

lakyara vol.314

Special Edition

C BDC challenges for Japan

- Interview with Hiromi Yamaoka by Tetsuya Inoue -

10.March.2020

Executive Summary

Technological advances have led to active debate on the issuance of central bank digital currencies (CBDCs), which involves national agendas and raises a variety of issues that cannot be resolved with technology alone. To get a better grasp of the difficulties involved and the issues Japan needs to tackle going forward, we spoke with Hiromi Yamaoka, who until a year ago served as Director-General of the Bank of Japan's Payment and Settlement Systems Department, led many of the Bank's discussions on CBDCs, and currently serves on the board of Future Corporation.



Hiromi Yamaoka

*Board member of Future Corporation and
Head of Future Institute of Research*

Graduated from University of Tokyo Faculty of Law (LL.B) in 1986 and from University of California Berkeley School of Law (LL.M) in 1990 and is currently an attorney at law in New York. Joined Bank of Japan in 1986. Appointed Alternate Executive Director for Japan at International Monetary Fund in 2007. Became Director-General of the Bank of Japan's Financial Markets Department in 2013 and Director-General of its Payment and Settlement Systems Department in 2015. Was also as a member of the Basel Committee on Banking Supervision (BCBS) and the Bank for International Settlements' Markets Committee (MC) and Committee for Payments and Market Infrastructure (CPMI). Appointed board member at Future Corporation in 2019.

Tetsuya Inoue

*Chief Researcher,
Financial Market & Innovation Research Department,
Nomura Research Institute*

Joined Bank of Japan in 1985. Completed master's degree in economics at Yale University's Graduate School of Economics in 1992. Served as secretary to then-BOJ Deputy Governor Toshihiko Fukui in 1994. Became staff member for Policy Board member Kazuo Ueda in 2000 before being appointed Director of Bank of Japan's Financial Markets Department in 2003, where he took part in initiatives to develop Japan's capital markets. Appointed Deputy Director-General of Financial Markets Department in 2006 and helped manage international conferences for the Bank for International Settlements' Markets Committee and other international bodies. Joined Nomura Research Institute in December 2008. Organized Japan-China Financial Roundtable and served as moderator. Books include *Ijigen kanwa* ("QQE").



Characteristics of central bank digital currencies (CBDCs)

Tetsuya Inoue: Recently there has been a great deal of discussion on the subject of central bank digital currencies (CBDCs). Could you please explain exactly what a CBDC is?



Hiromi Yamaoka: The standard practice both in Japan and international forums is to divide CBDCs into two categories. One is what the Bank for International Settlements (BIS) calls a general-purpose CBDC, which is used as a cash substitute by ordinary people for daily transactions. The other is a wholesale CBDC, which applies blockchain and other new technologies to central banks' (already digitized) current account deposits.

There are several reasons for discussing these two types of CBDC separately, but the biggest one is that general-purpose CBDCs still face substantial obstacles that are not so much technological as institutional and legal in nature. At present, only banks and other financial institutions are allowed to hold deposit accounts at central banks. The issuance of a general-purpose CBDC creates a situation that is similar to allowing businesses and households to directly hold accounts at the central bank and would therefore require a fundamental review of the current style of central banking.

Additionally, if households and businesses are allowed to hold CBDCs directly, bank runs ("digital bank runs") might unfold more quickly in the event of financial turmoil. The question of whether the central bank should pay interest (which might be negative) on the CBDC also has implications for monetary policy.

On the other hand, since central banks' current account deposits are already held in digital form, the adoption of wholesale CBDCs would present fewer difficulties in terms of institutional hurdles, monetary policy, and financial stability.

Inoue: Which of the two types of CBDC have the main central banks focused on in their discussions?

Yamaoka: Originally both received equal attention, but wholesale CBDCs have taken the lead in experimental studies, proof of concepts and projects.

When I served as Director-General of the Bank of Japan's Payment and Settlement Systems Department, we started a joint initiative with the ECB called Project Stella. By the end of 2019 the project produced three reports dealing with large-value payments and liquidity saving mechanisms, delivery versus payments regarding securities settlement, and cross-border transactions. These wholesale CBDC initiatives seek to derive advantages from the application of new technologies such as blockchain and DLT.

Other central banks are also focusing increasingly on the area of wholesale settlement, including trade finance, delivery versus payments and cross-border transactions. Examples include the Bank of Canada's Project Jasper and the Monetary Authority of Singapore's Project Ubin.

Inoue: Wholesale CBDCs will probably involve the application of smart contracts and other technological innovations.

Yamaoka: Smart contracts are one of the major attractions of using digital currencies to settle large transactions.

In Project Stella, we carried out an experimental study in delivery versus payments (DvP) regarding securities settlement. A massive infrastructure is currently required to synchronize the transfers of funds and securities in order to implement DvP, but the use of smart contracts would enable DvP automatically by embedding programs in digitized currencies and securities on the blockchain.

Viewed from another perspective, wholesale CBDCs are unlikely to provide significant benefits unless they are accompanied by some added value, such as DvP and the automation of back-office settlement procedures, realized by new technologies.

Inoue: Another topic of discussion is whether central banks should be responsible for issuing general-purpose digital currencies.

Yamaoka: That is perhaps the single most difficult question we face.





Currencies are currently supplied via a two-tiered structure consisting of the central bank and commercial banks. The central bank issues banknotes for use by general public, while current account deposits are issued mainly to commercial banks, which then issue deposit money.

Under this framework, commercial banks serve as financial intermediators by using deposits to fund loans. As deposits are also a means of payment and settlement for households and businesses, this system allows banks to provide payment and settlement services while utilizing private-

sector initiative to achieve efficient financial intermediation.

Replacing commercial bank deposits with CBDCs would increase the size of central bank balance sheets by expanding their liabilities. There is also the question of how central banks should invest the funds collected from businesses and households. If those funds are to be lent out to corporate borrowers, central banks have no comparative advantage in making judgments on risks and returns of private-based projects, while using the funds to buy government bonds would reduce the supply of funds to private businesses. General-purpose CBDCs would therefore require a fundamental review of the existing system of financial intermediation.

Inoue: There is also the question of whether we should continue to use bank deposits, which are simply the liability of a private-sector enterprise, as a means of payment and settlement. Doing so requires strict regulation and supervision of the banking system and the use of taxpayer money to rescue banks when something goes wrong. Given the number of financial crises that have unfolded in recent decades, we need to consider both the benefits and the costs of this arrangement.

Yamaoka: This also touches on a fundamental issue inherent in the current financial system.

At one time, the concept of a “narrow bank”—proposed by James Tobin and other economists—attracted a great deal of attention. It was based on the view that under the current financial framework, a loss of trust in bank deposits can spark a liquidity crisis, forcing the central bank to serve as “lender of last resort” and requiring deposit insurance systems to prevent such scenarios. Tobin and others argued that the cause of such crises could be removed by having banks issue means of payment and

settlement that were 100% backed by safe assets. I think the reason this idea never became a reality was that it entailed a certain inefficiency.

The issuance of general-purpose CBDCs, which replaces commercial bank deposits, is conceptually close to a “narrow bank”. It is difficult to say whether it would be more efficient to maintain the existing framework or to establish the kind of “narrow banks” proposed by these economists.

Inoue: I think the answer may differ depending on whether we focus on deposit money’s role as 1) a means of payment and settlement or 2) a means of financial intermediation.

Until now, it has been deemed more efficient to have deposit money play both roles, but recent financial innovations may mean that both functions can be better served by other means.

Yamaoka: Since only human beings are capable of assigning abstract value to goods and services, a means of settlement is a product of the human imagination. Any means of settlement must therefore be able to earn and keep people’s trust as a kind of standard to support this abstracting function, regardless of whether they are issued by banks, the central bank or other entities.

Background to CBDC debate

Inoue: Papers published by Europe’s main central banks appear to be arguing that central banks should issue CBDCs because one of their underlying roles is to provide the national economy with a safe and efficient settlement service.

Yamaoka: There are sufficient reasons why those central banks make such argument.

In Sweden, for example, cash in circulation now amounts to less than 2% of GDP.

The costs of circulating cash can be relatively high in a geographically large country with a widely dispersed population. As such, many bank branches and retail establishments no longer deal in cash. Therefore, this is an urgent question especially for Sweden in the sense that it is the central bank’s duty to supply an alternative means of risk-free payment instruments if people cannot obtain the cash they need.

Inoue: Apart from the need to do something in countries where the use of banknotes has sharply declined, what other factors have encouraged discussion of CBDCs?



Yamaoka: One is the growing focus on the costs of circulating paper-based banknotes, including those for handling, guarding and physically carrying them. As innovations in digital technology lead to greater use of alternative means of payment and settlement, the question of who should bear the cost of circulating banknotes, and how, becomes increasingly important. The chairman of the Japanese Bankers Association, for example, has estimated them now cost about 8 trillion yen per year to administer the cash economy in Japan, including the operation of ATMs. This is a significant amount, especially in view of banks' depressed earnings.

A second factor involves the growing calls for digital innovation in payments and settlements as a wide range of economic activities and services become increasingly digitalized.

Mobility as a Service (MaaS) is one example. Bicycle-rental services need to be able to identify each bicycle's location and each user's identity, which requires a digital payment system. Bicycles could easily be stolen if cash payments were allowed. Accordingly, MaaS strongly requires payment procedures to be also digitized.

A third factor is that digital currencies can help in the fight against money laundering and the financing of terrorism. A key characteristic of cash is its anonymity, which is why it can be used also for inappropriate purposes. Some proponents argue that the adoption of CBDCs could reduce such problems.

Country-specific factors and the CBDC debate

Inoue: My impression is that Sweden, the UK, and China were the initial leaders in research into CBDCs.

Yamaoka: In Sweden, the sharp decline in the use of cash coupled with the overwhelming adoption of cashless payment services provided by foreign companies



has left local authorities worried about losing control over the nation's financial infrastructure.

The UK, regardless of whether or not it decides to issue its own CBDC, was a research pioneer in this area. The financial sector is a key industry for the country, and the government and the central bank have actively promoted financial innovation based on the belief that London's continued development as an international financial center is essential to the nation's economic growth.

The situation in China is very different. One of the official objectives when plans for a digital yuan were announced in January 2016 was to combat tax evasion. The Chinese authorities seem to be focusing on CBDC's ability to collect and accumulate information and data attached to payments and settlements.

Some national authorities in emerging economies also view digital currencies as a way to bring under-developed financial infrastructures into the 21st century. In Cambodia, for example, the US dollar is widely used instead of the riel for payments and settlements. Since it would be costly for the authorities to set up the infrastructure for the physical riel, they might as well make it on a digitized currency from the outset.

Inoue: This is reminiscent of the way that some emerging markets have opted for mobile telephony instead of trying to build new landline networks from scratch.

Japan has also engaged in a variety of research on CBDCs, but these efforts may not be especially visible from the outside, perhaps partly because Japan remains such a heavy user of cash.

Yamaoka: In countries where cash is still commonly used, the move to a cashless system poses a variety of challenges that will have to be dealt with before we can even consider a CBDC. This is because of the network externalities that characterize all methods of payment and settlement.

In Japan, for example, many people coming from foreign countries are now working in convenience stores as cashiers. It is time-consuming and may not be very easy for those people to memorize and handle all the banknotes and coins issued in Japan. But, it would be difficult for retailers to refuse accepting cash if they think

about possible decline in sales. While refusing to accept cash would allow these establishments to reduce costs, the existence of a sizable group of customers who still use cash makes it difficult to implement such a policy.

That said, I think the move away from cash in Japan could accelerate once more people start going cashless, due to the decline in network effects of cash.

Inoue: Will the form of cashless payment systems currently in use influence the adoption of CBDCs?

Yamaoka: In countries where debit cards have become the main form of cashless payment, the small deposits used to fund those cards are covered by deposit insurance. From the perspective of credit risk, that reduces the need to issue a CBDC.

In China, payment and settlement services like Alipay and WeChat Pay have been required since 2018 to keep 100% of amount outstanding in customer accounts in reserve deposits at the central bank. So there are a variety of ways to minimize credit risk in payment and settlement services without issuing a CBDC.

Commercial bank earnings

Inoue: I think private-sector banks will need to start focusing more on overall profitability by bundling payment and settlement services with a variety of other financial services.

Yamaoka: The question of how to raise profits from payment and settlement services is an important one if the infrastructure is to be maintained over time.

Commercial banks traditionally sought to cover the costs for providing payment and settlement services through using deposits for loans and investments and profiting from the yield spread between invested assets and liabilities. Now they are paying more attention to the data attached to payments and settlements.

It may not be appropriate that banks have to spend too much for maintaining payment and settlement services. We need to consider how much should be spent throughout the economy to operate the payment and settlement system.

Inoue: Today's low interest rate environment may mean that financial institutions can

no longer depend on the spread between assets and liabilities for their earnings.

Yamaoka: Sweden, which continues to use the krona despite being surrounded by stronger economies and where interest rate is very low, has always sought to avoid spending any more than it has to on its payment and settlement infrastructure. The nation's ATM network is operated jointly by all banks, and the central bank has outsourced banknote issuance to a private-sector entity in an attempt to cut costs.

Inoue: I can see why such a country might ask whether it makes sense to build and operate its own payment and settlement infrastructure. Even if it decides to do so, it might want to create a common platform and then encourage companies to compete on that platform.



Yamaoka: We will see more discussion regarding the development of common platforms for payment and settlement. But if we are talking about sharing a global digital infrastructure, we ultimately come to the question of whether a nation should maintain its own currency. That decision probably needs to be based on whether the country needs an independent fiscal and monetary policy.

Estonia, for example, was the first of the three Baltic nations to adopt the euro. That means it does not have an independent monetary policy. However, it is trying to achieve economic growth by devoting resources to IT innovation and prioritizing its development as a digital nation.

Sweden belongs to the EU, but it maintains its own currency and has not adopted the euro, and accordingly it is required to make more efforts to innovate krona, and the effort to create e-krona is a part of them. As such, each nation will be asked to consider whether it will maintain its own currency and its competitiveness, or join a bigger currency infrastructure and its innovations.

From a cost standpoint, joining the currency zone considered most trustworthy and sharing a currency infrastructure can be an attractive option for some nations. However, if confidence in that currency declines through no fault of its own, those

nations will have no effective means to address the problem. Countries need to keep these risks in mind when prioritizing their policies. And it may also be difficult for larger nations with a long history to make a decision based solely on economic considerations.

Inoue: It seems to me that it should be possible—at least in theory—to separate the currency system from the payments and settlements technology, thereby enabling a country to share a payments infrastructure while maintaining its own currency.

Yamaoka: It might be possible in theory, but I think there would be major difficulties in practice. For example, quite a few countries outsource the printing of banknotes to foreign companies.

Inoue: That is common in emerging economies.

Yamaoka: It would be hard for a country that places more priority on security concerns, such as Japan, to do that.

I also think it would not be easy for Japan to utilize personal data collected via the use of a digital currency in other areas, as China is hoping to do. Since a currency represents part of a nation's core infrastructure, a variety of elements beyond the central bank's role come into play, including government institutions, the culture, the nation's history, and people's feelings about the currency. Changing the currency framework would require a comprehensive examination of these issues as well.

Inoue: Based on what you have said, it seems it would be difficult for a central bank to simply introduce a CBDC as an extension of its current operations. Such a decision could only be made once society had decided that it was appropriate to entrust this role to the central bank.

Yamaoka: That's true, particularly in the case of general-purpose CBDCs.

Coexistence of network externalities and competition

Inoue: What points do we need to focus on to ensure that CBDCs promote, rather than hinder, private-sector innovation?

Yamaoka: In terms of promoting private-sector innovation, it is critical that the

payments and settlements infrastructure be open in a technological sense. It is also important to prevent the CBDC from leading to the creation of monopolies or oligopolies.

The ideal scenario is an open technological infrastructure that allows anyone to use the platform introduced for the CBDC, with private enterprises competing against each other on that platform to provide efficient services.

The question of platform monopolization is a difficult one.

Inoue: China and Sweden have indicated plans for their central banks to proceed with the development and adoption of a CBDC by creating a consortium with a number of IT companies.

Yamaoka: I think these countries also recognize the difficulty of the problems involved.

As payment and settlement systems have strong network externalities, there is the risk that initial competition will eventually give way to monopoly. Swish, a mobile payments app in Sweden, is operated jointly by all the banks in the country, and it is designed to prevent individual banks from establishing a monopoly while maintaining adequate scale and benefiting from network externalities.

The question of how to benefit from the network externalities of payment and settlement systems while promoting competition is a major issue. At one point, Japan has already had too many firms competing in the cashless payments market. Although the competition itself could bear welfare gains, it may not be beneficial to users if it leads to excessive fragmentation of the market.

Inoue: Once a monopoly is established, there may be no guarantee that users will benefit.

Yamaoka: In the markets with strong network externality, the strongest competitor will eventually monopolize the market if the authorities stand by and do nothing.

In China, for example, two firms—Alipay and WeChat Pay—dominate the market almost completely. Whether that is a good thing or not depends on one's viewpoint.

When there are too many competing payment and settlement services, people incur



substantial costs in trying to assess whether those services are safe—even if they are—which acts as a drag on economic activity. Historically, the reason why central banks emerged and began issuing unified currencies was to resolve the problems created by a plethora of payment and settlement methods. Payment and settlement systems need to achieve a healthy balance: although they must be large enough to benefit from network externalities, it is also important to prevent the development of monopolies and oligopolies and maintain a competitive environment.

Inoue: The case of electrical power in the US demonstrates that when dealing with an industry that has infrastructure-like characteristics, simply reducing regulation and encouraging competition is not enough given network externalities and the large fixed costs involved. Maintaining a certain degree of monopoly often leads to favorable results when we take into account supply stability and other aspects of user convenience.

Central bank independence and CBDCs

Inoue: There are also concerns that the issuance of CBDCs will lead central banks to collect and hold personal information and transaction data.

If the central bank can return this information to the private sector under a proper set of rules, I do not think it will hinder the development of more efficient and sophisticated financial services. On the other hand, some do not welcome the idea of central banks or other public entities gathering and storing personal information and transaction data.

Yamaoka: I think this will be a very sensitive issue when it comes to the adoption of general-purpose CBDCs.

Banknotes are anonymous: even the central bank that issues them has no knowledge of who the holders are. Central banks today do not know the details of people's daily transactions. The other side of this coin is that the authorities do not ask central banks to provide such information, which helps to maintain their independence.

Assume for a moment that a central bank issued a CBDC and gathered information

about people's daily transactions. How should the central bank, which is guaranteed (and expected to maintain) a certain degree of independence, respond to requests from the police or the tax authorities to provide evidence in an investigation of tax evasion or other criminal activity?

The People's Bank of China is a central bank but is also an administrative agency of the Chinese government, so it might have less difficulty responding to such a request. But in Japan and many other countries, the central bank is viewed as something that is separated from a government agency and administrative power.

Inoue: What about the issue of returning information to the private sector?

Yamaoka: As you mentioned, there is the question of whether the central bank is capable of deciding to sell valuable data to some private-sector companies but not to others.

This is related to the question of whether it is appropriate for a central bank to issue a general-purpose CBDC and collect a wide range of information and data about retail payments. We need to seriously consider not just how information and data about personal transactions should be used but also who should collect them.

Inoue: In theory, I suppose different types of information could be handled differently, but that might prove difficult in practice.

Yamaoka: General-purpose CBDCs raise a host of issues. That is why central banks have chosen to discuss them separately from wholesale CBDCs.

That said, unless the Bank of Japan does everything it can to catch up to the world leaders in this area, the yen may no longer be a competitive currency infrastructure 10 or 20 years from now.

The study of CBDCs can be viewed as one aspect of the global infrastructure and platform competition whereby countries are trying to ensure their currencies will remain relevant and viable in the future. Inasmuch as demographic trends make a sharp surge in Japanese economic growth unlikely, Japan will at the very least need to secure and maintain a technological advantage if it wants to ensure the competitiveness and utility of its currency.

Former Bank of England Governor Mervyn King said in a famous speech in 1999 that “there may well be fewer central banks in the future.”

As the global economy becomes increasingly digitalized, currencies that have lost their users’ trust as well as currencies that are not as efficient as others are likely to be gradually weeded out in the currency infrastructure competition. More countries may decide that it makes more sense to join another currency zone that boasts greater credibility and utility and thereby share in the advantages of that platform than to continue the difficult process of trying to maintain their own currency infrastructures. When considering CBDCs, we should not overlook the increasingly fierce competition that is unfolding between currency infrastructures in the digital economy.

Inoue: Japan will need to work hard to win the innovation battle, but it still has a fighting chance.

Thank you for contributing to today’s wide-ranging discussion of CBDCs.



about NRI

Founded in 1965, Nomura Research Institute (NRI) is a leading global provider of system solutions and consulting services with annual sales above \$4.5 billion. NRI offers clients holistic support of all aspects of operations from back- to front-office, with NRI's research expertise and innovative solutions as well as understanding of operational challenges faced by financial services firms. The clients include broker-dealers, asset managers, banks and insurance providers. NRI has its offices globally including New York, London, Tokyo, Hong Kong and Singapore, and over 13,000 employees.

For more information, visit <https://www.nri.com/en>

.....

The entire content of this report is subject to copyright with all rights reserved.
The report is provided solely for informational purposes for our UK and USA readers and is not to be construed as providing advice, recommendations, endorsements, representations or warranties of any kind whatsoever.
Whilst every effort has been taken to ensure the accuracy of the information, NRI shall have no liability for any loss or damage arising directly or indirectly from the use of the information contained in this report.
Reproduction in whole or in part use for any public purpose is permitted only with the prior written approval of Nomura Research Institute, Ltd.

Inquiries to : Financial Market & Innovation Research Department
Nomura Research Institute, Ltd.
Otemachi Financial City Grand Cube,
1-9-2 Otemachi, Chiyoda-ku, Tokyo 100-0004, Japan
E-mail : kyara@nri.co.jp

<http://fis.nri.co.jp/en/publication/special.html>

.....