June 7, 2025
Bank of Japan

The Bank of Japan from the Perspective of Business Operations

Speech at the 2025 Spring Annual Meeting of the Japan Society of Monetary Economics

UCHIDA Shinichi
Deputy Governor of the Bank of Japan

(English translation based on the Japanese original)

Introduction

It is a great honor to be invited to the 2025 Spring Annual Meeting of the Japan Society of Monetary Economics. I am speaking today on the topic of the Bank of Japan from the perspective of its business operations. I would like to step back from the current macroeconomic situation and the conduct of monetary policy to focus on the Bank's business operations and reconsider what a central bank is.

Let me start with Chart 1. The Bank of Japan we normally see portrayed in the media is primarily characterized by its role as the entity that carries out monetary policy. Of the number of news articles about the Bank over the past fiscal year, two-thirds were related to monetary policy. Among topics other than monetary policy, there was a flurry of banknote-related stories around July last year, with the issuance of the new series of Bank of Japan notes -- the first such redesign in 20 years.

For most people, in fact, the first time they ever encountered the Bank was probably through the Bank of Japan notes. Students in junior high school learn in social studies class that the Bank is the issuer of banknotes, the bank of banks, and the bank of the government. When they reach high school, students learn about monetary policy, price stability, what a lender of last resort (LLR) is, and the stability of the financial system. When I was the General Manager at the Bank's branch office, I visited local junior high schools to give lectures in their gymnasiums about what money is.[1] It is difficult, however, even for adults, to connect these key phrases and explain them in a coherent way. For example: Why does the central bank issue banknotes, raise and lower interest rates, and assume responsibility for inflation and deflation?

The policy and business operations of a central bank are inseparable. The two are usually discussed in terms of policy-driven business operations. What I want to attempt today is to

[1] The Bank provided a wide range of age groups with financial and economic education for many years. This role was taken over last year by the Japan Financial Literacy and Education Corporation (J-FLEC), together with the roles of other organizations. However, as one of the contributors of capital, the Bank has continued to cooperate closely with J-FLEC in terms of human resources and funds, for example. The Bank's branches and offices have also contributed to the promotion of financial literacy through activities with local governments and other entities.

approach the matter from the other way around; that is, to start with the operations and then connect them to policy. I have considered this to be an important way of viewing things. In fact, there have been several attempts to do this in the past, some of which I played a part in.[2] I think we should revisit this approach from time to time, otherwise, this kind of topic tends to become overlooked. So, today I would like to take this opportunity to speak on this topic.

I. Issuer of Banknotes

A. Amount Outstanding of Banknotes in Circulation

Of the three functions I mentioned, I would like to start with the Bank as the issuer of banknotes. When someone begins working at the Bank, their first experience involves operations relating to cash at a branch office. I also had the opportunity to learn how to examine banknotes by hand in the Currency Issue Section of the Bank's Matsuyama Branch. That was 40 years ago, so we used an abacus to calculate the balance of banknotes in the vault. As long as they sit in the Bank's vault, banknotes are just slips of paper. But the moment they are paid out to financial institutions that conduct transactions with the Bank, they become the liability of the Bank and legal tender.

Looking at Chart 2, the amount outstanding of banknotes currently in circulation is 120 trillion yen, of which around 10 percent is held in the head offices and branches of financial institutions and in ATMs.

Chart 3 shows the ratio of banknotes in circulation to GDP since 1900. With two exceptions, the level has nearly always been just under 10 percent. The distinctive feature of banknotes as a payment instrument is that they can be used for payments anywhere but do not accrue interest. People often use bank transfers and credit cards for payments over a certain amount, but the amount of cash needed for everyday payments seems to be proportional to the size of the economy, regardless of when.

---

[2] For example, see Hayami, M., "My Theory on Central Banks," speech at Hitotsubashi University 125th anniversary commemorative lecture, April 2001; *Atarashii Nipponginkō: Sono kinō to gyōmu* [The new Bank of Japan: Its functions and operations], ed. Bank of Japan Institute for Monetary and Economic Studies (Tokyo: Yuhikaku Publishing, 2000); Shirakawa, M., "The Central Bank from the Viewpoint of 'Law and Economics,'" lecture at the University of Tokyo Faculty of Law, October 2009.

One of the two exceptions was the period around World War II, which likely reflects turmoil in the economy and in monetary value. The other exception was the period from the mid-1990s to the present, when the ratio of banknotes in circulation to GDP stood at 20 percent, according to the latest data, which is more than twice the usual amount of banknotes in circulation outside the Bank. One reason for this was the continued low interest rate environment in Japan, which caused people to stop depositing their cash frequently, more often keeping it on hand. This phenomenon appears to be the opposite of shoe-leather costs that are incurred during periods of inflation. On this point, the three interest rate hikes the Bank has made since last year have brought the policy interest rate to 0.5 percent and interest rates on ordinary deposits to about 0.2 percent. These are the same levels as the period of a year and a half or so from February 2007 to October 2008, but at that time, the trend in the amount outstanding of banknotes in circulation remained unchanged. I will leave aside the question of how interest rates will unfold because that would take us away from the topic of my speech today; in any event, it is not clear *a priori* what level of interest rates and over what period of time rates staying at that level will cause people to reduce their cash holdings. We would like to keep a close eye on future developments on this point.

B. Path Dependency

Although it is rare to come across one, the 2,000-yen note is a currently issued banknote in Japan. It is in circulation to a certain extent, for example, in Okinawa Prefecture. The 2,000-yen note was first issued on the occasion of the Kyushu-Okinawa Summit held in 2000. As Chart 4 indicates, banknotes containing the number "2" are common worldwide, like 20-dollar bills in the United States. This fact is confirmed by research done by Professor Yukinobu Kitamura in 1999.[3] In terms of number theory, the most rational currency denomination system, when considering small change, involves powers of three. Under the decimal system, however, almost no notes contain the prime number "3." Apparently, the 3-dollar bills of the Cook Islands in the South Pacific are popular as souvenirs. Instead, by combining "2" and "5," it is possible to create a distribution of currency denominations close to the power of three. In other words, mathematically speaking, issuing 2,000-yen notes was very rational.

[3] Kitamura, Y., "Kahei no saiteki na hakkō tan'i no sentaku ni tsuite" [On the Choice of Optimal Currency Denominations], *Kin'yu Kenkyu* 18, no. 5 (1999).

The fact that the 2,000-yen note, which was meant to be convenient, did not go into wider circulation partly reflects the lack of adequate time to prepare for its introduction. However, it also goes to show that the idea that, "if you make something good, everyone will use it," is not enough to make a decision on payment instruments. Settlement occurs when both parties consent to a transaction, so it is governed by people's habits. A frequently cited example is the clearly inefficient handwritten checks used by people in the United States for supermarket shopping in the past. This kind of path dependency of payment instruments is something to keep in mind when offering new payment instruments or designing future payment systems.

These considerations also show the importance of good preparation when introducing a new payment instrument. Although not on the same level, the issuance of new banknotes also requires sufficient preparation. As Chart 5 shows, regarding last July's issuance, around 30 percent of banknotes in circulation have been switched to the new banknotes. Some point out that this is slower than the last time new banknotes came out, but this is because there has been already a total of more than one and a half times as many banknotes in circulation as there were 20 years ago. The pace of replacement was faster, partly due to the high demand for the new banknotes, as we saw more counterfeiting around the time of previous issuance. By the time the new banknotes were issued last July, the equipment at financial institutions, ticket vending machines at train stations, and other machines had been made almost fully compatible. I think there may be cases where the new banknotes cannot be used, say, in drink vending machines around town, but it should be noted that, with the expansion of cashless payment methods, more and more people are making purchases with smartphones or transportation IC cards these days.

A little later, I will touch on the nature of settlement systems in a digital society, but what is necessary to keep in mind when designing payment instruments and settlement systems suited to a digital society is that settlements are path dependent and therefore time is needed to prepare adequately, so that such instruments and systems become generally accepted by the public at large.

II. Bank of the Government

A. Treasury Operations and Digitalization

Next, I would like to talk about the Bank's function as the bank of the government. Central banks carry out this function in various ways, but what most of them have in common is that the government holds a deposit account at the central bank. The Japanese government also has a deposit account at the Bank of Japan, and the Bank manages the inflow and outflow of treasury funds. Additionally, the Bank handles operational tasks of the government such as organizing accounting items and issuing Japanese government bonds (JGBs).

In order to function as the bank of the government, the Bank has a nationwide network of financial institutions that serve as its treasury or revenue agents. The Bank has a Head Office and 32 branches, but it is not common for people to visit these locations when paying taxes, and some of them are also situated far from government offices. Deposits and withdrawals of government funds at the Bank are ultimately completed through the exchange of information and funds between the Bank and this network of agents.

Treasury funds operations used to entail these agents mailing payment statements they received from individuals to the Bank's Head Office or branches, where the Bank tallied them. When I worked at a branch 40 years ago, I also used to flip through revenue slips and use an adding machine, a machine resembling a cash register, to tally them. As Chart 6 indicates, treasury funds operations have been extensively digitalized, with 99 percent of payouts from the treasury including pension payments now digitalized. By contrast, only around 70 percent of tax payments and other operations in which the treasury receives funds are digitalized, as this is largely a matter of choice on the part of payers. On this point, to make further advances in digitalization, the Bank, the National Tax Agency, local governments, financial institutions, tax accountant associations, taxpayer groups, and other entities released a statement, on a nationwide basis, in May 2024 to promote the cashless payment of national and local taxes, pointing out that this would lead to a reduction in social costs and suggesting that people would realize the system's convenience once they tried it. I believe digitalization will basically make headway as users find it to be more convenient. I will discuss this point later.

B. Central Bank and Government Transactions

In addition to managing treasury funds, the Bank is responsible for the operational management of government financing. The amount outstanding of government deposits fluctuates due to timing differences between income and expenditures, and treasury discount bills (T-Bills) are issued to cover short-term funding shortfalls. These bills are sold to financial institutions and other buyers in public auctions but, in exceptional cases, the Bank can take on the bills itself if an amount of unsubscribed bills remains or if the treasury faces an unforeseen need for funds. In such cases, the bills are redeemed with proceeds starting from the next public auction.

Also, when the maturity date arrives for JGBs that the Bank purchases for its own needs, such as for conducting market operations, the Bank can refinance the bonds with T-Bills. The Bank's Policy Board must approve such a rollover after confirming that it will not interfere with its market operations, while the government via the Diet must also approve it as an exception to Article 5 of the Public Finance Act.

Although this has been a somewhat detailed explanation, these business operations raise important issues with respect to the relationship between the government and the central bank when it comes to providing the government with credit. For this reason, the Bank has established the principal terms and conditions for its transactions with the government and clarified its standards and procedures.

In addition to the business operations it carries out as the bank of the government, the Bank also purchases JGBs for the purpose of conducting monetary policy. JGBs currently make up the largest item on the asset side of the Bank's balance sheet. The Bank has bought and held these bonds, guided by the needs of monetary policy aiming to achieve the 2 percent price stability target under the large-scale monetary easing since 2013. The intent is not to support the monetary financing of government debt. Nonetheless, I do not think this is an issue that can be resolved simply by the central bank stating that the purchases are for the purpose of monetary policy and not monetary financing. Throughout the entire monetary easing process, including during the exit phase, it is necessary for the Bank to conduct monetary policy that is appropriate for economic activity and prices, and the result must be that the Bank does not

deviate from such policy conduct out of fiscal considerations. In its future conduct of monetary policy, the Bank should make it clear that it is not engaging in monetary financing.

III. Bank of Banks

A. Interbank Settlement and the LLR Function

Although their history varies somewhat between countries, many central banks, including the Bank of England (BOE) -- one of the historical forerunners among central banks -- started out as a "bank of banks," administering the settlement of funds between banks. Naturally, this kind of interbank settlement requires that each of the banks has a deposit account at the central bank. It is also usually necessary for the central bank to provide credit to ensure smooth settlement. Central banks used to provide temporary liquidity to sound banks using assets backed by commercial flows, such as commercial bills, as collateral. To this day, the basic structure of providing liquidity to collateralized, solvent banks remains, except that the main form of collateral has changed to government bonds.

Since their establishment, or in the course of their history, many central banks, operating as the bank of banks, have been granted the public role of maintaining the stability of the financial system, functioning as LLRs. Whether or not the central bank provides unsecured loans or credit to non-solvent financial institutions, in addition to normal collateralized loans, varies from country to country, depending on the division of roles with deposit insurance systems or other safety nets. There have also been changes over time, for example, in the form and procedures of their credit provision.

In recent years, following the 2008 Global Financial Crisis, this LLR function has expanded, with such function now being referred to as global lenders of last resort (GLLRs) or market makers of last resort (MMLRs). One example is the network of swap arrangements between central banks in advanced economies that was created in response to the Global Financial Crisis, and the U.S. dollar funds-supplying scheme that uses this network. Each central bank can issue an unlimited amount of its own currency, but it can supply the currencies of other countries only to the extent that it holds them and therefore cannot serve as the LLR for a shortage of foreign currency liquidity among domestic financial institutions. By creating the swap network between advanced economies, the funds-supplying scheme has expanded the

scope for supplying other countries' currencies. The most recent case in which it functioned effectively as a backstop was in 2020, when U.S. dollar liquidity funding costs surged with the outbreak of COVID-19. This goes to show the extreme importance of collaboration between central banks, which are by nature domestic entities.

B. Guidance of Short-Term Interest Rates

Central banks exercise these LLR functions in exceptional cases, but even in normal times, they need to provide some form of liquidity to complete interbank settlements. As I mentioned at the outset, banknotes begin to circulate when the Bank of Japan pays them out to financial institutions that conduct transactions with the Bank. At the very least, financial institutions have to keep a balance in their accounts at the Bank to serve as a source of funds for this purpose. If we trace these deposits back to where they originated, we find they have to come from when the Bank provided credit to some financial institution or provided funds in exchange for JGBs and other assets it purchased.

Conventionally, after taking into account payments and receipts of banknotes and transactions with the government, a central bank supplies the amount needed for financial institutions to maintain the required minimum balance by means such as loans to financial institutions and government bond transactions. In this framework, the short-term interest rate is determined by the applied interest rate and other conditions at the time. Therefore, the size of a central bank's balance sheet used to be determined largely by the amounts outstanding of banknotes in circulation and the reserve balance. Chart 7 shows the balance sheet of the Bank as of the end of fiscal 1998, when the amounts outstanding of banknotes in circulation and the reserve balance determined the size of the balance sheet.

C. Interest on Current Account Balances and Implications of Such Interest

However, many central banks now separate the size of their balance sheets from their guidance of short-term interest rates. They do so because they have introduced a method of guiding interest rates in which they pay interest on current account balances. The Bank of Japan also introduced the Complementary Deposit Facility in 2008, which enables it to pay interest on excess reserves, or current deposits that exceed required reserves under the reserve requirement system. (It was initially introduced as a temporary measure and was later made

permanent.) Because financial institutions have the choice of placing excess funds in their current accounts at the Bank or releasing them into the market, arbitrage steers market interest rates toward a level close to the interest paid by the Bank. Currently, the interest rate on current account balances is 0.5 percent, and short-term interest rates in the market are at around 0.48 percent.

This separation went on to have major implications beyond its significance as a technical means of guiding interest rates. One implication is that it has become possible for a central bank to determine the size of its balance sheet separately from the guidance of interest rates, thereby enabling it to implement large-scale policies using the asset side of its balance sheet. One of the main tools of unconventional monetary policy is so-called quantitative easing -- that is, to push down long-term interest rates through government bond purchases -- and this is premised on the ability of the central bank to control short-term interest rates regardless of the size of its balance sheet. For the duration of its quantitative easing, zero interest rates could be acceptable even if a central bank cannot control interest rates. However, it is clear in advance that the exit process from quantitative easing will take time, and thus a central bank cannot adopt this measure unless there is a guarantee that the bank can control short-term interest rates while carrying such a large balance sheet.

Another consequence of separating the size of a central bank's balance sheet from its guidance of short-term interest rates is that it has become possible to address the uneven distribution of liquidity that occurs when the range of participants in the money markets and current account holders do not necessarily align. In a situation involving both institutions that have accounts at the central bank and those that do not, if the bank uses the conventional guidance of short-term interest rates to supply funds to only the bare minimum level of required reserve balances, this will be insufficient to meet the amount required by diverse participants in the financial market. This problem has existed for some time in countries including the United States, where the range of current account holders is basically limited by law to deposit-taking financial institutions. In recent years, however, the presence of non-bank financial intermediaries (NBFIs) -- e.g., insurance companies, pension funds, and other funds -- has expanded in a number of countries, and their impact is spreading to the money markets. To address the uneven distribution of liquidity, it is important for central banks to be able to

supply the required amount of liquidity to the market while guiding short-term interest rates through interest on current account balances. Currently, central banks worldwide are reducing the size of their balance sheets. Many of them will not return to conventional money market approaches. Instead, they will likely maintain the size of their balance sheets in line with the liquidity needed by the market, while guiding short-term interest rates through interest on current account balances.

IV. Two Key Phrases

A. Ensuring That People Can Use Money with Confidence

Please take a look at Chart 8. At this point, I would like to offer two key phrases that sum up the functions of the Bank that I have described so far: (1) ensuring that people can use money with confidence, and (2) providing payment instruments with settlement finality.

Article 1 of the Bank of Japan Act stipulates the purposes the Bank should achieve through the various business operations I spoke about earlier: issuing banknotes, carrying out currency and monetary control -- in other words, monetary policy -- and ensuring the smooth settlement of funds, "thereby contributing to the maintenance of stability of the financial system." Article 2 stipulates that the principle of monetary policy is "achieving price stability, thereby contributing to the sound development of the national economy."

The Articles use legal terminology such as "purpose" and "principle," and differentiate between the two; however, basically, the Bank's role is to ensure that people can use money with confidence. (This is how I explain the Bank's mission to students who are interested in the Bank.) Concrete examples of this include ensuring that banknotes are clean and that there are no counterfeit banknotes, and ensuring that the value of money, in other words, prices, is stable. Also, when people speak of "money," they are implicitly thinking of not only the cash they have on hand but also the balance in their bank accounts, so it is also important for the Bank to maintain the stability of the financial system.

B. Payment Instruments with Settlement Finality

The source of a central bank's ability to fulfill this mission is its ability to provide payment instruments with settlement finality as part of its business operations. I will first define

"finality." When someone hands a Bank of Japan note to another person or a store, payment is completed. The settlement of funds between financial institutions and between the Bank and the government is completed by payments and receipts between current accounts at the Bank. Both Bank of Japan notes and the Bank's current deposits have finality, while other payment instruments do not complete settlements in the same sense.

Central banks are able to serve as LLRs because they can provide settlement finality. They can lend without limit because they can post funds to the accounts of financial institutions (thereby increasing the central bank's liabilities) and acquire loans receivable (thereby increasing the central bank's assets). Also, as I mentioned earlier, the guidance of interest rates under monetary policy is a method that enables the central bank, as the sole entity that can offer the means of completing interbank settlements, to determine the terms (interest rates) of the money markets in which the funds are transacted, on the premise that there will be a constant shortage of funds needed for settlement.

A central bank, which can provide an unlimited amount of money through payment instruments with settlement finality, can also complete financing for the government, including providing credit. However, it is a historical fact that this involves some delicate issues and, in extreme cases, conflicts with the goal of achieving price stability. As I mentioned earlier, the purchase of government bonds under unconventional monetary policy can be said to be a modern example of this. Regarding the line between what constitutes monetary financing and what does not, I believe an important question is whether or not appropriate monetary policy is compromised by fiscal considerations. Some may hold the view, however, that a preventive line should be drawn earlier in the use of the ability to provide a payment instrument with settlement finality. I think the general understanding of central banks prior to the Global Financial Crisis included self-restraint on this point. Since I have discussed this issue on a separate occasion, I will not go into detail today.[4] However, I believe that the pros and cons of unconventional monetary policy since the Global Financial Crisis present a challenge for the central banking community as a whole.

[4] Uchida, S., "Japan's Economy and Monetary Policy," speech at a meeting with local leaders in Shizuoka, March 5, 2025.

Bank of Japan notes and current deposits at the Bank are both liabilities of the Bank. We can sum up what I have been discussing as follows: By providing payment instruments with settlement finality as its liability, the Bank fulfills its role of ensuring that people can use money with confidence.

V. Payment Systems and Central Bank Business Operations in a Digital Society

A. Digitalization of Payments

As we look at Chart 9 and move into the second half of my speech, I would like to consider these questions: How will the Bank's business operations and policy change in line with environmental changes such as digitalization? Or, what will remain unchanged?

Japan is said to have a low ratio of cashless transactions. Exactly how this ratio is defined differs from country to country, which makes strict comparisons difficult, but Japan is marked by a high proportion of direct debit and bank transfers. This is thanks to the Zengin Data Telecommunication System (Zengin System), in operation since 1973, which makes such transactions highly convenient. Also, as I explained at the beginning, the amount outstanding of banknotes in circulation in Japan has been higher than in many other countries, even prior to the low interest rate environment. This reflects the fact that people in Japan feel it is safe to carry cash, which has also led to a well-developed network of ATMs, including in convenience stores. Above all, it is important to note that the decision on what payment instruments to use is up to the individual to decide.

However, as digitalization of the economy progresses, including in daily shopping, it is vital that the central bank provides appropriate payment instruments so that people can choose the one that is safest and most convenient for them. It is necessary for central banks to consider what form of instruments they should provide as their liabilities and payment instruments with settlement finality, so that the payment and settlement systems as a whole demonstrate high stability and efficiency in a digital society.

B. Central Bank Digital Currency

Projects are underway in many countries to have central banks issue a digital currency (central bank digital currency, CBDC). The European Central Bank (ECB) completed its investigation

phase for a "digital euro" in 2023 and has moved into the preparation phase. The BOE has also published a progress report on the design phase of a "digital pound." China is conducting pilot experiments for its digital currency, the e-CNY, in 26 cities across the country and in Hong Kong. Meanwhile, the United States held public consultations on CBDC from 2022 to 2023, but there were strong concerns from banking associations and others. In January this year, President Trump signed an executive order suspending and prohibiting government agencies from working to issue a CBDC. In a congressional testimony in February, Federal Reserve Chair Powell also rejected the idea that a CBDC would be issued during his tenure.

In Japan, the Bank released The Bank of Japan's Approach to Central Bank Digital Currency in 2020 and is currently verifying technical feasibility. It began a pilot program in 2023 and is building and verifying a system for experimentation. At the same time, the Bank has established the CBDC Forum to draw on the technical knowledge of the private sector, and is holding discussions on various topics with the participation of a wide range of stakeholders. The government has also established the Relevant Ministries and the Bank of Japan Liaison Meeting on CBDC, and is currently working to identify and discuss the framework for system design.

A CBDC could become a critical piece of infrastructure that will determine the future of Japan's payment and settlement systems in a digital society. Whether to issue a CBDC must therefore be decided by discussions among the public, taking into account the various changes in the environment at home and abroad. As I have explained, the response varies across countries. However, whether or not a country issues a CBDC, it is essential to consider who, in a digital society, should provide payment instruments with the kind of settlement finality that cash has, and how this will contribute to the safety and efficiency of the payment and settlement systems as a whole.

With regard to specific mechanisms, I think the interface with users should basically be operated by the private sector. It is difficult for a public institution such as the central bank to address the various needs of individuals. I think this will encourage the advent of interfaces that are convenient for users, and innovation that capitalizes on these interfaces.

On this basis, the range of possibilities is fairly broad. Nearly all payment instruments are ultimately tied to the central bank (at the end of my speech I will explain why I do not say "all"). The question is, in order for payment instruments to be perceived as functioning in a similar way to cash, what degree of direct settlement finality should be provided, and how is that finality to be guaranteed. In this regard, since a CBDC is a liability of the central bank, it has the same settlement finality as cash. If the choice is to not issue a CBDC, it will be necessary to consider a variety of technical and other issues, such as how to link payment instruments provided by the private sector with the liabilities of the central bank, and how to ensure the robustness of and access to the operations of these instruments so that transfers are possible at any time, as with cash.

C. International Perspective

An international perspective is essential when considering the future of payments. In fact, it is a current, pressing issue rather than that for the future. There is a great deal of dissatisfaction with current international payment systems. How they can be made more convenient and more secure has been widely discussed. In many countries, for example, the high fees and the length of time it takes for people working abroad to send money home has become a problem. Enhancing cross-border payments has been on the Group of Twenty (G20) agenda since 2020. As one means of improving the operation of existing systems centered on correspondent banking arrangements, measures such as extending the operating hours of payment systems and standardizing international payment message formats have been considered and implemented. Other possibilities are also being explored, such as the interconnection of the retail real-time payment systems of various countries -- that is, Fast Payment Systems (FPSs). (In Japan, such FPSs include the Zengin System and COTRA, which is a small-value funds transfer service.)

Also, in the area of larger-value payments, such as those between financial institutions and for trade-related settlements, there are various initiatives currently underway, including projects led by groups of advanced economies or emerging economies, and they are racing to make headway. One example is Project Agorá, led by the Bank for International Settlements (BIS), which involves many private financial institutions and several central banks, including the Bank of Japan. A new type of payment infrastructure is being planned and tested as part

of this project, in which both commercial bank deposits and central bank deposits are placed on a common platform using distributed ledger technology (DLT), thereby being combined to allow safe and efficient cross-border payments.

The fact that these efforts regarding international payment systems are moving forward in a competitive manner cannot be separated from the issue of economic security. A recent example is the economic sanctions imposed on Russia by a number of countries following its invasion of Ukraine. To ensure that the sanctions are effective, there have been moves to exclude Russian banks from international payment networks such as Swift. From a different angle, since there are no borders in cyberspace, it is increasingly necessary to consider how to protect the security of a country's payment system in a world where cyberattacks are becoming larger and more organized, and what role the public sector, including the central bank, should play in this regard.

For example, if a digital currency is introduced, whether issued by a central bank or provided by a private-sector entity, it is likely to be subject to cyberattacks. The necessary funding and technology must be obtained to counter this threat. The United States appears to be moving forward basically with private-sector initiatives. Europe plans to build a CBDC ecosystem involving both the public and private sectors. As reasons for issuing a CBDC, the ECB has stated its desire to strengthen the strategic autonomy and monetary sovereignty of the euro area, and to reduce its dependence on private, non-European payment providers for euro-denominated payments. This seems to suggest that the issue goes beyond domestic circumstances and involves aspects of economic security and international competitiveness.

VI. Unconventional Monetary Policy and the Central Bank's Balance Sheet

A. Effects of Unconventional Monetary Policy from the Asset Side and Liability Side

My second topic for the latter half of this speech is unconventional monetary policy and the central bank's balance sheet. As the term itself suggests, unconventional monetary policy seeks to achieve monetary policy effects by expanding central bank business operations beyond the scope of conventional operations. This is often referred to as "balance sheet policy." When a central bank provides payment instruments with settlement finality as its liabilities, this means that it also holds assets. Since, in theory, the bank is capable of

providing any amount of liabilities with settlement finality, what kind of assets to hold and how much to hold can become policy parameters.

Chart 10 shows the Bank's balance sheet as of the end of this March. Under unconventional monetary policy, when the central bank purchases long-term government bonds, the amount of these bonds increases on the asset side, while the current deposits of the financial institutions increase on the liability side. Analysis has shown that the effects of such a policy mainly come from the asset side by absorbing interest rate risk from the market and pushing down term premiums through government bond purchases (the so-called stock effect).

On the other hand, while there is not the same direct effect as that from the asset side, the current account balance on the liability side, monetary base, or the balance sheet size has a certain degree of announcement effect. The market knows that the central bank cannot shrink a large balance sheet all of a sudden, so this can send the message that its monetary easing will continue for a while. In the early 2000s, in foreign exchange markets and among other markets, comparisons of the size of central bank balance sheets were sometimes used as reference data. In this regard, while it is impossible to derive a linear relationship, it was not impossible to discover a loose relationship as a proxy for the easing stance of central banks, and this may have functioned as a Keynesian beauty contest.

One instance where the Bank explicitly used the size of its balance sheet in communication was when, in introducing yield curve control in September 2016, it made a commitment to continuing to expand the monetary base until the year-on-year rate of increase in the observed consumer price index (CPI) for all items less fresh food exceeded the price stability target of 2 percent and stayed above the target in a stable manner (the inflation-overshooting commitment). As I mentioned earlier, because it is possible to separate the guidance of short-term interest rates and the size of the balance sheet, this commitment is not very strong. In theory, the Bank could have made a more direct commitment and, for example, have pledged to maintain target levels for long- and short-term interest rates (minus 0.1 percent for short-term interest rates, and around zero percent for 10-year JGBs) until the CPI exceeded 2 percent in a stable manner. As forward guidance, however, this would have been too strong, and there was a risk that it would mean sacrificing future flexibility, which is why the

commitment was linked to the size of the balance sheet. It is not natural to anticipate a central bank raising interest rates while it continues to expand its balance sheet. So, while conveying its stance of continuing monetary easing, the commitment left room for the Bank to start raising interest rates before shrinking the balance sheet (quantitative tightening), which is operationally possible.

This shows the delicate balance involved in forward guidance, a policy that binds itself to producing policy effects. In some cases, the guidance includes an explicit escape clause to balance the effectiveness and the freedom of policy, but there is also a way to leave room for a future response by incorporating elements of business operations. Naturally, central banks around the world, including the Bank, understood these things and made their commitments in consideration of the management of their balance sheets and policy interest rates, as well as their sequence. In this sense as well, policy and business operations are inseparable for a central bank.

B. Unconventional Monetary Policy and the Central Bank's Profits

Given the structure of their balance sheets, central banks are meant to generate profits under normal circumstances. Let me go back to Chart 7. Again, this shows the balance sheet as of the end of fiscal 1998, when the Bank was conducting conventional money market operations. Banknotes issued, which make up a large portion of the liability items, bear no interest. Current deposits also bore no interest. (At that point, the Bank had yet to introduce a facility under which an interest rate is applied to current account balances. Even if it had, there would have been practically no interest, as long as the Bank guided interest rates with the minimum level of reserve deposits.) On the other hand, JGBs and loans to financial institutions on the asset side do bear interest. The difference between the two reflects the profits (seigniorage) that go along with the authority to issue currency, and stem from the Bank's exclusive ability to provide payment instruments with settlement finality as liabilities.

This relationship changes if the central bank's balance sheet expands significantly under unconventional policy. First, throughout the period when the bank is implementing unconventional policy, its profits grow substantially. As short-term interest rates are either at zero percent or negative, basically no interest payments on the liability side are generated.

From the asset side, the larger the balance sheet, the greater the profits the bank can obtain. (In the case of the Bank, it adopted a three-tier system for current account balances. In this system, the Bank incurred interest payments on a net basis because of a positive interest portion while the negative interest portion was minimized. However, the positive effect from the asset side was much greater.) As Chart 11 shows, in fact, while the Bank's operating profits were around 600 billion yen on average before large-scale monetary easing, for every year during the period of this easing, the Bank recorded profits of several trillion yen.

When a central bank moves toward an exit, it will raise interest rates by means of its interest on current account balances, while fixing the asset side with the government bonds it purchased when interest rates were low, resulting in a negative spread. Bank of Japan staff have simulated this.[5] As Chart 12 indicates, the results depend on several factors, including the path of short- and long-term interest rates, the pace at which the balance sheet shrinks, and what happens to the amount outstanding of banknotes, as I explained at the beginning. If we assume that interest rates move in line with the interest rate outlook that the market had factored in as of September last year, the results will look like the blue solid line. Under this premise, the results show profits decreasing, but not resulting in a deficit. However, if more rapid interest rate hikes or other stress is applied, the Bank could incur a temporary deficit, as shown in the shaded area. In either scenario, however, profits will subsequently recover. In other words, profits will turn around as current deposits decrease on the liability side and the Bank replaces its JGBs with higher-yielding bonds on the asset side.

In this way, estimates of profits and capital vary depending on assumptions, but in any case, the state of the central bank's balance sheet will not undermine price stability. I do not need to explain this to those who are here, but under a managed currency system, the credibility of a currency is not ensured by the assets the central bank holds, but rather through the pursuit of price stability by conducting appropriate monetary policy. Nor does the bank's balance sheet affect its ability to implement policies in the pursuit of this objective. Even if the bank temporarily incurs a deficit or (in extreme cases) records negative net worth, profits and capital will be restored by means of future profits from seigniorage and, because it can supply

[5] Bank of Japan Monetary Affairs Department, "The Bank of Japan's Finances and Simulations for Profits and Capital," *Bank of Japan Review Series*, no. 25-E-1 (January 2025).

its own settlement finality, it can always make payments. In fact, many central banks, including the Federal Reserve and the ECB, are currently posting deficits, and some of them record negative net worth. However, there is no disruption to their business operations or conduct of monetary policy.

Nevertheless, many central banks to a certain degree have buffers in place, such as capital. In addition to having its capital, the Bank reserved a portion of the upswing in profits during its process of large-scale monetary easing to prepare against losses incurred during the exit phase. There is no problem if one understands the central bank's financial structure. Even so, if something happens that gives rise to doubts -- for example, if a central bank records a deficit or negative net worth and the market suspects the bank may hesitate to implement appropriate measures due to concerns over financial risks -- this will impede the transmission of policy effects. In order not to raise such doubts, it is important for the central bank to consider financial soundness through means such as the reserves that I have just mentioned, on the major premise that the bank will conduct appropriate monetary policy.

VII. The Future Landscape of Central Bank Business Operations and Payment Systems

A. The Future of Banknotes

Finally, I would like to do a thought experiment about the future of central bank business operations and payment systems. What will happen to banknotes as digitalization progresses? First of all, I want to emphasize that the Bank is committed to continuing to supply cash as long as there is demand for it. With the responsibility for cash supply lying with the central bank, it is vital that the channels through which cash circulates -- such as bank branch networks and networks of ATMs, including in convenience stores -- are maintained and that it remains convenient for people to use cash. How cash is used in the future will change depending on such developments. In Sweden, the ratio of banknotes in circulation to GDP has fallen to a mere 0.9 percent.[6] This mainly reflects the convenience of debit cards and person-to-person fund transfer systems, but it is said that there is another contributing factor; that is, access to cash has become inconvenient, mainly due to bank branch networks. For this reason, Sweden passed a law in 2021 which requires financial institutions to maintain locations where people can withdraw and deposit cash. A similar awareness of this issue has

[6] BIS, 2023 Red Book statistics.

been seen in other European countries as well. In the United Kingdom, for example, the Treasury has set distance standards for the placement of ATMs, based on a law passed in 2023. In Switzerland, the central bank and the Federal Department of Finance co-hosted a roundtable with financial institutions, cash-in-transit companies, retailers, consumer groups, and other parties to discuss the challenges surrounding cash and shared the recognition that cash will continue to be necessary in the future. Furthermore, although this is not the case in Europe, in some countries, the low convenience of and confidence in banknote use caused by such factors as counterfeiting are helping to drive moves toward a cashless society.

On the other hand, maintaining the cash supply framework naturally entails costs. Many parties have a part to play in cash supply in Japan, not only the Bank but also financial institutions, retailers such as convenience stores, and cash-in-transit companies that transport cash. To maintain this framework, they should have incentives to continue providing services for the supply of banknotes, meeting the needs of their respective customers.

In terms of customer needs, because payments are path dependent and cash is very convenient for in-person payments, I believe the demand for cash will not go away any time soon. The Bank will take responsibility for considering how to safely and efficiently maintain the cash supply framework for as long as the need for cash exists. While digitalization and a shift to cashless payments will have the effect of raising efficiency in society and in the economy, I believe this process should move forward driven by the free choice of users.

B. Hypothetical World A: A World Without Cash

In a world in which banknotes exist (even if the ratio of settlements using banknotes declines), the business operations and policy mechanisms of central banks that I have described so far will not change. As the only provider of payment instruments with settlement finality, the central bank will guide interest rates, complete daily settlements, and function as the LLR through the supply of funds and other operations.

This mechanism could change if either of the following two structural changes takes place. Both are hypothetical scenarios. I do not expect either to happen, but imagining these hypothetical worlds can be useful in better understanding the present.

One change is if cash disappears altogether. It is often said that if a CBDC is issued, it will be possible to apply negative interest rates, which will significantly change the conduct of monetary policy. This is not entirely true, however. First, even if a CBDC is issued, the zero lower bound on nominal interest rates will remain as long as cash remains. If there is a way to avoid negative interest rates, there will be a limit to applying negative interest rates to the CBDC. Conversely, if cash disappears, it will not matter so much whether a CBDC is issued or not. Even if a private-sector entity provides the digital currency, as long as it is backed by financial assets in some way, the central bank can break the zero lower bound by influencing the price of (interest rate on) those financial assets. For example, in the simple case where a private-sector digital currency is completely linked to a current account at the central bank, the bank can apply a negative interest rate to that digital currency by changing the interest rate on current account balances. In this sense, central banks would not think to issue a CBDC in order to enable negative interest rates.

In this hypothetical cashless world, because there is no zero lower bound, there is no limit to the negative interest that can be applied, and so there is no need to leave room for lowering the policy interest rate. If the price index is unbiased, the inflation target should be zero percent. The conduct of monetary policy will change significantly. Nevertheless, the fact that the central bank can fulfill its mission of achieving price stability and other objectives will remain unchanged.

C. Hypothetical World B: A World Without Yen

The other possibility is a scenario that the Bank or any central bank would not want to see happen: payment instruments not denominated in the sovereign currency -- that is, yen in Japan -- becoming the main form of payment instrument. Any instrument can be used to settle a transaction as long as both parties agree. It does not have to be limited to a yen-denominated asset, but could also be gold, rice, help with moving, or vouchers for shoulder massages, as long as both parties are satisfied that the financial obligation is discharged. In a digital society, crypto assets could be one such instrument. The original motivation for some crypto assets was the libertarian notion of not being dependent on sovereign states.

Currently, yen-denominated banknotes and bank deposit transfers are used because they are recognized as payment instruments that are acceptable to almost everyone. This premise is what gives the Bank of Japan notes the status of legal tender. However, this only means that they are a means of discharging financial obligations denominated in yen. People are not forced to trade. Under the principle of the freedom of contract, a seller could say they were willing to sell something only for gold or crypto assets.

I do not think this future with payment instruments not denominated in sovereign currencies will come to pass, at least in Japan. It is not easy to create a framework for stabilizing the value of payment instruments that are not tethered to the yen in relation to goods and services, because it would mean having the same independent function as the central bank's price stability. It is much more rational to rely on the yen, whose value is stabilized by the central bank. In this sense, as long as the central bank is fulfilling its mission properly, payment instruments other than yen-denominated instruments will not play a major role in settlements -- but note the caveat, "as long as the central bank is fulfilling its mission properly."

Conclusion

Today, I have explained the Bank's policy while focusing on its business operations. Please refer again to Chart 8. The source of a central bank's policy lies in its power to provide payment instruments with settlement finality (as liabilities) and assets it holds to back them. Through this, the Bank guides interest rates and functions as the LLR. Unconventional monetary policy can be said to be an exploration of how and to what extent the Bank can use this operation and its balance sheet.

When considering policy, it is essential to understand business operations. This does not mean that anything that cannot be done as part of business operations becomes a constraint. Rather, my sense is that it is better to grasp the potential of central bank business operations and then tie that knowledge to policy innovation. That said, it is crucial to have a keen awareness of the weight of being able to exclusively provide settlement finality. Cure-all solutions can create moral hazards, depending on how they are used.

Above all, we must never forget that the purpose of being given the power to provide settlement finality is to ensure that people can use money with confidence. If we cannot fulfill that mission, then settlement finality will not function. History has produced numerous examples of countries where price stability was compromised or the financial system collapsed, causing the country's currency to cease circulating. Furthermore, looking to the future, in a society that has made significant advances in digitalization, there is no guarantee that currency issued by the central bank of a sovereign nation will continue to function as a generally acceptable payment instrument. When conducting central banking business, we must keep in mind that people are free to choose their payment instruments. Doing so, of course, together with the many stakeholders involved.

I prepared today's speech as a way of reminding myself about these important lessons. Thank you very much for your attention.

The Bank of Japan from the Perspective of Business Operations

Speech at the 2025 Spring Annual Meeting of the Japan Society of Monetary Economics

June 7, 2025

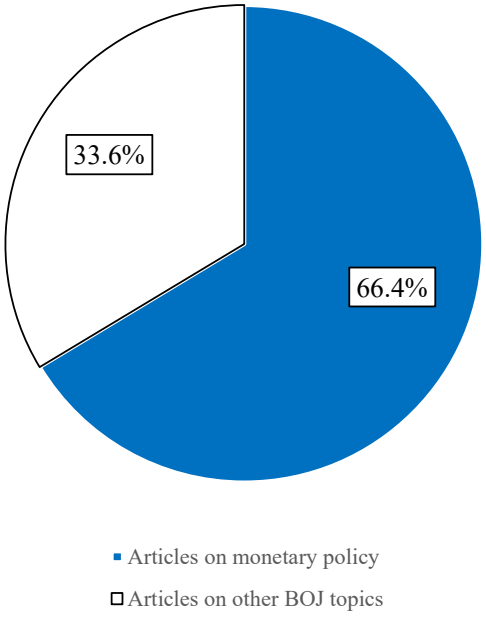
UCHIDA Shinichi

Deputy Governor of the Bank of Japan

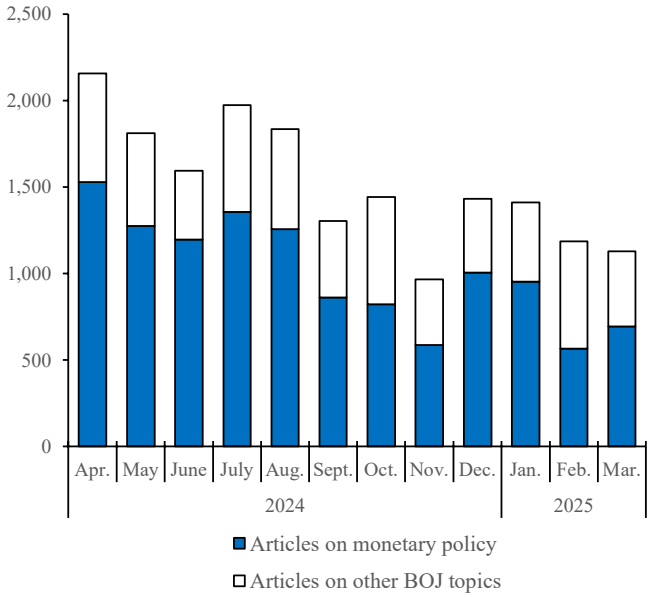
Chart 1

News Articles About the Bank of Japan

Fiscal 2024



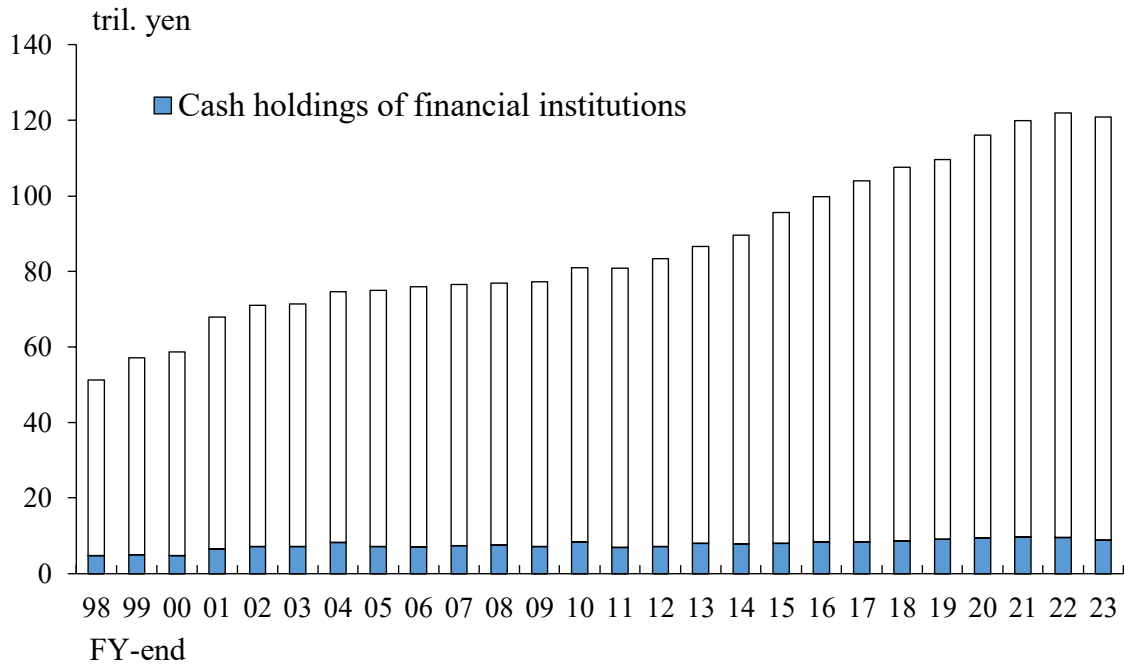
Monthly



Source: Bank of Japan.

Chart 2

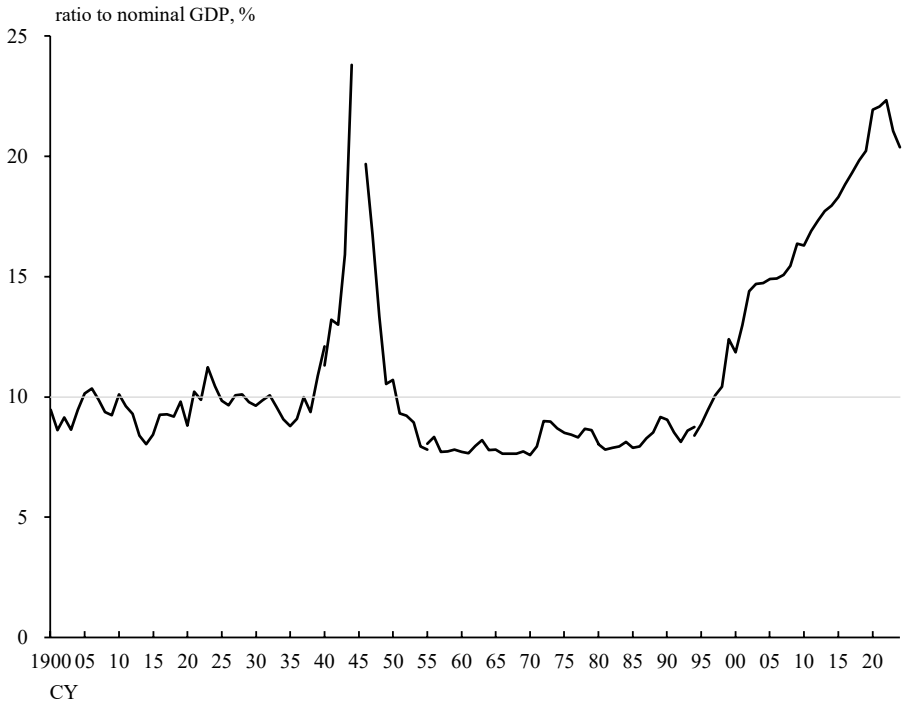
Amount Outstanding of Banknotes in Circulation



Source: Bank of Japan.

Chart 3

Ratio of Banknotes in Circulation to GDP



Note: Figures for nominal GDP up through 1955 are from 'Gross National Expenditure at Market Prices' in Table 1-A of Ohkawa, K., Takamatsu, N., Yamamoto, Y., *National Income*, Estimates of Long-Term Economic Statistics of Japan Since 1868, vo. 1 (Tokyo: Toyo Keizai Shinposha, 1974). The figures from 1955 through 1980 are from total domestic expenditures in 68SNA, and those from 1980 through 1993 are from total domestic expenditures in 93SNA. The figures from 1946 through 1951 are fiscal-year based. Those from 1994 onward are from total domestic expenditures in 2008SNA.
Sources: Cabinet Office; Toyo Keizai; Bank of Japan.

Chart 4

Currency Denominations

(prior to the issuance of 2,000-yen notes)

Distribution of currency denominations

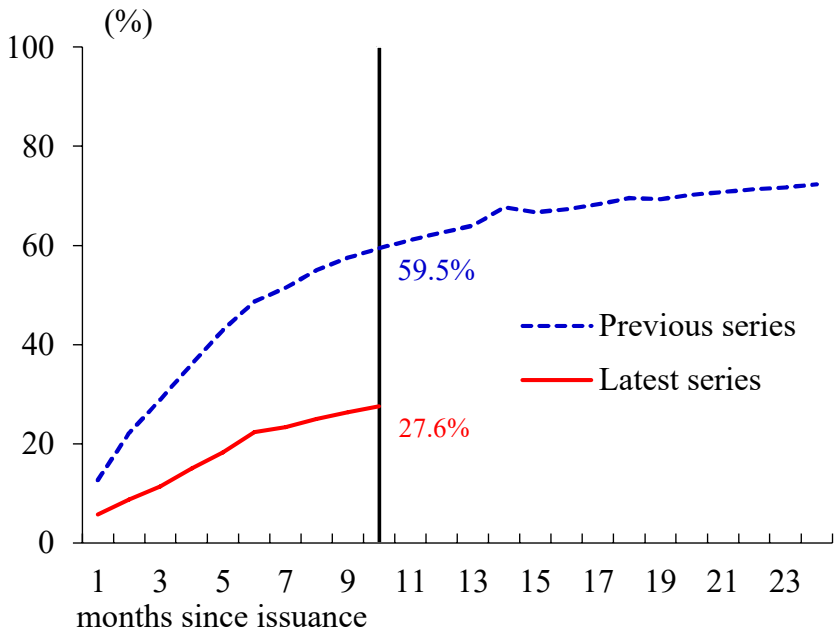
Optimal distribution, in theory $=3^K$	1	3	9	27	81	243	729	2187	6561
Japan	1	5	10	50	100	500	1000	5000	10000
United States	1	5	10	25	100	500	1000	2000	5000

Cook Islands 3-dollar bill

Note: K is a progression of 3. Excluding US 50-cent coins and 2-dollar bills, as these are rarely used.
Source: Kitamura, Y., "Kahei no saiteki na hakkō tan'i no sentaku ni tsuite" [On the Choice of Optimal Currency Denominations], *Kin'yu Kenkyu* 18, no. 5 (1999).

Chart 5

Ratio of New Banknotes in Circulation

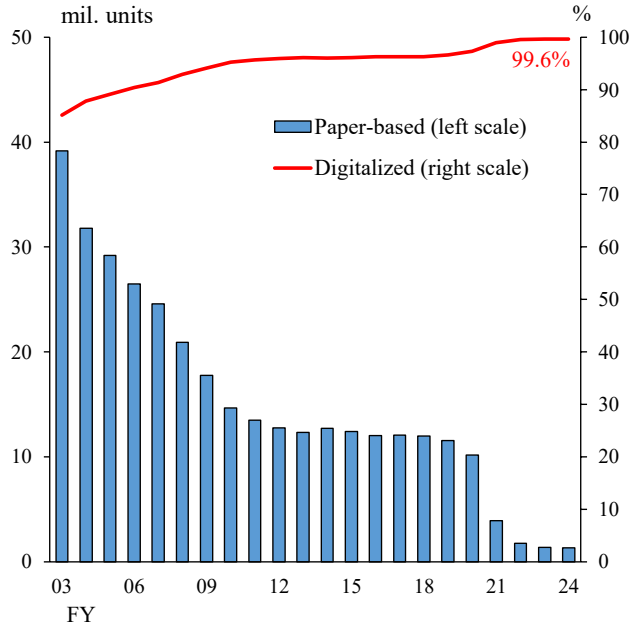


Source: Bank of Japan.

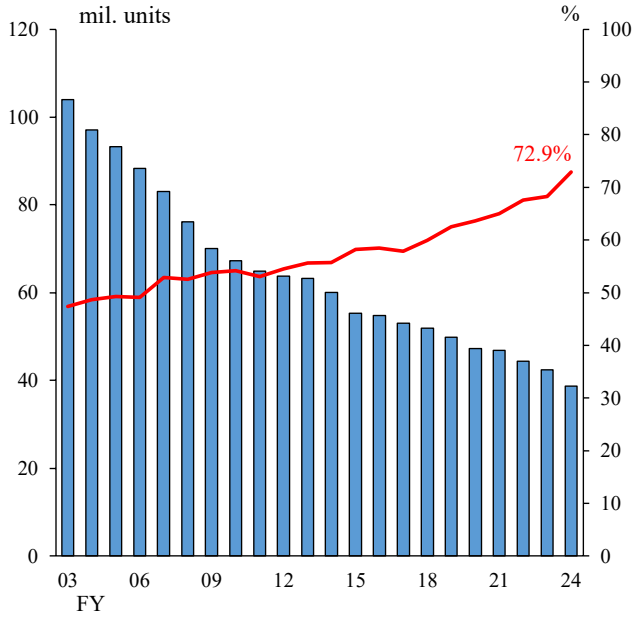
Chart 6

Ratio of Digitalized Treasury Funds Operations

Payment (Annual Expenditure)



Income (Annual Revenue)

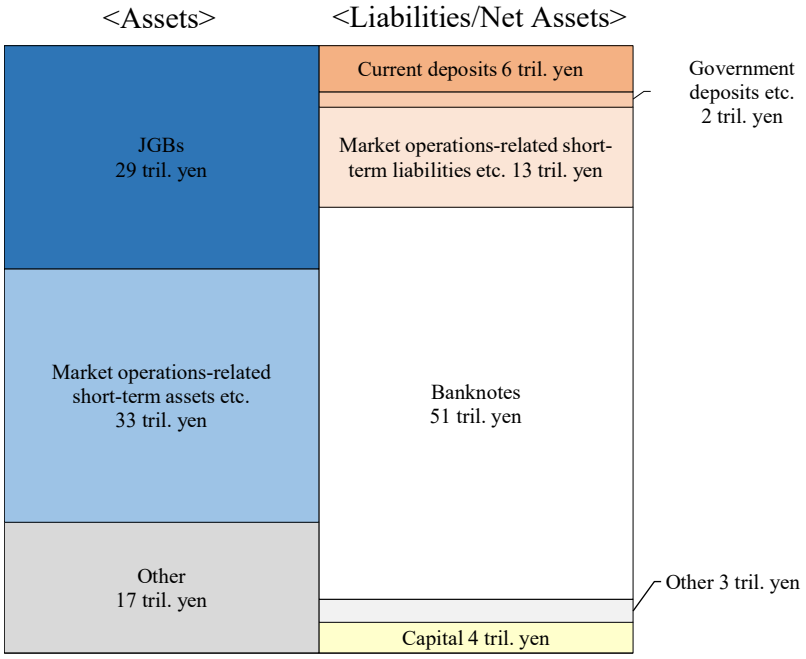


Source: Bank of Japan.

Chart 7

The Bank of Japan's Balance Sheet

as of end of FY 1998: 79 tril. yen



Source: Bank of Japan.

Chart 8

Two Key Phrases

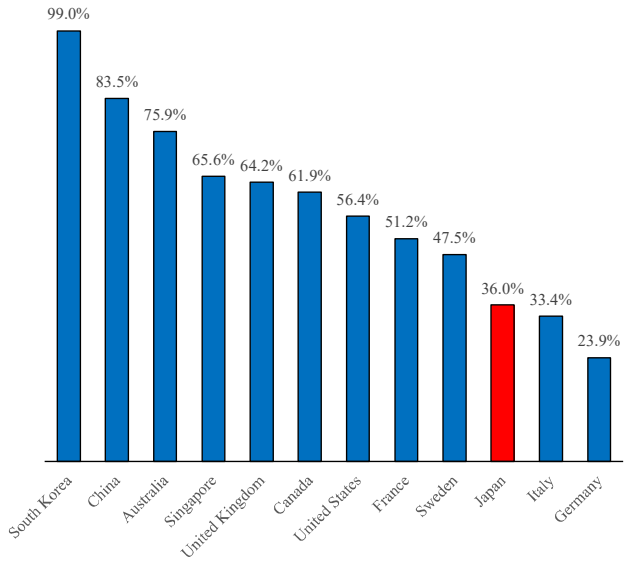
A. Ensuring that people can use money with confidence

- Issuer of Banknotes
  (ensuring that banknotes are clean and that there are no counterfeit banknotes)
- Bank of Banks
  (price stability)
  (stability of the financial system)
- Bank of the Government

B. Providing payment instruments with settlement finality

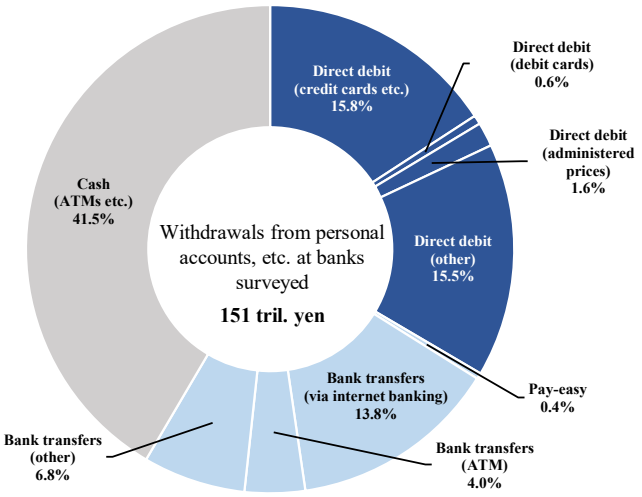
Ratio of Cashless Transactions

Ratio of Cashless Transactions in Major Economies (CY 2022)



Source: Payments Japan Association, *Cashless Roadmap 2024*.

Ratio of Cashless Payouts (first half of CY 2024)

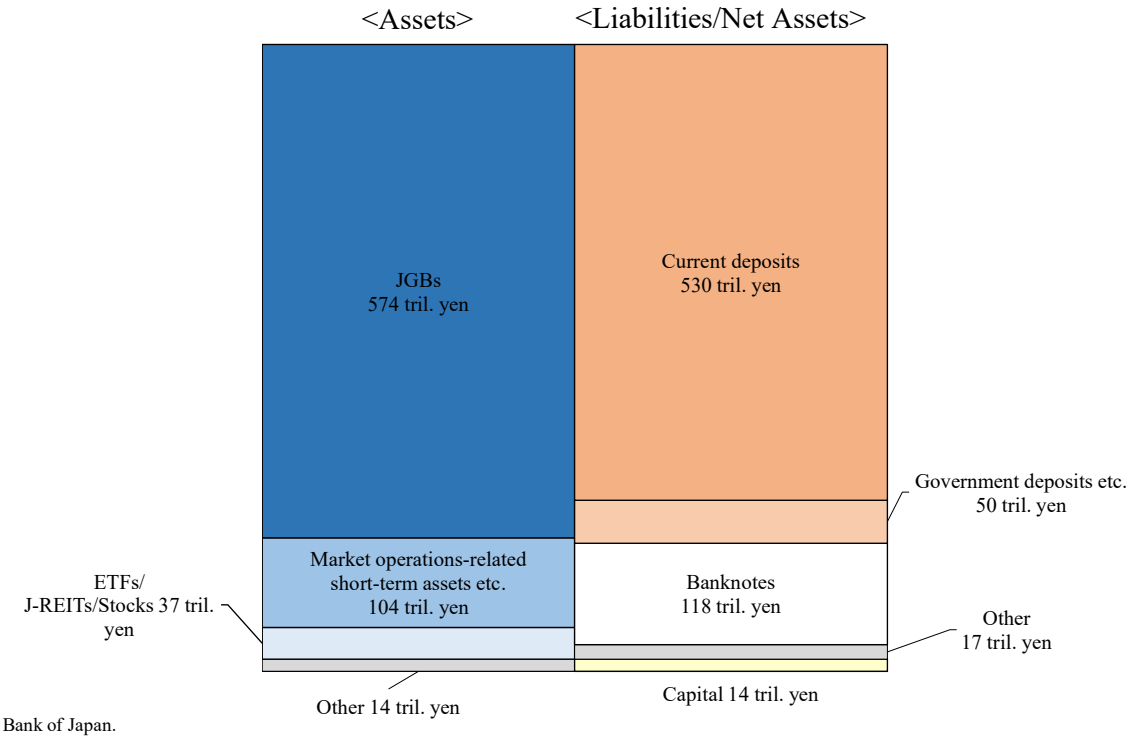


Direct Debit and Bank Transfers 58.5%

Note: Figures are ratios of account transfers and bank transfers to withdrawals from personal accounts, etc. at banks surveyed for the January-June 2024 period on a cumulative basis. The banks surveyed are: Mizuho Bank, MUFG Bank, Sumitomo Mitsui Banking Corporation, Resona Bank, Saitama Resona Bank, and Japan Post Bank.
Source: Japanese Bankers Association.

The Bank of Japan's Balance Sheet

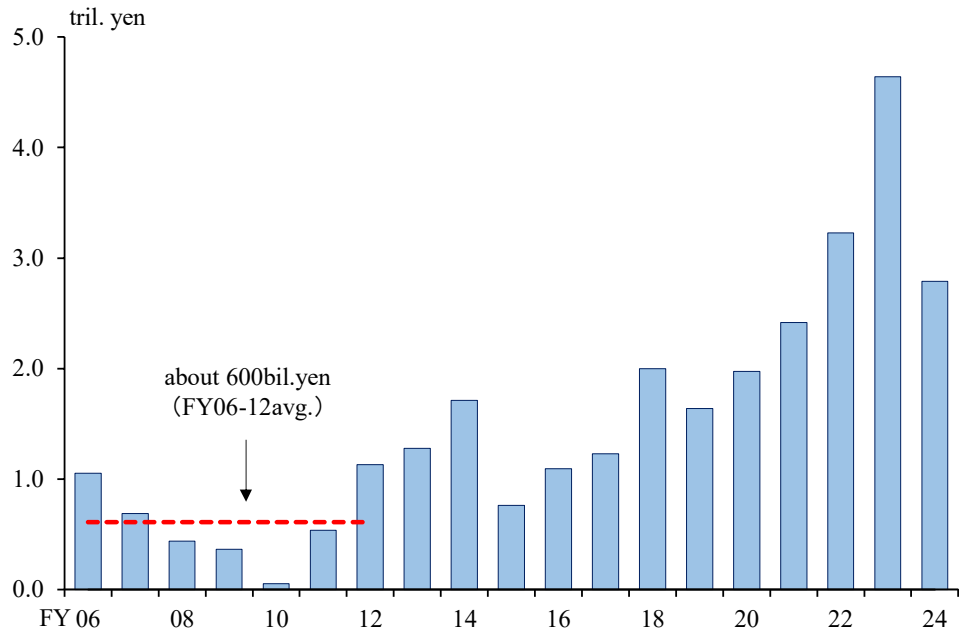
as of end of FY 2024: 729 tril. yen



Source: Bank of Japan.

Chart 11

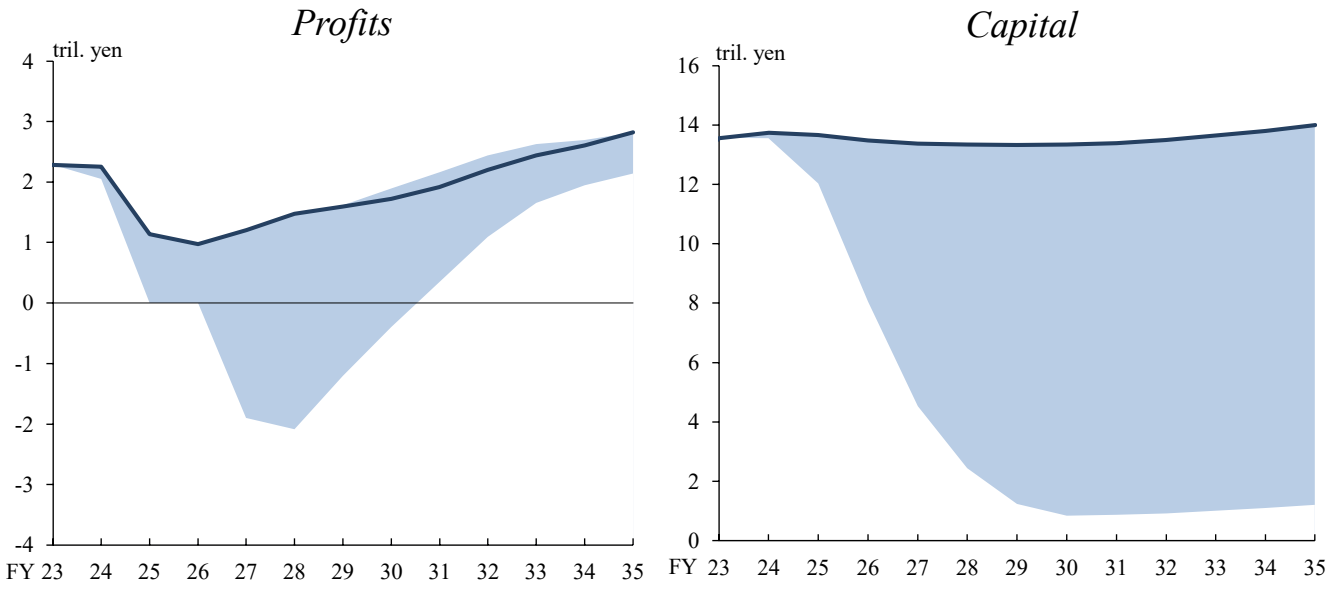
The Bank's Profits (Operating Profits)



Source: Bank of Japan.

Chart 12

The Bank's Simulations for Profits and Capital



Note: The solid lines show the result of the scenario based on the path of interest rates priced in by the market rate as of the end of September 2024; shaded areas denote, in addition to the path of interest rates priced in by the market rate, the ranges of simulations that assume (a) short-term interest rates will range from 1.0% to 2.0% over the next few years and (b) the spread between long- and short-term interest rates will range from +0.25%P to +0.75%P. For details, see Policy Infrastructure Division, Monetary Affairs Department, Bank of Japan, "The Bank of Japan's Finances and Simulations for Profits and Capital," *Bank of Japan Review Series*, no. 25-E-1 (January 2025).

Sources: Bank of Japan; Bloomberg; QUICK.