

Return of the Bond-Price Support Regime: Bank of Japan's Dual Bond-Purchase Program

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Abstract

1. This is the first study on Bank of Japan's **Yield Curve Control (YCC)**.
2. BOJ's YCC is similar to the Fed's **bond-price support regime** during WWII.
3. A large fixed-rate purchase operation decreased the **JGB** yield but not the **LIBOR swap** rate in the short run.
4. Both **trend and cycle** became stable and **less volatile** during YCC.
5. JGB yields has become **stationary** across the entire yield curve.
6. International yield **correlations** decreased.

What is Yield Curve Control?

1. The BOJ started **Quantitative and Qualitative Easing (QQE)** in April 2013 to achieve a 2% inflation rate.
2. YCC started in September **2016** with a **dual** bond-purchase program: **fixed-amount** auctions and **fixed-rate** purchases.
3. In fixed-rated operations, BOJ purchases an **unlimited amount** of JGBs at a target price.

Relation to the Fed's Bond-Price Support Regime

1. In **1942**, the Fed and the Treasury Department agreed to **peg** short- and long-term bond yields to certain rates (e.g., Friedman and Schwartz, 1963; Hutchinson and Toma, 1991).
2. BOJ's YCC is similar to this program by setting a **ceiling** for long-term yields (Amamiya, 2017).

Research Questions

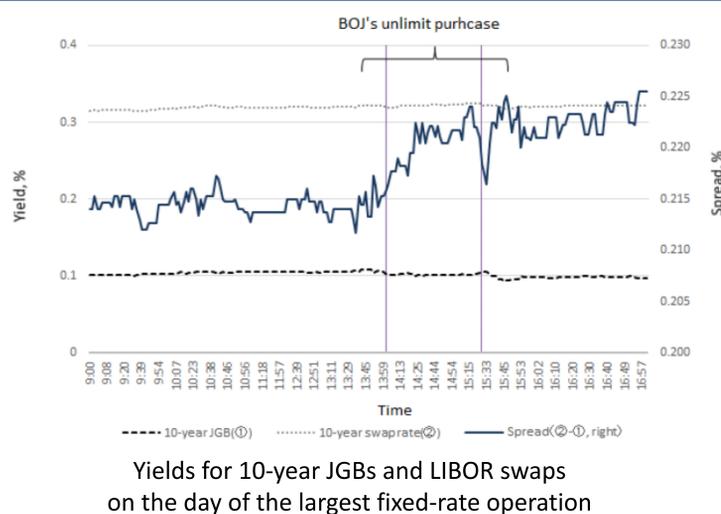
Can a central bank control the yield curve in the modern financial market?

Hypotheses:

1. JGB rates follow **stationary** process for all maturities.
2. The yield **volatility** decreases.
3. The yield **spread** will not change between swap rates.

The Largest Fixed-Rate Purchase Operation

1. The **largest fixed-rate operation (>\$1T)** took place on July 30, **2018**.
2. BOJ does not announce the timing of a fixed-rate purchase operation, unlike for regular fixed-amount auctions.
3. We analyze the effect of the operation on intra-day yields by **difference-in-difference**.
 - Treatment: 10-year JGBs
 - Control: 10-year interest LIBOR swap
4. The swap-JGB **spread increased** and remained large for 30 days.



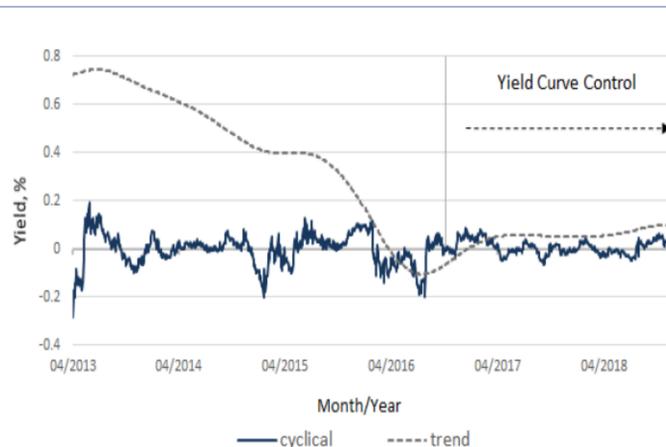
Variable	Coefficient	Std. Error	t-Statistic
JGB	-0.214377	0.000252	-852.0
Post	0.002951	0.000247	11.9
JGB × Post	-0.007461	0.000385	-19.4

Note: The dependent variable is the rate of 10-year JGBs and swaps. The independent variables are dummies for JGBs, post operation (after 14:00), and the interaction term. Bloomberg provided Intra-day data for on-the-run JGBs and 10-year interest rate swaps. The frequency of the data is 1-minutes from 09:00 to 17:00 on July 30, 2018.

Difference-in-difference estimation result

Stochastic Properties of Daily Yields

1. We decompose 10-year JGB yields into a stochastic **trend and cycles** by the HP and Hamilton filters. During YCC,
 - The stochastic **trend is stabilized**.
 - The **cycle volatility decreased** (0.068% → 0.031%).
2. We run Augmented Dickey-Fuller and Phillips-Perron **unit-root tests**.
 - All 2-, 5-, 7-, 10-year yields have become stationary.
3. The result suggests that BOJ policy is considered **credible**.



Notes: This figure depicts the decomposition of 10-year JGB daily yields into trend and cyclical components by the Hodrick-Prescott (HP) filter.

The trend and cyclical component of 10-year JGB yield

	Before YYC		During YYC	
	April 2013 - September 2016		October 2016 - December 2018	
	ADF	PP	ADF	PP
2-year JGB	-0.1986 (0.936)	-0.1439 (0.943)	-3.0502 (0.031)	-2.8326 (0.054)
5-year JGB	-0.5069 (0.887)	-0.4026 (0.906)	-4.1012 (0.001)	-4.0530 (0.001)
7-year JGB	-0.7043 (0.844)	-0.4974 (0.889)	-3.7091 (0.004)	-3.7230 (0.004)
10-year JGB	-0.4370 (0.900)	-0.2822 (0.925)	-3.2961 (0.016)	-3.3370 (0.014)

Note: This table shows the result of the ADF and Phillips-Perron (PP) unit-root tests for 2-, 5-, 7-, and 10-year JGB yields. Tests are based on the daily data obtained from the Ministry of Finance of Japan. P-values are shown in parentheses.

Unit-root tests of JGB yields

Additional Results

1. **Correlations** between JGB yields and **US/German** yields decreased (US 0.80 → 0.56, German 0.9 → 0.61)
2. BOJ **flexibly uses fixed-amount auctions** in response to yield increases.

References

1. Amamiya, M. (2017). History and theories of yield curve control (keynote speech at the financial markets panel conference to commemorate the 40th meeting). Speeches 2017, Bank of Japan.
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3. Hutchinson, W. K. and Toma, M. (1991). The bond price support program as a change in policy regimes: Evidence from the term structure of interest rates. *Journal of Money, Credit and Banking*, 23(3):367-382.