SUERF The European Money and Finance Forum

SUERF Policy Brief
No 691, October 2023

Identifying the security lending channel in a central bank's asset purchase program: a case of Bank of Japan's ETF purchases*



By Mitsuru Katagiri (Hosei University), Junnosuke Shino (Waseda University), and Koji Takahashi (Bank for International Settlements)

Keywords: asset purchase program, security lending market, Bank of Japan's ETF purchases.
JEL codes: E58, G12, Q14.

The Bank of Japan's ETF purchase program can influence stock returns via two different channels: direct channel and security lending channel. Direct channel simply means that, in general, BOJ's purchases have effects of raising stock returns by tightening supply-demand conditions in the stock spot market. Security lending channel, on the other hand, works with interconnectedness between the stock market and the stock lending market: Over the longer term, the accumulated ETFs purchased by the bank can contribute to increasing the supply of lendable stocks in the lending market, lowering lending fees and eventually exerting downward pressure on stock returns. This security lending channel should be taken into account in evaluating the effect of the asset purchase program on asset prices, especially when the target asset can be lent out in the lending market.

Bank of Japan's ETF purchase program

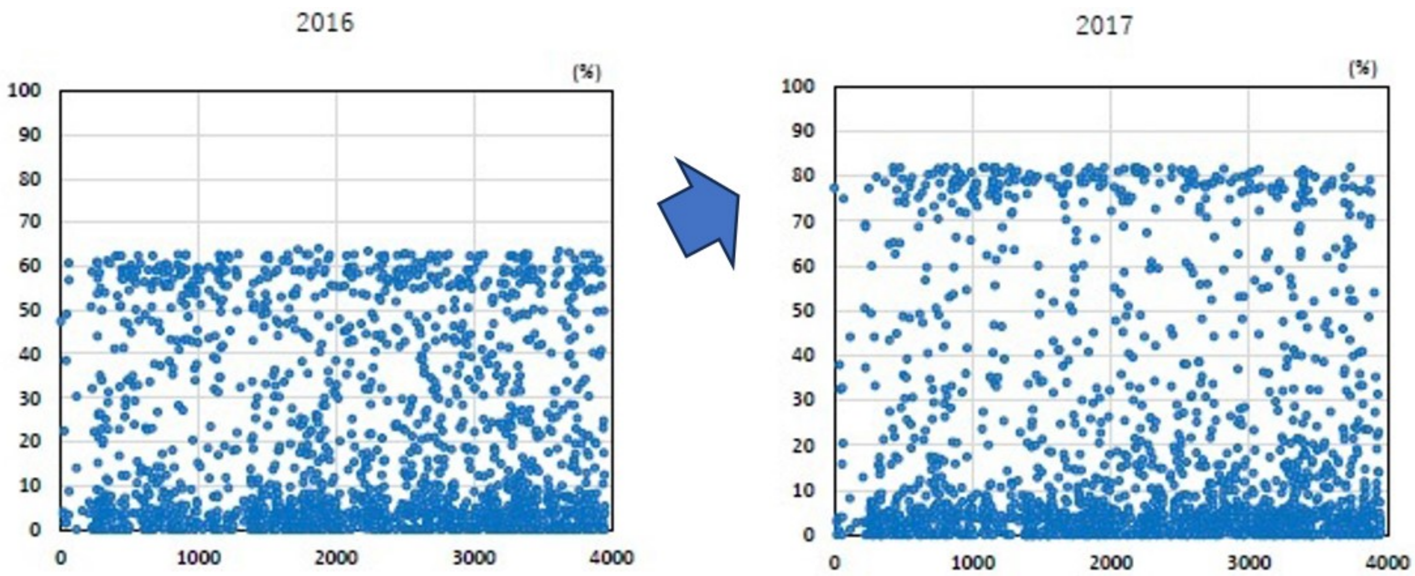
The Bank of Japan (BOJ) introduced the ETF purchasing program in 2010 in order to stimulate the economy after the GFC. Since then, continuous and massive purchases of equity index-tracking ETFs (i.e., TOPIX and Nikkei 225 tracking types are two majors) have provoked discussions among economists and researchers on the BOJ's impact on the stock market. In particular, one of the most frequently asked questions is, to what extent does it affect stock prices? To answer this question, it is worth taking a closer look at the structure of the program.

*This policy brief is based on "To Lend or Not to Lend: the Bank of Japan's ETF purchase program and securities lending," BIS working papers No 1113. Disclaimer: The views expressed in this note are those of the authors and do not necessarily reflect the official views of the Bank for International Settlements.

Two observations are made: First, the BOJ's ETF purchases increase the creation of ETFs. As the market-tracking ETFs that the BOJ has been purchasing are non-synthetic, ETFs need to hold a market basket to follow its mandate of minimizing tracking errors from the market returns. Therefore, the BOJ's ETF purchases inevitably result in increases in demand for individual stocks that constitute the indexes, thus tightening supply–demand conditions in the stock market and possibly leading to increases in stock prices or liquidity shortages of individual stocks.

Second, ETF managers can lend out their holding stocks that constitute ETFs purchased by the BOJ. In the balance sheet of an ETF managed by ETF fund managers, the liability side includes principals obtained by issuing beneficiary certificates. Under the BOJ's massive ETF purchase program, most of the certificates are held by the BOJ. On the asset side, the ETF holds the corresponding amounts of individual stocks to minimize tracking errors. This implies that the direct holder of the stocks is not the BOJ but ETF mangers. Under this framework, ETF fund managers have strong incentives to earn lending fees by supplying stocks in ETFs to the stock lending market. It is particularly true for ETFs held by the BOJ, given that the BOJ does not have plans to sell its ETF holdings and is considered a long-term ETF holder. **Figure 1** shows that the upper limits of the stock lending ratios, defined as the number of lending stocks to the total number of stocks in ETFs, have been raised as the purchase program expands.

Figure 1: Lending Ratios of stocks held by individual ETFs



Note: Each panel shows the stock lending ratio (vertical axis) of an individual stock with its security code, arranged in ascending order (horizontal axis) in a specific year. The stock lending ratio for security code i is defined as the amount of stock i in the ETF used for lending divided by the total amount of stock i in the ETF, both measured by market value.
Sources: ETF balance sheets, EDINET.

Direct Channel vs Security Lending Channel

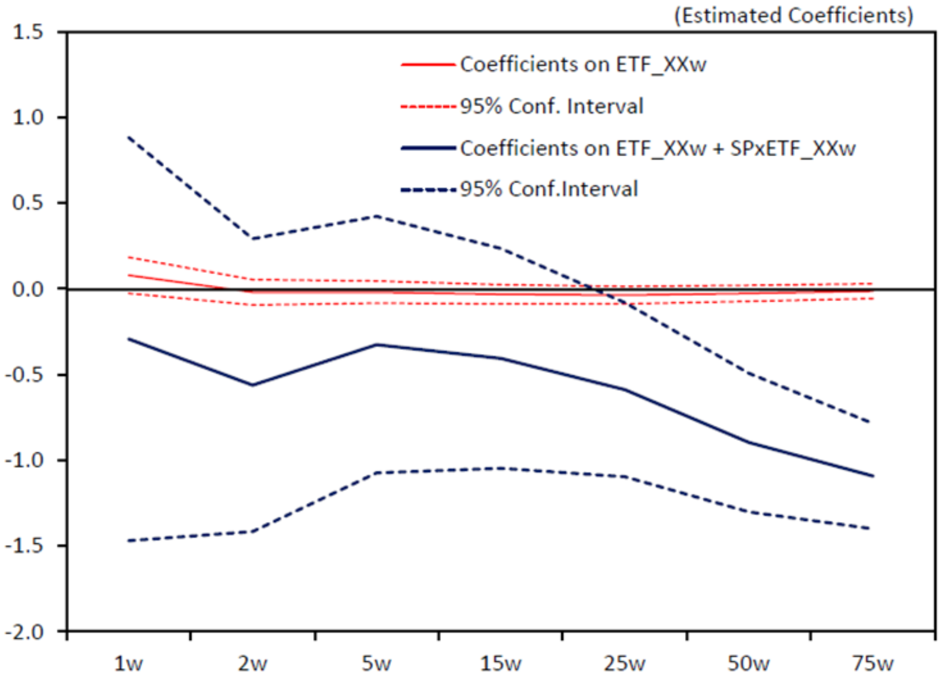
Based on those observations, consider the following channel through which the ETF purchase program can influence on stock returns.

Step 1: ETF purchases directly exert upward pressure on stock prices.
Step 2: Stocks purchased by BOJ are supplied in the lending market.
Step 3: Increases in lendable stocks lower lending fees.
Step 4: Stock borrowing transactions (= short sells) increase.
Step 5: Downward pressure is exerted on stock prices.

While existing research on the effects of the program on stock returns mainly focuses on **Step 1**, Katagiri, Shino and Takahashi (2023) investigate whether **Step 1** through **Step 5** affect stock returns as a whole. Here it should be noted that, in order for the whole mechanics (especially **Step 3**) to effectively work, lending fees of some stocks should have substantial room to be lowered. That is, for some stocks, there should not be excess supply in the lending market so that lending fee is sufficiently high. Following existing literature of stock lending markets such as Blocher, Reed and Van Wesep (2013), we call such stocks with high lending fees "special stocks," otherwise "non-special stocks."

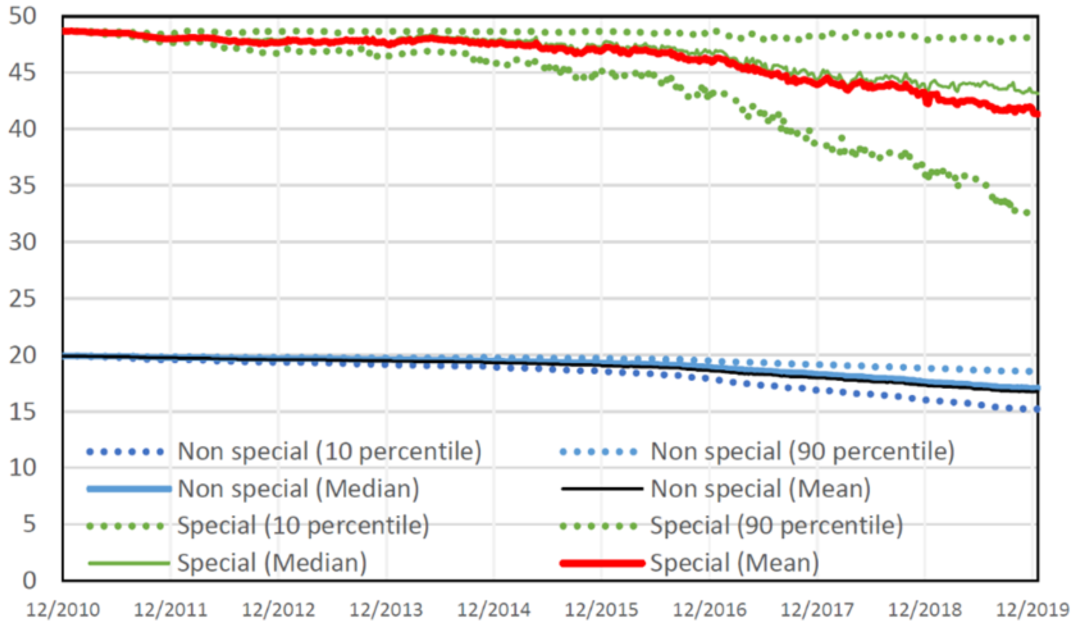
Specifically, Katagiri, Shino, and Takahashi show evidence of the two channels through which the ETF purchase program affects stock markets: the **direct channel** and the **security lending channel**. First, they find that the ETF program has a positive effect on stock returns by shifting upward the demand curve in the stock market, which we call the "direct channel," corresponding to **Step 1** above. Next and more intriguingly, they show that, over longer periods, the BOJ's accumulated purchases have lowered lending fees in the stock lending market (**Step 3**) and thus exerted downward pressures on stock returns (**Step 5**), particularly for "special stocks" (See **Figure 2** and **Figure 3** below). This suggests that the accumulated purchases by the BOJ increased the supply of lendable shares in the stock lending market, and the rightward shift of the supply curve in the lending market is a "security lending channel." These results indicate that the intended effects of the BOJ's ETF purchase program on stock returns can be offset by the increased supply of lendable shares in the stock lending market through the response of ETF managers.

Figure 2: Effects of the ETF purchase program on lending fee



Note: Based on the estimation results in Katagiri, Shino and Takahashi (2023), the figure represents the average effects of purchases on lending fees for non-special stocks (the red line), and those for special stocks (the blue line), for different time horizons. The dashed lines around the bold lines are 95% confidence intervals. It clearly shows that the ETF purchase exerts downward pressure on lending fees of special stocks for a longer time horizon, while no such effect is identified for non-special stocks. Sources: Estimation results in Katagiri, Shino and Takahashi (2023).

Figure 3: Marginal effects on returns for special and non-special stocks



Note: Based on the estimation results in Katagiri, Shino and Takahashi (2023), the blue and black solid lines indicate the median and mean of the marginal effects of an ETF purchase on weekly stock returns for non-special stocks, respectively, while the dotted blue lines indicate their 10th and 90th percentiles. Similarly, the green and red solid lines indicate the median and mean of the marginal effects of the purchase on stock returns for special stocks, respectively, while the dotted green lines indicate their 10th and 90th percentiles. It shows that the average marginal effects for special stocks have declined over time, while those for non-special stocks have remained almost unchanged. Sources: Estimation results in Katagiri, Shino and Takahashi (2023).

Policy Insights

Our analysis has shown that the security lending channel should be considered in evaluating the effect of an asset purchase program on asset prices, especially when the assets purchased by a central bank can be lent out subsequently in the associated lending market. For instance, suppose that, as the BOJ is retaining the large scale ETF purchase program, the supply of lendable stocks is expected to increase, i.e., the supply curve in the lending market shifts rightward. Based on our results, the rightward shift exerts downward pressure on lending fees for special stocks, which offsets the intended policy effects generated by the direct channel.

On the other hand, there is also a possibility that this program can be evaluated positively in terms of helping the stock lending market operate more effectively. Specifically, when the BOJ's ETF purchases help increase the supply of lendable stocks in the lending market, it helps investors borrow overvalued stocks and sell them in the spot market, which exerts downward pressure on overvalued stock prices and thus corrects price distortions among individual stocks. In other words, if such effects exist, the BOJ should consider the possibility that an exit from their ETF purchase program may cause a sudden deterioration in the availability of lendable stocks and induce unintended consequences.

References

J.A. Blocher, V. Reed and E. D. Van Wesep. 2013. Connecting two markets: An equilibrium framework for shorts, longs, and stock loans. Journal of Financial Economics 108: 302– 322.

M. Katagiri, J. Shino and K. Takahashi. 2023. To lend or Not to Lend: the Bank of Japan's ETF purchase program and security lending. BIS Working Papers No 1113.

About the authors

Mitsuru Katagiri: *He is an associate professor of business administration at Hosei University. Before joining Hosei University, he held positions at the Bank of Japan (2004-2016, 2019-2021) and the International Monetary Fund (2016-2019).*

Junnosuke Shino: *He is an associate professor at the School of International Liberal Studies at Waseda University, Japan. Prior to joining Waseda University, he worked as a senior economist at the Bank of Japan.*

Koji Takahashi: *He is a visiting economist at the Bank for International Settlements. Previously, he was a senior economist at the Research and Statistics Department (2019-2021) and Financial System and Bank Examination Department (2017-2019) of the Bank of Japan.*