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The Future of Monetary and Payment Systems Under Technological Innovations and Geopolitical Tensions

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(English translation based on the Japanese original)

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Introduction

It is my great pleasure to be here today. At the Bank of Japan, I have been involved in payment system issues for quite a while. The payment and settlement systems are indispensable and important infrastructures that support the basis for economic and social activities. However, payments and settlements have long remained inconspicuous. In the past, it was no exaggeration to say that only a small number of experts in central banks ever discussed these issues seriously. Recently, however, more experts over a wider range have entered this area and begun to actively discuss the future of payment systems, or more broadly, the future of monetary and payment systems. I assume that there are technological innovations and geopolitical tensions behind such a change. Today, I would like to speak about "the future of monetary and payment systems under technological innovations and geopolitical tensions."

I will start with global topics regarding the monetary and payment systems. I will then explain the basic characteristics of the conventional monetary and payment systems. Lastly, I will share some of my thoughts with you on the future of payments. Please note that the views expressed today are solely my own and not those of the Bank of Japan.

I. Impacts of U.S. Presidential Actions

In January this year, President of the United States Donald J. Trump signed an Executive Order titled, "Presidential Actions: Strengthening American Leadership in Digital Financial Technology." Two important points should be highlighted in these actions. One is the prohibition by the U.S. of any action to establish, issue, or promote Central Bank Digital Currencies (CBDCs). The other is the promotion of the development by the U.S. of U.S. dollar (USD) stablecoins in order to promote and safeguard the sovereignty of the USD.

Of these actions, the prohibition of CBDCs was anticipated to some degree. In the U.S., the banking industry as well as some political lobbyist groups had expressed strong concerns about the potential impact of CBDCs in terms of financial intermediation and/or privacy protection. On the other hand, the U.S. Administration's clear stance on promoting USD stablecoins globally invoked a strong sense of caution among policymakers around the world. The reason is that stablecoins can circulate widely across borders, while CBDCs are usually intended to be circulated domestically. It is easy to imagine that policymakers in many

jurisdictions have concerns about the risk of currency substitution by USD stablecoins, especially if people in those jurisdictions do not have sufficient trust in their sovereign currency.

Next, I would like to talk about what CBDCs and stablecoins are, and why they have attracted so much attention.

II. Central Bank Digital Currency

Central Bank Digital Currency (CBDC) is a digital form of money that central banks provide for the general public. At present, the Bank of Japan provides "Bank of Japan notes" and "Bank of Japan current account deposits" as central bank money. "Bank of Japan notes" are provided and used for daily small value payments by the general public. "Bank of Japan current account deposits" are provided and used for large value payments by financial institutions that hold current accounts with the Bank of Japan. While banknotes are paper-based money, current account deposits are money in a digital form settled through an IT system called the BOJ-NET. A CBDC is another form of central bank money that should be distinguished from these two. It is a liability of the central bank.

As private digital payment instruments have come to be widely used while the circulation of cash such as central bank notes has rapidly declined in some jurisdictions, such as Sweden and China, CBDCs have become a matter of discussion. In the 2010s, the central banks in these jurisdictions were the first central banks to seriously investigate the possibility of introducing CBDCs. In 2019, Facebook (currently renamed as Meta) unveiled a plan to issue global stablecoins called "Libra coin." This project reignited global discussion of CBDCs. In the "Libra" project, "Libra coin," denominated in an original unit of account detached from any sovereign currency, could function as a means of payment to facilitate global transactions using blockchains. At that time, Facebook had about 2 billion account holders. It was conceivable that payment transactions between these 2 billion account holders could be easily made with the Libra coin.

Governments, monetary authorities, and central banks around the world saw this plan as a serious threat to the existing monetary and payment systems and decided to take a series of

actions. First, they began discussion on how to regulate stablecoins. Second, since this plan stems from the fact that users were frustrated with the inconvenience of existing monetary and payment systems, the Group of Twenty (G20) adopted an agenda of improving cross-border payments, which had been considered for a long time to have a large number of pain points that needed to be addressed. Furthermore, many jurisdictions began to seriously explore the possibilities of CBDCs. In Japan, the Bank of Japan initiated a CBDC investigation and experimental project in 2020.

Since then, almost five years have passed. It seems that central banks' views on CBDCs have diverged across jurisdictions. The U.S. has prohibited CBDCs. Canada and Australia are also negative about introducing retail CBDCs. On the other hand, China is still working on wider adoption of its CBDC, called "Digital yuan." In the euro area, the European Central Bank (ECB) is also working toward the introduction of its CBDC, called "Digital euro."

In China, the government and central bank strive for the adoption of the digital yuan because they face an issue of how the public sector performs its responsibilities to ensure stable provision of small value payment instruments to the general public in a digitalized society, while private digital payment instruments such as Alipay and WeChat Pay are already widely used. In the euro area, the ECB believes that there is a need to ensure the strategic autonomy of the euro area in the monetary and payment systems given that most digital small value payment instruments in the euro area are provided by foreign capital companies. Then, what about Japan? I will come back to this point later.

III. Stablecoins

Stablecoins are a type of crypto asset distributed on blockchains. However, stablecoins are different from crypto assets such as Bitcoins, which are volatile in value. Stablecoins are designed to maintain a stable value and can be used for payments. Among stablecoins, there are two types. One type is stablecoins that are designed to ensure the stability of value to be used for payments. In the U.S., such stablecoins are often called "payment stablecoins." The other type is stablecoins that are not so stable in value. I would say the former includes "USDC" and "PayPal USD." The difference between these two types is mainly due to the difference in the safety and liquidity of backing assets.

For example, payment stablecoins are backed by assets composed of mostly bank deposits and short-term government securities, which are safe and highly liquid. These backing assets are segregated from an issuer's own assets, and the value of stablecoins is safeguarded from default risk of an issuer. In contrast, if the backing assets of those stablecoins are illiquid and are subject to credit risk, it is questionable whether redemption requests will be swiftly honored at par value.

In the GENIUS Act, recently passed by the U.S. Congress, "payment stablecoins" are defined as digital assets that are to be used as a means of payment or settlements. Non-banks as well as subsidiaries of depository institutions are eligible to issue these stablecoins. As I have already mentioned earlier, stablecoins can circulate widely across borders, as they can circulate freely on permissionless blockchains.

At present, it is assumed that the main cases for the use of stablecoins include payments for trading of crypto assets. They are also used for certain cross-border payments. However, cross-border payments using stablecoins issued on permissionless blockchains may raise concerns about the higher risk of illicit payments, as performing Know Your Customer (KYC) checks is more difficult compared with bank deposit money.

Next, I will explain the basic characteristics of conventional monetary and payment systems, which will help understand the strengths and weaknesses of stablecoins.

IV. Characteristics of modern monetary and payment systems

Three layers of monetary and payment systems

Broadly speaking, the modern monetary and payment systems consist of three layers. The first layer is the payment systems in which central bank money is used as settlement assets. In Japan, central bank money includes Bank of Japan notes and Bank of Japan current account deposits. For example, the BOJ-NET, which uses Bank of Japan current account deposits as settlement assets, forms this first layer.

The second layer is the payment systems in which commercial bank deposits are used as

settlement assets. Deposit transfer systems operated by commercial banks form this second layer.

The third layer is the payment systems in which non-bank private money such as e-money issued by non-bank payment service providers is used as settlement assets. For example, the payment mechanism for "xxPay" and/or prepaid e-money issued by public transportation companies forms this third layer.

Please note that commercial bank deposits used as settlement assets in the second layer are based on the existence of central bank money in the first layer. For example, when depositors withdraw their deposits, deposits are paid out by cash such as Bank of Japan notes. Or when depositors transfer their deposits held at a bank to another bank, the payer bank needs to make interbank settlement with the payee bank using Bank of Japan current account deposits.

Non-bank private money used as settlement assets in the third layer is based on the existence of the money in the first and the second layers. For example, in order to obtain or top up e-money, people use cash or credit cards where their bank deposits are later transferred from their accounts to the accounts of the issuers of e-money. In the case of prepaid e-money, redemption is not usually expected in Japan, but if redemptions are necessary, prepaid e-money can be paid back by cash.

Settlement mechanism of conventional money

Putting aside cash, such as Bank of Japan notes, for now, I would like to explore the features of the conventional monetary and payment systems consisting of three layers. As for Bank of Japan current account deposits, commercial bank deposits or e-money by non-banks, issuers of each type of money are responsible for verifying the transfer of money. For example, the Bank of Japan is responsible for verifying the transfer of money by debiting and crediting the current accounts of financial institutions held at the Bank. Similarly, commercial banks verify the transfer of money by debiting and crediting deposit accounts of their depositors. Issuers of e-money also verify the transfer of money by debiting and crediting their users' accounts. With these mechanisms, financial institutions, as issuers of money and operators of payment mechanisms, can perform KYC checks at the timing of onboarding customers, and can be

alert to illicit payments by monitoring the track records of payments by customers.

On the other hand, this type of money requires additional mechanisms in order to establish a wide range of payment networks beyond the issuers' systems. If everyone has a bank deposit account at the same bank, this single bank can handle all payments by debiting and crediting its own ledger system. However, such a situation is highly unlikely. Therefore, for domestic payments within Japan, commercial banks need to hold current accounts at the Bank of Japan. When a bank customer sends money to another bank's customer via bank accounts, the following three steps are taken.

Step 1: The sending bank debits the payer's deposit account and sends a payment instruction to the Bank of Japan.

Step 2: The Bank of Japan then debits the sending bank's current account and credits the receiving bank's current account held at the Bank.

Step 3: Once the receiving bank confirms the receipt of money at the Bank of Japan, the bank then credits the payee's deposit account.

Step 1 represents a decrease of "deposit (liability) of the sending bank," Step 2 represents a decrease and increase of "deposit (liability) of the Bank of Japan," and Step 3 represents an increase of "deposit (liability) of the receiving bank." In other words, "deposit of a sending bank" is not directly transferred to a payee. Instead, payments are completed by sequentially changing settlement assets from the "deposit of the sending bank," "deposit of the Bank of Japan" to "deposit of the receiving bank." Historically, efforts to ensure smooth execution of these steps led to the evolution of payment and settlement systems of central banks and/or interbank clearing in many jurisdictions, and these infrastructures were digitalized during the last century.

Complexities of cross-border payments

While domestic interbank payment systems have evolved to achieve a certain level of efficiency, cross-border payment systems seem to have lagged behind. This is because it is

not feasible to have a single central bank and a single payment system to settle all cross-border payments. As those of you in the banking industry may be well aware, in order to make cross-border payments through banks, commercial banks need to establish correspondent banking relations with foreign banks and open a correspondent deposit account (a Nostro/Vostro account). Given such correspondent banking relations, for example, a sending bank in Japan converts Japanese yen (JPY) received from a payer into USD by using deposits at its correspondent bank in the U.S., and requests the correspondent bank in the U.S. to send USD on its behalf to the receiving bank at which a payee has a deposit account. In this payment process, there is no central bank nor payment system in between that can provide payment services centrally to the sending bank in Japan and the receiving bank in the U.S. Instead, the commercial bank deposits in JPY and USD held at correspondent banks are used for interbank settlement, and payment messages are sent through the financial messaging system called Swift among relevant banks in this payment chain. By the way, Swift is not a payment system. Swift delivers payment messages but it does not handle the transfer of money by itself. The transfer of money in cross-border payments is conducted by debiting and crediting bank deposit accounts at correspondent banks.

Uniqueness of transfer mechanism of stablecoins

On the other hand, stablecoins, particularly those circulating on a permissionless blockchain where holders are not basically restricted, have quite different mechanisms of verifying the transfer of money from those of central bank money, commercial bank deposit money, and e-money by non-banks. Issuers of stablecoins are not responsible for verifying the transfer of money. The transfer of stablecoins is verified by participants via encryption keys and a consensus algorithm employed by the blockchain. If an internet connection is available and a kind of standardized software that allows access to blockchains is installed on computers, payment networks using stablecoins can be expanded globally and rapidly with low cost. If a bank tries to provide its deposit money across the world, it needs to obtain a banking license and meet various regulatory requirements in each jurisdiction, and thus the associated cost would likely be quite large. Compared with this, the expansion of a payment network using stablecoins is much easier to achieve.

Meanwhile, there would also be a downside. As mentioned before, in the case of using a

permissionless blockchain, it is more difficult to perform a KYC check at the timing of onboarding users, as well as on an ongoing basis, to confirm whether a wallet is used by the right user. As a result, it is often pointed out that the risk of illicit payments can be high with payment networks using stablecoins.

V. Improving international payment infrastructure

When used for payments, the transfer process of stablecoins is very simple. Stablecoins are directly transferred from a payer to a payee on a blockchain without changing the issuers of money. In addition, smart contracts embedded in blockchains are available. By using smart contracts, automation of various payments and payment-related operations can be easily achieved. Thus, many people believe that the convenience of payment systems can be enhanced. With the simplicity of transfer mechanism and the convenience due to automation, it is expected that the use of stablecoins can bring efficiency gains, particularly in cross-border payments, where the transaction process is lengthy and complex. But at the same time, as mentioned earlier, the risk of illicit payments may become higher.

Bank-led initiatives using bank deposit money

Confronted by competition with stablecoins, the conventional monetary and payment systems have launched several new initiatives in response. One of the major initiatives is to develop the bank deposit-based payment systems on blockchains or, more generally, by using Distributed Ledger Technology (DLT). The pioneering experimental project has been carried out by a group of U.S. banks. This project, called "Regulated Liability Network (RLN)," aims at testing the concept of a common platform using DLT on which bank deposit ledgers of commercial banks and a central bank reserve ledger are developed. Using smart contacts, the RLN project aims at a significant improvement of the efficiency and convenience of various payments and payment-related operations. While the change in issuers of bank deposits to process payments still needs to occur, the operational efficiency of complicated processes would improve significantly by automation using smart contracts. It would therefore not be an insurmountable problem. While this project appears to be successful, the target of the project is limited to USD domestic payments.

Sometime later, the concept of "Unified Ledger" was proposed by the Bank for International

Settlements (BIS). A "Unified Ledger" is a grand idea that expands the concept of RLN to cover currencies other than USD as well as various digital assets to be managed on a DLT platform. While this idea needs to be supported by robust understanding of practical matters, the BIS launched an international experimental project named "Project Agorá," to test whether cross-border payments can be improved using the concept of a unified ledger. A number of central banks have participated in this project, including the Bank of Japan.

"Project Agorá" is the largest international experimental project in geographical scope, bringing together seven central banks and more than 40 private financial institutions from seven jurisdictions, namely Japan, the U.S., and the U.K.; France representing the euro area; and then South Korea, Mexico, and Switzerland. By developing a common DLT platform, and managing central bank deposit accounts and commercial bank deposit accounts on this platform, Project Agorá aims to establish an infrastructure to facilitate cross-border payments where currency conversions can be done efficiently and smoothly on a 24/7 basis. Project Agorá aims to improve the operational efficiency of cross-border payments as well as payment-related operations such as pre-validation of accounts and checks for Anti-Money Laundering and Countering the Financing of Terrorism (AML/CFT). While it is not an easy task to build such a new infrastructure, the success of the project could bring groundbreaking results. Members of participating institutions are now working hard on this project.

As seen in RLN and Project Agorá, bank deposit money managed on a DLT platform is called a "tokenized deposit." Here, tokenization means managing (e.g. issuing, holding, and transferring) digital money and digital assets on a programmable platform. "Programmable" signifies that programs such as smart contracts can be deployed and several such programs can be combined (so-called composability) on a DLT platform.

Impact of geopolitical risk

There are many other projects that aim to improve cross-border payment infrastructures. While Project Agorá has been launched for the purpose of testing the concept of a "Unified Ledger," there are some projects that seem to be motivated at least partly by geopolitical considerations.

For example, in response to the Russian invasion of Ukraine, international financial sanctions have been imposed on Russia. These include the exclusion of certain Russian banks from the Swift network. In response to these and previous sanctions, Russia has worked on developing alternative payment networks that are not dependent on Swift and banking systems in western countries. In addition, there are unconfirmed media reports that BRICS countries are now pursuing the development of new international monetary and payment systems.

As the economic presence of emerging economies has been increasing, some emerging economies are undertaking initiatives to develop a new payment and settlement infrastructure for facilitating cross-border payments. For example, China, Hong Kong, Thailand, UAE, and Saudi Arabia have worked on a cross-border project named mBridge. In mBridge, a DLT platform has been developed on which central banks issue central bank money. Each central bank allows foreign commercial banks to hold central bank money directly on the platform. By allowing this, participating commercial banks can make cross-border payments without using the traditional correspondent banking networks. Since participating banks can hold foreign central bank money directly, they can settle the currency conversion transactions from payers' local currency to payees' local currency by themselves. This is considered to be a significant change to conventional central bank access policy. Furthermore, some jurisdictions are promoting the interlinking of domestic Fast Payment Systems (FPS) in order to make small value cross-border payments faster and cheaper. While there are reasons for promoting all these initiatives, if these projects are designed to exclude international currencies and financial institutions of other jurisdictions, this may lead to a fragmentation of international monetary and payment systems. We need to watch carefully to avoid such a problem.

Regarding USD stablecoins, which the U.S. will likely promote, there has been a growing sense of caution mainly among emerging economies. USD, as a vehicle currency, is a very useful currency in foreign exchange transactions. In addition, the USD market is the most liquid market for international investment funds. Meanwhile, few emerging economies want to accept dollarization, since it would increase the risk of losing the controllability of their economic policies. I do not take the position that USD stablecoins alone will promote further dollarization in many emerging economies, but I assume that USD stablecoins could expand

options to invest in USD liquid assets for many people, and in some cases, USD stablecoins may become the gateway to USD crypto assets. In addition, these stablecoins may be used to circumvent the capital controls of emerging economies.

In this way, it seems that more jurisdictions are now exploring various design options to build international monetary and payment systems that are more favorable to their own jurisdictions by taking advantage of new technologies.

VI. Central bank's responsibility in retail payments

Next, I will turn to the topic of retail payments, particularly CBDCs. I have explained earlier about the background of China and the euro area promoting CBDCs. While China pays attention to the large presence of private digital payment instruments, the euro area pays attention to the large presence of digital payment instruments provided by foreign capital companies. These jurisdictions appear to have the common issue of how the governments and central banks should carry out their responsibilities in providing people with safe and secure small value payment instruments that can be used in their daily lives.

This issue is also raised and shared in jurisdictions where CBDCs are not pursued. In the U.S., the Federal Reserve (Fed) has historically been active in providing various retail payment services. Recently, the Fed launched the FedNow Service, an FPS operated by the Fed. While Real-Time Payments (RTP), an FPS operated by the private sector, had been in operation since 2017, many small financial institutions in regional communities did not use RTP. As a result, customers of these financial institutions have not been able to access 24/7 instant payment services. This also raises the issue of financial inclusion. In addition, the FedNow could increase the resilience of small value payments in the U.S. by providing an alternative in case of failure of RTP.

In Sweden, Swish, an FPS operated by the private sector, has been widely used for small value payments. The Riksbank, the central bank of Sweden, has decided to take on the role of operating the backend systems of Swish in terms of business continuity and resilience of Swish. While the user interface is unchanged, the interbank real-time settlement system of Swish is now operated by the Riksbank using the TIPS platform developed by the Eurosystem

to settle small value payments in euro in real time. Swish payments in Swedish Krona are settled as a part of the TIPS platform.

While CBDCs are not pursued in the U.S. and Sweden, central banks in both jurisdictions take actions to ensure the resilience and stable provision of small value payment instruments. The Fed directly operates the FPS and the Riksbank operates the backend systems for the private sector solution.

Many central banks around the world have provided central bank notes for small value payments and central bank deposits for large value payments. As for large value payments, systemic risk consideration has been a top priority for central banks due to the large value of payments. In this regard, central banks have upgraded their payment systems from deferred net settlement (DNS) to an RTGS system. As for small value payments, rather than containing systemic risk, ensuring universal availability has been a top priority. In other words, central banks focus on ensuring people's access to payment instruments, regardless of time and place. As the economy and society are becoming more digitalized, central banks are likely to be confronted by the issue of achieving universal availability of small value payment instruments in a resilient manner.

VII. Future of payments

As I have discussed today, new types of digital money and payment systems using new technologies are emerging. From an economic perspective, this can be interpreted as competition and/or new coordination between the conventional players and new players in payment systems. From a geopolitical perspective, it can be also interpreted as competition and/or new coordination among jurisdictions and among sovereign currencies. It is still too early to say what impact these economic and geopolitical dynamics will have on the future of payments. Based on my experience as a central banker working in the field of payment systems, I would like to raise some major issues and share my current thoughts.

Stablecoins and tokenized deposits

The first issue is the similarities and differences between stablecoins and tokenized deposits. Both are settlement assets managed on a platform developed using DLT. Both can be

programmed using smart contracts. However, there are two major differences. One is in their financial structures, and the other is in their operational structures.

Looking at the financial structures, tokenized deposits entail a credit creation (or money creation) function, since tokenized deposits are essentially commercial bank deposits in nature. Imagine a case where outgoing payments precede incoming payments, payers need to prefund a large amount of money to make daily payments. If payers use bank deposit money as settlement assets, they can tentatively utilize overdraft facilities provided by their bank. They can make outgoing payments first, and pay back the overdraft with incoming payments received later. This process can be completed very smoothly.

On the other hand, stablecoins are settlement assets that require prefunding. Unlike tokenized deposits, stablecoins do not entail a credit creation function. If payers use stablecoins as settlement assets, they need to purchase stablecoins in advance. This can be a huge burden, especially when making large value payments. If stablecoins are used as settlement assets for large value payments, it would be better to confine their uses to the extent that there would be no material problem in funding liquidity.

Looking at operational structure, since tokenized deposits are bank deposits in nature, payments across different banks require multiple banks to debit and credit their ledgers on the platform. Issuers of deposits are sequentially changed in a payment chain. (Since issuers of tokenized deposits are responsible for verifying the transfer of money, they would be willing to take a leading role in this verification in many cases, even if some type of consensus algorithm is implemented.)

On the other hand, in the case of using stablecoins, coins issued by the same issuer are transferred directly from a payer to a payee on a blockchain without changing the coin issuer. This process is very simple in the sense that there is no need for a change in issuers of money. Therefore, stablecoins are considered operationally more efficient than commercial bank deposit money in nature. However, as a reflex effect of this direct transfer, the compliance check, whether illicit payments are handled or not, depends on parties other than issuers, which shows a stark difference from tokenized deposits. In addition, such a comparative

advantage in the operational efficiency of stablecoins can be neutralized by tokenized deposits utilizing smart contracts on the same platform, which improves the operational efficiency of the transfer of commercial bank deposit money.

Another reflex effect of "the direct transfer of coins from a payer to a payee" is that the mechanisms to ensure the singleness of money are not in place for stablecoins. The singleness of money means that monies used as settlement assets can be readily convertible to central bank money. This forms the foundation for efficient economic activities. In the case of commercial bank deposit money, commercial banks need to demonstrate their ability to convert their deposits to central bank money at par value every time they need to make interbank settlement payments. On the other hand, in the case of stablecoins, the issuers of coins do not need to demonstrate their ability to convert (or redeem) their coins to central bank money or commercial bank deposit money at par value as often as issuers of commercial bank deposits, since they do not need to change settlement assets to make payments. In fact, holders of stablecoins usually have to sell their stablecoins in the market via intermediaries when converting their stablecoins back to a fiat currency, rather than requesting redemption from the issuers. While this may be favorable for the issuers of stablecoins in view of investing their assets, the holders of stablecoins may be exposed to the risk of deviation from par value. Thus, it is hard to say that stablecoins ensure the singleness of money.

At the same time, mechanisms to ensure the singleness of money between tokenized deposits of commercial banks and central bank money are also required. Therefore, it is desirable to manage not only commercial bank money but also central bank money on the same platform in order to make interbank settlement using tokenized deposits safe and efficient. Project Agorá adopts such a scheme.

Roles and implications of stablecoins

While stablecoins and tokenized deposits have both strengths and weaknesses, the core system of modern monetary and payment systems will be the system using bank deposit money. While there is a role for stablecoins as a complement to bank deposit money, it is unlikely that stablecoins will become the core of the monetary system. Due to lack of a credit creation function, stablecoins have no proper mechanisms for adjusting the quantity of money

to accommodate changes in demand for settlement assets. If demand for stablecoins for making payments increases, people will borrow money from banks to buy stablecoins and use them for settlement. In the end, bank deposit money is the one through which the quantity of money is adjusted, while stablecoins improve and streamline the payment process.

Or if monetary and payment systems depending totally on stablecoins were to be established, the following situations would likely occur.

Let us assume that stablecoins used as a means of payment are 100 percent backed by government bonds, and demand for settlement assets shifts from bank deposit money to stablecoins. In such a world, in order to accommodate increased demand for settlement assets along with economic expansion, the governments would increase the issuance of bonds and increase the expenditure accordingly. In the conventional world, when demand for bank deposit money as settlement assets increases along with economic expansion, the banking sector would provide money through the credit creation function. In comparison, in the case where stablecoins backed by government bonds take the core role in the monetary and payment systems, the role of the government in allocating resources within an economy will substantially increase.

While there may be differences across jurisdictions, market economies in the world tend to have the belief that the two-tier system, where credit is extended and allocated by the commercial banking sector supported by central banks, would be better for long-term economic growth than a centralized resource allocation system by the government. Stablecoins are expected to deliver some efficiency gains in payment systems. However, if stablecoins were to become the core part of the monetary and payment systems, there would be a fundamental change in how the economy is viewed.

Thinking on an international common platform

I have mentioned earlier that there is a risk of fragmentation in international monetary and payment systems due to the emergence of new technologies and geopolitical dynamics. As international connections are important for many economies to achieve economic growth, it is necessary to avoid such a fragmentation risk.

In this respect, the Bank of Japan shares the basic thinking on building an international common platform, an infrastructure for improving international payments and settlements. There are four items to be considered.

First, a common platform should be open, transparent, and secure while being distributed in terms of monetary sovereignty. This is an important principle that allows various jurisdictions and entities to participate in the platform.

Second, a common platform should be designed to avoid harm to the price formation process and market liquidity of the relevant financial markets. This means that it is necessary to have efficient mechanisms for price formation via international reserve currencies and vehicle currencies such as USD.

Third, a common platform should also provide functionalities that facilitate transaction processes closely related to settlement. This is intended to reduce the burden of payment-related operations such as AML/CFT checks.

Fourth, a common platform should provide functionalities for ensuring smooth settlement, such as gridlock resolution mechanisms and intraday liquidity funding facilities. Given that cross-border payments require the processing of many large value foreign exchange transactions for settlement, financial institutions may avoid using the common platform if these liquidity facilities are not available.

The Bank of Japan has been making efforts to incorporate these ideas into the improvement of cross-border payments by sharing the basic thinking at various international fora and workstreams of Project Agorá.

Roles and implications of CBDC

I have explained earlier that while there are divergent views on the introduction of CBDCs, there are some common issues regarding how to ensure universal availability and resilience of small value payments in each jurisdiction. Why, then, does each jurisdiction come up with

a different view toward CBDC?

A CBDC is money provided in the first layer of the monetary and payment systems. It is intended to be used by the general public. It is not paper based and is transferred by debiting and crediting digital account ledgers. Compared with stablecoins, a central bank as an issuer of money is responsible for managing money but does not basically hold private information.

At the beginning, I pointed out that CBDCs are something like digital banknotes. Precisely speaking, CBDCs, compared with banknotes, provide a means of payment function that is more convenient than banknotes, but have limitations in terms of the store of value function of money. These limitations reflect the upper holding limits to be set on CBDCs in order to avoid large-scale shifts of funds from bank deposits to CBDCs, which would impair the financial intermediation of banks. Because of this, CBDCs cannot be settlement assets used for the redemption of bank deposits.

This implies, at least for the time being, that we cannot abolish central bank notes. On the other hand, the role of central bank notes as the medium of exchange or the means of payment is expected to decrease going forward. Thus, the important point is how to ensure the universal availability and resilience of digital small value payment instruments that could compensate for the decrease in the use of banknotes. One possible policy action is the introduction of a CBDC. This is an option in which a central bank, together with the government, provides small value payment instruments to make them available to the general public anytime, anywhere. Another policy action is to take regulatory, supervisory, or oversight measures to ensure the availability, safety and resilience of private sector digital payment instruments. There are also mixed approaches. As in the U.S., a central bank may provide an FPS instead. Or as in Sweden, a central bank may provide backend systems to support a private sector FPS.

I believe that the choice of actions depends on the historical path of the payment systems in each jurisdiction as well as the views of the public on the reasonable division of roles. Based on this, I would like to add one more thing that needs careful attention.

In general, payment systems are affected by network effects. Adopting digital technologies may accelerate network effects. As a result, there is a tendency toward monopoly or oligopoly in digital payments. Looking at the cases in other jurisdictions, an oligopoly dominated by two large players is a realistic possibility.

There is some discussion internationally as to whether placing regulatory and supervisory requirements on dominant players in monopolistic and/or oligopolistic markets to ensure the efficiency, safety, and resilience of their services really proves to be effective. For example, it would not be feasible to issue an order to suspend overall service provisions by monopolistic and/or oligopolistic payment service providers, since such an order can halt the payment and settlement functions of the whole economy. If there is a gap between public interests and interests of a monopolistic or oligopolistic entity, the "principal-agent problem" will emerge, and the monitoring cost will increase. If that is the case, there is also a view that rather than constraining players by regulations or contracts, direct control of payment infrastructures by the entity designed to reflect public interests may be a more straightforward and more effective means to ensure policy objectives.

There are various views on this issue. As I have mentioned, there are also various initiatives being taken in other jurisdictions. In Japan, the discussion will continue going forward. Whether CBDCs will be adopted or not, it is necessary to consider proper actions in a digitalized society that will enable people to use digital small value payment instruments safely and securely.

Thank you for your kind attention.

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The Future of Monetary and Payment Systems Under Technological Innovations and Geopolitical Tensions

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Contents

1. Impacts of U.S. Presidential Actions

Presidential Actions: Strengthening American Leadership in Digital Financial Technology (Jan. 2025)

1. Prohibition of Central Bank Digital Currencies (CBDC)

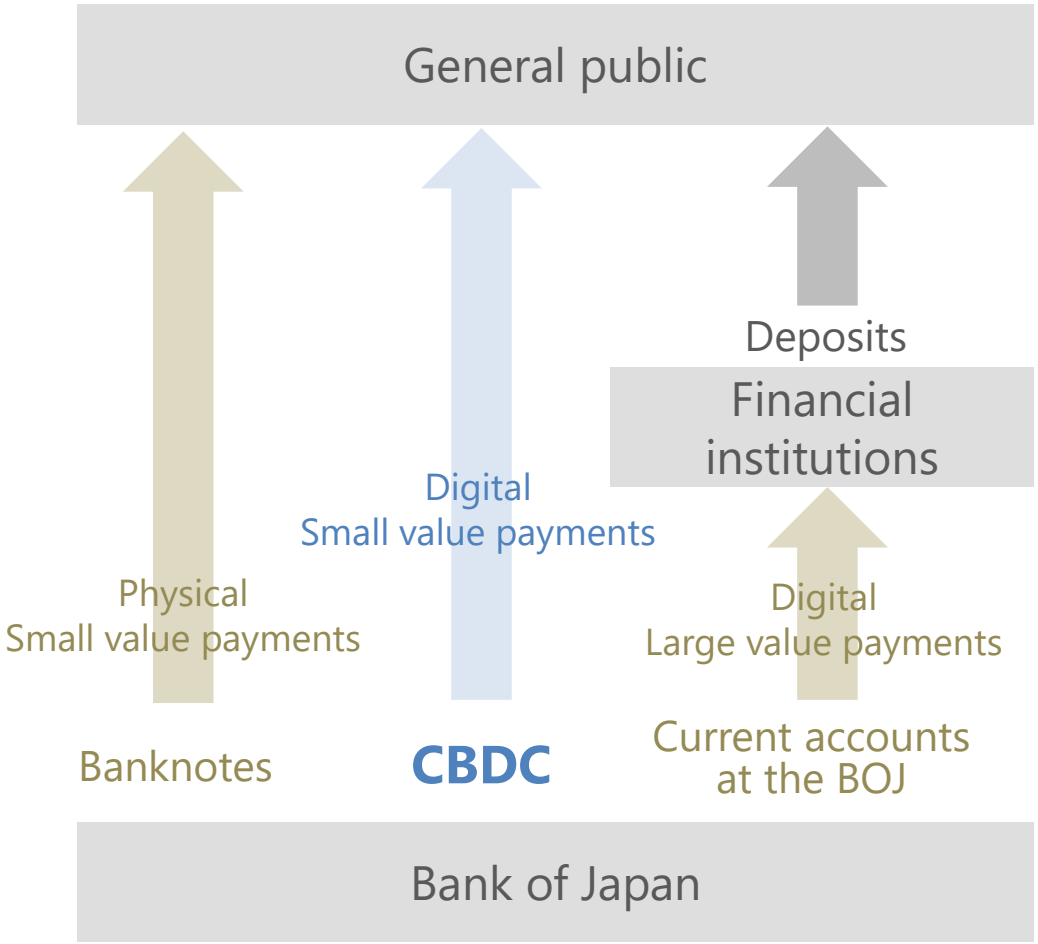
- ✓ "Except to the extent required by law, agencies are hereby prohibited from undertaking any action to establish, issue, or promote CBDCs within the jurisdiction of the United States or abroad"
- ✓ "Except to the extent required by law, any ongoing plans or initiatives at any agency related to the creation of a CBDC within the jurisdiction of the United States shall be immediately terminated, and no further actions may be taken to develop or implement such plans or initiatives"

2. Promotion of USD stablecoins

- ✓ "promoting and protecting the sovereignty of the United States dollar, including through actions to promote the development and growth of lawful and legitimate dollar-backed stablecoins worldwide"

2. Central Bank Digital Currency

Money provided by the BOJ



Discussions on CBDC

2010s

Initiation of CBDC discussions due to the spread of private digital payment instruments and the decrease in cash circulation (Sweden, China, etc.)

2019

"Libra Project" (formerly Facebook)

2020

"The Bank of Japan's Approach to Central Bank Digital Currency"

Present

Divergence of views on CBDC across jurisdictions

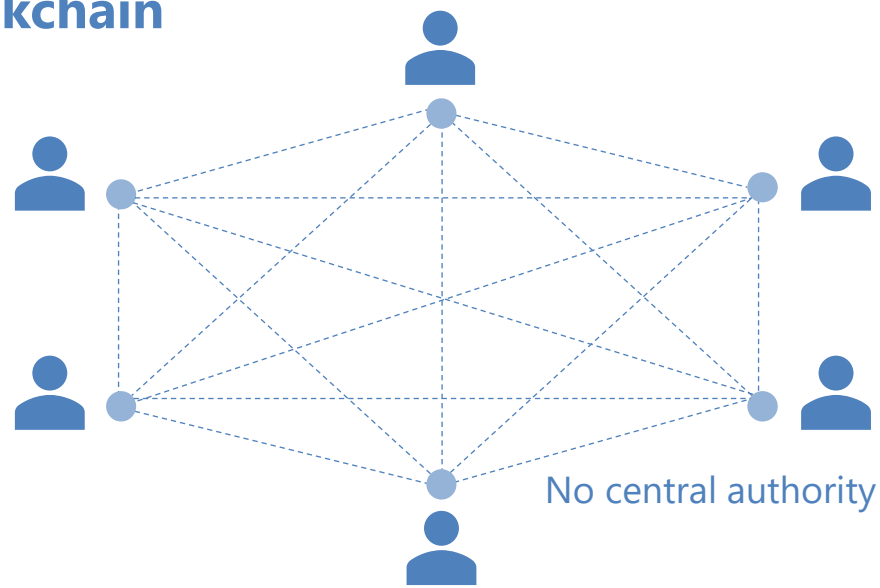
3. Stablecoins

Classification of stablecoins

Assets/money on blockchain	Uses	Backing assets	Examples
Crypto assets	Investment/speculation	Many do not have backing assets	Bitcoin
Stablecoins	Waiting funds for cryptocurrency trading, international remittances	Cryptocurrencies, algorithms, none, etc.	DAI
		Cryptocurrencies, fiat currencies, government bonds, etc.	USDT (?)
Payment stablecoins	Payment use (emphasizing stability of value)	Cryptocurrencies, fiat currencies, government bonds, etc.	USDC, PayPal USD

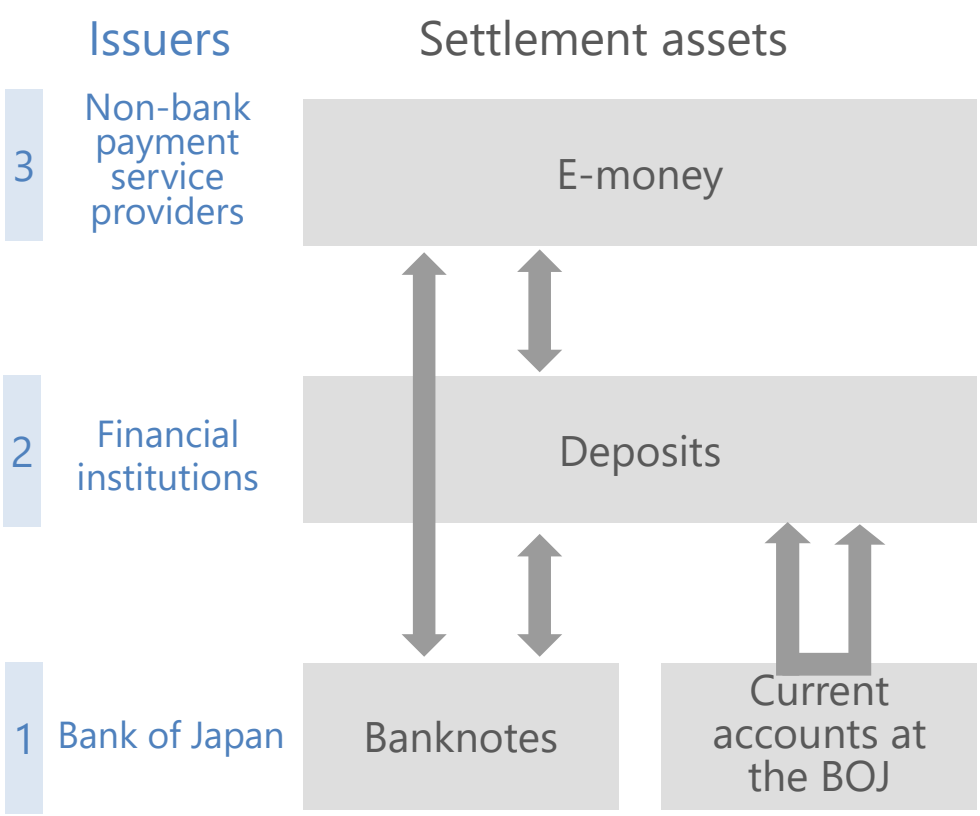
Permissionless blockchain

Open to participation by an unspecified number of people



4. Characteristics of modern monetary and payment systems

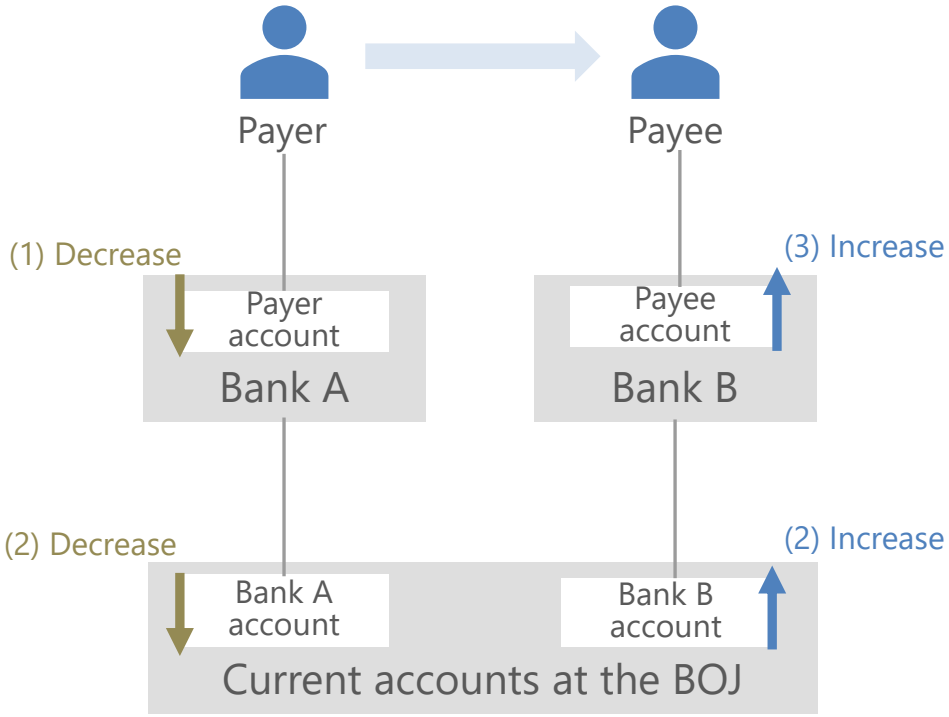
Three layers of monetary and payment systems



Note: In principle, prepaid payment instruments (one form of e-money) are non-refundable.

Settlement mechanism of conventional money

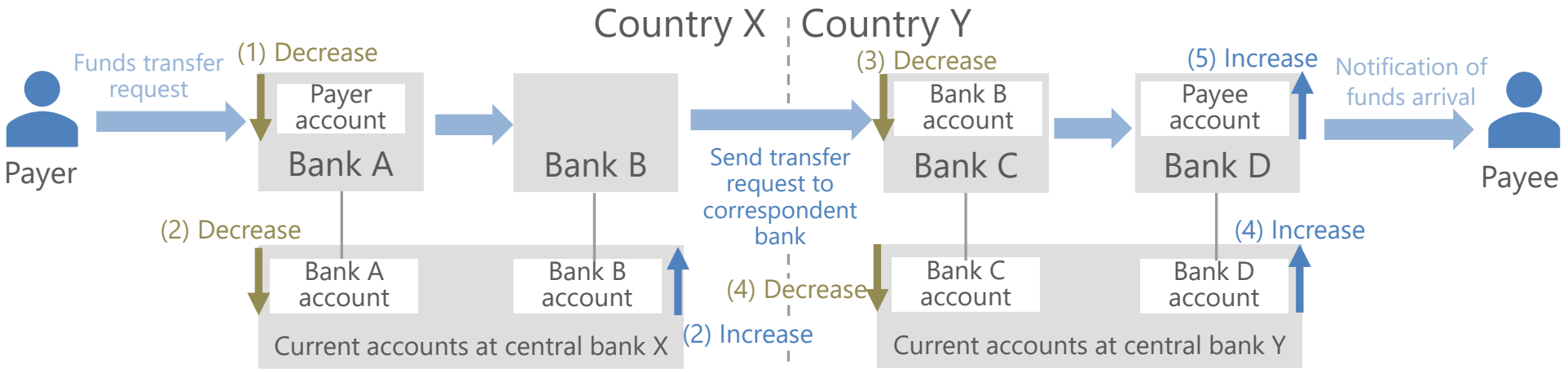
(Case of transferring money using banking system)



Note: For small-value domestic funds transfers, interbank settlement is conducted via Zengin-Net current account (omitted in the chart above).

4. Characteristics of modern monetary and payment systems

Complexities of cross-border payments

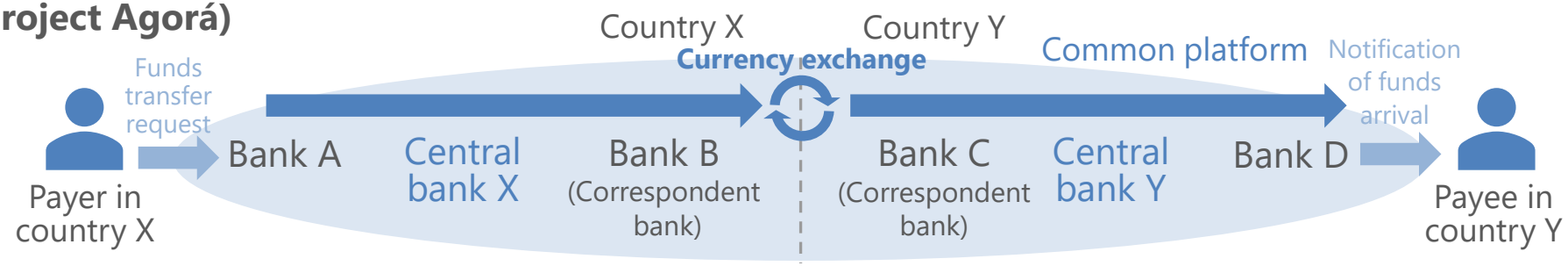


Uniqueness of transfer mechanism of stablecoins

5. Improving international payment infrastructure

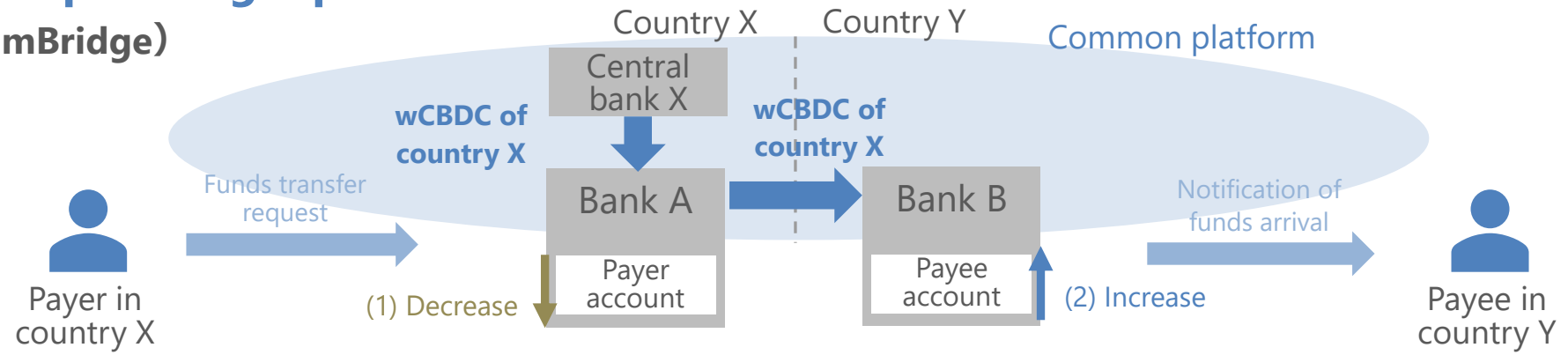
Bank-led initiatives using bank deposit money

(Project Agorá)

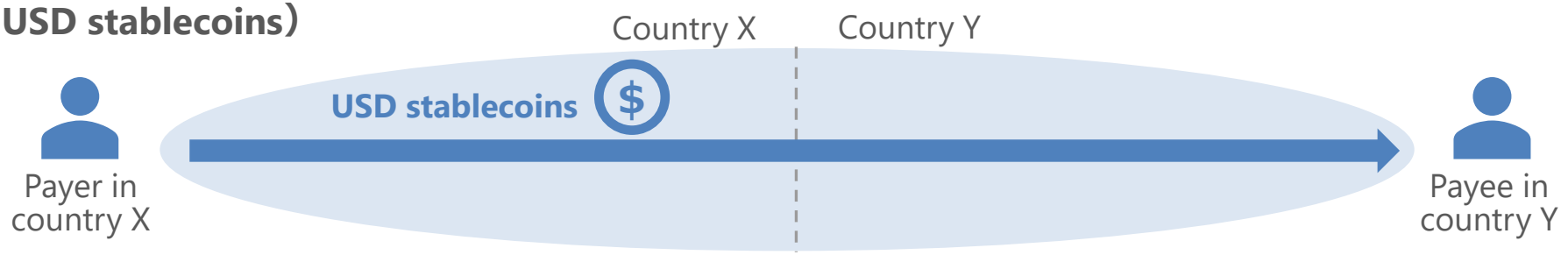


Impact of geopolitical risk

(mBridge)



(USD stablecoins)



6. Central bank's responsibility in retail payments

Initiatives regarding retail payments

Jurisdiction	Initiative	Objectives
China	CBDC	Stable provision of small value payment instruments amid the large presence of private digital payment instruments
Euro area	CBDC	Ensuring strategic autonomy amid the large presence of private digital payment instruments provided by foreign capital companies
U.S.	FedNow	Widespread adoption of 24/7 instant payment services including for small financial institutions Ensuring resilience of small value payments
Sweden	Operating the backend systems of Swish	Ensuring resilience of small value payments

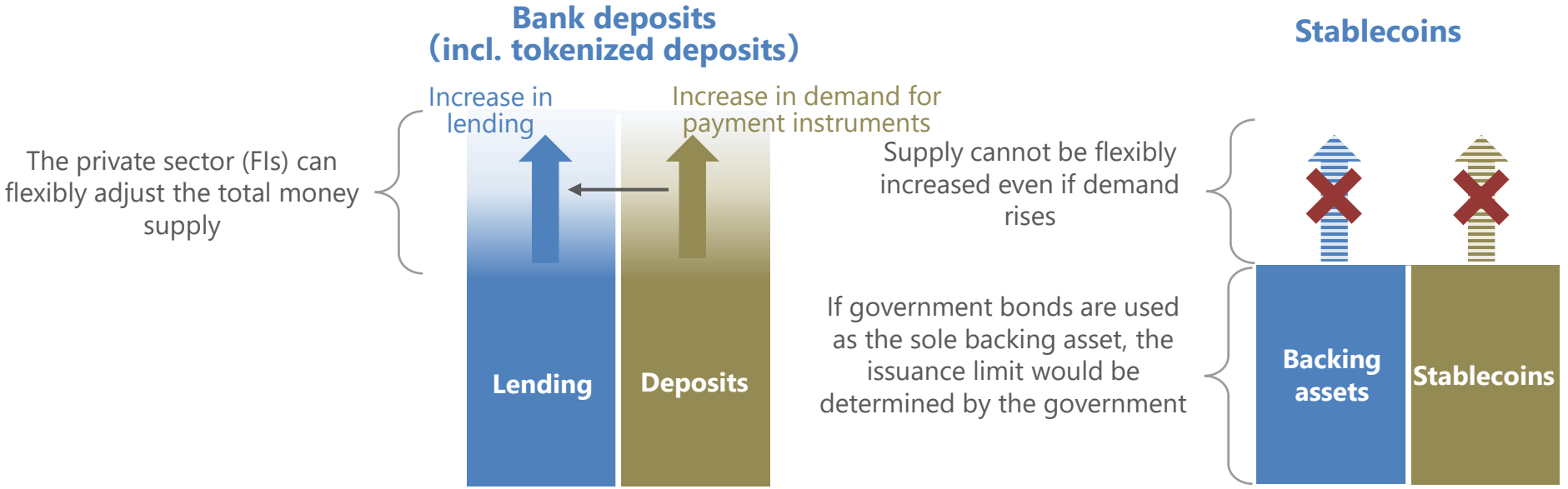
In every jurisdiction, as the economy and society are becoming more digitalized, the central bank will likely be confronted by the issue of achieving universal availability of small value payment instruments in a resilient manner.

7. Future of payments

Tokenized deposits and stablecoins

	Tokenized deposits	Stablecoins
Utilization of DLT	✓	✓
Credit creation function	✓	—
Validation of transfer by the issuer	✓	—

Roles and implications of stablecoins



7. Future of payments

Thinking on an international common platform

- ✓ There is a risk of fragmentation in international monetary and payment systems due to the emergence of new technologies and geopolitical dynamics.
- ✓ BOJ shares the basic thinking on building an international common platform:

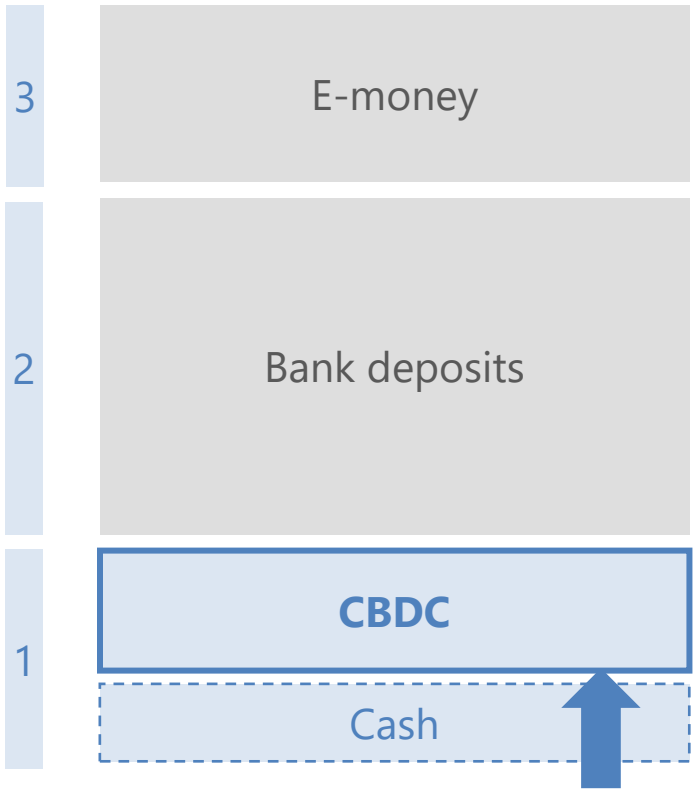
1. A common platform should be open, transparent, and secure while being distributed in terms of monetary sovereignty.
2. A common platform should be designed to avoid harm to the price formation process and market liquidity of the relevant financial markets.
3. A common platform should also provide functionalities that facilitate transaction processes closely related to settlement.
4. A common platform should provide functionalities for ensuring smooth settlement, such as gridlock resolution mechanisms and intraday liquidity funding facilities.

7. Future of payments

Roles and implications of CBDC

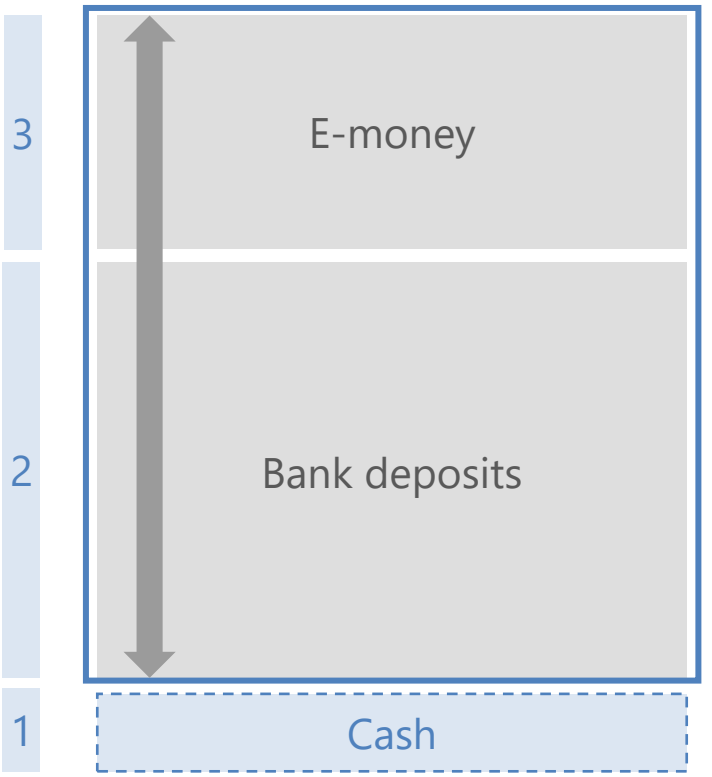
✓ How to ensure universal availability and resilience of small value payments.

(Case where CBDC is introduced)



Direct provision of small value payment instruments through CBDC issuance

(Case where CBDC is not introduced)



1. Regulation, supervision, oversight

2. Central bank provides the system