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Bank of Japan

**Future of Central Bank Payment and Settlement Systems
Under Economic Globalization and Technological Innovation**

*Remarks at the Forum Towards
Making Effective Use of the BOJ-NET*

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(English translation based on the Japanese original)

Introduction

I would like to express my deepest gratitude and appreciation to all delegates for coming to the Forum Towards Making Effective Use of the BOJ-NET today.

Central bank payment and settlement systems are facing big changes amid the wave of economic globalization and innovation in information technology. Today, I would like to introduce these topics.

I. Payment and Settlement Systems as a Core of Central Banking

History of Central Banking and Payment and Settlement Infrastructures

Looking back at history, many central banks were established with the aim of ensuring or restoring stability in payments and settlements after the creation of nation states and during the transition from the modern era to the postmodern era. On the other hand, monetary policy as a macroeconomic policy to influence aggregate demand attracted broad attention from the public only after the Great Depression in the 1930s. The effectiveness of monetary policy and "lender of last resort" (LLR) functions are based on the fact that the liabilities of central banks – Yen in Japan – are used for payments by the people.

The history of many central banks only goes back 100 years or so, which is not very long. Today in most countries, however, the central banks have the sole authority to issue banknotes and operate central bank payment and settlement systems such as high value payment systems and securities settlement systems. These facts imply that there is a strong economic rationale, which is common in countries worldwide, for central banks to provide these infrastructures.

In each country, the central bank is the only entity able to provide central bank money with "finality," which is free of credit risks and "unwinding" of settlements. The settlements through central bank money play a critical role in the economy, since they relieve economic entities from the risks regarding payments and settlements stemming from past transactions and thereby enable them to allocate their resources to promising economic activities for the future.

Banknotes and Central Bank Payment and Settlement Systems

There are some differences between banknotes and central bank payment and settlement systems such as the BOJ-NET, although both are settlement infrastructures with finality provided by central banks.

Banknotes are payment instruments that can be used by anyone 24/7. Banknotes do not carry any information other than "value," and so information attached to payment activities such as "who pays whom and when" is not grasped by the central bank, which is the issuer of banknotes. From the perspective of information sharing, banknotes can be regarded as a "distributed" or "de-centralized" infrastructure. On the other hand, central bank payment and settlement systems such as RTGS systems can be deemed as a "centralized" framework in the sense that the information is likely to be concentrated to central banks, which manage the centralized ledgers as trusted third parties. In most central bank payment and settlement systems, the operating hours of these systems are limited and the participants are restricted to commercial banks and other particular types of entities.

It may be an interesting topic to point out that there are such differences between banknotes and central bank payment and settlement systems. Banknotes have conventionally depended on paper, although there has been technological progress such as printing technologies for preventing counterfeiting. On the contrary, central bank payment and settlement systems have changed continuously and substantially incorporating the latest available technologies and reflecting changes in economic and financial environments. In the early days, central banks used paper-based ledgers to manage their accounts. Then, central banks replaced paper-based ledgers with digital systems. Also in terms of settlement methods, central bank payment and settlement systems, which used to be based on "designated-time net settlement," recently adopted "real-time gross settlement" (RTGS). Such developments suggest that central bank payment and settlement systems will continue to change in the future.

II. Globalization, Innovation in Information Technology and Central Bank Payment and Settlement Systems

Globalization and Central Bank Payment and Settlement Systems

Central bank payment and settlement systems are once again facing significant environmental changes stemming from recent economic globalization and innovation in information technology. Central banks now need to deal with challenging policy issues: To what extent in terms of both "space" and "time" should central banks facilitate settlement with finality through central bank money in economic society?

Reflecting economic globalization, cross-border economic activities are increasing, and some companies operating in multiple countries try to manage liquidity in a centralized way. These activities may lead to new demand for cross-border remittance services that can also be used at night.

Also, as financial institutions inject more resources into cross-border activities, funding liquidity in foreign currencies is becoming very important for the operation of Japanese banks. Moreover, under financial globalization, the Global Financial Crisis showed that liquidity crises can spill over to other jurisdictions. It is therefore important to ensure liquidity sources through collateralized transactions such as repos, also from the viewpoints of controlling moral hazard, deterring over-dependence on central bank LLR and maintaining global financial stability. Financial institutions, including Japanese banks, typically hold large amounts of government securities issued by their home countries. Accordingly, it is becoming important to establish a facility by which banks can raise foreign-currency liquidity in host countries through collateralizing government securities issued by home countries. Under such circumstances, central banks need to consider how and to what extent they provide their own infrastructures including high-value payment systems and securities settlement systems in order to support such collateralized transactions. For example, in terms of the "space" dimension, central banks will have to consider whether and to what extent they should respond further to facilitate settlements with finality also on a cross-border basis.

In retail payments, increased economic activities at night and on weekends are requiring initiatives called "24/7 instant payments" that enable real-time payments to be made 24

hours a day, 365 days a year. Retail payments made at night and on weekends may cause an increase in unsettled amounts among commercial banks and other entities. There are risk-management methodologies to deal with such unsettled amounts through collateral and credit limits. As an ultimate measure to reduce such unsettled amounts, however, a central bank might be able to take decisive action in terms of time and provide settlements with finality also at night and on weekends. Indeed, such action is now being considered in Europe and Australia.

Innovation in Information Technology and Central Bank Payment and Settlement Systems

Meanwhile, innovation in information technology is making the cost of handling cash more visible. In addition, while virtual currencies such as Bitcoin have emerged under the trend of FinTech, some people argue that central banks should consider issuing digital currencies, which could partially replace banknotes. Such arguments would mean applying digital technology even to banknotes, which have always been based on paper-based technology. This could have a substantial impact on the traditional concept of banknotes.

At the same time, central bank digital currency (CBDC) is one of the issues in considering the role of banknotes and central bank payment and settlement systems. If CBDC is directly issued to the general public, it would allow wider access to central bank payment and settlement systems both in time and space. In an extreme case in which CBDC provides the same functionality as banknotes as an alternate measure, it could enable everyone to access central bank accounts 24/7, year-round. Some overseas central banks have started to consider the rationale for or to conduct researches and analyses on CBDC.

Also, amid the global trend of FinTech, some non-bank companies and their services, such as PayPal in the United States and WeChatPay in China, have built up a large presence in payment and settlement services, and the structure and composition of payment service providers are now changing rapidly. Accordingly, some overseas central banks have started to reconsider to whom they should allow access to their payment and settlement systems. As economic globalization and technological

innovation advance, the environment surrounding central bank payment and settlement systems is entering a new phase.

III. Initiatives Taken by the Bank of Japan

The Bank of Japan has been continuously improving its infrastructure. We established the BOJ-NET in the 1980s, and then introduced RTGS and liquidity-saving features. In 2015, we started full-scale operation of the new BOJ-NET. Although economic globalization and technological innovation are causing dramatic changes in payment and settlement infrastructures, we are confident that the BOJ-NET can keep up with such changes and continue serving as a core infrastructure in the new era.

At the same time, regarding how central banks should provide their infrastructures under the changing environment, we need to consider various issues.

First, there is the issue of how to strike an appropriate balance between central bank money and private-based money in the economy, and between the stability in settlements and private-led innovation. These are classical issues. Nonetheless, as new FinTech players have increased their presence in payments and settlements, big-data attached to payment and settlement transactions is becoming more important as a source of added-value in various businesses. We will need to focus not only on the classical issue of "desirable sharing between central bank money and commercial bank money," but also on new payment instruments carrying additional information provided by new players such as "non-bank FinTech firms." The emergence of these new payment instruments will make things far more complicated.

Second, it is crucial for central banks to ensure the security of central bank payment and settlement systems, which are the core infrastructure of the economy. We may also need to consider how to manage the information attached to payment and settlement activities, especially if such information is concentrated to central banks. Moreover, we should try to grasp the possible impacts of new technologies, such as blockchain and distributed ledger technology, on payment and settlement infrastructures including central bank payment and settlement systems.

We need to bear in mind that central bank payment and settlement infrastructures are operated by using the nation's resources. Therefore, when central banks consider how and to what extent they should provide their infrastructures, they must examine whether doing so would contribute to the economy. In order for central banks to make appropriate decisions on such matters, it is extremely important to engage in sincere and constructive communication with a wide range of users.

The Bank of Japan highly respects the opinions of users. Bearing these opinions in mind, the Bank has considered very carefully how and to what extent it should provide its settlement infrastructures to the economy, and has taken decisive action. In terms of the time dimension, since February 2016, the Bank has extended the operating hours of the BOJ-NET until 9 o'clock in the evening, and will continue to consider appropriate operating hours through discussions with users. In terms of the space dimension, the Bank announced today that it will permit the BOJ-NET to be accessed from terminals overseas, which is called "global access."

The Bank will continue to make utmost efforts to advance our payment and settlement infrastructures with the changes in economic environments in order to provide the optimum functions. To help us achieve this, we always appreciate constructive dialogue with all of you.