



August 27, 2016  
Bank of Japan

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**Re-anchoring Inflation Expectations via  
"Quantitative and Qualitative Monetary Easing  
with a Negative Interest Rate"**

*Remarks at the Economic Policy Symposium Held by  
the Federal Reserve Bank of Kansas City*

**Haruhiko Kuroda**

*Governor of the Bank of Japan*

## **Introduction**

It is always a great pleasure to speak at the Economic Policy Symposium here in Jackson Hole. I would like to thank Ms. Esther George, President of the Federal Reserve Bank of Kansas City, for inviting me to this panel.

Over the past two decades, Japan found itself in several economic difficulties, such as prolonged deflation, declining potential growth, several financial crises, and structural impediments arising from a rapidly aging population and dwindling labor force. Given such experiences, I stress one observation in thinking about the resilience of monetary policy framework; that is, in the long run, low inflation and low nominal interest rates are most likely to coexist. Under such a circumstance, central banks have very little latitude for cutting policy rates due to the existence of the zero lower bound of nominal interest rates. In other words, the resiliency of monetary policy -- more precisely, conventional or standard monetary policy -- is considerably eroded.

Soon after I took office in March 2013, the Bank of Japan introduced Quantitative and Qualitative Monetary Easing (QQE) to overcome mild but protracted deflation. QQE has two key elements that enable the Bank to move beyond the previous monetary policy measures. The first is the Bank's strong and clear commitment to achieving the price stability target of 2 percent at the earliest possible time, which is underpinned by a large-scale monetary easing, thereby drastically converting the deflationary mindset among people and raising inflation expectations. The second is to put downward pressure on the entire yield curve through massive purchases of Japanese government bonds (JGBs), financed by an equally massive increase of the monetary base (Chart 1). These two elements together have reduced real interest rates and thus have produced strong easing effects.

In October 2014, QQE was expanded in both quantitative and qualitative terms. Subsequently, in January 2016, it was augmented by adding a third dimension of negativity in nominal interest rates, as "QQE with a Negative Interest Rate." QQE evolved into a flexible and powerful policy framework that enables the Bank to make full use of the three dimensions of policy measures: quantity, quality, and interest rates.

Today, with this backdrop in mind, I will focus on the two key issues in considering how to ensure a resilient monetary policy framework: (1) the role of anchoring inflation expectations and (2) the transmission channels of a negative interest rate policy.

## **I. Re-anchoring Inflation Expectations**

### **A. Crude Oil Prices and Inflation Expectations**

As many of us well recognized, crude oil prices declined significantly from the summer of 2014. In terms of the inflation forecast, the decline in crude oil prices is generally taken to be temporary. Crude oil futures markets were not broadly anticipating a further decline in crude oil prices over the next year. Consequently, long-term inflation expectations were unchanged, as evidenced by fairly stable developments in 6- to 10-year U.S. inflation forecasts collected by the Survey of Professional Forecasters (Chart 2). In contrast, a puzzling decline in long-term inflation forecasts was observed in Japan. Even considering the technical difference in the details of the data, it is hard to deny that the recent weakening in long-term inflation expectations in Japan was partly caused by the declines in crude oil prices from 2014.

The headline consumer price index (CPI) inflation started to fall more or less in reflection of the declines in crude oil prices, which were largely common to advanced economies after 2014. However, a marked difference was observed in terms of the pace of recovery in the underlying trend of the CPI inflation between the United States and Japan. In the United States, the CPI inflation excluding energy rebounded toward 2 percent fairly quickly, while the comparable CPI inflation indicator in Japan has remained relatively low so far: positive but significantly below 2 percent. It could be said that inflation dynamics in Japan are less resilient than those in the United States against significant external shocks, including large swings in crude oil prices.

As mentioned earlier, oil price fluctuations should not produce persistent effects on long-term inflation expectations, in that they are typically perceived to be just temporary. This could be the case for the United States while something different must be factored in to understand the case for Japan. An interpretation of different inflation dynamics between the

United States and Japan could be that long-term inflation expectations are yet to be anchored around the 2 percent target in Japan while they are relatively well anchored in the United States. The impact of the declines in crude oil prices on realized inflation was amplified by weakening inflation expectations in the case of Japan.

The interpretation of the interaction between realized inflation and inflation expectations is still a hypothesis that requires solid empirical analysis. However, some symptoms can be found in the data, which appear to support such interpretations. The U.S. 6- to 10-year inflation forecasts have been broadly stable around 2 percent while the Japanese indicator has been much more volatile. More importantly, it appears that long-term inflation expectations in Japan have been lower than 2 percent since the mid-1990s, although some signs of improvement can be found since early 2013, when QQE started. In line with these observations, a hypothesis worthy of empirical analysis is that Japanese inflation dynamics remained vulnerable to adverse shocks as the economy was halfway through the re-anchoring process as of 2014.

### **B. Understanding the Learning Process of Inflation Dynamics**

The contrasting behaviors with regard to long-term inflation expectations between the United States and Japan, as described earlier, lead us to a deeper question: how do people formulate their inflation expectations?

There seems to be a consensus, in theory, that full information rational expectation models provide a useful benchmark for monetary policy analysis; in practice, however, firms and households do not update their information sets so frequently. Noticeable disagreements sometimes exist regarding long-term inflation expectations for a considerable period of time. It is often argued that inflation expectations are formed in an "adaptive" or a "backward-looking" manner. The arguments in favor of departure from full information rational expectation models do not necessarily imply that people formulate their expectations "irrationally." Existing economics literature demonstrates that rational agents do not necessarily update their information sets in a constant manner if information collection is costly.

Looking back at Japan's experiences from the 1990s, CPI inflation hovered at around zero percent or even slipped into negative territory for some periods, and long-term inflation expectations showed a downward trend with volatile fluctuations (Chart 3). Unstable long-term inflation expectations amplified adverse shocks to the Japanese economy, including several financial crises, and forestalled effects of a variety of policy measures to combat deflation, such as the zero interest rate policy and quantitative easing.

In light of Japan's experiences, anchoring long-term inflation expectations at near-target levels is definitely a prerequisite for a resilient monetary policy framework. As mentioned earlier, the Bank, with its commitment to achieving the price stability target of 2 percent, is currently undertaking QQE with a Negative Interest Rate to overcome deflation. One of the key elements in our policy is to push up inflation expectations toward 2 percent price stability target and to re-anchor them there.

## **II. Transmission Channels of Negative Interest Rate Policies**

### **A. Negative Interest Rate Policy: How It Works in Practice**

The other contemporary issue is the implementation of negative interest rate policies (NIRPs) at some central banks, including the Bank of Japan. NIRP has been included most lately in the unconventional policy toolbox. The Bank of Japan introduced QQE with a Negative Interest Rate in January 2016 by applying a negative interest rate of minus 0.1 percent to a marginal increase in the current accounts that financial institutions hold at the Bank. This new policy measure reduced the marginal funding cost for financial institutions, thereby inducing interbank money market transactions to take place with negative interest rates. The JGB market and other financial markets reacted significantly to the introduction of QQE with a Negative Interest Rate. In particular, JGB yields with long- and super-long maturities saw sizable declines (Chart 4). Subsequent declines in long-term borrowing costs have stimulated firms' demand for long-term funding and households' demand for mortgage loans, thereby benefiting a wide range of borrowers. Among other factors, new developments in corporate finance are notable as a significant increase in issuance of corporate bonds with a maturity of 20 years or even longer has been observed.

As evidenced by the effective implementation of NIRPs at some central banks, the zero lower bound of nominal interest rates is no longer an insurmountable constraint in practice. Competition among financial institutions and arbitrage in money markets stretch the application of negative interest rates into new financial transactions. Of course, removing the zero bound does not necessarily mean that central banks are able to cut the nominal interest rate to an arbitrarily negative level. It is natural to assume that another lower bound exists depending on the cost of holding cash currency, although the current level of the negative interest rate in Japan, at minus 10 bps, is still far from such a lower bound. Even with such a caveat, NIRPs certainly provide more leeway with central banks in coping with a variety of adverse shocks as a practical monetary policy tool.

### **B. Impact of Adding a Negative Interest Rate to QE**

Japan's experience of QE shows that *real* interest rates declined significantly, reflecting a rise in inflation expectations. But observed declines in JGB *nominal* yields appeared to be not so large until QE with a Negative Interest Rate was deployed, partly because nominal yields were already at low levels when QE started three years ago. So, why did adding a negative interest rate to QE produce the marked reaction of the entire yield curve? By introducing QE with a Negative Interest Rate, the marginal deposit rate of the current accounts at the Bank declined by just 20bps, from plus 10bps to minus 10 bps. The resulting spillover to interest rates with longer maturities was considerably large compared with the experiences of the European economies. A natural question we need to address is: what creates the difference in the size of "multipliers," so to speak? In other words, what factors could determine the size of decline in longer-term yields per unit change in the interest rate applied to current accounts at the central bank?

The question remains to be answered. Hypothetically, a multiplier could have been smaller or gone negative. That is, in response to an introduction of NIRP, yields with longer maturities can *increase*, reflecting some rises in long-term inflation expectations. However, this was not the case for Japan or for most European economies deploying NIRPs. One common observation was a bull-flattening of the yield curves. In theory, declines in term premiums along with longer maturities and possible downward revisions to a future monetary policy path can account for such bull-flattening. While both remain as possible

factors to explain the observed broad downward shifts of the yield curves, focusing on a future monetary policy stance subject to the zero bound can provide a plausible interpretation. Namely, suppose that market participants had been expecting that the central bank's strong easing stance would continue for a lengthy period of time, and as a result, latent interest rates were much lower than the observed interest rates. Deploying NIRP removed the zero bound and uncovered the "true" nominal interest rates unconstrained by the zero bound. In this case, introduction of NIRP has a larger effect if the gap between latent and actual interest rates were large, which effectively means that NIRP's initial effects depend on the extent to which the zero bound was a binding constraint on nominal interest rates with various maturities.

### **Concluding Remarks**

There is a broad consensus that central banks' strong commitment to achieving inflation targets influences expectation formations by firms and households. A commitment itself thus remains an important element for establishing a resilient monetary policy framework.

Looking ahead, the Bank will continue to carefully examine risks to economic activity and prices at each monetary policy meeting and take additional easing measures without hesitation in terms of three dimensions -- quantity, quality, and the interest rate -- if it is judged necessary for achieving the price stability target. QQE with a Negative Interest Rate is an extremely powerful policy scheme and there is no doubt that ample space for additional easing in each of these three dimensions is available to the Bank. The Bank will carefully consider how to make the best use of the policy scheme in order to achieve the price stability target of 2 percent, and will act decisively as we move on.

Thank you.