

Japan Yen Rates Strategy

“It’s the volatility, stupid”

- **Volatility more important than size** —BoJ operations have inflated JGB VAR, thereby sapping the market’s capacity to take risk. This is also affecting other assets. We do not think expectations for economy recovery have driven the increase in mortgage and corporate loan rates.
- **Recent increase in interest rates due to expansion in risk premium** — If the yield curve reflects future expectations, does it indicate that the market expects policy rate cuts for three years starting in seven years’ time? Of course the market consensus forecast would not be so nonsensical. What the distorted yield curve actually indicates is that there is now a liquidity shock equal in severity to that of the 2008 financial crisis.
- **The problem is how bazooka is used**— The BoJ’s planned purchases of JGBs are ample relative to the flow, but may not be sufficient relative to the stock. Furthermore, the setting of limits on monthly purchases makes them largely ineffective. We think the BoJ should focus on reducing VAR, by abolishing monthly limits.
- **Ways of supplying VAR tolerance to market** — Even if limits on monthly purchases are abolished, the VAR tolerance that has been sapped by BoJ operations will not be easy to restore. The only way to do this is to directly reduce VAR. Asset-side volatility has been inflated, but could be offset by supply of long-term fixed rate funding. It would be possible to underwrite VAR by supplying long-term funds, as the ECB does MRO.
- **Trust in BoJ should rectify distortions in 7yr zone** — We think the current distortions in the yield curve and volatility smile are due to a liquidity shock. This man-made shock can be solved by man-made means. If one is to believe the BoJ’s statement that it will “do whatever is necessary,” then the introduction of fixed-rate, long-term funding should reduce volatility, stimulate liquidity and correct the cheapness at 7y sector.

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Ways to reduce volatility

1. Distortion in 7yr zone due to liquidity shock

Market stress exceeds that due to
Lehman shock

Distortion in the futures sector is indicative of the extent of the liquidity shock affecting the market. As shown in Figure 1, the most pronounced daily change since 1995 in the 5-7-10 butterfly using MoF data for compound yield by maturity was on April 5. The second greatest change was on March 17, 2008, at the time of the Bear Stearns shock, and the third on September 16, 2008, at the time of the Lehman shock. The distortion in the futures sector is due to the concentration of flow resulting from a lack of liquidity, and the 5-7-10 butterfly currently indicates that the liquidity shock is greater than that during the 2008 financial crisis.

Forward curve significantly inverted from
7yr to 10yr

The 7yr zone distorted significantly after the introduction of monetary easing of “a different dimension.” The distortion was subsequently rectified, but occurred again after the Golden Week holidays. This is clearly manifest in the forward curve, which is significantly inverted between 7yr and 10yr. The increase in the current premium at 20y sector is also a phenomenon typical of a market lacking liquidity. The cause is the expansion in the risk premium due to decline in liquidity that results from increase in volatility when interest rates rise, and this is clearly not due to expectations for economic recovery.

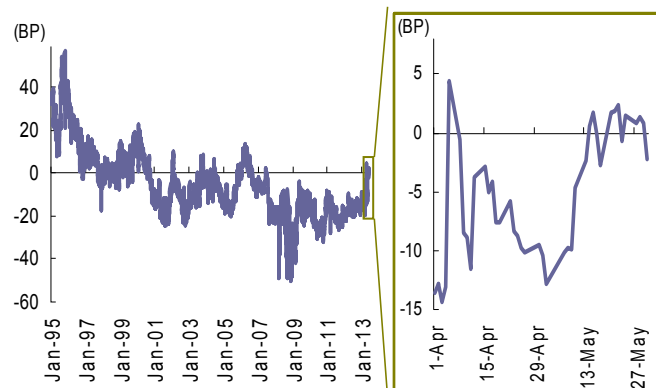
5-7-10 long same as paying 5yr2yr/7yr3yr

The JGB yield curve puts 3yr rates in seven years’ time at around the same level as 2yr rates in five years’ time. This is because the JGB forward curve is significantly inverted after a peak at 7yr. As this is not at all because the market expects rate cuts, we expect inverse yields to return to positive yields as liquidity recovers. Paying 3yr rates in seven years’ time and receiving 2yr rates in five years’ time is roughly the same as receiving the 5-7-10 butterfly. This is because the net face value of the 5-7-10 butterfly is roughly zero. A long 5-7-10 butterfly is effectively a forward steepener, and would be a “buy” as long as one does not expect rate cuts in seven years’ time.

Decline in volatility should rectify
distortion in 7yr zone

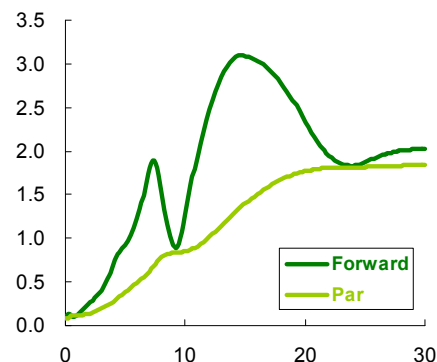
The biggest risk is an increase in the distortion. This will be a significant risk if the BoJ does nothing to reduce volatility. However, BoJ Governor Kuroda has said that he will act to reduce volatility. Ultimately, it is impossible to describe the current massive volatility, which exceeds even that caused by the Lehman shock, as a natural phenomenon. We would expect a gradual decline in volatility if the BoJ were to increase the flexibility of the size of monthly JGB purchases, and to introduce MRO type of fixed-rate long-term funding. The consequent recovery in liquidity and contraction in the risk premium should rectify the distortion in the 7yr zone.

Figure 1. 5-7-10 butterfly



Source: Citi Research

Figure 2. May 31 JGB curve



Source: Bloomberg, Citi Research

2. Why a long-term funding operation?

Causes of increase in volatility to persist in the medium term

As we explained in last month's report [Japan Yen Rates Strategy - Rising interest rate scenarios and effective hedges](#), the skew of the 5yr underlying is very steep. The BoJ has ways to impact the medium-term zone, the first of which is common collateral operations, as well as a range of other tools it could apply flexibly. It is not unreasonable to describe the medium-term zone as reflecting the BoJ's intentions. So the fact that the BoJ is doing nothing to reduce volatility in the medium-term zone has a big impact on the overall market.

Interest rate risk in medium-term zone more than double that at time of VAR shock in 2003

Overall market risk in terms of DVO1 has grown to more than treble that at the time of the so-called VAR shock in 2003, as shown in Figure 4. However, most of the increase derives from the super-long zone, and most is held in accounts that do not require marking to market. This means that medium- to long-term zone risk is more important to market volatility. As is evident from Figure 5, risk in the 2yr-5yr zone is now more than twice that of 2003, and in percentage terms is much higher than that in the 5yr-10yr zone. However, over the past three years, the average excess return relative to GC in the 2yr-5yr zone has been less the one-quarter of that in the 5yr-10yr zone. In 2012, for example, it was just one-sixth.

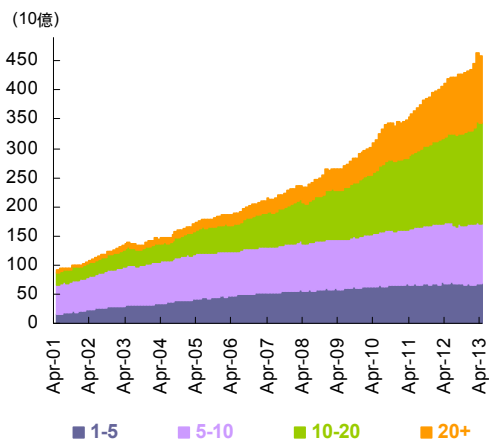
Introduction of long-term fixed rate funding operation would reduce 5yr volatility

Investors' preparedness to take on large amounts of risk despite small excess returns in the medium-term zone was predicated upon the low levels of volatility, which in turn were predicated on the BoJ's appropriate use of the tools at its disposal. The only way to ensure a recovery in market VAR tolerance after damaging it once is to buy the relevant asset or to provide long-term fixed rate funding, and the latter is preferable in terms of avoiding unnecessary jump in volatility. This is because increase in volatility despite the size of asset purchases causes decline in the market's capacity to take on risk.

Five-year implied volatility should decline if market trusts BoJ

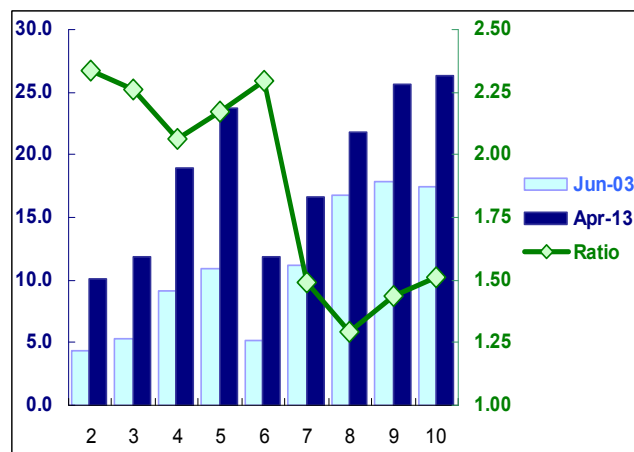
We would like to trust BoJ Governor Kuroda's statements that he will reduce volatility, and that he will do whatever is required. MRO type of long-term fixed rate funding is something that he can do, and that would also contribute to decline in volatility. We think the extent of decline in 5yr volatility would be indicative of the extent to which the market's trust in the BoJ has recovered.

Figure 3. Outstanding market DVO1



Source: Citi Research

Figure 4. Comparison of outstanding market DVO1



Source: Citi Research

3. Calendar roll the touchstone

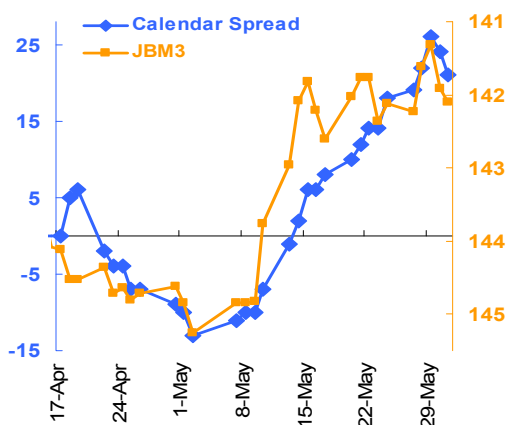
Recent expansion in calendar spread due to outperformance by JB308

With liquidity concentrated in futures, there is a focus on calendar roll. Partly because of the low coupon on the JB310 September CTD, calendar spread contracted to -13 early last month. The spread subsequently expanded due to decline in futures prices (as the September DVO1 is 0.4–0.5 larger), recovering to 6 in mid-May. Since then, the calendar spread continued to expand, to around 21 at end-May. Most of the expansion in the first half of May derived from delta, but the more recent expansion is due to the relative outperformance of JB308, in other words the 7yr/8yr steepening, as illustrated in Figure 5.

No decline in demand for short roll unless volatility reduced

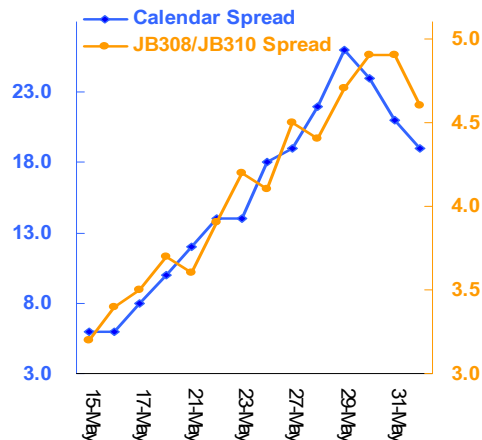
Unless liquidity improves in the underlying market, volatility will not decline and hedging demand will remain concentrated on futures. In this case, short roll demand will remain large, and widening pressure on the calendar spread will continue. The calendar spread has tightened somewhat recently, as futures prices have risen, but if the cost of short roll were to expand rapidly, it may indicate that it is too early to bet on either the correction of the distortions in the curve or on decline in gamma.

Figure 5. Calendar spread vs. front futures



Source: Citi Research

Figure 6. Calendar spread vs. CTD yield spread



Source: Citi Research

Appendix A-1

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