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Bank of Japan

**Overcoming Deflation: Japan's Experience and
Challenges Ahead**

*Speech at the 2019 Michel Camdessus Central Banking Lecture,
International Monetary Fund*

Haruhiko Kuroda

Governor of the Bank of Japan

Introduction

It is my great pleasure to have the opportunity today to give a speech in honor of Michel Camdessus.

In my speech today, I would like to share some thoughts on Japan's deflation that started from the late 1990s, when Mr. Camdessus served as the Managing Director of the International Monetary Fund (IMF). The inflation rate in Japan started to decline after the burst of the asset bubble in the early 1990s. The economy fell into deflation in the late 1990s, in the sense of a sustained decline in prices, and this deflation persisted for about 15 years.

Such chronic deflation used to be regarded as a phenomenon unique to Japan. However, most advanced economies have been experiencing low inflation and low interest rates since the global financial crisis. Many central banks now face a common challenge of how to raise inflation rates. I believe that Japan's experience of a long battle against deflation would provide a case study for other central banks in conducting monetary policy going forward.

Keeping this in mind, I would like to discuss two topics today. The first is the reasons behind chronic deflation in Japan and the effects of quantitative and qualitative monetary easing (QQE) that the Bank of Japan introduced in 2013 as a measure to overcome deflation. As I will explain later, Japan's economy is finally no longer in deflation owing to the powerful monetary easing, and it is reconfirmed that monetary policy is effective even in overcoming chronic deflation. However, it is taking time to achieve the Bank's price stability target of 2 percent. After explaining the reasons behind this, I will move on to the second topic of the Bank's initiatives to overcome the current persistent low inflation. The Bank introduced the new policy framework, "QQE with Yield Curve Control," in 2016 and strengthened it in 2018. I will elaborate on the Bank's thinking behind the new initiatives and its experience.

I. Chronic Deflation and QQE

A. Decline in the Natural Rate of Interest and Chronic Deflation

Now, let me start with Japan's experience of deflation. In Japan, after the burst of a large-scale asset bubble in the early 1990s, the economy decelerated significantly and the inflation rate declined gradually. The economy fell into deflation amid the successive collapse of major financial institutions in the late 1990s. Thereafter, except for some periods when commodity prices surged, the CPI inflation rate remained in negative territory for about 15 years (Chart 1).

Why did Japan's economy fall into deflation and face difficulty in getting out of it for a long time? In my view, this is basically because the natural rate of interest declined rapidly, due to the stagnant potential growth rate, the bubble burst, and the subsequent financial crisis (Chart 2).¹ The Bank had been searching for measures to strengthen monetary easing from an early stage. It adopted the zero interest rate policy in 1999 and introduced quantitative easing (QE) in 2001 ahead of other central banks. However, it could not create sufficiently accommodative financial conditions in a situation where the nominal policy interest rate had already reached the zero lower bound, and QE at that time simply exchanged nearly zero interest rate short-term assets for zero interest rate deposits at the Bank of Japan. In addition, amid a situation of stagnant economic activity and prices, it was perceived by the public and markets that the Bank did not commit strongly enough to achieving price stability. This also gradually pushed down inflation expectations and made it more difficult to overcome deflation.

B. Developments in Economic Activity and Prices since the Introduction of QQE

In order to break through this situation, the Bank introduced QQE in April 2013. This framework of powerful monetary easing consists of two pillars: (1) a strong and clear commitment to achieving the price stability target of 2 percent at the earliest possible time and (2) large-scale purchases of short- to long-term government bonds to reduce long-term interest rates.

¹ Nao Sudo, Yosuke Okazaki, and Yasutaka Takizuka, "Determinants of the Natural Rate of Interest in Japan: Approaches Based on a DSGE Model and OG Model," *Bank of Japan Research Laboratory Series*, no.18-E-1, 2018.

QQE exerted significant effects, supported by the favorable economic conditions at the time. Nominal interest rates declined largely across the entire yield curve. In particular, long-term interest rates were influenced strongly, since they had room for a further decline even under the zero lower bound on short-term interest rates. With concern about the persistent deflation being dispelled, inflation expectations rose, and short- and long-term real interest rates fell to a level far below the natural rate of interest. As a consequence, the economy improved significantly and the inflation rate went up. For the first time in about 15 years, Japan's economy is no longer in deflation. Since the global financial crisis, the inflation rate in Japan alone has increased, while the rates in many advanced economies have declined. This indicates the significant effects of QQE (Chart 3).

That said, the inflation rate is still below 1 percent and the low inflation environment remains. As I just mentioned, in Japan, powerful monetary easing has boosted demand through a decline in real interest rates. This transmission mechanism has worked firmly as initially intended. However, the problem is that, even though demand shortage was met, it is still taking time to overcome low inflation.

C. Reasons Why It Takes Time for Inflation to Rise

In our understanding, the combination of a vulnerability of inflation expectations to adverse shocks and structural factors explains why a rise in inflation is taking time.

Inflation expectations started to rise following the introduction of QQE in 2013, but leveled off around the next summer and started to decline thereafter. Such a decline was largely due to a drop in the inflation rate that mainly reflected a significant fall in crude oil prices. In 2014, Japan's economy was halfway through the re-anchoring process from a deflationary equilibrium to a new equilibrium. Unfortunately, the economy faced large adverse price shocks at such a critical point, and inflation expectations stopped rising as they are vulnerable to such shocks before they are well anchored.²

² As for the effects of price shocks on inflation expectations, see Yoshihiko Hogen and Ryoichi Okuma, "The Anchoring of Inflation Expectations in Japan: A Learning-Approach Perspective," *Bank of Japan Working Paper Series*, no.18-E-8, 2018.

However, inflation remained sluggish even after 2016, when crude oil prices started to increase. So, it is not possible to attribute the reason only to past price shocks. Let me introduce some hypotheses that focus on structural factors to explain the current sluggish inflation.

The first is that the hysteresis effects of inflation expectations are stronger than expected. The introduction of QQE dispelled an extremely pessimistic view that deflation would continue. However, the experience of prolonged low growth and low inflation has become deeply embedded in people's mindset and behavior, and the assumption that prices will not increase easily has been entrenched. Recently, many analyses show that households' inflation expectations are significantly affected by their experience for a long time. For example, compared to the age group who experienced relatively high inflation, inflation expectations are lower for younger generations in Japan. They only have the experience of low inflation and deflation.³

The second hypothesis is that the past experience of deflation and recent technological innovation have constrained the unit labor cost and this mechanism has worked strongly. Even though the unemployment rate has declined to about 2.5 percent and the tightening of labor market conditions has been evident, wage growth for regular employees has remained moderate. Because of the long experience of a severe employment situation under deflation, both labor and management may have come to prioritize the stability of long-term employment over immediate wage increases.⁴ In fact, wages of part-time workers, whose employment can be adjusted more flexibly, have been increasing by more than 2 percent, while those of regular workers increasing by less than 1 percent. In addition, the unit labor

³ With regard to the characteristics of households' inflation expectations by generation in Japan, see Jess Diamond, Kota Watanabe, and Tsutomu Watanabe, "The Formation of Consumer Inflation Expectations: New Evidence from Japan's Deflation Experience," *CARF Working Paper*, CARF-F-388, 2017.

⁴ Regarding the effects of the past employment situation on the present wage-setting stance, see Yuto Iwasaki, Ichiro Muto, and Mototsugu Shintani, "Missing Wage Inflation?: Estimating the Natural Rate of Unemployment in a Nonlinear DSGE Model," *IMES Discussion Paper Series*, no.2018-E-8, 2018.

cost is constrained by offsetting a rise in labor cost with an improvement in productivity. Since the IT investment using the recent digital technology is highly substitutable to labor, it may constrain a rise in real wages (Chart 4).

In addition to the two factors that I explained, there are many others, including the progress in globalization. Various factors are interacting with each other and working on prices. For example, when households strongly believe that prices will not increase easily, firms may become cautious about raising their prices for fear of losing their customers, and thereby try to constrain the unit labor cost or markup.

Reflecting these various factors, the Phillips curve in Japan has flattened, and it has taken time for the curve to shift upward due to the delay in a rise in inflation expectations. I think Japan's experience may be a clue to explaining the "missing inflation" in advanced economies. The United States and Europe suffered severe economic downturns after the global financial crisis as well as the prolonged low growth and low inflation environment since then. As with Japan's experience of deflation, such severe situations may have affected the mindset and behavior of households and firms in those countries. The progress in digitalization and globalization is also common among advanced economies.

II. Lessons Learned from Japan's Experience and Challenges Ahead

So far, I have talked about the first topic of Japan's experience of deflation and the Bank's powerful monetary easing to overcome it. I also explained the reasons behind the persistent low inflation. Now, I would like to move on to the second topic of the Bank's challenges under the low inflation environment.

Regarding the monetary policy conduct, I think that the Bank learned two lessons from the past experience.

First, even in the face of a substantial decline in the natural rate of interest, it is possible to realize accommodative financial conditions and stimulate economic activity and prices by strengthening monetary easing. We have not yet fully understood the effects and side effects of unconventional monetary policy, but there is no need to be too pessimistic about them.

Second, we need to bear in mind that it may take time to overcome entrenched low inflation, even with the powerful monetary easing. Of course, this does not mean that the inflation rate will never rise again. In Japan, firms' moves to raise wages and prices have been spreading gradually, while the economy has continued on an improving trend. The Bank considers it important to persistently support such moves through monetary policy. We need to maintain upward pressure on the inflation rate for as long as possible and encourage people to change their mindset and behavior.

Based on this understanding, the Bank has pursued powerful monetary easing since the introduction of QQE that is called a "new phase of monetary easing." However, it is not easy to continue with such powerful measures for a long time. Next, I would like to talk about three points regarding the challenges in maintaining accommodative financial conditions and the Bank's initiatives to overcome them.

A. Communication and Expectation Management

The first challenge is how to communicate with the public in order to manage people's expectations effectively. Expectation management is one of the most fundamental elements of monetary policy conduct, and in particular, forward guidance regarding the future policy stance plays an important role under the low interest rate environment.

In a standard economic model, even when short-term interest rates reach the effective lower bound, if a central bank announces that it will maintain accommodative financial conditions for a long time, the behavior of each economic entity could change, thereby producing significant monetary easing effects. In reality, however, people's behavior does not seem to change as much as the theory suggests, especially when the forward guidance horizon becomes longer. One of the reasons behind this "forward guidance puzzle" is the difficulty in assuring people's understanding of the central bank's guidance for the distant future. The central bank's guidance cannot gain confidence unless people perceive it as realistic and time consistent. However, if the central bank focuses too much on such consistency and makes the guidance complicated, it becomes more difficult to convey its thinking to the public. As suggested by recent studies on the "rational inattention," households and firms do

not always pay close attention to monetary policy or price developments. So, the central bank needs to clearly explain its thinking in plain language in order to manage their expectations.

On this basis, the Bank of Japan has adopted two types of forward guidance. The first is an "inflation-overshooting commitment" introduced in September 2016. This is a commitment that the Bank will continue expanding the monetary base until the observed inflation rate exceeds 2 percent and stays above that level in a stable manner. By linking to the price stability target, the Bank clearly shows its determination to maintain accommodative financial conditions for longer than assumed in a standard economic model. The second is "forward guidance for policy rates" introduced in July 2018. This shows the Bank's intention to maintain the current extremely low levels of short- and long-term interest rates for an extended period of time, at least through around spring 2020, taking into account uncertainties regarding economic activity and prices. Through this forward guidance, the Bank has made clear that it considers it appropriate to maintain the current low levels of interest rates for such a long time. It also has clarified the time frame to make its intention easy to understand. Since the introduction of forward guidance for policy rates, the survey results show that an increasing number of market participants consider that interest rates will remain low (Chart 5). This indicates the effectiveness of such guidance.

B. Securing Effective Policy Measures

The second challenge in maintaining accommodative financial conditions for a long time is to secure highly sustainable policy measures.

In order to address this challenge, in September 2016, the Bank decided to place yield curve control at the core of the monetary policy framework. Under yield curve control, the Bank aims to control both short- and long-term interest rates, setting the target level of 10-year Japanese government bond (JGB) yields at around zero percent. The previous policy framework that set the amount of JGB purchases as the operating target was simple to operate in practice. However, there was a problem that the degree of downward pressure on the yields could change to a large extent, depending on economic and market conditions at the time. In contrast, under yield curve control, the Bank sets the specific target level of

interest rates and conducts JGB purchases so as to achieve this target. In exerting monetary easing effects stably for a long time, the Bank judges that yield curve control is a better framework in terms of both controllability and sustainability.

There are several points that warrant attention in order to elicit the utmost effects of yield curve control.

The first is to secure confidence that a central bank can actually control long-term interest rates. Unlike the money market dominated by the central bank, the government bond market consists of various participants, and the price mechanism is more complex. Based on our experience, in order to control long-term interest rates, the central bank needs to gain a strong presence in the government bond market. It also is important to develop and secure effective operational measures to realize fine-tuned interest rate control.

More specifically, the Bank already holds more than 40 percent of JGBs on a stock basis. Also, its share of JGB transaction volume on a flow basis has been at a high level (Chart 6). Long-term interest rates have been controlled by changing the amount of JGB purchases appropriately, based on the premise that the Bank has a strong presence in the JGB market in terms of both stock and flow.⁵ When yield curve control was introduced in September 2016, there were skeptical views about the Bank's ability to control interest rates. In fact, when U.S. and European long-term interest rates rose significantly from late 2016 to early next year, there was sudden upward pressure on JGB yields as well. In this phase, the Bank used a powerful tool called "fixed-rate purchase operations," in which it buys unlimited amounts of JGBs at a specific interest rate level. As this new tool was used in a timely manner, market confidence regarding the Bank's ability to control interest rates has strengthened. Since mid-2017, long-term interest rates have shown a greater tendency to move at around the target level.

⁵ For the effects of JGB purchases on long-term interest rates in Japan, see Nao Sudo and Masaki Tanaka, "Do Market Segmentation and Preferred Habitat Theories Hold in Japan?: Quantifying Stock and Flow Effects of Bond Purchases," *Bank of Japan Working Paper Series*, no.18-E-16, 2018.

The second point is to maintain the minimal market functioning while controlling the long-term interest rates appropriately. Of course, there is a trade-off between strengthening a central bank's ability to control interest rates and maintaining the market functioning. Increasing market confidence in the central bank's ability implicitly works as a put option. If this situation progresses further, the market functioning could be overly constrained. In fact, from around early 2018, as confidence in the effectiveness of yield curve control strengthened, daily fluctuations in JGB yields clearly became smaller and the JGB transaction volume also showed a decreasing trend (Chart 7). To deal with this difficult situation, in July 2018, the Bank clarified that long-term interest rates might move upward and downward to some extent mainly depending on developments in economic activity and prices, and made clear that it would conduct JGB purchases in a more flexible manner depending on market conditions. Meanwhile, the Bank has proceeded with adjustments to maintain and improve the market functioning, for example, by relaxing the terms and conditions for the Securities Lending Facility (SLF). Reflecting these efforts, price movements and the transaction volume of JGBs have recovered recently.

As I mentioned earlier, yield curve control was introduced in 2016 to enhance the sustainability of the monetary easing policy. In addition, I believe that the Bank can maintain accommodative financial conditions for a long time by continuously making efforts to strike a balance between conducting yield curve control as well as maintaining and improving the market functioning.

C. Examination of the Financial Functioning

The third challenge in continuing with powerful monetary easing is to examine its impact on the financial functioning.

To achieve price stability, it is essential to ensure financial stability and sustain the transmission mechanism of monetary policy. If long-term and super-long-term interest rates decline excessively, the rates of return on insurance and pension products also will decline. The Bank considers it necessary to pay attention to the possibility that this will give rise to a feeling of anxiety about the sustainability of financial functioning in a broad sense. The Bank also has examined whether the prolonged low interest rates will lead to an expansion

of leverage due to excessively bullish expectations and whether they will result in the malfunctioning of financial intermediation through the impact on profits of financial institutions.

Out of the two effects stemming from the prolonged low interest rates, the latter warrants more attention at this point. Excessively low interest rates could make financial institutions reluctant to lend, such as through capital constraints, and thereby diminish the monetary easing effects. In addition, if financial institutions take excessive risks under the severe profit environment in order to acquire immediate profits, the vulnerability of the financial system could increase in the longer term. These risks are judged as not significant at this point, mainly because financial institutions have sufficient capital bases. However, we will continue to pay attention to whether there are any changes in financial institutions' behavior or the functioning of financial intermediation amid continued accommodative financial conditions.

Conclusion

As time is running out, I would like to conclude my speech.

In recent years, low inflation and low interest rates have been prolonged globally, and many central banks face a common challenge of how to raise inflation rates. Based on this recognition, I talked about Japan's experience and challenges from a somewhat long-term perspective, as Japan faced low inflation and low interest rates at an early stage and has continued to make various efforts to overcome this situation.

Japan's economy has improved significantly while the Bank has continued with powerful monetary easing through "QQE with Yield Curve Control." The positive annual CPI inflation has taken hold, and the economy is no longer in deflation in the sense of a sustained decline in prices. That said, annual CPI inflation is in the range of 0.5-1.0 percent. The Bank will persistently continue with powerful monetary easing in order to maintain the momentum toward achieving 2 percent inflation.

Recently, uncertainties regarding the global economy have been heightening, and some nervousness has been seen in global financial markets. The Bank needs to pay close attention to the effects of these developments on Japan's economic activity and prices. We will carefully examine various risk factors, in addition to developments in economic activity and prices as well as financial conditions, and weigh the benefits and costs of the policy effects. In this way, the Bank will continue to conduct its policy in an appropriate manner.

Thank you very much for your attention.

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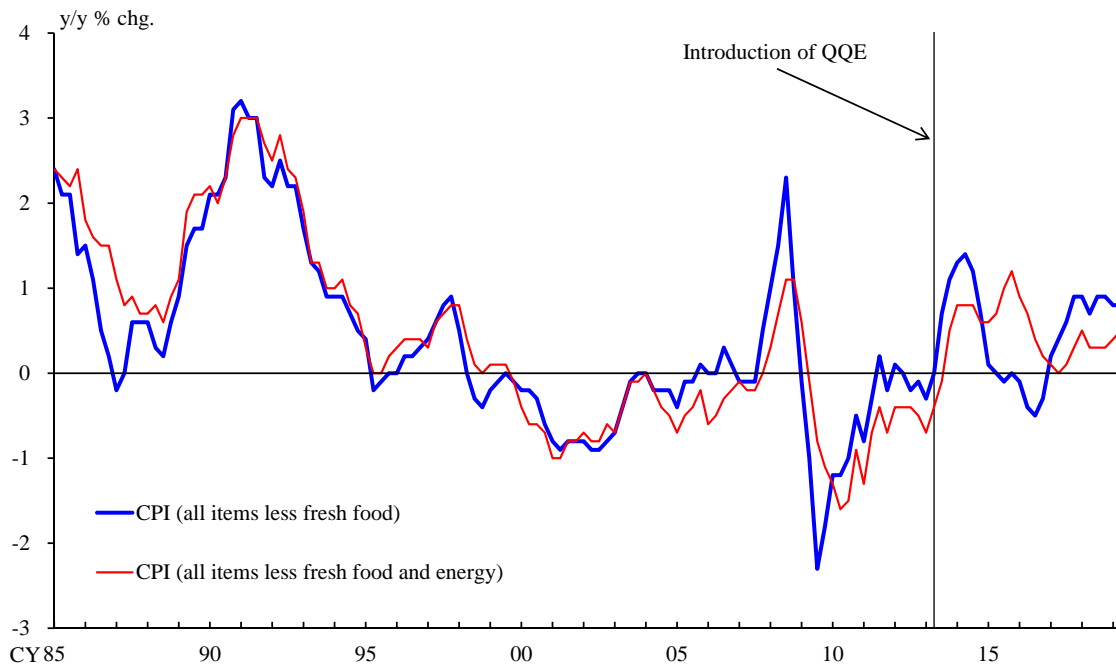
Introduction

I. Chronic Deflation, and Quantitative and Qualitative Monetary Easing (QQE)

II. Lessons Learned from Japan's Experience and Challenges Ahead

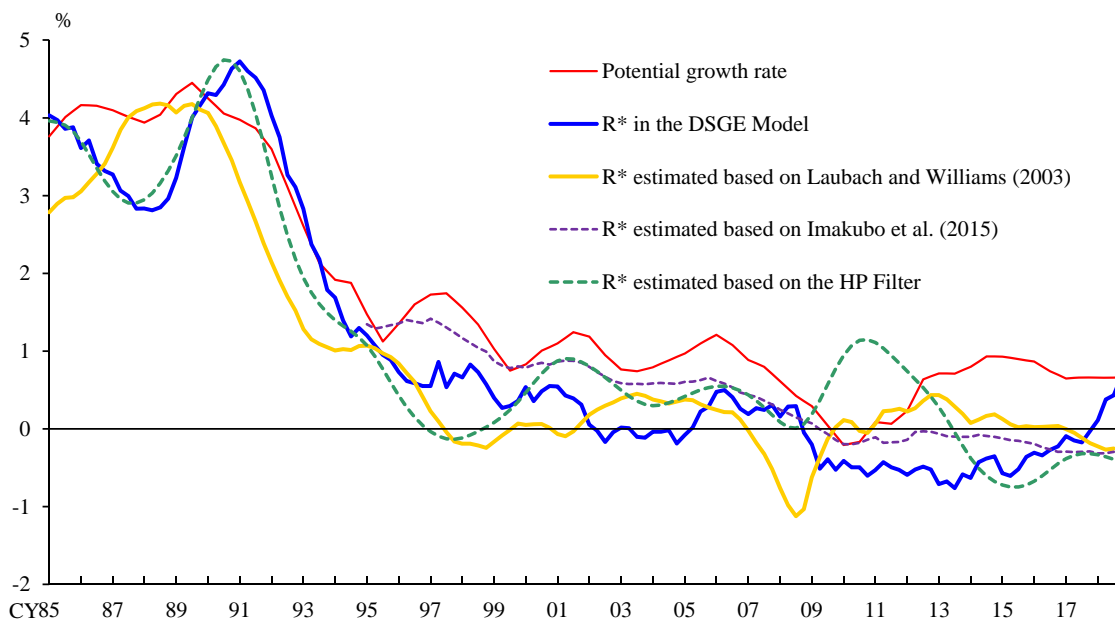
Conclusion

Consumer Prices



Note: Figures are adjusted for changes in the consumption tax rate.
Source: Ministry of Internal Affairs and Communications.

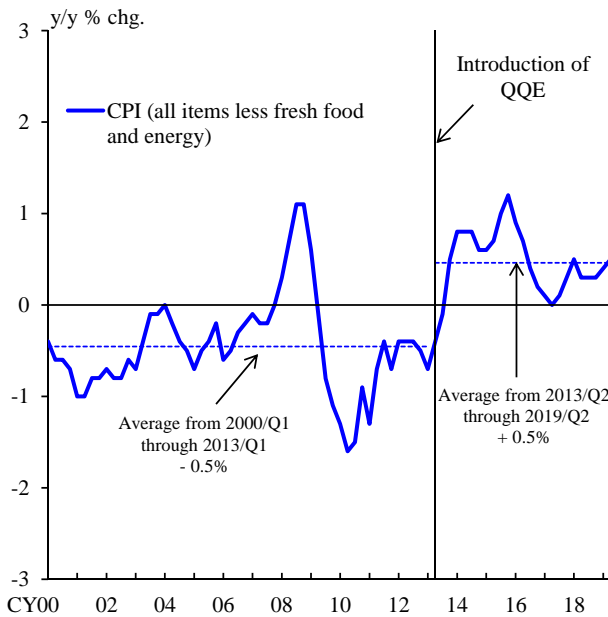
Natural Rate of Interest



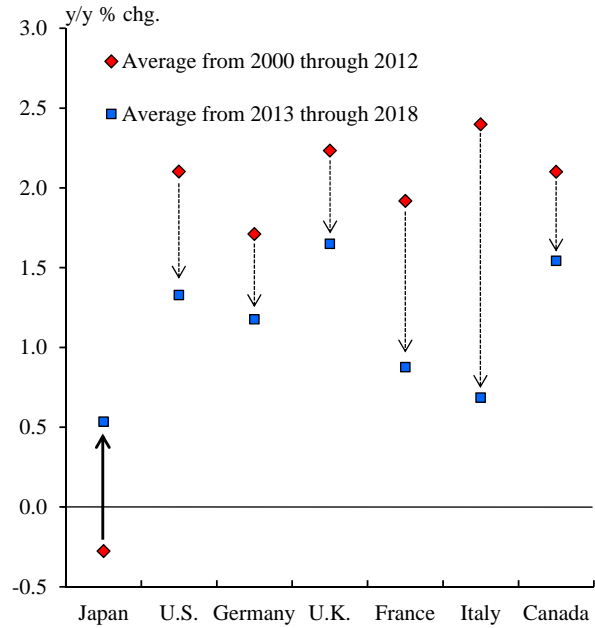
Notes: 1. Figures for the potential growth rate are based on staff estimations.
2. For details of the methodologies used in this chart, see Nao Sudo, Yosuke Okazaki, and Yasutaka Takizuka, "Determinants of the Natural Rate of Interest in Japan: Approaches Based on a DSGE Model and OG Model," *Bank of Japan Research Laboratory Series*, no.18-E-1, 2018.
Sources: Consensus Economics Inc., "Consensus Forecasts"; Bank of Japan.

QQE and Price Developments

Japan's Consumer Prices



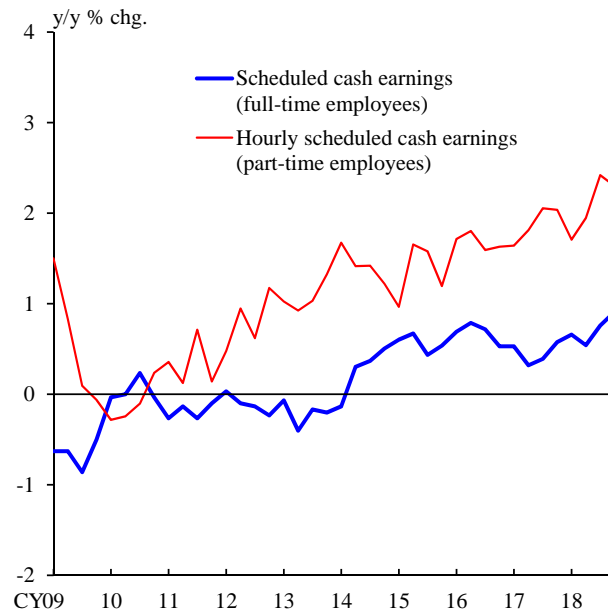
Price Developments in G7 Countries



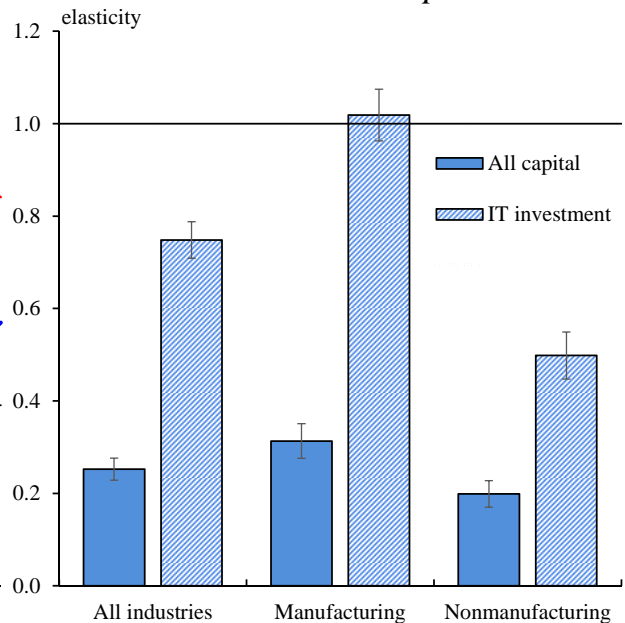
Notes: 1. Figures for Japan are adjusted for changes in the consumption tax rate.
 2. In the right chart, figures for Japan, U.K., and Canada are the CPI; those for U.S. are the PCE deflator; and those for the euro area countries are the HICP.
 Sources: Ministry of Internal Affairs and Communications; Haver.

Mechanism of Constraint on ULC

Wages of Full-Time and Part-Time Employees



Elasticity of Substitution between Labor and Capital



Notes: 1. In the left chart, Q1 = March-May, Q2 = June-August, Q3 = September-November, Q4 = December-February. Figures from 2013/Q1 are based on corrected figures adjusted for establishments in Tokyo with 500 or more employees. Figures from 2016/Q1 are based on continuing observations following the sample revisions of the "Monthly Labour Survey."
 2. In the right chart, the impacts of changes in the ratio of capital cost to real wages on the capital-labor ratio are estimated by the data classified by type of industries. The estimation period is 1995-2017. Industry fixed effects are considered. The error bands indicate ± 1 standard deviation.
 Sources: Ministry of Health, Labour and Welfare; Ministry of Finance; Cabinet Office; Bloomberg; Bank of Japan.

Forward Guidance for Policy Rates

BOJ's Forward Guidance

July 2018

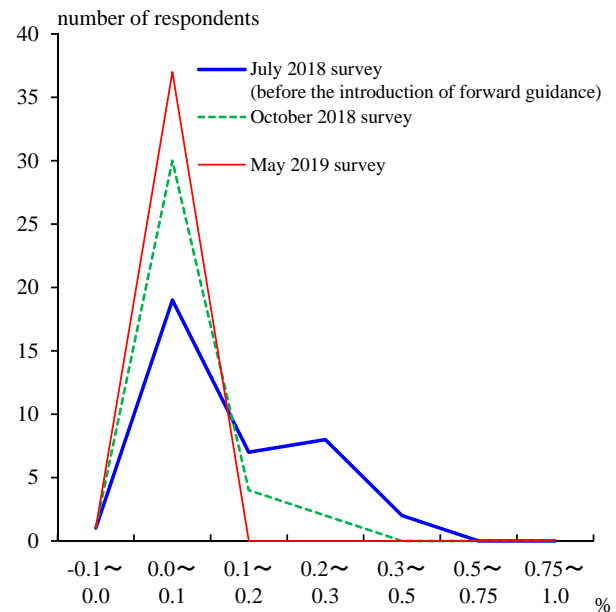
"The Bank intends to maintain the current extremely low levels of short- and long-term interest rates for an extended period of time, taking into account uncertainties regarding economic activity and prices including the effects of the consumption tax hike scheduled to take place in October 2019."



April 2019

"The Bank intends to maintain the current extremely low levels of short- and long-term interest rates for an extended period of time, at least through around spring 2020, taking into account uncertainties regarding economic activity and prices including developments in overseas economies and the effects of the scheduled consumption tax hike."

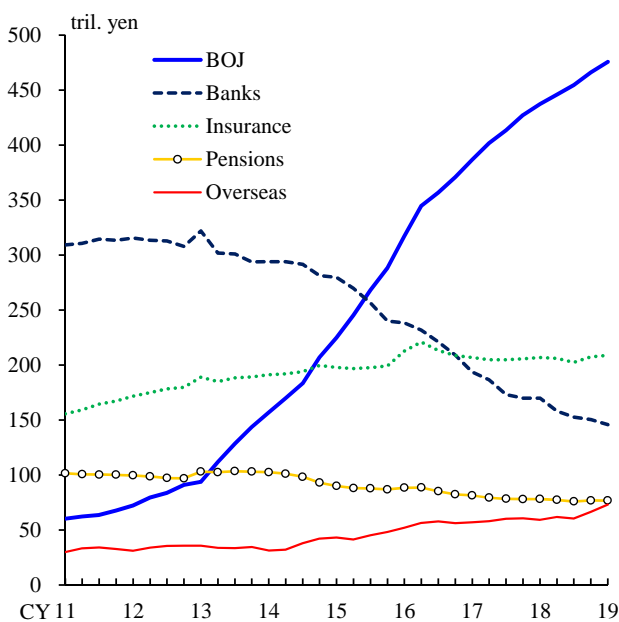
Forecasts for the Target Level of the Long-Term Interest Rate at End-2019



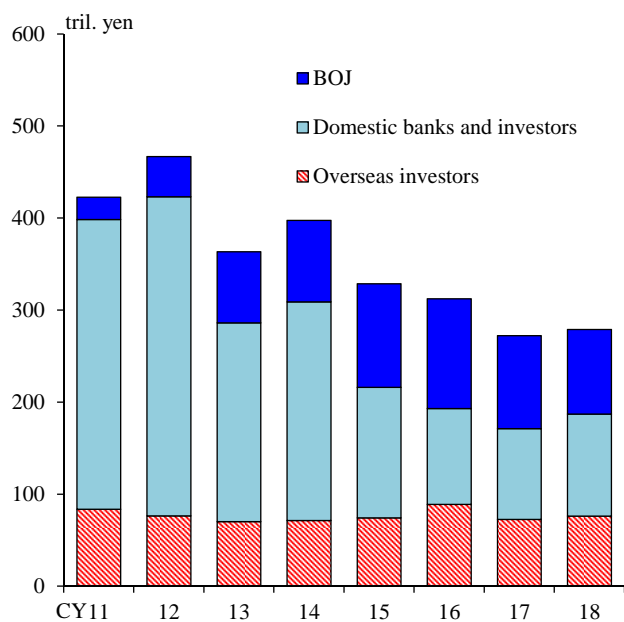
Source: JCER, "ESP Forecast."

Structure of the JGB Market

Amount of Holdings by Sector (Stock Basis)



Transaction Volume by Sector (Flow Basis)



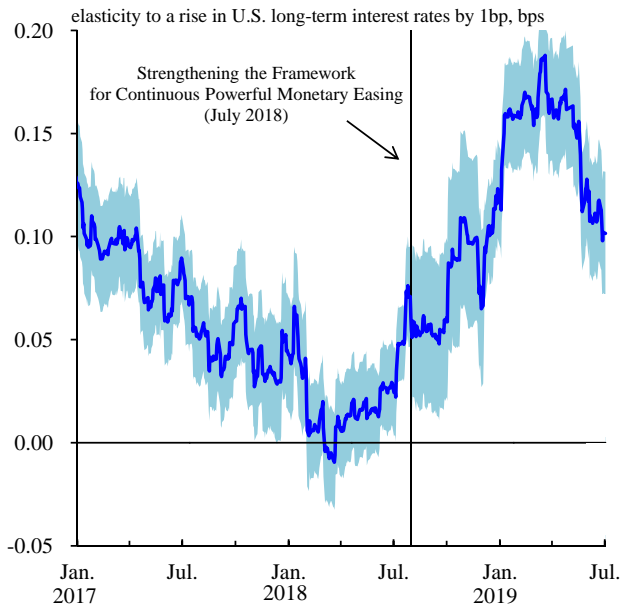
Notes: 1. JGBs exclude T-Bills.

2. In the right chart, figures basically indicate the amount of JGBs sold by dealers, excluding inter-dealer transactions. Note that figures for "BOJ" indicate the total amount of JGBs purchased by the BOJ, including those from entities other than dealers.

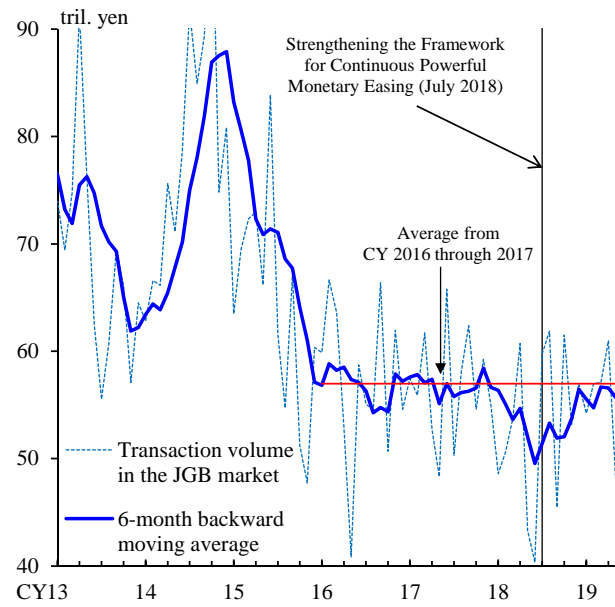
Sources: JSDA; Bank of Japan.

Functioning of the JGB Market

JGB Yield Elasticity to U.S. Long-Term Interest Rates



Developments in the JGB Transaction Volume



Notes: 1. In the left chart, figures are slopes in a simple regression model (90-day backward rolling regression) in which the dependent variable is daily changes of 10-year JGB yields and the explanatory variable is daily changes of 10-year U.S. Treasury yields (one-period lag). Shaded areas indicate ± 1 standard error bands.

2. In the right chart, the transaction volume is the gross amount purchased by banks, investors, and bond dealers. JGBs exclude T-Bills.

Sources: Bloomberg; JSDA.