

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

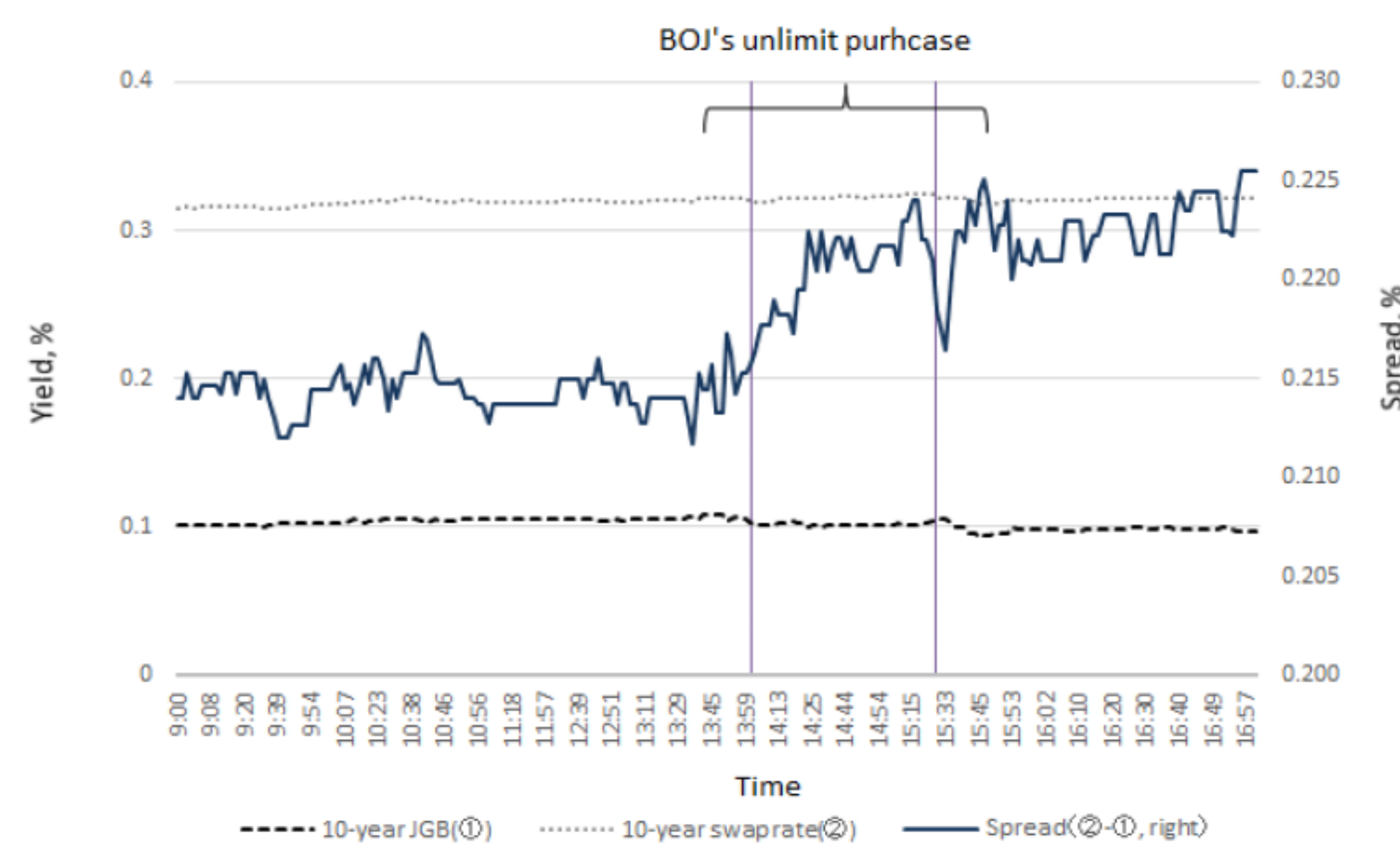
Can a central bank control the yield curve in the modern financial market?

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.



Yields for 10-year JGBs and LIBOR swaps on the day of the largest fixed-rate operation

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

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