Daiwa's View

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Past quantitative easing and its effects

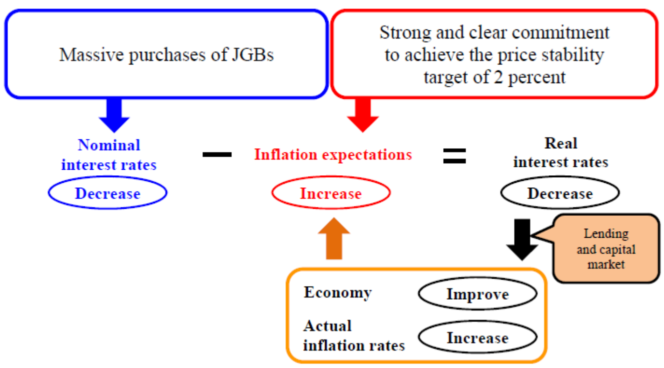
- JGB purchases by BOJ effective in lowering long-term JGB yields
- These purchases exerted downward pressure of about -1% on average
- Stronger effect when purchasing JGBs with longer maturities

With policy normalization now in sight, there have been several reports about a new "quantitative easing" framework at the BOJ. Market speculation about the scale of JGB purchases by the BOJ has escalated since the speech by Monetary Policy Board member Hajime Takata on 29 February and a related Jiji Press report on 8 March. Meanwhile, since the ongoing quantitative and qualitative monetary easing (QQE) measures have been in place for a long time (since introduction in Apr 2013), we need to take a fresh look back at the evolution and effects of this monetary policy to date. In this report, we will summarize the history and transition of quantitative easing since the inception of QQE under BOJ Governor Haruhiko Kuroda, as well as its market impacts.

First, let's review the history surrounding the introduction of QQE. The QQE introduced in April 2013 was formulated to achieve the BOJ's 2% price target. This price target is defined as a 2% increase for the consumer price index in accordance with the objective of the "Joint Statement of the Government and the Bank of Japan on Overcoming Deflation and Achieving Sustainable Economic Growth" released in January of that same year. Kuroda, who took office in March of that year, introduced the so-called "2-2-2" QQE measures (double monetary base, double amount of JGB holdings, achieve target in two years), with the aim of achieving this goal as soon as possible.

The intension of this policy is to bolster monetary easing effects via (1) an increase in inflation expectations through the BOJ's commitment to early realization of the 2% target and (2) downward pressure on JGB yields through the purchasing of JGBs by the BOJ. Subsequently, the policy was further strengthened in October 2014 as an expansion of QQE in response to the downward pressure on prices due to sluggish demand following the April 2014 consumption tax rate hike, along with declining crude oil prices.

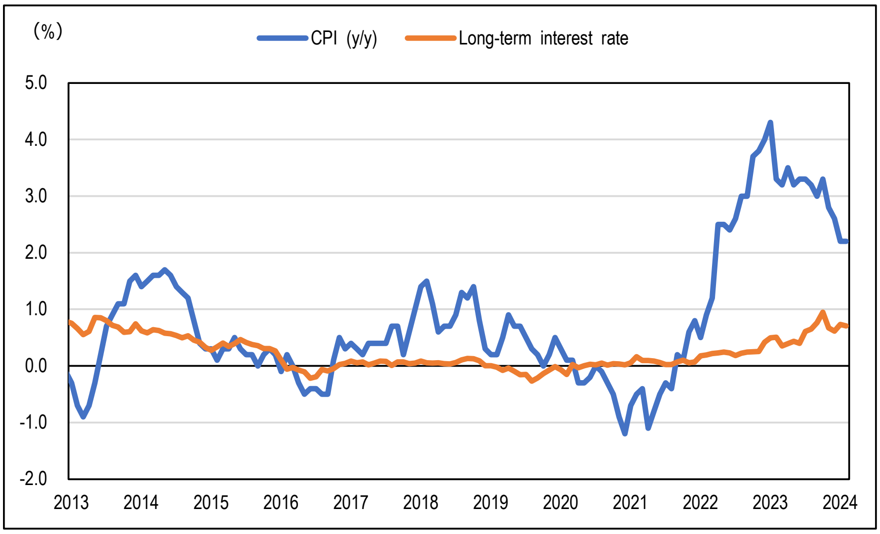
Chart 1: Mechanism of Quantitative and Qualitative Monetary Easing



Source: Excerpted from BOJ's "Overcoming Deflation: Theory and Practice."

Nevertheless, prices continued to fall and an early realization of the initially stated price target of 2% was far from certain. So, the BOJ introduced “QQE with Negative Interest Rates” in January 2016. This new policy aimed to further push down interest rates in response to the declining price level.

Chart 2: CPI, Long-term Interest Rate



Source: Bloomberg; compiled by Daiwa.
Note: CPI data excludes impacts of consumption tax hikes.

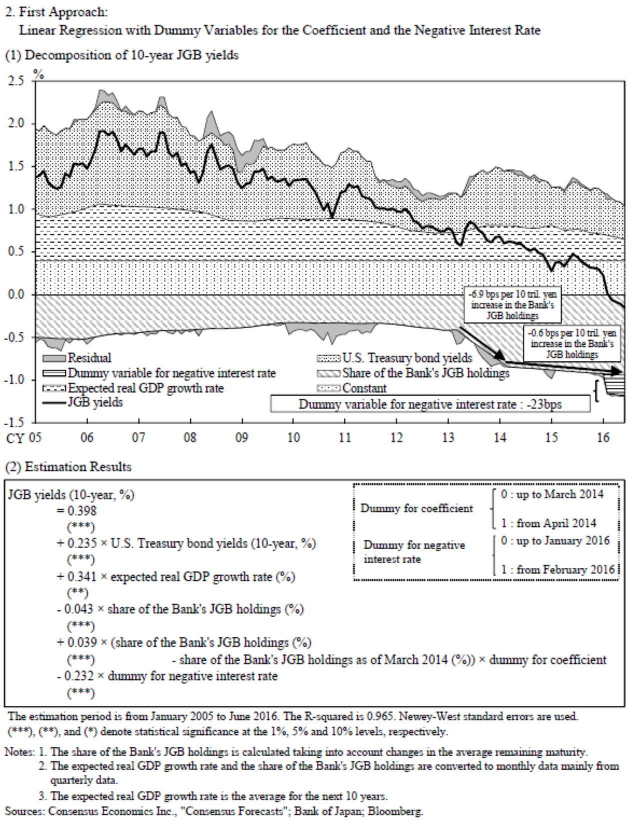
With the situation surrounding prices becoming increasingly uncertain due to slowdowns among emerging economies and other factors, the BOJ in July 2016 announced that it would conduct a “comprehensive assessment” of the policy effects of quantitative easing. The BOJ released the results of this assessment in September of that year.

In the following section we will discuss the results of this assessment in terms of the downward effect for nominal long-term interest rates. According to the BOJ, long-term interest rates reflect factors such as the outlook for economic activity and prices as well as long-term interest rates overseas. Therefore, the Bank conducted quantitative analyses of the impact of its JGB purchases on long-term interest rates while controlling these factors, and found that (1) the Bank’s JGB purchases have been effective in significantly lowering long-term interest rates, (2) the impact of a given increase in the Bank’s JGB holdings on long-term JGB yields diminished between the start of 2014 and before the introduction of the negative interest rate, and (3) the negative interest rate policy has been effective in lowering long-term interest rates.

From April 2013, the downward effect per each Y10tn increase in the Bank’s JGB holdings on long-term JGB yields was minus 6.9bps until March 2014 and minus 0.6bps from April 2014 onward. The introduction of the negative interest rate policy in January 2016 pushed down long-term JGB yields by 23bps (Chart 3). Also, this downward effect on the yield was larger for longer maturities and this tendency was pronounced especially during the period after the introduction of the negative interest rate policy (NIRP) (Chart 4).

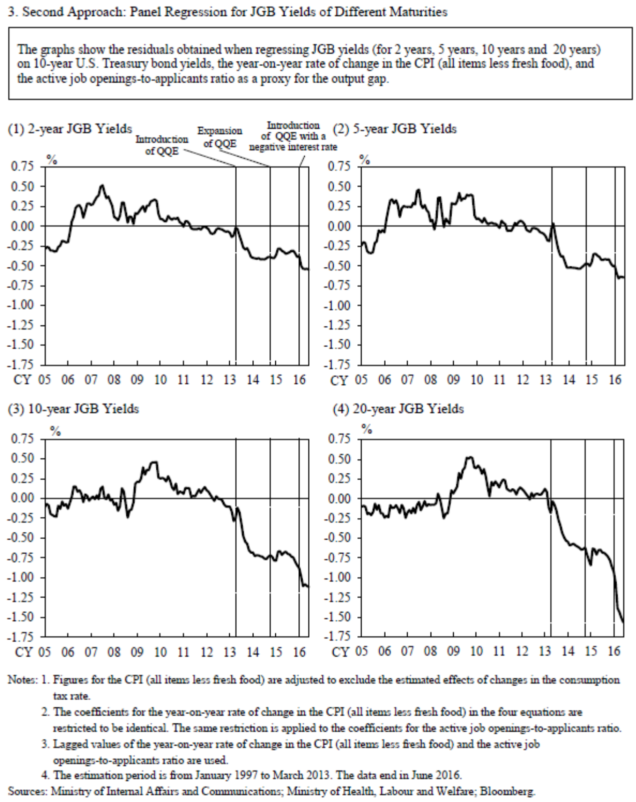
Meanwhile, the BOJ indicated that an excessive decline and flattening of the yield curve may have a negative impact on economic activity by leading to a deterioration in people’s sentiment, as it can cause uncertainty about the sustainability of financial functioning in a broader sense.

Chart 3: Impact on Long-Term Interest Rates ①



Source: Excerpted from BOJ materials.

Chart 4: Impact on Long-Term Interest Rates ②



Source: Excerpted from BOJ materials.

Based on the findings from the assessment, the BOJ announced the introduction of "QQE with Yield Curve Control." This policy newly adopted the two elements of an inflation-overshooting commitment and yield curve control (YCC). Here, the BOJ changed the basis for its guidelines for money market operations from "quantity" to "yields" (Chart 5).

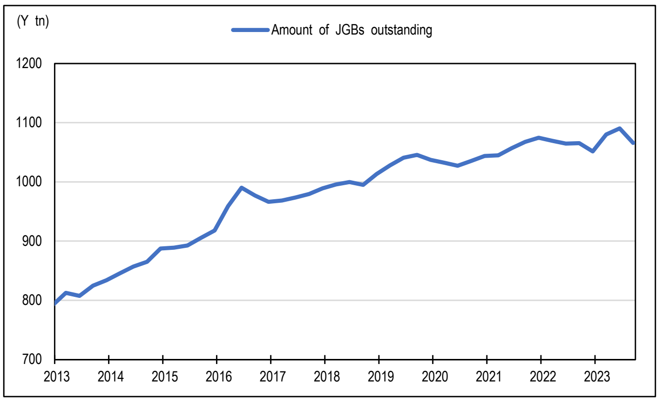
Until now, the BOJ has used the "increase" in its JGB holdings as its policy for purchasing JGBs. However, this was impossible to sustain unless the amount of JGBs issued increased at a faster pace than redemptions and the outstanding balance of JGBs continued to rise. In fact, the pace of increase for subsequent outstanding JGBs started to slow (Chart 7).

Chart 5: Transition for Money Market Operations Guidelines

	Monetary base increase (each year)	Long-term JGBs		Long-term interest rate		
		Increase in JGB holdings (each year)	Avg remaining maturity for BOJ's JGB purchases	Operation target	Fluctuation range	Upper limit
Apr 2013～	About Y60~70tn	About Y50tn	About 7 years	-	-	-
Oct 2014～	About Y80tn	About Y80tn	About 7～10 years	-	-	-
Jan 2016～	About Y80tn	About Y80tn	About 7～12 years	-	-	-
Sep 2016～	-	-	-	Around 0%	-	-
Mar 2021～	-	-	-	Around 0%	Around ±0.25%	-
Dec 2022～	-	-	-	Around 0%	Around ±0.50%	0.50%
Jul 2023～	-	-	-	Around 0%	-	1.00%
Oct 2023～	-	-	-	Around 0%	-	-

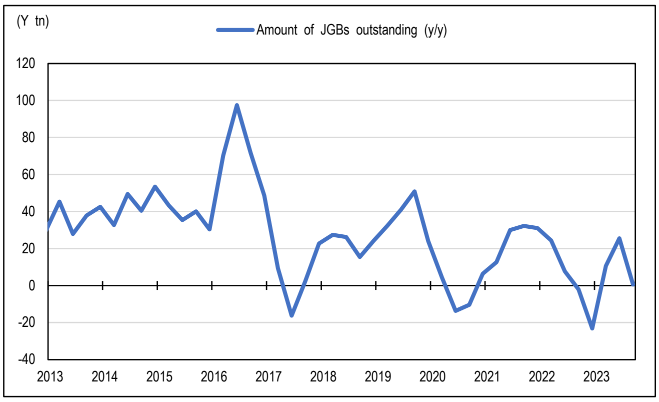
Source: BOJ; compiled by Daiwa.
Note: Excludes ambiguous expressions such as "approximate aim."

Chart 6: Amount of JGBs Outstanding ①



Source: Bloomberg; compiled by Daiwa.

Chart 7: Amount of JGBs Outstanding ②



Source: Bloomberg; compiled by Daiwa.

Subsequently, the economic recovery phase that began in November 2012 continued until October 2018, but the global economy then slowed due to intensifying trade friction between the US and China. Following the consumption tax hike in October 2019, the Japanese economy fell into a recession in 2020 when the novel coronavirus infection began spreading.

The BOJ announced that in December 2020 it would conduct an "Assessment for Further Effective and Sustainable Monetary Easing" amid prolonged downward pressure on the economy and prices in the wake of the new coronavirus outbreak. The content of this assessment was released in March 2021.

Here, we again discuss the details related to the effect of pushing down nominal long-term interest rates. According to the BOJ, long-term interest rates reflect factors such as the outlook for economic activity and prices as well as long-term interest rates overseas. Again, the quantitative analysis of the impact of JGB purchases by the BOJ on long-term interest rates, while controlling for these factors, shows that the JGB purchases had a significant impact on pushing down long-term interest rates. The results of the assessment confirmed a downward pressure effect of about -1% on average (charts 8 and 9).

Based on the contents of these assessments, the BOJ determined that continuation of "QQE with YCC" was appropriate, and so decided to adopt "Policy Actions to Conduct Further Effective and Sustainable Monetary Easing." This policy response includes the introduction of an interest scheme to promote lending and fixed-rate JGB purchase operations for consecutive days, as well as clarification of the permissible trading range for the 10-year JGB yield.

Later, as yen swap rates rose, the BOJ, which had curbed the rise in JGB yields through massive JGB purchases, gradually increased the permissible fluctuation range and upper limit for its YCC policy. The response came as the pace of increase in the BOJ's JGB holdings, which had been shrinking since the introduction of negative interest rates, again accelerated (charts 10, 11).

Currently, the BOJ is reportedly considering changing the focus of its guidelines for money market operations from "yields" back to "quantity." When considering yield levels after ending NIRP and eliminating YCC, the "quantitative easing" policy effect that the BOJ has been analyzing may serve as one reference. If the policy effects are similar to those obtained from past analyses, long-term JGB yields will rise (fall) in response to a decrease (increase) in the BOJ's share of JGB holdings in the future. Also, that effect is expected to be larger for JGBs with longer maturities, with larger effects expected immediately after the policy change.

Chart 8: Effects on Nominal Long-Term Interest Rates ③

(1) Estimation Using Difference between Counterfactual and Actual Paths of 10-Year JGB Yields

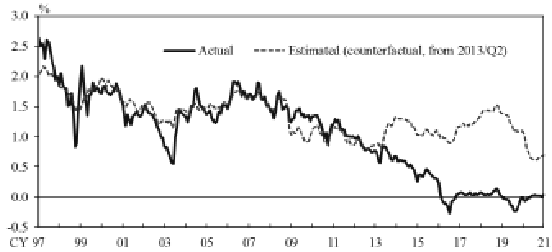
- Using data before the introduction of QQE, the Bank conducted linear regression analysis employing 10-year JGB yields as an independent variable and the following three variables as dependent variables: the active job openings-to-applicants ratio, the CPI, and U.S. Treasury bond yields (10-year). Using the estimation results, the Bank estimated the counterfactual path that 10-year JGB yields would have followed if QQE had not been introduced. The difference between the counterfactual and actual paths of 10-year JGB yields is regarded as the effects of the Bank's JGB purchases on 10-year yields since the introduction of QQE.
- As shown in (b) below, the counterfactual estimates of 10-year JGB yields have been at around 1 percent on average. Actual figures for 10-year JGB yields under yield curve control have been stable at around 0 percent. The policy effects as implied in the difference between the counterfactual estimates and the actual figures are estimated to be around minus 1 percentage point.

(a) Estimation Result

JGB yields (10-year, %)
= 0.22* + 0.28** × Active job openings-to-applicants ratio
+ 0.10** × CPI (all items less fresh food, y/y change, %)
+ 0.25** × U.S. Treasury bond yields (10-year, %)

Estimation period: Jan. 1997 to Mar. 2013. Adjusted R-squared: 0.71.
Lagged values (lag order: 1) are used for the active job openings-to-applicants ratio and the CPI.

(b) Estimated and Actual 10-year JGB Yields



Notes: 1. ** and * denote statistical significance at the 1 percent and 5 percent levels, respectively.
2. The CPI figures used in the estimations exclude the effects of the consumption tax hikes, policies concerning the provision of free education, and the "Go To Travel" campaign, which covers a portion of domestic travel expenses. The figures from April 2020 onward are based on staff estimations and exclude the effects of measures such as free higher education introduced in April 2020.
Sources: Ministry of Health, Labour and Welfare; Ministry of Internal Affairs and Communications; Bloomberg.
40

Source: Excerpted from BOJ materials.

Chart 9: Effects on Nominal Long-Term Interest Rates ④

(2) Estimation Using the Bank's Share of JGB Holdings

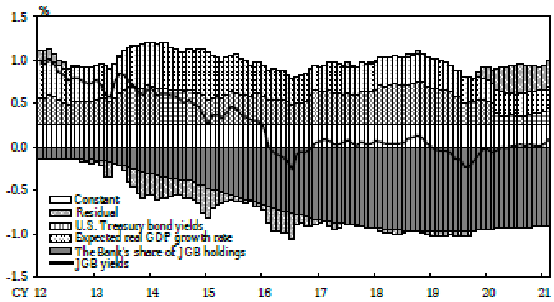
- The Bank conducted linear regression analysis employing 10-year JGB yields as an independent variable and the following three variables as dependent variables: the Bank's share of JGB holdings, U.S. Treasury bond yields (10-year), and the expected real GDP growth rate. The changes in 10-year JGB yields that are attributable to the Bank's share of JGB holdings are regarded as the effects of the Bank's JGB purchases on 10-year yields.
- Looking at developments in 10-year JGB yields shown in (b) below, the contribution of the Bank's share of JGB holdings to 10-year JGB yields expanded, pushing down the yields by about 1 percentage point as the Bank's share increased. The contribution has generally remained the same thereafter.

(a) Estimation Result

JGB yields (10-year, %)
= 0.25*
+ 0.16* × U.S. Treasury bond yields (10-year, %)
+ 0.45* × Expected real GDP growth rate (%)
- 0.02 × The Bank's share of JGB holdings (%)**

Estimation period: Jan. 2006 to Feb. 2021. Adjusted R-squared: 0.95.
Newey-West standard errors are used.

(b) Decomposition of 10-year JGB Yields



Notes 1. ** and * denote statistical significance at the 1 percent and 5 percent levels, respectively.
2. The Bank's share of JGB holdings is calculated taking into account changes in the average residual maturity. The expected real GDP growth rate and the Bank's share of JGB holdings are converted to monthly data mainly using quarterly data. The expected real GDP growth rate is the forecast for the next 6-10 years.
Sources: Bloomberg; Consensus Economics Inc., "Consensus Forecasts"; Bank of Japan; Ministry of Finance.
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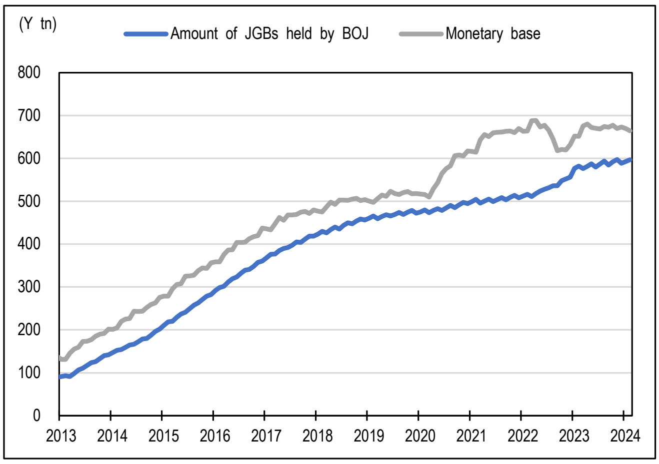
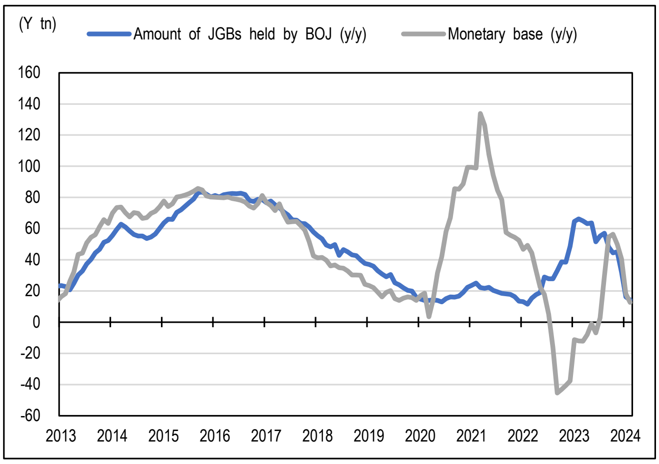
Source: Excerpted from BOJ materials.

Chart 10: Amount of JGBs held by BOJ, Monetary Base ①



Source: Bloomberg; compiled by Daiwa.

Chart 11: Amount of JGBs held by BOJ, Monetary Base ②



Source: Bloomberg; compiled by Daiwa.

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