Fiscal cost to exit quantitative easing: the case of Japan☆

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ABSTRACT

This paper simulates the cash flows and balance sheet of the Bank of Japan (BoJ) before and after the end of Quantitative and Qualitative Monetary Easing (QQE) under various scenarios. The simulations show that the BoJ will record significant accounting losses after the end of QQE, because the yields on Japanese government bonds (JGBs) acquired during QQE will be lower than the interest rate on excess reserves after the end of QQE. These losses are fiscal costs for the consolidated Japanese government, as they correspond to increased interest expenses to the public. The extent of the BoJ's accounting losses depends crucially on the duration of QQE and the interest-rate elasticity of banknote demand.

1. Introduction

The Bank of Japan (BoJ) commenced its "Quantitative and Qualitative Monetary Easing" (QQE) policy in April 2013. The purpose of this policy was to achieve a two percent annual CPI inflation rate at the earliest possible time, with a time horizon of about two years. Through this policy, the BoJ has more than doubled the monetary base and the holdings of Japanese government bonds (JGBs).[1] The BoJ has also doubled the average remaining maturity of newly purchased JGBs. As a result, the size of the BoJ's balance sheet relative to GDP has become far larger than those in the US and the euro area, as shown in Fig. 1. Fig. 2 summarizes the composition of the BoJ's assets between 1998 and 2015.

QQE remains ongoing. In April 2015, two years after the onset of QQE, the BoJ announced that it expected to achieve the two percent annual inflation target in the first half of fiscal year 2016; thus it could not achieve the inflation target as initially planned. In April 2016, the BoJ revised the expected time of the achievement of the inflation target to fiscal year 2017.

While QQE continues, the BoJ has not made any announcement on a QQE exit strategy yet. For example, at the Standing Committee on Audit in the Upper House of the National Diet of Japan in June 2015, BoJ Governor Haruhiko Kuroda said that it was too early to discuss an exit strategy as the appropriate strategy would depend on economic and financial market conditions at the time of exit.[2]

Nevertheless, it is important to discuss the BoJ's exit strategy before exit because of a possibility that the BoJ will report significant accounting losses after the end of QQE. If the BoJ raises the policy interest rate after the achievement of the inflation target, it may then incur a capital loss associated with the decline in the market price of its long-term bond holdings, as suggested by Goodfriend (2000) and simulated by Fujiki et al. (2001). While the

[1] The monetary base increased from 138 trillion yen at the end of 2012 to 380 trillion yen as of June 2016. Over the same period, its JGB holdings increased from 89 trillion yen to 373 trillion yen.

[2] There is a dissenting BOJ Policy Board member who is expressing his view on the possible effects of QQE on the BOJ's profit and balance sheet in the course of exiting QQE in the future (see Kiuchi, 2015).
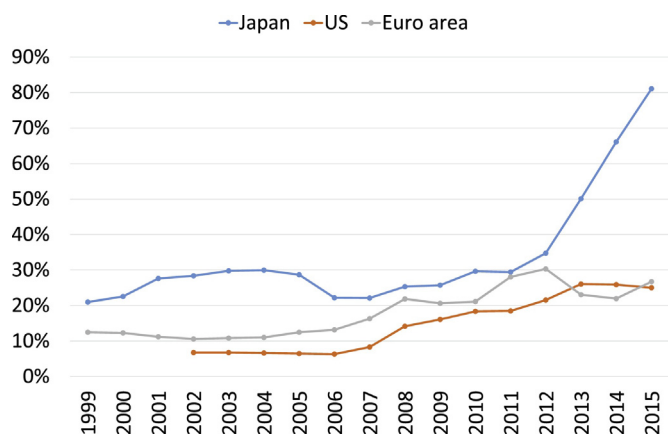
Fig. 1. Ratio of the central bank's total assets to GDP.
Sources: The central bank's total assets: the Bank of Japan, the Federal Reserve Bank of St. Louis (FRED), and the European Central Bank; GDP: Economic and Social Research Institute (Cabinet Office, the Government of Japan), the Bureau of Economic Analysis, and the European Central Bank.
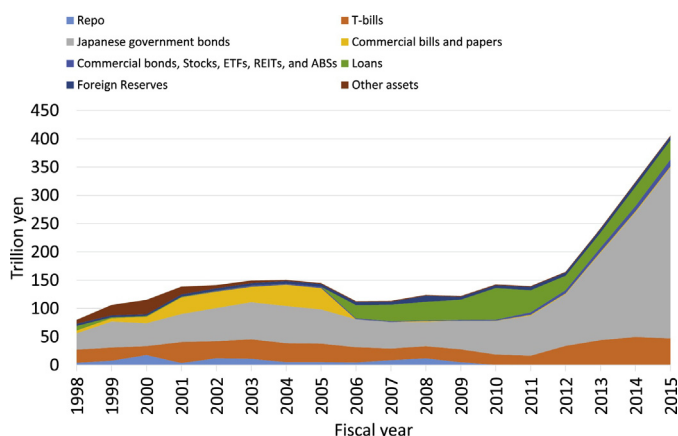

Fig. 2. Composition of the BoJ's assets. Note: "T-bills" for 1998–2000 includes only Financing Bills, as the Bank of Japan Accounts do not report the total short-term government debt before 2001. From 2001 onward, "T-bills" equals the total short-term government debt, which consists of Financing Bills and Treasury Bills. Currently, both of them are called T-bills in the market. "Commercial bills and papers" are replaced by "Loans" in 2006, as the BoJ has introduced the Funds-Supplying Operations against Pooled Collateral on behalf of the Paper-Based Bill Purchasing Operations in that year. "Loans" also include lending facilities, such as the Loan Support Program.
Source: The Bank of Japan.

BoJ has adopted an amortized cost method for its accounting since 2004, so that a mark-to-market capital loss will not appear on its balance sheet if it holds long-term assets until maturity, it will still need to maintain central-bank current account balances held by banks (i.e., reserve balances) at a high level for an extended period of time in such a case. In this case, the BoJ will need to pay interest on excess reserves to control the policy rate. It is possible that the interest expenses on excess reserves exceed the interest revenues from asset holdings, causing the BoJ to run accounting losses. The BoJ's payments to the Japanese government will then be zero, or even negative if it receives government subsidies to cover any part of the losses.

In theory, the central bank is part of the consolidated government, so its accounting loss per se should not matter as long as the government and the central bank arrange a loss-sharing rule in advance. Such a rule, however, is not envisioned by the law governing the Bank of Japan, the Bank of Japan Act, currently. Also, Ueda

(2003), a then Policy Board member at the BoJ, pointed out that if the government could be committed to a loss-sharing rule with the central bank without a significant problem, then central-bank independence would not be an issue in the first place. He raised a concern that if the central bank runs negative equity, then the government may intervene in the central bank's monetary policy through capital injection. Indeed, the current level of fiscal debt in Japan is very high.[3] Some argue that there is a concern that fiscal policy may dominate monetary policy to maintain a low interest rate on government fiscal debt (Ikeo, 2013; Okina, 2015).

In the US, several existing studies examine the Federal Reserve's balance sheet, which was expanded due to the Large-Scale Asset Purchases programs operating between 2008 and 2014. For example, Carpenter et al. (2015) and Greenlaw et al. (2013) simulate the Federal Reserve's accounting profit and net assets after the end of the quantitative easing (QE). Also, other studies consider the effect of the Federal Reserve's net assets on price stability. For example, Del Negro and Sims (2014) argue that the central bank cannot guarantee price stability if the government is not committed to sharing losses with the central bank, because the central bank may tolerate a high inflation rate to offset losses by increasing seigniorage. They show that this possibility leads to multiple equilibria because of self-fulfilling public expectations. Likewise, Reis (2015) classifies three types of central bank insolvency (negative current profit; violation of the rule for the distribution of current profit; and intertemporal insolvency). Reis argues that the inflation rate will depend on the type of insolvency applied to the central bank, as the central bank will adjust seigniorage to achieve the given condition for its solvency. Regarding a loss-sharing rule between the central bank and the government, Goodfriend (2014) has proposed that the Federal Reserve should retain its profit before the exit from QE to build a loss-absorbing capital buffer for post-exit losses.

In this paper, we simulate the transition of the BoJ's balance sheet to analyze how QQE will account for accounting losses to the BoJ in the course of the exit from QQE. Our analysis largely draws on Carpenter et al.'s (2015) work in the US and also Iwata and Japan Economic Research Center (2014), which applied Carpenter et al.'s (2015) analysis to Japan in June 2014. Iwata and Japan Economic Research Center (2014) shows that the BoJ will report accounting losses after the end of QQE, even without the expansion of the BOJ's asset purchase program in October 2014. The contribution of our analysis to the literature is to incorporate subsequent policy changes by the BoJ and also to simulate the transition of the BoJ's balance sheet under various scenarios to identify the key determinants of its losses after the end of QQE. We find that a longer duration of QQE and a higher interest-rate elasticity of banknote demand will increase the BoJ's accounting losses significantly. Thus, the BoJ should allow for an increased cost when extending the duration of QQE, and should not take the current banknote demand, about 19% of nominal GDP as of June 2016, for granted.

The remainder of the paper is organized as follows. Section 2 models the BoJ's balance sheet. Section 3 sets up the simulation, including the description of data and the calibration of parameters. We report the results of the benchmark simulation in Section 4 and describe sensitivity analysis in Section 5. Section 6 concludes the paper.

2. Model of the Bank of Japan's Accounts

We consider a simple model of the BoJ's balance sheet, consisting of the following items:

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[3] The ratio of fiscal debt to GDP in Japan is 232% in 2016, according to the estimate by the OECD.