ETFs in Monetary Policy

Case Study: Bank of Japan

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Key Points

- **Bank of Japan (BoJ) has diversified assets in its purchase program through the use of ETFs***
- **ETF purchases perform a supplementary role in monetary policy, but have significant implications for equity and ETF markets**
- **Divestment of the ETFs and other shares will need careful management**

Using Exchange-Traded Funds (ETFs) for monetary policy purposes remains rare and controversial, despite many central banks adopting unconventional measures following the financial crisis. Some central banks buy equities for their foreign exchange reserves,** but they are usually considered too risky for use in domestic monetary policy. However, one major central bank — the Bank of Japan (BoJ) — has been purchasing shares using ETFs since 2010, as part of its broader asset-buying program to ease monetary conditions. In this paper, we examine why BoJ chose this mechanism and the footprint it has left on the structure of the Japanese equity market. We consider the future policy implications and next steps BoJ might take.

* Exchange-traded funds (ETFs) are funds that trade on an exchange and typically offer exposure to an index of underlying securities.

** Foreign exchange reserves are assets held by central banks in foreign currencies, used to back their liabilities, conduct monetary policy and intervene in currency markets.

Why Equities?

Post the 2008 crisis, many central banks embarked on asset-purchase programs to expand their balance sheets and increase the monetary base, all with a similar rationale.

When short-term interest rates (the price of money) reach levels close to or below zero, central banks conduct further monetary easing by directly increasing the quantity of money. Central banks create reserves (liabilities) by purchasing assets on the open market and increasing their balance sheets (assets). The money creation process is independent of the type of the asset purchased; however, for a variety of reasons, most post-2008 programs primarily purchased government bonds.

In contrast, BoJ's program, which started in October 2010 and is one of the largest, includes a very wide range of assets: government bonds, corporate bonds (both long-term and short-term), equities and real estate funds. The stated reason for this was that the program would serve to reduce the risk premiums* across different asset classes, encourage lower long-term interest rates and indirectly boost economic activity.

BoJ had to deal not only with the consequences of the global financial crisis, but also with the broader issues in the Japanese economy such as persistently low or negative inflation. In addition, BoJ had more experience of unconventional monetary policy measures than other central banks did, and the institutional capacity to extend it into new areas. As a result, it has been actively buying shares, in significant amounts, for nearly seven years.

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* Risk premium is the return in excess of the risk-free rate of return an investment is expected to yield.

Why ETFs?

BoJ had bought publicly traded shares before 2010, but not for monetary policy reasons. From 2002 to 2003, it bought specific shares in order to alleviate the impact on major financial institutions of unwinding their cross-shareholdings in big conglomerates (*keiretsu*).

The program was of sufficiently large scale that the BoJ has not, to date, entirely disposed of those shares. It started selling them gradually in 2007 but suspended the disposal program in 2015. As of October 2017, it still held 1.1 trillion yen of these 'original' shares — dwarfed by 16.1 trillion yen of newly purchased ETFs, but still a visible balance sheet item.

The experience of 2002 raised important questions about the appropriate ways for central banks to invest in shares. Occasionally, central banks invest a fraction of excess foreign exchange reserves into equities (sometimes via ETFs),[1] but hardly ever in their domestic stock markets. A central bank is a public institution with a broad policy purpose and significant financial firepower; when it purchases shares of individual companies, it may be seen to distort the market as it provides a boost to the specific companies and 'picks winners'. Any big ticket sales of BoJ's 2002 share purchases could also have a significant impact on prices.

ETFs, in contrast, allow investors to capture either the entire market (by investing into a broad index) or a specific theme, but do not let them buy individual stocks. At the start of its asset-purchase program, BoJ explicitly identified ETFs as one of the asset types it intended to buy (rather than announcing share purchases and then choosing ETFs as a vehicle), and, to our knowledge, has never publicly discussed the relative merits of ETFs versus other vehicles. Nevertheless, we believe that the 2002 legacy likely played a role in BoJ's more recent approach.

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ETF Purchase Program: Key Stages

ETF purchases were first announced on October 5 2010, after which the program was amended several times. All the individual decisions about the program are listed in Figure 1, which is followed by a description of the program's features.

Figure 1: Key Stages of ETF Purchase Program

Announcement Date	Amount of ETFs in Yen Held by BoJ[2]	Key Features	Context
October 2010[3]	0	Intention to purchase 450 billion yen of ETFs (subject to approval) announced	To be done as part of: 'Comprehensive Monetary Easing' (CME) – increasing balance sheet by 35 trillion yen (7% of GDP), 30 trillion through lending against collateral and 5 trillion through outright asset purchases
November 2010[4]	0	Specifics announced: ETFs to track TOPIX and Nikkei 255 (in proportion to their market value)	BoJ receives approval to buy ETFs
March 2011[5]	185 billion	Total intended amount doubles to 900 billion	Fukushima disaster – all asset purchases doubled and CME extended to mid-2012
August 2011[6]	511 billion	Total intended amount of ETF purchases increased to 1.4 trillion	
October 2012[7]	1.4 trillion	Total intended amount increased to 1.9 trillion	Overall program extended to 2013
January 2013[8]	1.5 trillion		Program set to be open-ended from 2014, with BoJ announcing monthly purchase amount but no overall cap
April 2013[9]	1.7 trillion	Overall cap abandoned, intention to purchase 1 trillion yen of ETFs annually announced	Change of leadership at BoJ; CME replaced with Quantitative and Qualitative Easing (QQE), with 60-70 trillion annual increase in monetary base
October 2014[10]	3.4 trillion	Annual ETF purchases tripled to 3 trillion yen; JPX Nikkei 400 added to the list of indexes	QE increased to 90 trillion a year, thus share of ETFs within QE raised form 1-2% to ~4%
December 2015[11]	6.9 trillion	Supplementary program: annual purchases of 300 billion ETFs to support firms' investment in physical and human capital	Supplementary Program commences in March 2016
September 2016[12]	9.8 trillion	Additional 2.7 trillion of ETF purchases annually, bringing the total to 6 trillion; new 2.7 trillion to buy TOPIX only, thus the ratio of purchased ETFs no longer corresponds to the ratio of their market capitalization	QQE enhanced with 'yield curve control'

Key Features of the Program

Comprehensive Monetary Easing (CME) — 2010

- CME announced with an asset-purchase (AP) program, alongside forward guidance
- Program starts October 2010 under Masaaki Shirakawa, Haruhiko Kuroda's predecessor
- A pre-determined total amount of securities to be purchased rather than an open-ended amount per period (BoE-style rather than Fed-style)
- Program scale changes over time, but the key principles and procedures stay the same; for the ETF part, the principles are as follows:[13]
  - Purchases through appointed trust banks (appear as 'pecuniary trusts' on BoJ's balance sheet)
  - ETFs to track the Tokyo Stock Price Index (TOPIX) and the Nikkei 225 Stock Average; the proportion of the two indexes would roughly track their relative market valuations
  - Disposal happens in two ways:
    - For technical reasons (e.g., holding fractional ETF shares)
    - Exiting or unwinding the program: in that case, BoJ's rules aim to avoid "as much as possible, incurring losses and inducing destabilizing effects on the financial markets."[14]
  - No maximum ownership limit

Quantitative and Qualitative Easing (QQE) — 2013

- Haruhiko Kuroda succeeds Maasaki Shirakawa in March 2013
- Old AP program is terminated; re-launched as QQE with goal of expanding the entire monetary base by 60-70 trillion yen annually
- Transition from a stock to a flow target (1 trillion yen in ETFs annually, open-ended)
- Disposal rules and other technical details of ETF purchases unchanged

Supplementary Program — 2015

- Announced in December 2015, with aim to purchase 300 billion yen per year of ETFs which "support firms' investment in physical and human capital".[15]
- Three key goals stated:
  - Balance sheet management — buying growth stocks to offset potential losses from 2002 shares
  - Promoting investment in human capital as part of wider reflationary goal: higher headcounts, higher wages and better working conditions (hence the colloquial expression 'wage-hike ETFs').
  - Promoting expenditure on research and development (R&D).
- Eligible ETFs that track tailored indices in line with aims include:
  - JPX/S&P Capex and Human Capital index
  - MSCI Japan Human and Physical Investment Index
  - Nomura Enterprise Value Allocation Index
  - iSTOXX MUTB Japan Proactive Leaders 200.
- Important differences from QQE:
  - Targeted particular types of firms, not the whole market (but specific stock selection remained with index providers)
  - Created a demand for instruments which did not previously exist, stimulating the creation of new types of ETFs
  - Unlike the main program, operated an ownership cap of 50% of the total market value of any ETF

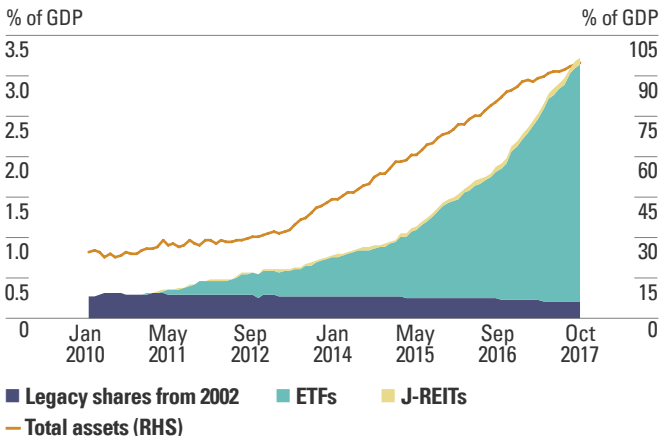
Impact of the ETF Program on Monetary Policy & Markets

Few central banks (including BoJ itself) have ever purchased shares on such a scale over such a long period. Here we analyze the impact of the program on monetary policy, the stock market, and within that, the ETF market.

Monetary Policy

The impact on monetary policy has been limited as the shares do not occupy a very large proportion of BoJ's balance sheet (see Figure 2). As of 31 October 2017, the balance sheet stood at 518 trillion yen, of which the 2002 stocks stood at 1.1 trillion and the later ETF purchases stood at 16.1 trillion – a total of 3.3%. If we look at June 2017 alone, the monetary base increased by 550 billion yen through BoJ's operations, of which 3.7 billion was done through ETFs. Therefore, the ETF purchases did not happen because BoJ ran out of other assets to buy and turned to stocks. BoJ made a deliberate policy choice to purchase ETFs to reduce the risk premia in the stock market; moreover, the presence of ETFs in the program allowed BoJ to diversify a small part of its assets away from government bonds.

Figure 2: Bank of Japan's Balance Sheet as % of GDP



Source: BoJ, as of 31 Jul 2017.

Equity Market

The impact on the stock market has been more significant. BoJ's accounts show that, as of October 2017, BoJ owned about 2.5% (including the undisposed 2002 purchases) of the total market cap of the Tokyo Stock Exchange,[16] which was then 677 trillion yen (115% of 2016 GDP). Such a share is not necessarily alarming, but the indexes purchased by BoJ tend to include larger companies, and there are some companies where, according to Nikkei,[17] if the direct and indirect (held through ETFs) ownership stakes are added up, BoJ holds over 10%.

ETF Market

In the ETF market, BoJ's share is much bigger. The total ETF market in March 2017 was 23 trillion yen, with BoJ holding 13 trillion. Considering that most of BoJ's investment goes into ETFs which track the big indices, the share in those particular indices is even larger. September 2016 data suggests that BoJ holds 42% of all ETFs that track the TOPIX, 53% of those that track the Nikkei 225 and 5% of those that track the JPX-Nikkei 400.[18]

Given BoJ's domination of the ETF market, might it run out of funds to buy? The available data suggests that the creation of ETF units is not keeping up with BoJ purchases. The total amount of outstanding ETFs is on the rise, but holdings by other types of investor are not increasing as fast as BoJ's share (see Figures 3 and 4). Between July 2015 and July 2016, ETF market growth slowed considerably, so BoJ bought ETFs from other investors. However, in our view, they are unlikely to run out of ETFs to buy, as ETF providers can always create new units to meet BoJ's demand.

The only ETFs which carry this risk are the 'specialist' ones (within the supplementary program). If they fail to attract new private investors and the BoJ hits 50% ownership in all of them, it would have to re-adjust the terms of its supplementary program or suspend it. Such ETFs constitute less than 5% of BoJ's program.

A more implicit risk is that BoJ may ultimately dominate the market to such an extent as to undermine its proper functioning, in terms of volume or price. To date, such effects appear to be limited. Although BoJ has been a large buy-to-hold ETF investor, the volumes remain healthy enough to support market liquidity (see next section). As for the share price impact, BoJ's stated intentions for the program did not include the support of stock prices; if it had such a goal, it would have likely designed the program differently, e.g. buy stocks when share prices were falling. Instead, it acts as a price-insensitive buyer, with purchases conducted broadly evenly month-to-month. In any case, the buying shares to support prices is more relevant to central bank responses during acute financial crises (e.g., the Hong Kong Monetary Authority's intervention in 1998), rather than to broad reflationary programs.

Moreover, BoJ periodically adjusts its behaviour, in part to mitigate such risks. For example, in late 2016, it rebalanced ETF buying towards TOPIX at the expense of Nikkei 225, possibly due to the fact that there are 2,000 stocks in TOPIX versus only 225 in the Nikkei, and the risks of ownership concentration are less pronounced.

Figure 3: ETF Holdings by Investor Type in JPY Billions

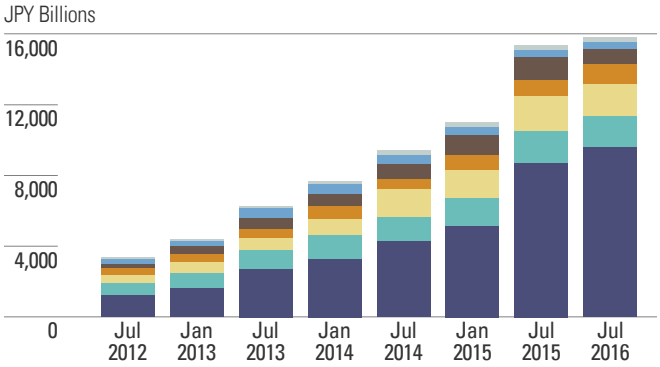
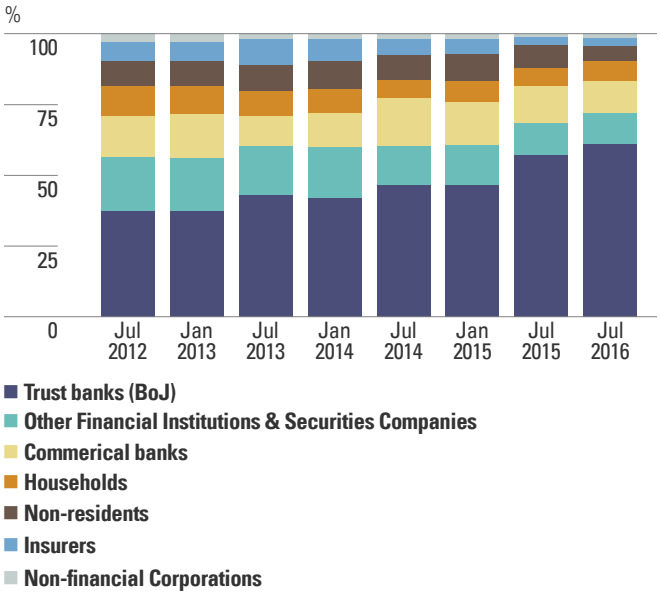


Figure 4: ETF Holdings by Investor Type, % of Total Market



Source: Tokyo Stock Exchange, as of 31 Jul 2016 for illustrative purpose.

Inverse and Leveraged ETFs

Another aspect of market impact is whether the spread of inverse ETFs could partly counter BoJ's policy goals. The argument is that inverse ETFs would, in effect, result in the creation of net short positions and thereby reduce the efficacy of a QE program designed to create positive asset demand bias. Indeed, as the ETF market expanded, many new ETFs of that type were created, and generated a lot of interest. Tokyo Stock Exchange's monthly ETF reports showed substantial trading volumes in inverse and leveraged ETFs. However, the volumes do not reflect the size of those ETFs – they are actually fairly small and completely dwarfed by 'plain vanilla' ETFs, especially on the key indices that BoJ is buying.

Figure 5 looks at the ETF database[19] and takes the December 2016 data for the three main indices BoJ is buying (TOPIX, Nikkei 225 and JPX-Nikkei 400). It shows that the volume to asset value is higher for inverse or leverage versions than for conventional indices. The difference in volumes may have a number of explanations, and the comparatively low volatility of long ETFs may be attributed to BoJ activity. It is more likely, however, that the long-only ETFs generally attract buy-and-hold investors. Moreover, a lot of the inverse funds are very new and thus generate a lot of initial market attention.

Figure 5

Index	Type	NAV*	Average Daily Volume*	Avg Daily Volume/NAV ('turnover')
TOPIX	Plain long	8,003	33	0.4%
	Leveraged (all types)	24.4	4.4	18.0%
	Inverse (+ double inverse)	12.8	0.27	2.1%
Nikkei 225	Plain long	9,476	57.7	0.6%
	Leveraged (all types)	389.7	182	46.7%
	Inverse (+ double inverse)	112.7	2.6	2.3%
JPX-Nikkei 400	Plain long	854	5.2	0.6%
	Leveraged (all types)	3.3	0.2	6.1%
	Inverse (+ double inverse)	15.9	0.3	1.9%

Source: JPX, as of 30 Dec 2016 for illustrative purpose only.
*Net Asset Value (NAV) and Average Daily Volume in JPY Billions

Where Next for BoJ & ETFs?

Through sequential asset purchase programs, BoJ has reached a point where stocks constitute 3.3% of its balance sheet and it owns 2.5% of the Japanese stock market. The bulk of it is held via ETFs, aside from some legacy stocks acquired in 2002. The majority of these ETFs track broad indices like TOPIX and Nikkei 225 and BoJ's substantial purchases mean it now owns half of some ETFs.

BoJ's high share of the ETF market and continued demand has driven financial innovation and increased the use of ETFs across Japanese financial markets. For example, the industry has had to create specialist ETFs to meet BoJ's demand for vehicles that promote 'human and physical capital", though these have attracted limited interest beyond BoJ[20] and have comparatively low liquidity.

Given this current position, where might the policy develop from here? At the time of writing, the QQE asset purchase program remains open-ended and there is no explicit cap on ETF ownership, other than for the specialist "human and physical capital" ETFs. Nor has BoJ committed to any timing or method of exiting from these ETFs, other than for technical reasons.

The ETF holdings are not critical to money creation in the sense that BoJ could easily replace them with other types of assets when altering monetary policy. Instead they offer a diversification benefit away from government bonds. However, they also pose potential concentration risks in particular stocks, given the size of their ETF holdings as a share of the overall market. As a result, BoJ may want to limit its ownership in specific companies, if they are present on BoJ's balance sheet in undesirably high quantities via multiple ETFs and individual shares acquired in 2002. In this scenario, BoJ could redeem a certain amount of ETFs in kind and rebalance its portfolio.

BoJ's reflationary goals may take a long time to achieve, in which case asset purchases could continue over the medium term. Nonetheless, it is likely that at some point, BoJ may want to reduce its balance sheet and divest assets including ETFs. In such a case, it would have significant flexibility on the timing of the exit from ETFs, as it would be divesting other, much larger asset pools too. BoJ has said it will only sell ETF shares in a way that limits market volatility and does not constitute too high a loss. However, its big role in the ETF market would mean that any sale would need to be carefully orchestrated and may have to occur at multiple points over an extended period.

BoJ's use of ETFs may be considered unorthodox by some, but so far it has proved a useful additional policy tool. While its purchases have boosted the ETF market, any future divestments may impact equity prices unless prudently and patiently managed.

[1] How Do Central Banks Invest?

[2] Amount at month-end; all data from BoJ website.

[3] Comprehensive Monetary Easing, 5 October 2010, Bank of Japan.

[4] Establishment of "Principal Terms and Conditions for Purchases of ETFs and J-REITs Conducted through the Asset Purchase Program", 5 November 2010.

[5] Enhancement of Monetary Easing, 14 March 2011, Bank of Japan.

[6] Enhancement of Monetary Easing, 4 August, Bank of Japan.

[7] Enhancement of Monetary Easing, 30 October 2012, Bank of Japan.

[8] Introduction of the "Price Stability Target" and the "Open-Ended Asset Purchasing Method", 22 January 2013, Bank of Japan.

[9] Introduction of the "Quantitative and Qualitative Monetary Easing", 4 April 2013, Bank of Japan.

[10] Expansion of the Quantitative and Qualitative Monetary Easing, 31 October 2014, Bank of Japan.

[11] Statement on Monetary Policy, 18 December 2015, Bank of Japan.

[12] Change in the Maximum Amount of Each ETF to be Purchased, 21 September 2016, Bank of Japan.

[13] Establishment of "Principal Terms and Conditions for Purchases of ETFs and J-REITs Conducted through the Asset Purchase Program", 5 November 2010.

[14] Ibid.

[15] Establishment of "Detailed Rules on Eligibility Criteria for Indices regarding Purchases of ETFs to Support Firms Proactively Investing in Physical and Human Capital", 15 March 2016.

[16] As obtained by adding 5 different segments of the market together.

[17] BOJ's 'wage-hike ETFs' hit wall of investor apathy, April 26, 2017.

[18] SSGA Research.

[19] Please refer to http://www.jpx.co.jp/english/equities/products/etfs/investors/index.html.

[20] BOJ's 'wage-hike ETFs' hit wall of investor apathy, April 26, 2017.

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