Japan has a largely bank-centered financial system, while the United States has a primarily market-based financial system. In Japan, an overall picture of financial intermediation structure remains almost unchanged over time, with depository institutions still playing a leading role. In the United States, in contrast, other financial intermediaries have the largest share, and depository institutions have a much smaller share.¹⁸ Other financial intermediaries include investment trusts, financial dealers and brokers, nonbanks, and funding companies, which are major players in the originate-and-distribute business.

Second, looking at the size of the financial sector relative to nominal GDP, the asset size expands significantly in the run-up to a financial crisis in both Japan and the United States. Of course, reflecting the differences in the financial intermediation structure, depository institutions are the driving force from the mid-1980s to the early 2000s in Japan, while other financial intermediaries are the driving force from the second half of the 1990s in the United States. That suggests that credit expansion took place in the United States during the run-up to the recent financial crisis, as the originate-and-distribute business model prevailed through those intermediaries.

¹⁸ As discussed below, the traditional banking sector, although it has a limited share in the overall asset size of the financial sector, also took a substantial amount of risk by engaging in operations related to the originate-and-distribute business, such as the provision of credit and liquidity enhancement to off-balance sheet investment vehicles.

Before the recent crisis, the financial system, especially a market-based financial system as in the United States, is expected to distribute risks among a broad range of economic agents, and not just within financial institutions. In theory, the financial system thus enables the distribution of funds and risks in a more efficient way by making use of financial markets. In practice, however, a mechanism that amplifies risks, i.e., the expansion of credit and leverage and the extension of maturity mismatches, is embedded in the process of transferring risks from financial institutions to investors.

C. Recent financial crisis as an asset-price and credit bubble

As described above, the recent financial crisis, starting from the U.S. subprime mortgage problem, can be seen as a typical example of an asset-price and credit bubble, as in the case of Japan's bubble in the second half of the 1980s. One difference between the two cases can be seen in the fact that the U.S. subprime mortgage problem was associated with a sharp increase in credit in the household sector (Figure 6).

Prior to the recent crisis, the global economy enjoyed seemingly steady growth with low and stable inflation, which was referred to as "great moderation." Under such circumstances, high optimism and ample liquidity undeniably contributed to the U.S. credit boom and the associated housing price bubble. In that process, many financial institutions failed to properly evaluate and manage the risks related to structured credit products, and a number of investors and financial institutions also failed to evaluate the risks inherent in such complex financial transactions.

The structured credit products business related to mortgages has been regarded as a typical example of the originate-and-distribute business (Figure 7). Financial institutions converted mortgages into structured credit products, thereby removing credit and liquidity risks associated with mortgages from their balance sheets, and transferring them to various financial institutions and investors. In such a process, financial institutions repackaged mortgages several times and split them into tranches such as senior, mezzanine, and equity to generate complex structured credit products. At the same time, they made wide use of an investment strategy to create a funding

mismatch and raise leverage through off-balance sheet investment vehicles, such as conduits and structured investment vehicles (SIVs).¹⁹

The above observation suggests that, even in a market-based financial system like the United States, a network of various types of financial institutions plays a crucial role in channeling funds from savers to borrowers. That network is thus often called as a “shadow banking system.”²⁰ In the process of transferring risks from financial institutions to investors, the shadow banking system embedded a mechanism of amplifying risks, i.e., the expansion of credit and leverage as well as the extension of maturity mismatches. In addition, such amplified risks continued to remain within the shadow banking system, while those risks were initially considered as being separable from the system through the originate-and-distribute business.

The episodes of asset-price and credit bubbles, examined so far, suggest that incentives for a financial institution are underpinned not only by the framework for financial regulation and supervision at a micro level but also importantly by the financial and economic environment at a macro level. Under benign economic and financial conditions at the macro level, risk perception and risk tolerance of economic agents, at the micro level, change gradually but steadily, thereby affecting their risk-taking behavior. That induces an expansion of credit and leverage at financial institutions, and results in the accumulation of financial imbalances behind the scenes at the macro level.

III. Macroprudential Orientation in the Financial Reform

In this section, I will selectively review the issues related to recent debates on the design

¹⁹ Some investment vehicles intentionally generated maturity mismatches between their assets and liabilities by investing in structured credit products with longer maturities against short-term funding in asset-backed commercial papers (ABCPs). That behavior suggests that investors and financial institutions behind such investment vehicles were taking highly leveraged positions with significant credit, liquidity and interest rate risks, thereby pursuing higher returns.

²⁰ Pozsar *et al.* (2010) provide a comprehensive review of the shadow banking system. Adrian and Shin (2008) proposes an analytical framework for a risk transfer mechanism by modeling a balance sheet interaction between various financial intermediaries, called a “financial system perspective.” Hattori, Shin, and Takahashi (2009) apply the perspective to analyzing fund flows behind Japan’s asset price bubble in the second half of the 1980s.

of macroprudential policy tools.

A. Overall direction of regulatory reform

Triggered by the recent financial crisis, fundamental reform of the financial system is advocated to establish more stable foundations for supporting sustainable growth in the global economy.

There are a lot of voices calling for more stringent regulations, such as raising minimum regulatory requirements significantly above the existing Basel rules to ensure the quality and quantity of overall capital in the global banking system.²¹ The Basel Committee on Banking Supervision (2009) recommends four types of measures to influence the size, composition and riskiness of the balance sheet at financial institutions to:²² (i) improve the quantity and quality of capital; (ii) limit the extent of maturity transformation and the reliance on wholesale funding; (iii) improve risk coverage on counterparty credit exposures related to derivatives, repurchase agreements, securities lending, and complex securitizations; and (iv) introduce leverage ratios to supplement risk-weighted capital requirements.

Achieving higher stability purely by more stringent microprudential regulations, however, tends to result in lower efficiency in financial intermediation as a basis for economic growth.²³ In addition, it is crucial to understand that the higher regulatory burden is likely to produce incentives for regulatory arbitrage. At the same time, it has become widely recognized that the soundness of individual financial institutions does not necessarily assure the stability of the financial system as a whole. Financial crises are fundamentally endogenous to the financial system and arise from exposure to

²¹ In addition, we also need to address the issues related to, for example, the governance of the institution, the incentives of its executives, and the enhancement of market discipline.

²² As mentioned earlier, the Basel Committee on Banking Supervision (2010c, d) presents details of global regulatory standards on bank capital and liquidity requirements.

²³ The Basel Committee on Banking Supervision (2010b) quantifies the benefits from stronger capital and liquidity requirements, and compares them to the long-term costs. Macroeconomic Assessment Group (2010a, b) estimates transition costs for raising capital adequacy requirements and introducing liquidity requirements. A basic conclusion appears to be that the benefits outweigh the costs in the transition phase as well as in the long term. It should be noted, however, that such cost-benefit comparison depends crucially on the structure of the financial system and the composition of banks' balance sheets.

common risks among financial institutions. Incentives for a financial institution are underpinned not only by a framework for financial regulation and supervision at the micro level but also importantly by a financial and economic environment at the macro level. In that context, macroprudential policy is often pointed out as a missing element in the recent policy framework in order to strike a balance between the efficiency and the stability of the financial system as a whole.

It seems to have become a general consensus that macroprudential policy aims at reducing systemic risk, which is likely to disrupt the function of the financial system as a whole, thereby potentially destabilizing the macroeconomy.²⁴ Macroprudential policy thus needs to address two key externalities in the financial system: procyclicality in an intertemporal dimension as well as spillover effects in a cross-sectional dimension. Procyclicality concerns an intertemporal amplification mechanism within the financial system as well as between financial system and the macroeconomy. Spillover effects concern a cross-sectional amplification mechanism through a complex network of various types of financial institutions, comprising not only commercial banks but also other market-based financial intermediaries and institutional investors.²⁵

To address the key externalities, macroprudential policy tools are formulated as an extension of existing microprudential policy tools by incorporating a system-wide perspective in their implementation. It is thus crucially important to consider the fact that incentives for a financial institution are underpinned not only by a framework for financial regulation and supervision at the micro level but also importantly by a financial and economic environment at the macro level.²⁶ As experience with monetary policy suggests that policy actions can work best when it is fairly predictable and transparent, macroprudential policy is most likely to work well when being

²⁴ Bank of England (2009), Committee on the Global Financial System (2010), Group of Thirty (2010), and Hanson, Kashyap, and Stein (2010) provide a more detailed examination on a broader range of macroprudential policy tools.

²⁵ Hanson, Kashyap, and Stein (2010) emphasize the social costs of excessive balance-sheet shrinkage, in the form of credit crunches and fire sales, stemming from a common shock to a wide-range of financial institutions.

²⁶ It should be noted that a macroprudential perspective is also important in implementing microprudential regulation and supervision, given the interaction of incentives between the micro and macro levels.

implemented based on simple rules and guidelines, presumably linked to clear indicators of systemic risk.

In that context, central banks need to be closely involved in the formulation and implementation of macroprudential policy, based on close coordination among the related policy authorities.²⁷ That reflects the extensive experience of central banks in system-wide analysis and the role as a lender of last resort, as well as the close, two-way relationship between monetary and macroprudential policies. I will elaborate on that point later in Section IV.

Another important point in that regard lies in the fact that, once financial distress materializes, the boundary between monetary and prudential policies becomes extremely ambiguous, as evidenced by the unconventional monetary policy responses at major central banks.²⁸ In a normal situation, once a policy interest rate is set at a desirable level from the perspective of monetary policy, a central bank expects the thus-determined policy interest rate to be transmitted to other longer-term interest rates through arbitrage in the financial markets. During financial crises, however, the above transmission mechanism is unlikely to work properly because the behavior of financial institutions is severely restricted by liquidity constraints. Financially stressed banks tend to have serious difficulties not only with lending, but also arbitraging and dealing in financial markets, thus hampering the transmission mechanism from a policy interest rate to longer term rates, resulting in market segmentation among various financial markets.

B. Measures to dampen procyclicality

One mechanism of the so-called procyclicality of the financial system attracts increasing attention as an amplification mechanism for economic fluctuations. In particular, since the current framework for capital adequacy requirements (Basel II) is more risk-sensitive than Basel I, procyclicality has been discussed mainly from the

²⁷ In this context, there is heated debate on how to design a systemic stability regulator, especially whether to keep monetary policy and systemic stability regulation separated or not. In practice, however, the financial reforms in advanced economies share a common direction that central banks need to be involved in a macroprudential policy framework.

²⁸ For the further discussions on unconventional monetary policy, see Shiratsuka (2010).

viewpoint of whether regulatory and institutional factors have amplified economic fluctuations by inducing changes in the behavior of financial institutions.²⁹

It should be noted, however, that the financial system is inherently procyclical, as emphasized by Borio and White (2003). The inherent procyclicality of the financial system also interacts with the real economy, thereby amplifying economic fluctuations and potentially leading to a persistent decline in a trend growth path. During booms, self-reinforcing processes of taking larger amount of risks can develop, resulting in the build-up of financial imbalances. Those processes operate in a reverse direction during contractions.

The current regulatory and supervisory framework does not have the effective mechanisms and instruments necessary to control the inherent procyclicality of the financial system. Measures against procyclicality need to address the build-up of financial imbalances in upturns and their subsequent unwinding in downturns from a system-wide perspective. Such measures need to be considered to ensure financial system stability through serving as a shock absorber, instead of a transmitter of risk to the broader economy, thus functioning as an automatic stabilizer of boom-and-bust cycles.³⁰

Some measures are currently explored to encourage financial institutions to accumulate sufficient buffers in the good times that can be drawn down in the bad times. More precisely, two measures are actively explored: one is to promote more forward-looking provisions (dynamic provisioning) and the other is to conserve capital buffers (countercyclical capital buffers).³¹ The provisioning measures focus on

²⁹ The tendency of market participants to behave in a procyclical manner has been amplified through a variety of channels, including through accounting standards for both mark-to-market assets and held-to-maturity loans, margining practices, and through the build-up and release of leverage among financial institutions, firms, and consumers. The Financial Stability Board (2010b) provides an overview of the progresses of a the broad range of financial reforms.

³⁰ Caruana (2010) points out the importance of designing macroprudential tools so as to function as automatic stabilizers.

³¹ Time-varying capital requirement is also considered as an alternative measure to dampen procyclicality in the financial system. That scheme requires financial institutions to hold higher ratios of capital to assets in good times than in bad times. In designing such a scheme, it is important to note that the regulatory capital requirement is often not the binding constraint on financial institutions even in bad times.

strengthening the banking system against expected losses, while the capital measures focus on unexpected losses.

In designing such countercyclical measures, one important element is the choice of conditioning variables that link financial and macroeconomic conditions with the build-up and release of buffers at individual financial institutions. With appropriate conditioning variables, countercyclical measures enable financial institutions to build up the margin to a sufficient level in good times, and release it at the right speed and in the right amount in bad times.

The Basel Committee on Banking Supervision (2010a, e) proposes a scheme for a countercyclical capital buffer using the credit-to-GDP gap, computed as a deviation of the credit-to-GDP ratio from its Hodrick-Prescott filtered trend (HP-filtered trend) as a conditioning variable that links the required level of the capital buffer with financial and economic conditions.³² More precisely, the credit-to-GDP gap is computed using the one-sided HP-filtering with a large smoothing parameter of 400,000 for quarterly data.³³

In a practical use of the aforementioned scheme, however, I emphasize that it is difficult to adequately discern the long-term trend of credit on a real time basis.³⁴ The proposed procedure by the Basel Committee on Banking Supervision (2010a, e) considers the information availability on a real time basis by using the one-sided HP-filtering, not the standard two-sided HP-filtering. Still, we should be concerned

³² Drehmann *et al.* (2010) deliver a comprehensive review on the candidates for conditioning variables, and conclude that the credit-to-GDP gap shows the best performance. They, however, note that no conditioning variable provides perfect signals, and a strict rule-based measure does not seem possible at this stage.

³³ A one-sided HP-filtered trend is computed by running a loop over time and retaining the final value from HP-filtered trend at each point in time. About a smoothing parameter, Hodrick and Prescott (1997) propose to set it at 1,600 for quarterly data, which corresponds to the duration of business cycles ranging from 4 to 8 years. Drehmann *et al.* (2010) make a guess about the duration of credit cycles as the three to four times longer than that of business cycles, and recommend to use a smoothing parameter of 125,000 ($=3^4*1,600$) or 400,000 ($=4^4*1,600$).

³⁴ Okina and Shiratsuka (2002) emphasize that continued economic expansion gradually makes it difficult to decompose a rising growth rate into cyclical and trend components. They then point out that that makes assessment of inflation pressure on a real time basis crucially difficult, since the level of the output gap varies depending on the estimates of potential GDP. In addition, we should be concerned about the effects of *ex-post* data revisions, especially regarding nominal GDP in Japan. It is well known that Japanese GDP data tends to be revised significantly from the initial estimates to the final ones.

that the estimated series of the credit-to-GDP gap is likely to be suffered from an endpoint bias for trend measurement on a real time basis.

Figure 8 plots Japan's credit-to-GDP ratio and its HP-filtered trend based on both the two-sided and one-sided procedures in the upper panel, and computed credit-to-GDP gap in the lower panel.³⁵ In spite of using a large smoothing parameter, the one-sided HP-filtering is deemed still vulnerable to the effects of data accumulation, as shown by the significant differences with the estimates of the two-sided HP-filtering.

The above observation suggests that it is difficult to rely solely on a rule-based mechanism for setting countercyclical buffer levels. As mentioned earlier, however, macroprudential policy tools are most likely to work well when being implemented as automatic stabilizers, based on simple rules and guidelines, and experience with monetary policy suggests that policy actions work best when they are fairly predictable and transparent. A scheme for a countercyclical capital buffer thus needs to be designed so as to balance discretion with predictability and transparency.

C. Measures to deal with spillover effects in the financial system

A sharp contraction in economic activity is likely to occur when the financial system becomes destabilized and malfunctions through spillover effects of shocks within the financial system, typically triggered by the failure of a financial institution.

In the recent global financial crisis, real GDP in advanced economies registered the largest decline during the period from the fourth quarter of 2008 to the first quarter of 2009 (Figure 9). Such a massive decline was attributed to a malfunction of the financial system, particularly interbank money markets, triggered by the failure of Lehman Brothers. By contrast, Japan did not take an abrupt liquidation measure for its failed financial institutions during the financial crisis in the late 1990s, and the decline in real GDP was smaller in Japan at that time. The Japanese financial system became destabilized in the fall of 1997, triggered by the failure of Sanyo Securities, and real

³⁵ The data for the credit-to-GDP ratio in Japan is compiled by basically following the description in the Basel Committee on Banking Supervision (2010e), except for making seasonal adjustments using X-12-ARIMA, considering the significant seasonality in the end-of-month series of credit aggregates. The data for the credit-to-GDP ratio starts from 1970, and two-sided HP-filtering is computed using data for the full sample. One-sided HP-filtering is computed from 1978, which is the starting point for the figure, to obtain enough time-series for the initial loop.

GDP declined most from 1997 to 1998.³⁶ Given the serious adverse effects of the failure of Sanyo Securities on interbank money markets, at the time of the subsequent and larger failure of Yamaichi Securities, the Bank of Japan (BOJ) committed to providing an unlimited amount of liquidity, thereby enabling its orderly resolution.³⁷

A complex and highly interconnected network of various types of financial institutions, as seen typically in the shadow banking system, tends to rapidly propagate risks throughout the financial system. Increased interconnectedness and exposure to common risks have left financial institutions susceptible to endogenous shocks, potentially resulting in a sharp contraction in economic activity. In order to maintain a financial intermediary function in the financial system, two tasks are deemed crucial in addressing spillover effects through the financial system: one is to enhance the robustness of individual financial institutions, and the other is to contain spillover effects resulting from such a failure.³⁸

Regarding the first task, a number of approaches have been suggested to limit the systemic importance of large and complex financial institutions, recently called systemically important financial institutions (SIFIs). Those include capping the size of those financial institutions, keeping them from seemingly risky activities, requiring them to hold more capital, and reducing their odds of failure by requiring them to hold debt that automatically converts to equity in a crisis situation (contingent capital). In that context, blanket limitations of the size and scope of financial institutions do not

³⁶ The failure of Sanyo Securities in 1997 led to the first default in interbank money markets in the postwar period in Japan. That triggered a sudden liquidity contraction in the interbank money markets, immediately spilling over to a wide range of the financial markets.

³⁷ Yamaichi Securities played an important role as one of the four big securities companies in Japan and actively conducted overseas businesses. Due to massive off-book liabilities, the so-called stock shuffle (loss compensation), Yamaichi's funding became increasingly tight both at home and abroad. Yamaichi finally decided to go into voluntary closure of its securities business in November 1997. When Yamaichi failed, the BOJ provided uncollateralized liquidity in order to support the orderly wind-down of its transactions, some of which turned out to be irrecoverable at the conclusion of Yamaichi's bankruptcy procedures in January 2005.

³⁸ The Financial Stability Board (2010a) proposes asking for higher loss absorbency for global SIFIs (G-SIFIs) and improving a resolution scheme for SIFIs in an orderly manner. It should be noted that spillover effects through the financial system need to be examined from the broader perspective of a cross-sectional amplification mechanism in the entire financial system, including the working of the "shadow banking system."

seem to be effective measures, given that those financial institutions play an important role in promoting efficient financial intermediation on a global basis. Capital and liquidity surcharges need to play a central role in enhancing the robustness of individual financial institutions against systemic risk, while, in implementing such surcharges, there remains a difficult question regarding how to set the level of surcharges by striking a balance between the costs and the benefits of limiting the size and scope of financial institutions.

Concerning the second task, it is essential to devise an effective scheme to resolve a failure of large and highly interconnected financial institutions in an orderly manner, thereby minimizing the damage to the financial system. As recent events attest, in the case of an abrupt resolution of SIFIs, the end result can be market turmoil, cascading declines in wide-ranging classes of financial assets, and panic in the financial system. In addition, as I discussed earlier, the prevalence of the shadow banking system suggests that we need to design an orderly resolution scheme that covers nondepository financial institutions. Living wills and some contingent capital schemes would also seem to be helpful in that regard.

IV. Macroprudential Policy and Central Banks

As discussed so far, a macroprudential policy regime needs to be designed to integrate contributions from various policy authorities, such as those for financial regulatory and supervision, fiscal and monetary policies. In implementation, macroprudential policy tools are considered to work effectively by making use of their nature as automatic stabilizers of boom-and-bust cycles. In that respect, it is important to note that incentives for a financial institution are underpinned not only by a framework for financial regulation and supervision at the micro level but also importantly by a financial and economic environment at the macro level.

In this section, given such understanding of a macroprudential policy regime, I will discuss the role of central banks in macroprudential policy and explore a policy framework for central banks to effectively implement macroprudential policy in collaboration with other areas of central banking, particularly monetary policy.

A. Missions of a central bank

As a starting point for discussing the role of central banks in macroprudential policy, it is worthwhile examining a practical way of thinking on the missions of a central bank.

In general, a central bank is assumed to have missions to achieve price stability as well as financial system stability, thereby laying a solid foundation for sustained economic growth.³⁹ On the one hand, price stability is generally defined as a state where various economic agents may make economic decisions without being concerned about fluctuations in general price levels.⁴⁰ On the other hand, financial system stability can be defined similarly as a state where various economic agents may make economic decisions without being constrained by the state of the financial system.

There has been a repeated debate about whether a fundamental trade-off exists between the two objectives.⁴¹ Even though there may exist a trade-off between the two in the short term, it is clear that both continue an important basis for sustained economic growth. Japan's experience since the late 1980s clearly shows the importance of achieving sustained stability in monetary conditions, supported by both price and financial system stability, as an indispensable basis for the sound development of the economy in the medium to long term. In that sense, such trade-off arguments seem to be a matter of time horizons, and price and financial system stability are complementary each other in the medium- to long-term. Central banks need to map out their policy framework, from a medium- to long-term viewpoint, to expand the policy frontier for price and financial system stability with a short-term trade-off (Figure 10).

³⁹ Of course, it is still difficult to say that a global standard has been established with respect to the role of central banks in promoting financial system stability, especially in the field of financial regulation. In practice, it is also true that central banks certainly play various roles in achieving financial system stability from a system-wide perspective, regardless of their assigned roles in financial regulation.

⁴⁰ Greenspan (1996), for example, refers to price stability as being a state in which "economic agents no longer take account of the prospective change in the general price level in their economic decision making." That definition can be interpreted as indicating the importance of attaining the state of "classical dichotomy" in which price fluctuations do not affect the decision making of economic agents regarding resource allocation.

⁴¹ For issues on the separation of monetary policy and financial supervision, see, for example, Goodhart and Schonemaker (1995).

Shiratsuka (2001) elaborated on the concept of price stability by differentiating between “measured price stability” and “sustainable price stability.” Measured price stability expresses price stability in numerical terms to set a tolerable target range for the inflation rate, such as a rate of inflation from zero to 2 percent. Sustainable price stability emphasizes the importance of achieving a stable macroeconomic environment as a fundamental condition for sustainable growth, rather than merely pursuing a specific level of inflation measured by a specific price index at a particular point in time.

Looking back at Japan’s experience since the bubble period, the Japanese economy experienced a decline in inflation and faced the risk of tumbling into a deflationary spiral in the aftermath of the bubble economy (

Figure 11).⁴² Okina, Shirakawa, and Shiratsuka (2001) concluded that “Japan’s economy did not succeed in sustaining price stability after the bubble period,” and emphasized the importance of evaluating the sustainability of price stability over a fairly long period.

The above arguments suggest that the two objectives for central banks, price stability and financial system stability, can be considered as complementary and inseparable in the medium to long term, in the sense that one is a precondition for achieving the other.⁴³ A central bank can contribute to economic growth by simultaneously achieving the two objectives.

B. Central bank policy responses to an asset-price and credit bubble

Given that the two objectives for central banks, price and financial system stability are complementary and inseparable in the medium to long term, one often-asked question is what should be central bank’s policy responses, including both monetary and macroprudential policies, to an asset-price and credit bubble and a potential build-up of financial imbalances under benign financial and economic conditions.

That issue is often debated simply as whether monetary policy should lean against the wind, i.e. excessive asset-price increases. Prior to the recent global financial crisis, the majority view could be summarized into two points.⁴⁴ First, before the burst of an asset-price and credit bubble, monetary policy should respond to asset-price fluctuations, whether driven by the fundamentals or not, only to the degree that those movements have implications for future inflation and economic growth. Second, after the burst of a bubble, central banks should carry out “mop-up operations” aggressively and swiftly against its adverse effects.

⁴² At the time of the bubble period, consumer price inflation had been extremely stable until around 1987, started to rise gradually in 1988, and the year-on-year increase in the Consumer Price Index (CPI) was still 1.1 percent in March 1989, immediately before the introduction of the consumption tax. The year-on-year increase in the CPI, adjusted for the impact of the consumption tax, continued to rise after April 1989, reaching 2 percent in April 1990 and 3 percent in November 1990, and then peaking out in December 1990 and January 1991 at 3.3 percent.

⁴³ As mentioned earlier, Shirakawa (2009a) argues that central banks need “one large toolkit” to achieve the two inseparable long-term objectives, price and financial system stability.

⁴⁴ See, for example, Bernanke and Gertler (1999), and Kohn (2008). White (2009) argues against such views, and emphasizes the necessity of extra operations in advance.

The above line of argument is generally premised on the assumption that a bubble is very difficult to be identified on a real time basis. Thus it seems fair to follow the principle that monetary policy should respond to asset-price movements, whether driven by the fundamentals or not, only to the degree that those movements have implications for future inflation and economic growth.

However, the real issue here is how to understand the expression of “only to the degree that asset price movements have implications for future inflation and economic growth” in implementing monetary policy. From our experiences of the recent crisis as well as Japan’s asset-price and credit bubble, it is apparent that if we allow an asset-price and credit bubble to expand massively, that is most likely to make *ex-post* policy responses extremely difficult. Asset-price movements potentially have implications for inflation and economic growth over a fairly long term beyond the boom phase of asset-price movements.⁴⁵

Monetary policy needs to address asset-price fluctuations considering their long-term implications on prices and economic activity. In that regard, preemptive monetary policy actions are needed anyway to contain excessive asset-price increases, even though the build-up of excesses cannot be contained by monetary policy alone and needs to be addressed by a combination of policy measures. It should be noted, however, that such preemptive policy actions are not aimed at picking a bubble, but attempt to prevent asset prices from increasing to excessively high levels.

C. A comprehensive policy framework for central banking

As repeatedly emphasized in this paper, central banks have medium- to long-term goal of maintaining price stability as well as financial system stability. In addition, those two objectives are closely interlinked and complementary in the medium to long term. Given increasing macrofinancial linkages, neither objective can be achieved without maintaining the other over a fairly long period.

⁴⁵ Kohn (2008) points out the importance of making economic projections over long term, even though he maintains a skeptical attitude toward preemptive monetary policy actions against asset-price and credit bubbles. In light of the recent financial crisis, Yellen (2009a) and Dudley (2009), who used to make a stand up for the majority view before the crisis, review their position to a more supportive one regarding preemptive monetary policy responses to asset-price and credit bubbles.

From the viewpoint above, it is crucially important for central banks to evaluate risks to the economy at an early stage from a system-wide and long-term perspective, and to deal with them in a preemptive manner. Of course, it is impossible to totally eliminate a build-up of financial imbalances in a boom-and-bust cycle. But it is possible and desirable to contain risks associated with a build-up of financial imbalances by carrying out both monetary and macroprudential policies in a sufficiently preemptive and consistent manner, thereby making economic fluctuations smaller.

In that context, I suggest extending the framework of constrained discretion for monetary policy, proposed as the conceptual basis for flexible inflation targeting, to an overall policy framework for central banking.⁴⁶

Constrained discretion for monetary policy is designed to pursue price stability in the medium to long term, while responding flexibly to shocks in the short term.⁴⁷ More precisely, central banks retain some discretion over the use of monetary policy instruments to respond to economic shocks, financial disturbances, and other unanticipated developments. Such discretion, however, is constrained by a firm long-term commitment to keeping inflation low and stable. That approach is expected to strengthen the overall policy performance of central banks in achieving price stability in the long term, thereby promoting the sound development of the economy.

Similarly, constrained discretion for central banking attempts to pursue price and financial system stability in a consistent and sustainable manner. As examined earlier, a central bank needs to make some discretionary judgment in implementing macroprudential policy tools. In doing so, a central bank needs a more pragmatic approach in implementing policy measures from a long-term perspective while explaining the intention and rationale to society. Such a policy framework, although

⁴⁶ The Bank of England (2009) also points out the importance of constrained discretion in macroprudential policy framework. From the viewpoint of a monetary policy framework, White (2009) emphasizes the importance of integrating a macroprudential perspective into monetary policy implementation, thereby establishing a new macrofinancial stability framework. He asserts that such a framework enables a central bank to respond to an asset-price and credit bubble in a systematic and symmetric manner.

⁴⁷ See, for example, Bernanke *et al.* (1999) for details on constrained discretion for monetary policy as a conceptual basis for flexible inflation targeting.

an abstract concept, provides central banks with a basis for achieving sustained stability in monetary conditions, supported by both price and financial system stability.

The above direction of practice can be observed in some central banks through incorporating assessments of the long-term risks to price stability into a monetary policy framework. The BOJ, for example, examines its monetary policy from two perspectives. The first perspective examines the baseline projections for one to two years in the future, and the second perspective examines, over a longer horizon, various risks, including a low-probability event that entails extreme costs.⁴⁸ Similarly, the European Central Bank (ECB) takes the monetary policy strategy of a “two-pillar approach”: economic analysis and monetary analysis. Economic analysis assesses short-to-medium-term price developments by focusing on economic activity and financial conditions. Monetary analysis serves as a means of cross-checking the economic analysis, from a longer-term horizon.⁴⁹

V. Conclusions

In this paper I have explored a policy framework for central banks from a macroprudential perspective, to pursue price and financial system stability in a consistent and sustainable manner. In that context, I have emphasized the importance of a “macroprudential perspective,” not just “macroprudential policy” itself. That is because such a framework needs to bring together contributions not only from financial regulation and supervision but also from macroeconomic policy, particularly monetary policy.

Macroprudential policy, combined with monetary policy and other macroeconomic policies, is expected to address a build-up of financial imbalances in upturns and their subsequent unwinding in downturns from a more system-wide perspective. To make such a framework workable, it is deemed crucial for central banks to implement monetary and macroprudential policies in a preemptive and

⁴⁸ Shirakawa (2010) argues that the BOJ’ monetary policy practice based on examinations from the “two perspectives” can be regarded as an innovative approach of implementing “flexible” elements of inflation targeting in a systematic manner.

⁴⁹ See ECB (2010a, b) for recent advances in monetary analysis to assess long-term risks to price stability.

consistent manner, based on risk assessment of the economy at an early stage from a system-wide and long-term perspective. Constrained discretion for central banking, while still an abstract concept, provides central banks with a basis for pursuing price and financial system stability in a consistent and sustainable manner.

It should be noted that no concrete rules exist regarding how to recognize risks associated with financial imbalances. Kindleberger (1995), for example, notes that there are no cookbook rules for policy judgments against asset-price misalignments, and it is inevitable that central banks will have to make discretionary judgments.⁵⁰ It is thus crucially important for central banks to have a good track record and credibility regarding their policy actions. In that case, a good track record should include decisive actions of central banks with a high degree of transparency, which would support good economic performance.

It should be also noted that achieving higher financial system stability purely by more stringent microprudential regulations tends to result in lower efficiency in financial intermediation. Crises are fundamentally endogenous to the financial system and arise from exposure to common risks among financial institutions, underpinned by complicated incentives at both the micro and macro levels. It is thus deemed crucial to map out a macroprudential policy framework in order to strike a balance between the efficiency and stability of the financial system as a whole.

References

Adrian, Tobias, and Hyun Song Shin, “Financial Intermediaries, Financial Stability and Monetary Policy,” *Managing Stability in a Changing Financial System*, Federal Reserve Bank of Kansas City, 2008.

Bank of England, “The Role of Macroprudential Policy,” Discussion Paper, 2009.

Basel Committee on Banking Supervision, “Strengthening the Resilience of the Banking Sector,” Consultative Document, Bank for International Settlements, 2009.

⁵⁰ Kindleberger (1995) comments on this point as follows: “When speculation threatens substantial rises in asset prices, with a possible collapse in asset markets later, and harm to the financial system, or if domestic conditions call for one sort of policy, and international goals another, monetary authorities confront a dilemma calling for judgment, not cookbook rules of the game.”

- _____, “Countercyclical Capital Buffer Proposal,” Consultative Document, Bank for International Settlements, 2010a.
- _____, “An Assessment of the Long-term Economic Impact of Stronger Capital and Liquidity Requirements,” Bank for International Settlements, 2010b.
- _____, “Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems,” Bank for International Settlements, 2010c.
- _____, “Basel III: International Framework for Liquidity Risk Measurement, Standards and Monitoring,” Bank for International Settlements, 2010d.
- _____, “Guidance for National Authorities Operating the Countercyclical Capital Buffer,” Bank for International Settlements, 2010e.
- Bernanke, Ben S., and Mark Gertler, “Monetary Policy and Asset Price Volatility,” in *Achieving Price Stability*, Federal Reserve Bank of Kansas City, 1999, pp. 77-128.
- _____, Thomas Laubach, Frederic S. Mishkin, and Adam S. Posen, *Inflation Targeting: Lessons from the International Experience*, Princeton: Princeton University Press, 1999.
- Blanchard, Olivier J., and Mark Watson, “Bubbles, Rational Expectations and Financial Markets,” in P. Wachtel, ed., *Crises in the Economic and Financial Structure*, Lexington: Lexington Books, 1982, pp. 295-315.
- Borio, Claudio, “Toward a Macroprudential Framework for Financial Supervision and Regulation,” BIS Working Paper No. 128, 2003.
- _____, and William R. White, “Whither Monetary and Financial Stability? The Implications of Evolving Policy Regimes,” in *Monetary Policy and Uncertainty: Adapting to a Changing Economy*, Federal Reserve Bank of Kansas City, 2003.
- Caruana, Jaime, “Macroprudential Policy: What We Have Learned and Where We Are Going,” Keynote speech at the Second Financial Stability Conference of the International Journal of Central Banking, Bank of Spain, June 17, 2010.
- Clement, Piet, “The Term of ‘Macroprudential’: Origins and Evolution,” *BIS Quarterly Review*, March issue, 2010, pp. 59-67.
- Committee on the Global Financial System, “Macroprudential Instruments and Frameworks: A Stocktaking of Issues and Experiences,” CGFS Papers, No. 38, Bank for International Settlements, 2010.
- Drehmann, Mathias, Claudio Borio, Leonardo Gambacorta, Gabriel Jiménez, and

- Carlos Trucharte, "Countercyclical Capital Buffers: Exploring Options," BIS Working Papers, No. 317, 2010.
- Dudley, William C., "Remarks," The Eighth Annual BIS Conference, Basel, Switzerland, June 26, 2009.
- European Central Bank, "Asset Price Bubbles and Monetary Policy Revisited," *ECB Monthly Bulletin*, November 2010a, pp. 71-83.
- _____, "Enhancing Monetary Analysis," *ECB Monthly Bulletin*, November 2010b, pp. 85-99.
- Financial Stability Board, "Reducing the Moral Hazard Posed by Systematically Important Financial Institutions," FSB Recommendation and Time Lines, 2010a.
- _____, "Progress since the Washington Summit in the Implementation of the G20 Recommendations for Strengthening Financial Stability," Report of the Financial Stability Board to G20 Leaders, 2010b.
- Galati, Gabriele, and Richhild Moessner, "Macroprudential Policy --- A Literature Review," DNB Working Paper No. 267, De Nederlandsche Bank, 2010.
- Goodhart, Charles, and Dirk Schoenmaker, "Should the Functions of Monetary Policy and Banking Supervision Be Separated?," *Oxford Economic Papers* 47(4), 1995, pp. 539-560.
- Greenspan, Alan, "Opening Remarks," *Achieving Price Stability*, Federal Reserve Bank of Kansas City, 1996.
- Group of Thirty, Working Group on Macroprudential Policy, *Enhancing Financial Stability and Resilience: Macroprudential Policy, Tools, and Systems for the Future*, 2010.
- Hanson, Samuel, Anil K. Kashyap, and Jeremy C. Stein, "A Macroprudential Approach to Financial Regulation," mimeo, 2010.
- Hattori, Masazumi, Hyun Song Shin, and Wataru Takahashi, "A Financial System Perspective on Japan's Experience in the Late 1980s," IMES Discussion Paper No. 2009-E-19, Institute for Monetary and Economic Studies, Bank of Japan, 2009.
- Hodrick, Robert J., and Edward C. Prescott, "Postwar U.S. Business Cycles: An Empirical Investigation," *Journal of Money, Credit, and Banking*, 29 (1), 1997, pp. 1-16.
- Kindleberger, Charles P., "Asset Inflation and Monetary Policy," *BNL Quarterly Review*

vol. 48, no. 192, 1995, pp. 17-37.

Kohn, Donald L., "Monetary Policy and Asset Prices Revisited," Speech presented at the Cato Institute's 26th Annual Monetary Policy Conference, November 19, 2008.

Macroeconomic Assessment Group (established by the Financial Stability Board and the Basel Committee on Banking Supervision), "Assessing the Macroeconomic Impact of the Transition to Stronger Capital and Liquidity Requirements," Interim Report, Bank for International Settlements, 2010a.

_____, "Assessing the Macroeconomic Impact of the Transition to Stronger Capital and Liquidity Requirements" Final Report, Bank for International Settlements, 2010b.

Okina, Kunio, Masaaki Shirakawa, and Shigenori Shiratsuka, "The Asset Price Bubble and Monetary Policy: Japan's Experience in the Late 1980s and the Lessons," *Monetary and Economic Studies*, 19 (S-1), Institute for Monetary and Economic Studies, Bank of Japan, 2001, pp. 395-450.

_____, and Shigenori Shiratsuka, "Asset Price Bubbles, Price Stability, and Monetary Policy: Japan's Experience," *Monetary and Economic Studies*, 20 (3), Institute for Monetary and Economic Studies, Bank of Japan, 2002, pp. 35-76.

_____, and _____, "Asset Price Fluctuations, Structural Adjustments, and Sustained Economic Growth: Lessons from Japan's Experience since the Late 1980s," *Monetary and Economic Studies*, 22 (S-1), 2004, pp. 143-167.

Pozsar, Zoltan, Tobias Adrian, Adam Ashcraft, and Hayley Boesky, "Shadow Banking," Federal Reserve Bank of New York Staff Reports, No. 458, 2010.

Shirakawa, Masaaki, "Preventing the Next Crisis: The Nexus between Financial Markets, Financial Institutions and Central Banks," Speech given at the London Stock Exchange, May 13, 2009a.

_____, "Some Thoughts on Incentives at Micro- and Macro-level for Crisis Prevention," Remarks at the Eighth Bank for International Settlements Annual Conference in Basel, Switzerland, June 26, 2009b.

_____, "Macroprudence and the Central Bank," Speech at the Seminar of the Securities Analysts Association of Japan in Tokyo, December 22, 2009c.

_____, "Roles for a Central Bank -- Based on Japan's Experience of the Bubble, the

Financial Crisis, and Deflation --," Speech at the 2010 Fall Meeting of the Japan Society of Monetary Economics, September 26, 2010.

Shiratsuka, Shigenori, "Is There a Desirable Rate of Inflation? A Theoretical and Empirical Survey," *Monetary and Economic Studies*, 19 (2), Institute for Monetary and Economic Studies, Bank of Japan, 2001, pp. 49-83.

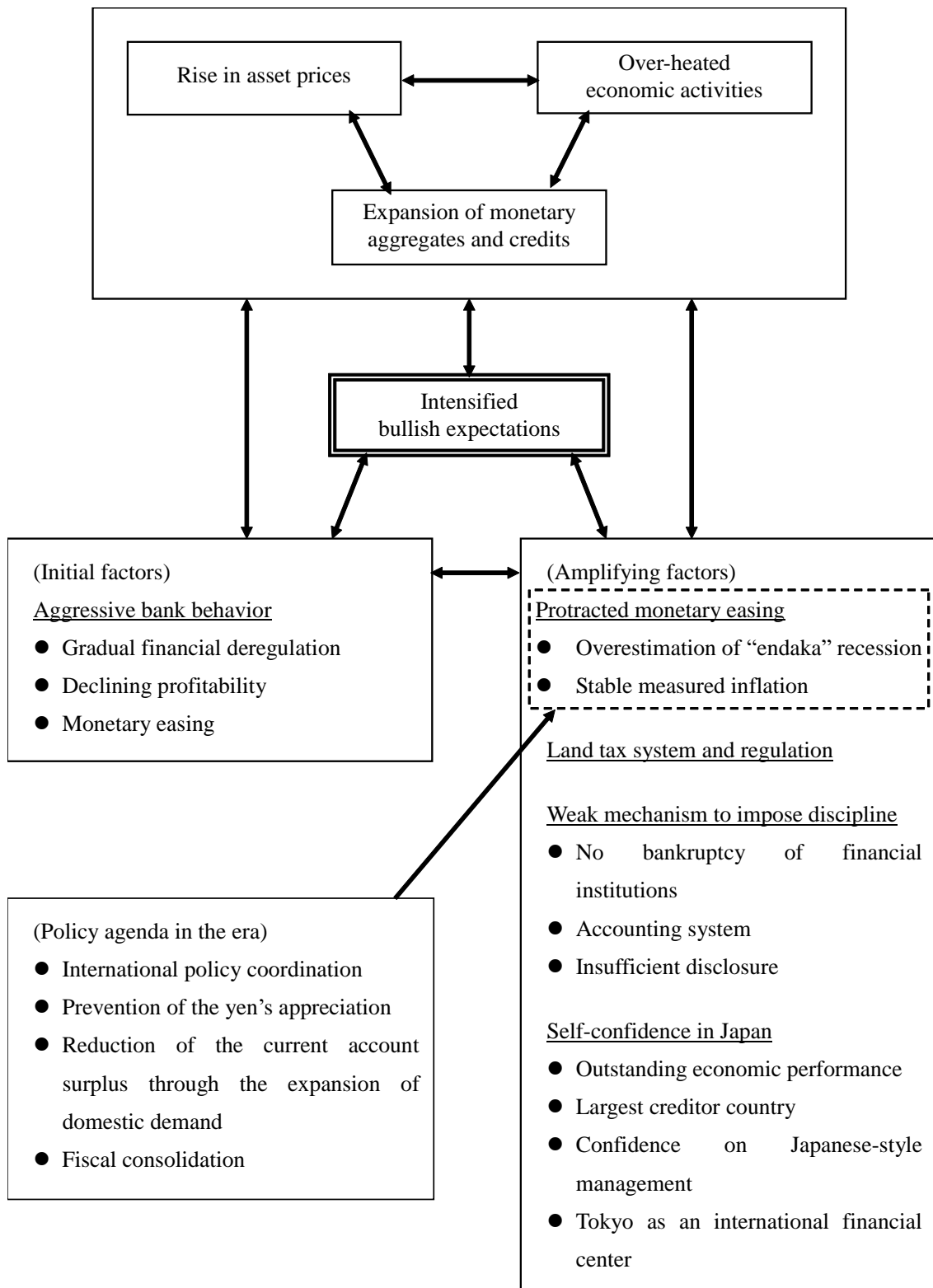
_____, "Size and Composition of the Central Bank Balance Sheet: Revisiting Japan's Experience of the Quantitative Easing Policy," *Monetary and Economic Studies*, 28, 2010, pp. 79-105.

White, William R., "Should Monetary Policy 'Lean or Clean'," Working Paper No. 34, Globalization and Monetary Policy Institute, Federal Reserve Bank of Dallas, 2009.

Yellen, Janet L., "Closing Panel Presentation," The Federal Reserve Board / *Journal of Money, Credit, and Banking* Conference on Financial Markets and Monetary Policy, Washington DC, June 5, 2009a.

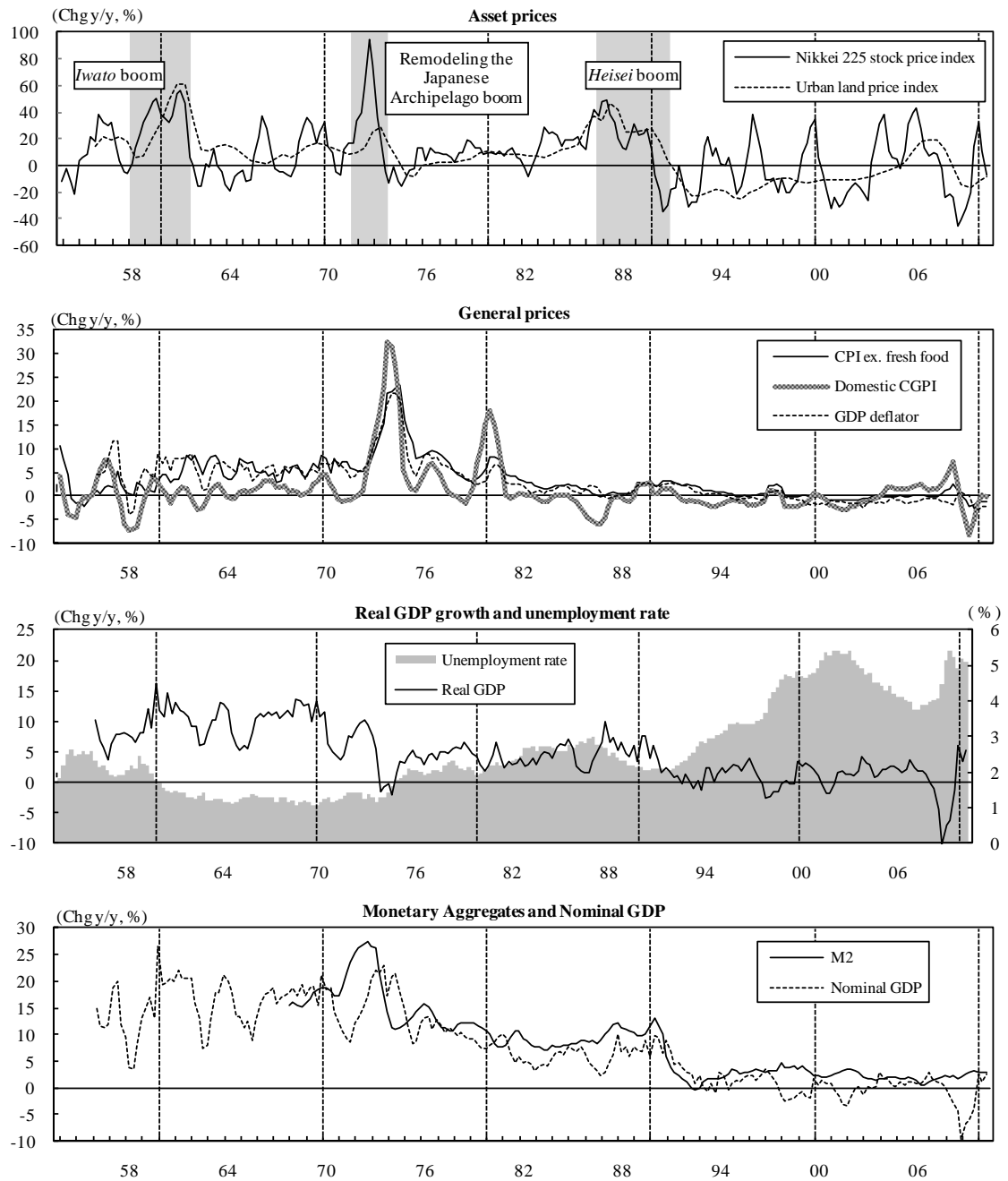
_____, "Linkages between Monetary and Regulatory Policy: Lessons from the Crisis," *FRBSF Economic Letter* No. 2009-36, 2009b.

Figure 1. Illustration of the Bubble Economy in Japan



Source: Figure 13 in Okina, Shirakawa, and Shiratsuka (2001)

Figure 2. Financial and Economic Environment

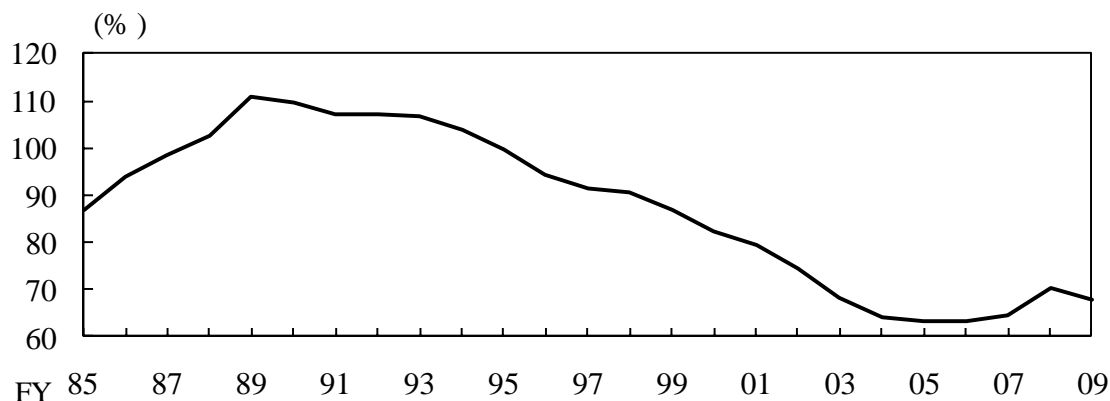


- Notes:
1. The urban land price index is figure for commercial land in six major cities.
 2. Regarding the CPI before 1970 and domestic WPI before 1960, the prewar base series is connected to the current series.
 3. The unemployment rate is seasonally adjusted.

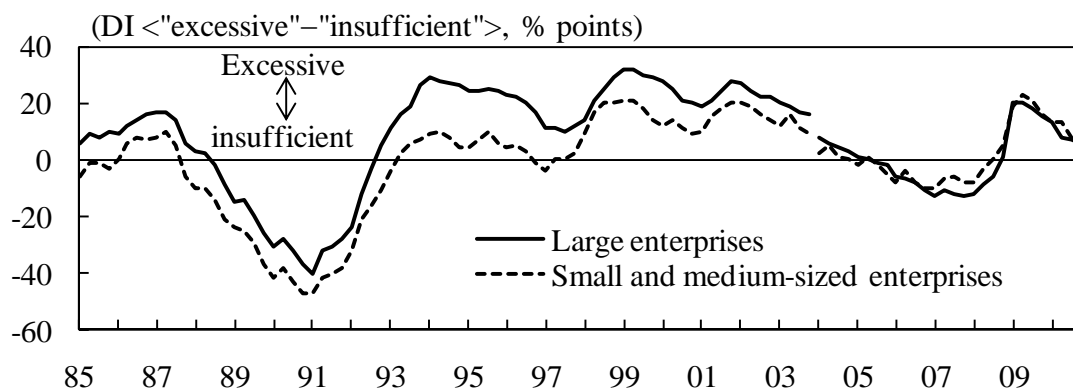
Sources: Bank of Japan, *Financial and Economic Statistics Monthly*, and other sources.

Figure 3. “Three Excesses” in the Japanese Business Sector

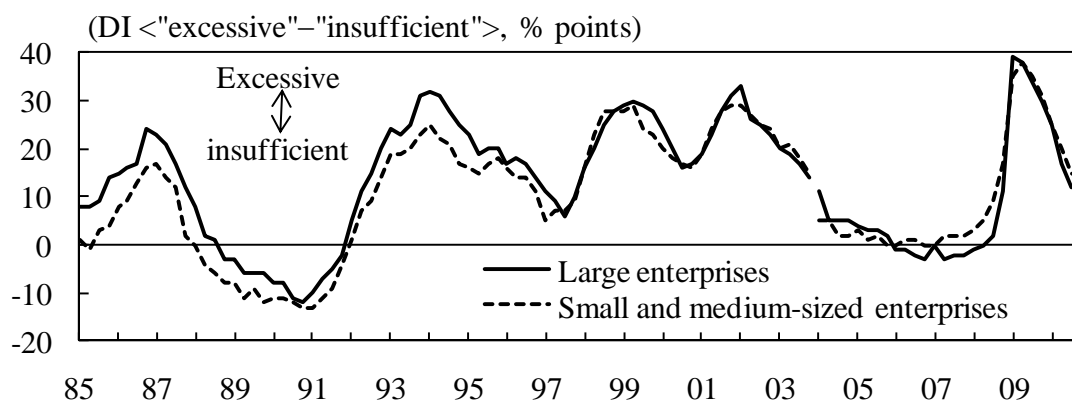
[1] Ratio of debts to nominal GDP (Private non-financial corporations)



[2] Employment Condition DI (all industries)



[3] Production Capacity DI (manufacturing)

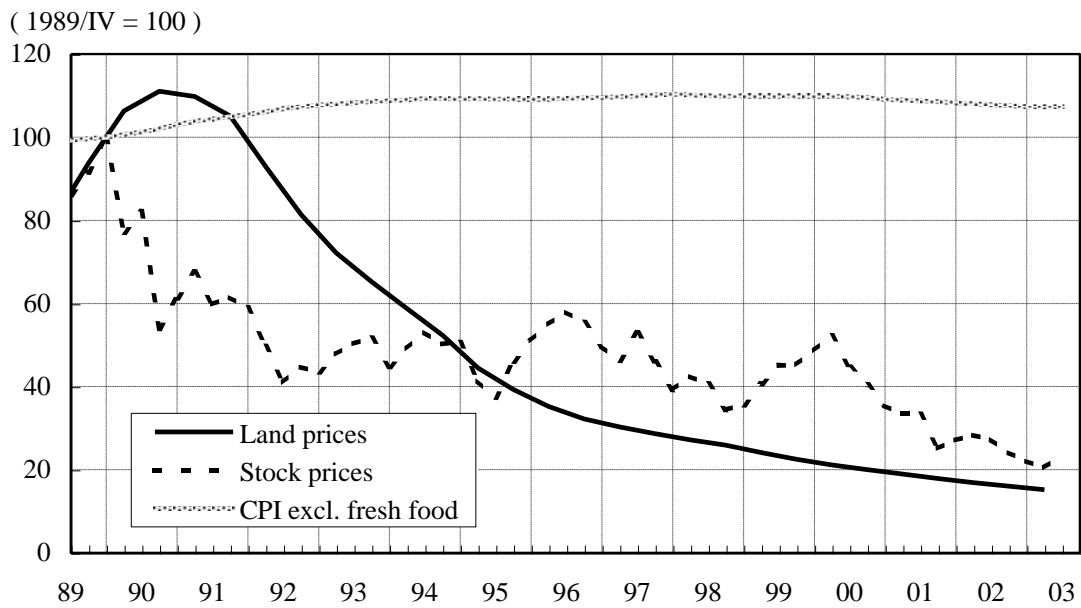


Notes: 1. The Tankan has been revised from the March 2004 survey. Figures up to the December 2003 survey are based on the previous data sets. Figures from the December 2003 survey are on a new basis.

2. Debts are the sum of loans and securities (other than equities) in private non-financial corporations.

Sources: Cabinet Office, *Annual Report on National Accounts*; Bank of Japan, *Bank of Japan, Tankan: Short-Term Economic Survey of Enterprises in Japan, Flow of Funds*.

Figure 4. Asset Price Deflation

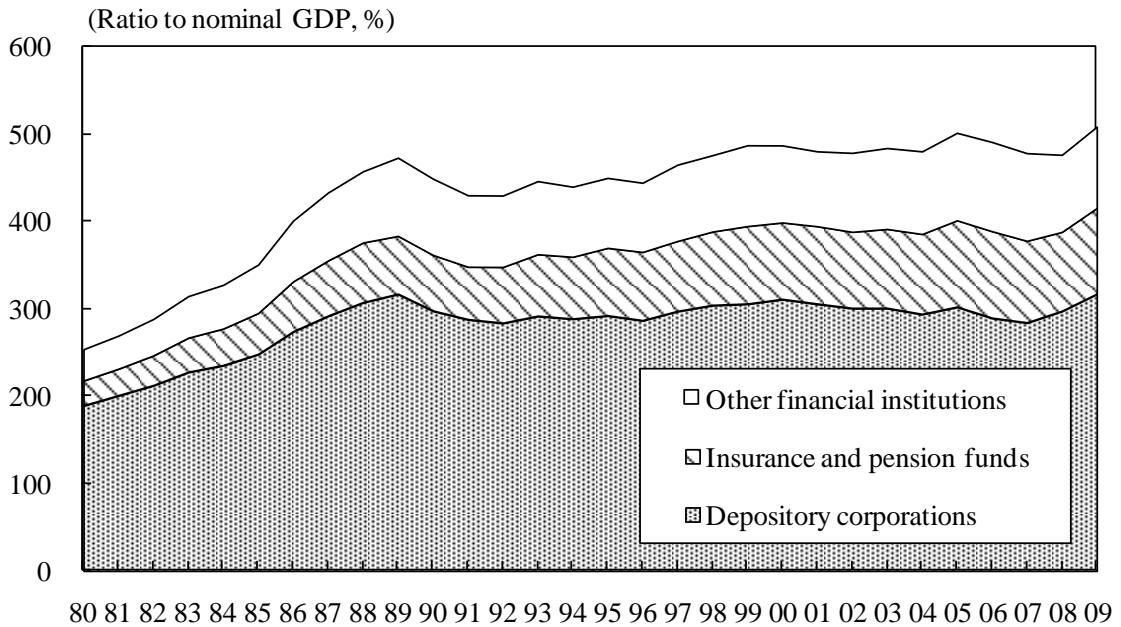


Notes: CPI excluding fresh food is seasonally adjusted by X-12-ARIMA with options of (0 1 2) (0 1 1) ARIMA model and level shifts in April 1989 and April 1997 when the consumption tax was respectively introduced and subsequently hiked.

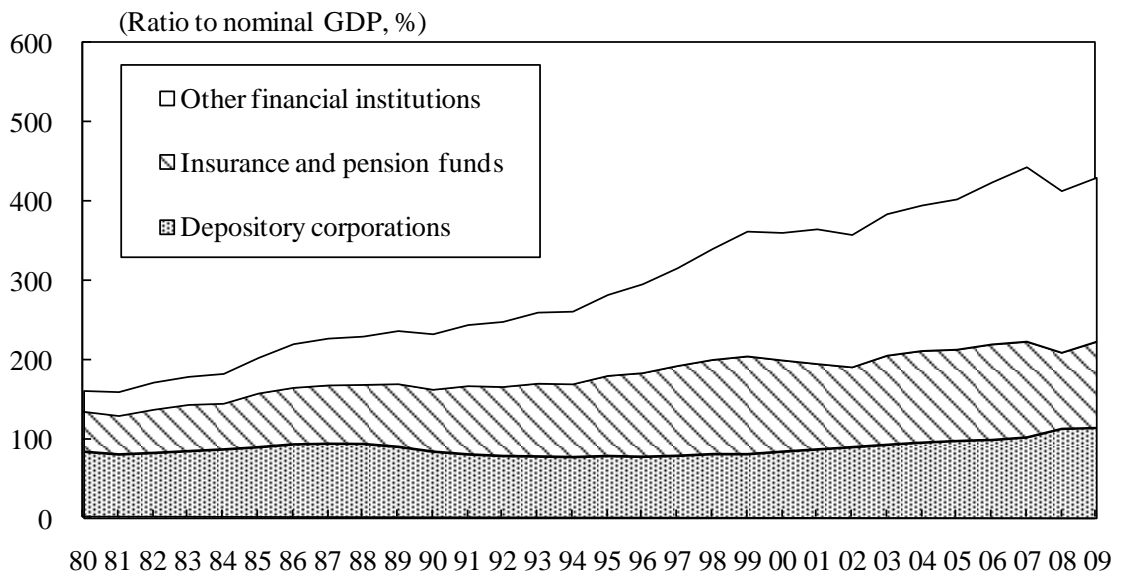
Sources: Bank of Japan, *Financial and Economic Statistics Monthly*; Ministry of Public Management, Home Affairs, Posts and Telecommunications, *Consumer Price Index*; Japan Real Estate Institute, *Urban Land Price Index*.

Figure 5. Structure of Financial Intermediations

[1] Japan



[2] The United States

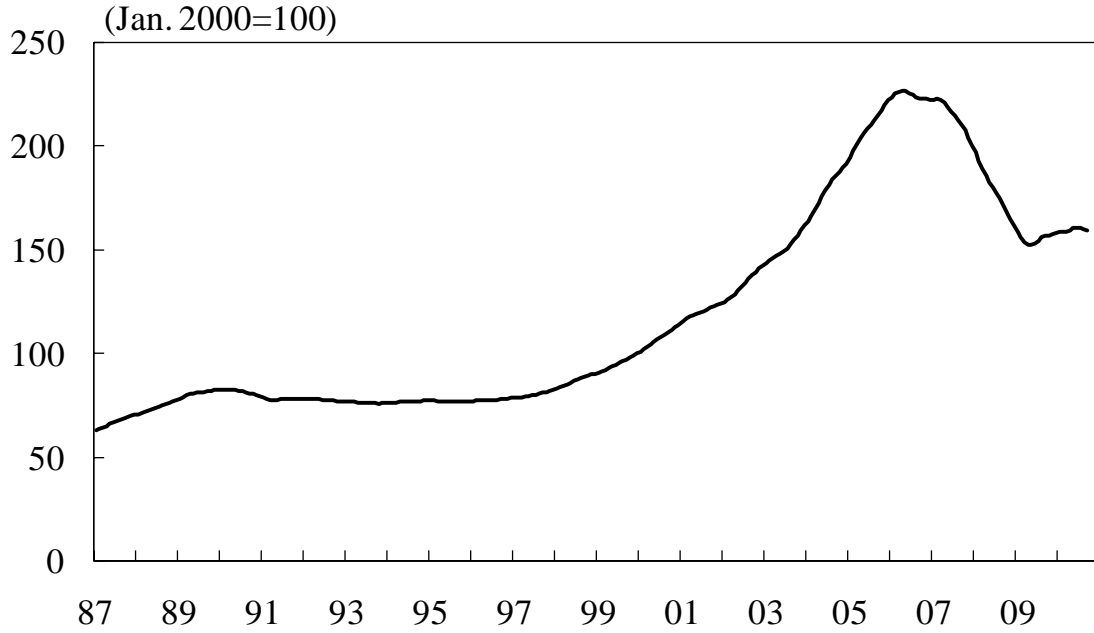


Notes: Other financial institutions in Japan comprise securities investment trusts, nonbanks, and financial dealers and brokers. Those in the United States are the sum of investment trusts, financial dealers and brokers, nonbanks, and funding companies.

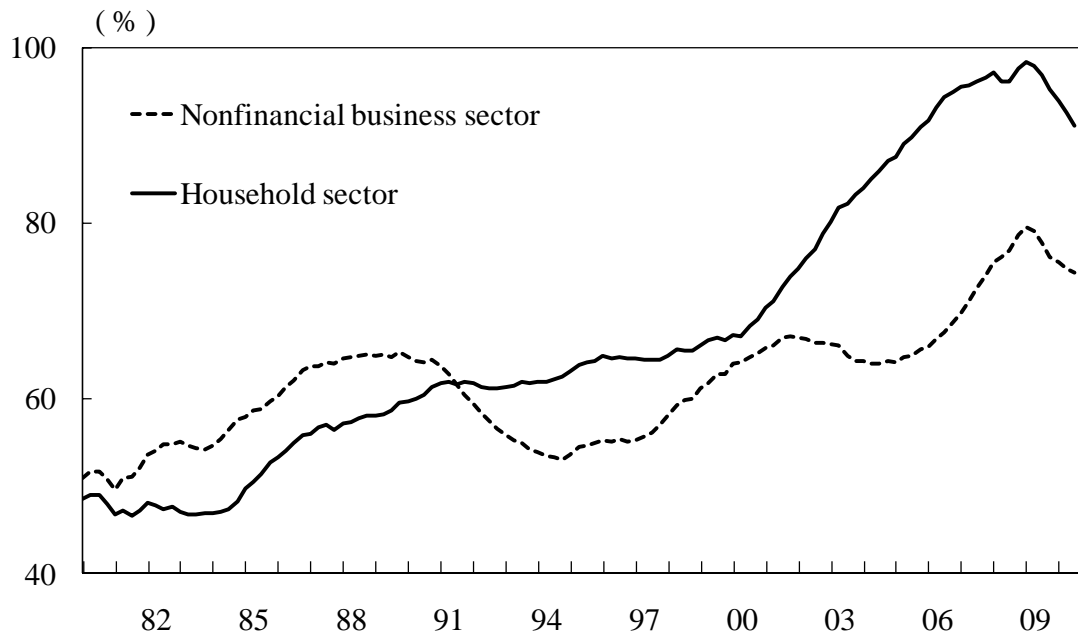
Sources: Cabinet Office, *National Accounts*; Bank of Japan, *Flow of Funds Accounts*; Bureau of Economic Analysis, *National Economic Accounts*; FRB, *Flow of Funds Accounts of the United States*.

Figure 6. Housing Prices and Credit in the United States

[1] Housing Prices

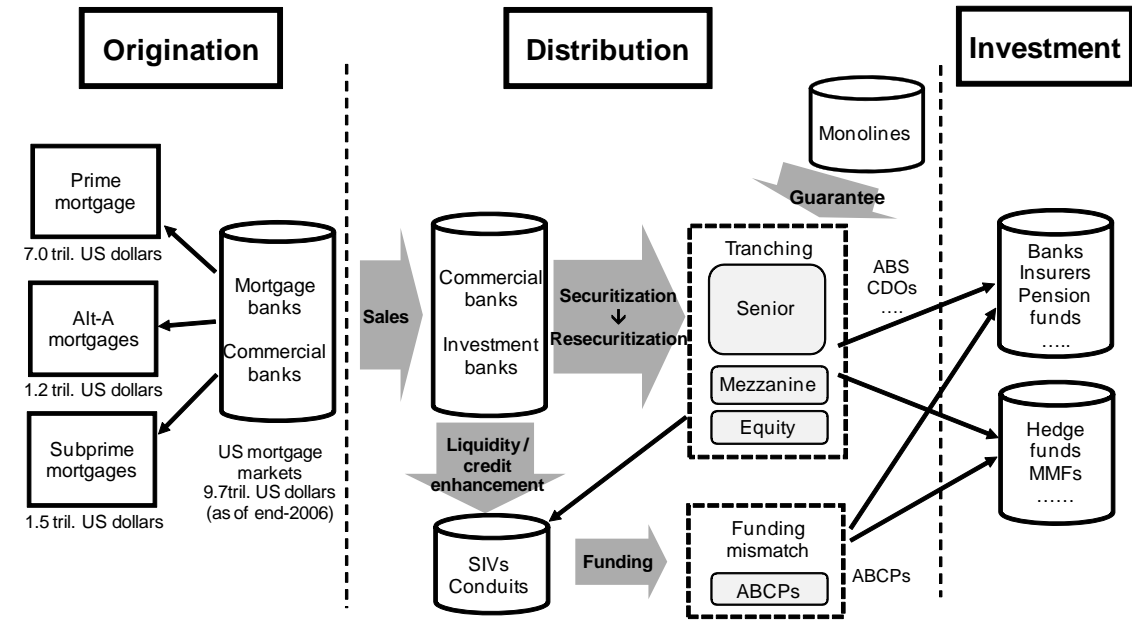


[2] Credit-to-GDP ratios



Sources: Standard & Poor's, *S&P/Case-Shiller Home Price Indices*; Board of Governors of the Federal Reserve System, *Flow of Funds Accounts of the United States*; Bureau of Economic Analysis, *National Economic Accounts*.

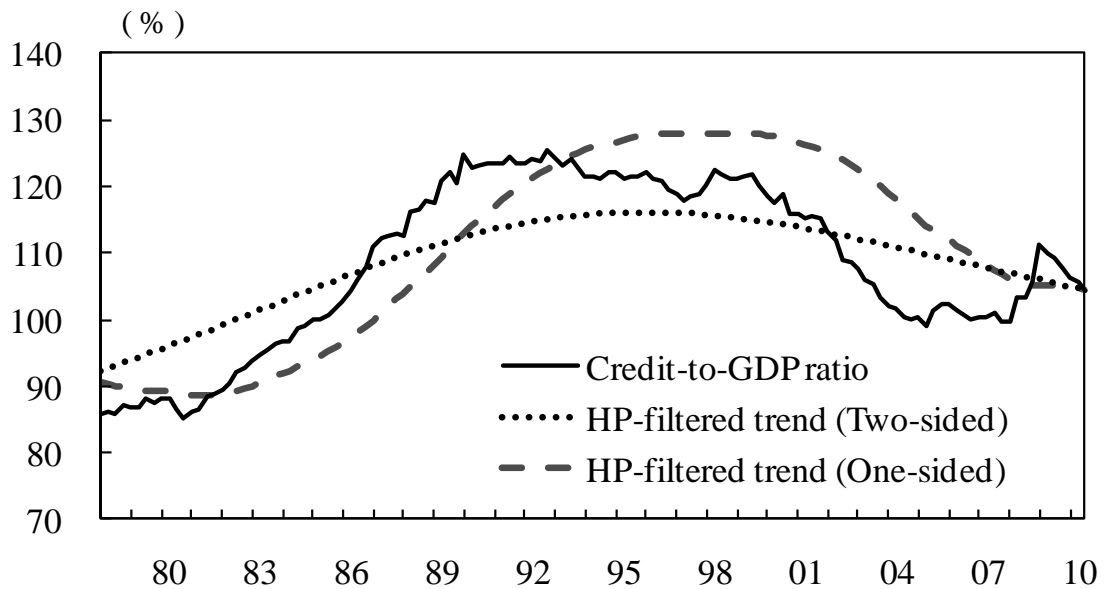
Figure 7. Securitization Markets Related to the U.S. Subprime Mortgages



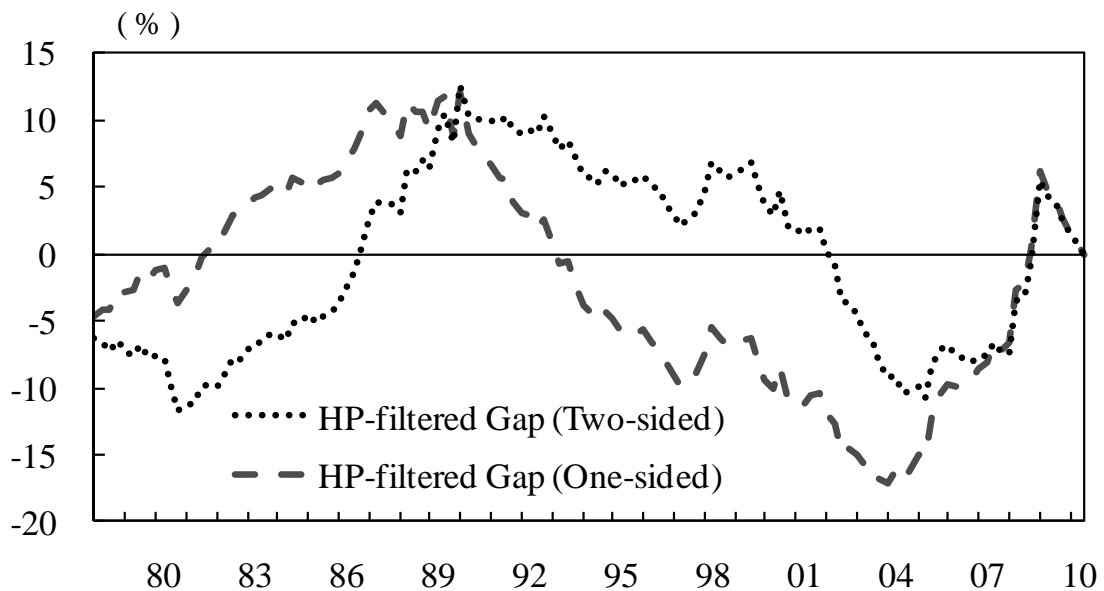
Sources: Bank of Japan, *Financial System Report*, March 2008.

Figure 8. Credit-to-GDP Ratio in Japan

[1] Credit-to-GDP ratio and its trends



[2] Credit-to-GDP gaps

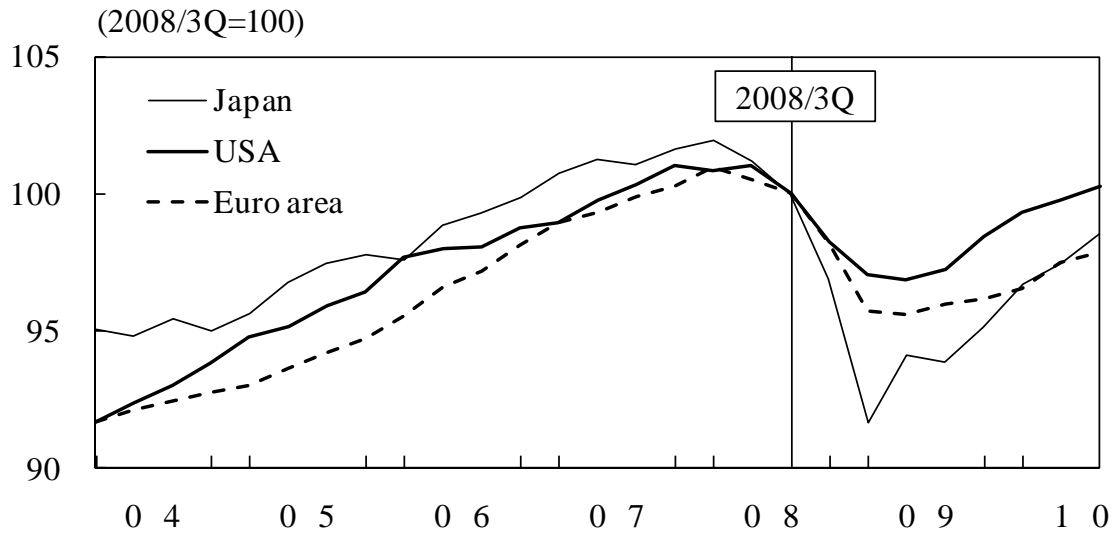


Notes: HP-filtered trends for both one-sided and two-sided procedures are computed using a smoothing parameter of 400,000, as proposed by BCBS (2010a, e).

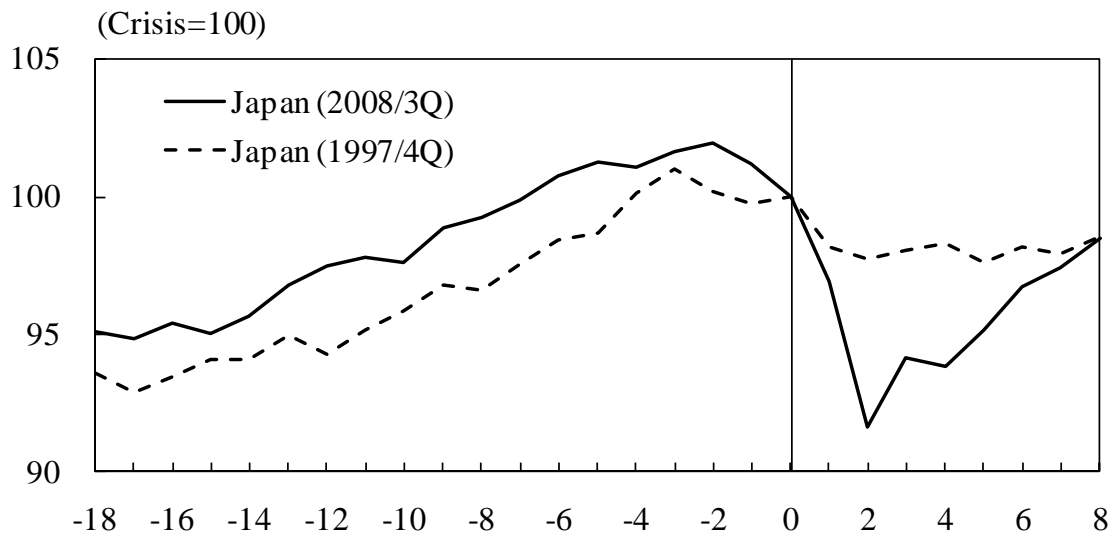
Sources: Bureau of Economic Analysis, *National Economic Accounts*; FRB, *Flow of Funds Accounts of the United States*.

Figure 9. Output Declines after the Crises

[1] Output decline after the failure of Lehman Brothers



[2] Output decline in Japan



Sources: Cabinet Office, *Annual Report on National Accounts*; U.S. Bureau of Economic Analysis, *National Economic Accounts*; Eurostat, *National Accounts*.

Figure 10: Policy Frontier for the Two Stabilities: Illustration

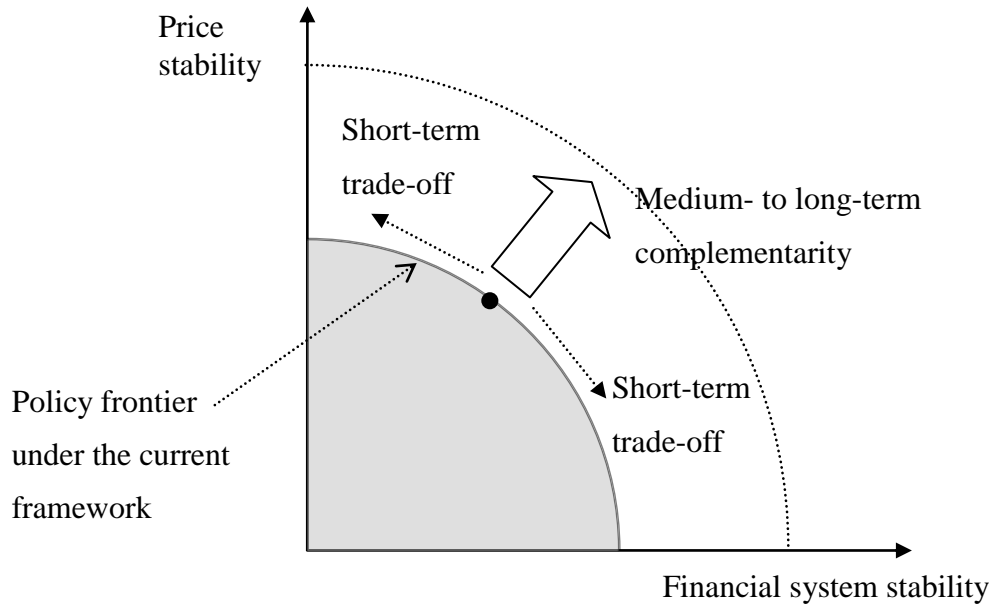
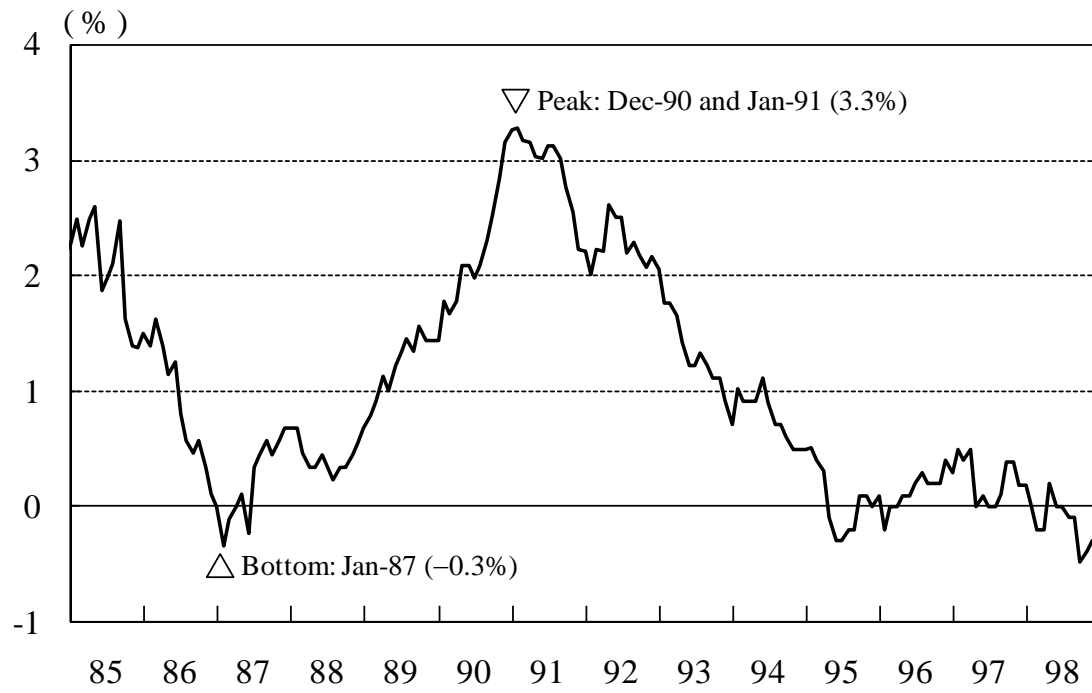


Figure 11: Price Development since the mid-1980s



Note: Figures are adjusted for the impact of consumption tax.

Sources: Ministry of Internal Affairs and Communications, *Consumer Price Index*.