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Interest Rate Formation Mechanism after Introduction of Negative Interest Rate by BOJ

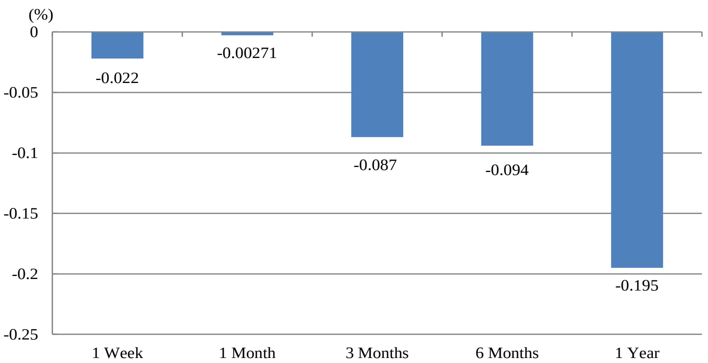
- Before the introduction of negative interest rate by BOJ from 16th February 2016, yield of both long- and short-term bonds have already dropped below zero.
- In theory, short-term interest rate should converge to -0.1% and the yield of short-term government bonds (Treasury Bills) should fall below -0.1%.
- There will be a concern over lower liquidity in the money market and JGB market in future as long-term JGBs saw negative yield.

Before the introduction of negative interest rate by BOJ from 16th February 2016, yield of both long- and short-term bonds have already dropped below zero

Yield curve sharply moved below zero as interest rates across the curve fell all at once after the introduction of negative interest rate was announced by BOJ on 29th January 2016. Negative interest rate of -0.1% will be applied to part of the outstanding balance of current accounts that financial institutions hold at the BOJ from 16th February 2016. However, short term interest rate (less than 1 year) and the yield on 10-year JGBs have already dropped below zero. Now, let me try to outline interest rate formation mechanism in this report.

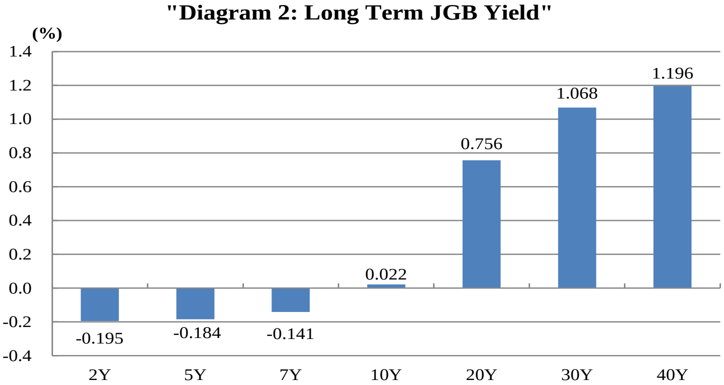
First, I will outline how bank transactions in the money market will be like. Lenders will have incentives to lend if the interest rate is higher than -0.1%. Assuming lending at the rate of -0.05%, although lenders need to pay interest rate, it is less than paying 0.1% to current accounts at BOJ. On the other hand, borrowers will have incentives to borrow if interest rate is less than -0.1%. Assuming borrowing at the rate of -0.15%, borrowers can receive interest by which payment of 0.1% interest rate to current accounts of BOJ can be covered.

"Diagram 1: Short Term Interest Rate and Short Term JGB Yield"



(Note) Data as of 5th Feb. 2016. 1 week and 1 month are Yen LIBOR, 3 and 6 months are TB yield, 1 year yield is yeild of JGB (maturity of 1 year).
(Source) SMAM, based on data by Bloomberg L.P.

"Diagram 2: Long Term JGB Yield"



(Note) Data as of 5th Feb. 2016.
(Source) SMAM, based on data byBloomberg L.P.

In theory, short-term interest rate should converge to -0.1% and the yield of short-term government bonds (Treasury Bills) should fall below -0.1%

However, eventually the level of interest rate at which transactions settle will be -0.1%. Consequently, it can be assumed that the short-term interest rate will converge to -0.1% as a theory. However, general view is that the short-term interest rate is expected to be traded within the range of -0.1% to zero, as the financial institutions not under reserve deposit requirement system also participate in financial transactions. Meanwhile, even outside the short-term money market, yields of JGBs (less than 1 year maturity) and Treasury Bills have dropped into negative territories.

This is because BOJ will purchase JGBs with negative yield from financial institutions. As a result, financial institutions can make a profit even by purchasing Treasury Bills with negative yield at auction by the Ministry of Finance, as they can sell them to BOJ with a higher price (lower yield). Even though financial institutions have to pay 0.1% interest rate as their current account balance increases as they sell JGBs to BOJ, the yield has already dropped close to -0.1% since financial institutions have an incentive to purchase Treasury Bills with negative yield as far as profits will cover losses.

There will be a concern over lower liquidity in the money market and JGB market in future as long-term JGBs saw negative yield

Generally, interest rate beyond 1 year is benchmarked to the yield of JGBs. Already, the yields of JGBs maturing around and before 8 years are below -0.1% level. This is because BOJ will purchase JGBs even though their yields are below zero, as I have already explained. However, the yields of JGBs for 10 years and beyond are still in the positive territories (Diagram: 2). It is assumed that the yields of longer term bond market does not fall below zero as life insurance companies, who are not under reserve deposit requirement system, are the major participants in this market, thus having no incentives to purchase JGBs at negative yield.

Meanwhile, foreign investors also have an incentive to purchase JGBs with negative yields. For instance, in the case of US investors, if they lend USD and borrow JPY through swaps, they can receive USD interest as well as negative JPY interest. There will be an opportunity for them to make a profit by reselling JGBs (with negative yield) that they have bought using JPY they borrowed. The above is an explanation on mechanism of interest rate formation after introduction of negative interest rate. I have a few concerns over lower liquidity of money market and JGB market in the future, due to possible convergence of money market yield to around -0.1% and the fact that major participants in the JGB market will be limited to financial institutions and some foreign investors with the objective to make a profit by reselling JGBs to BOJ.

*** Please note that this report is a translation of Japanese report written on 8th February, 2016.**