VII. Future of Payments

The future of payments holds boundless opportunities. In particular, it is essential to develop a payment system that is suitable for further digitalization of economic society. In what follows, in envisioning the future of payments, the benefits and challenges of conventional payment systems are first discussed, followed by the opportunities and risks that new technologies may bring for payment systems. On this basis, the direction of improvement in payment systems will be examined and assessed.

A. Benefits and Challenges of Conventional Payment Systems

Traditionally, banks' deposit currencies have played a significant role in payment systems. Meanwhile, opportunities to use electronic money have seen exponential growth, and the potential use of stablecoins as a payment instrument has also been under discussion. Here, the benefits and challenges of deposit currencies will be laid out while forming comparisons with electronic money and stablecoins.

Deposit Currencies as a Payment Instrument

A key characteristic of deposit currencies is that banks are equipped with credit creation functions; in other words, banks are able to create deposit currencies through lending, which function as a means of payment, and this process is referred to as credit creation. For example, large-value payments are, as the term suggests, large in amount. Unlike small-value payments, they require a large amount of money to be prepared in advance, which means they are burdened with prefunding. As such, it would be highly convenient if temporary funding to cover payment funding is available when the timing of the payout precedes that of the incoming payment. Such temporary funding needs grow to be quite substantial when accumulated on a macro scale and fluctuate significantly depending on the period. Banks' deposit currencies, which are equipped with credit creation functions, can meet these needs flexibly.

At the same time, deposit currencies also have their inconveniences. Because of their credit creation function, they are subject to strict regulatory supervision and consequently burdened heavily by multinational business expansion. Therefore, when cross-border payments are made using deposit currencies, a longer transaction chain of funds and information is

observed among the payer's bank, the intermediary bank, and the receiver's bank. In addition, individual banks need to conduct thorough checks for anti-money laundering and combating the financing of terrorism (AML/CFT), respectively. Consequently, the use of deposit currencies becomes costly and time consuming.

In contrast, electronic money offered by non-bank payment service providers and stablecoins are prefunded means of payment. Since they do not have a credit creation function, the burden accompanying the operation of overseas bases is lighter compared with banks -- equipped with this function -- including being subject to less stringent regulation and supervision, and because of this they can more easily be deployed on a multinational basis. In fact, some major non-bank payment service providers have established their own multinational payment networks. As for stablecoins, the public blockchain does not even require the creation of its own multinational network.

One of the notable characteristics of deposit currencies is that they have long assumed an important role, and because of this tend to be drawn to traditional systems. In light of this, the challenge being addressed today is whether banks can provide the appropriate means of payment in a timely manner when commercial information and digital assets are managed on digital platforms using new technologies, such as distributed ledger technology (DLT) and blockchains.

New Payment Instruments

Electronic money and stablecoins also have their own advantages and challenges as new payment instruments. The strength of electronic money is that it can be used to make payments to a wide range of recipients by simply recording the funds in the company's account books. While the transfer of funds between an electronic money account and deposit currencies requires payment services by banks, internal payment of electronic money can be completed by recording the funds in the company's account books. As mentioned above, cross-border payments can be made through the company's own bookkeeping alone, as multinational expansion is fairly easy to achieve. Similarly, AML/CFT checks can be conducted efficiently, with very few agents involved in the payment process.

Challenges do exist, however. While provision of payment services is currently concentrated in small-value payments, there will be additional burdens if electronic money is to be used for large-value payments as well. For example, it may be necessary to allocate a large amount of money in various currencies in advance to ensure swift cross-border payments. In addition, if transactions directly related to cash management of corporate clients are to be processed, securing alternative means of payment so that clients would not be inconvenienced in the event of a system failure would constitute a significant responsibility.

With regard to stablecoins, their strength lies in their nature of being technologically affinitive as a means of payment on a digital platform using DLT and blockchains. In particular, stablecoins have the ability to systematically execute various conditional payments by utilizing smart contracts, without relying on the trust in a single agent. Moreover, when conducting transactions on a public blockchain, where direct regulation proves difficult, the fact that transactions are currently possible with high anonymity will be attractive to those who emphasize such qualities.

While the use of stablecoins in the real economy is quite limited at present, when used for normal economic transactions, it may be difficult for users to enjoy the benefits of anonymity. Another issue revolves around the questions of whether the stability of the coin's value will truly be ensured, and who will be responsible for ensuring the efficiency and safety of the coin's distribution and settlement network.

Meanwhile, the stability of the coin's value will largely depend on the backing assets and how they are managed. Hypothetically, this stability will not be maintained if the safety and liquidity of the backing assets are insufficient, and claims for redemption might not be met swiftly unless the backing assets are managed appropriately.

Having in place a mechanism for ensuring the efficiency and security of a distribution and settlement network in a sustainable manner is also a challenge. Stablecoins differ from electronic money[1] and deposit currencies, in that they can unbundle the issuer of coins and

[1] It should be noted, however, that with regard to conventional types of electronic money, regulations on intermediation have been imposed through the amendment of the Payment Services Act in 2022

the entities responsible for the distribution and settlement platform. While the issuer may in some cases earn investment profit (a kind of seigniorage) by managing the money in lieu of issuing the coins, how the entities responsible for the settlement platform secure their income becomes a point of discussion. Without sufficient income, it will be difficult to ensure the efficiency and security of the payment and settlement network in a sustainable manner. If the public blockchain serves as the distribution and settlement infrastructure for stablecoins, it is more often the case that these entities, by supporting the said blockchain and handling the distribution of the stablecoins, gain returns in the form of crypto assets linked to the blockchain. In such cases, when the crypto-asset prices fall or the entities come to underestimate future values, fewer entities would be willing to stay, possibly putting the sustainability of the distribution infrastructure in question. Moreover, regardless of whether the distribution infrastructure is a blockchain, if one were to increase profits by utilizing transaction information for other businesses, ensuring privacy would be required and, with the potential need to expand the network significantly, issues such as oligopolistic and monopolistic activities in the market might arise. Whereas a virtuous cycle is at work for deposit currencies, allowing investment profits to be used for maintaining the banking system's distribution and settlement network, how stablecoins will establish such a sustainable virtuous cycle warrants attention.

B. Potential Opportunities of New Technologies and Underlying Risks

In the field of payment systems, technologies such as open application programming interface (API) and the cloud began to draw attention from around the 2000s, and having undergone implementation, continue to be in practical use. Subsequently, other technologies including DLT, blockchains, and smart contracts have gained attention since around the 2010s. Their use is concentrated in the crypto-asset market, however, with practical implementation in traditional payments remaining limited.

Meanwhile, expectations are high for the potential opportunities of technologies such as DLT platforms and blockchains, as well as smart contracts, which could be utilized on these, as can be seen in the various experimental projects being carried out in areas including payments.

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with a view to allowing business operations to be conducted efficiently by means of separating issuance from intermediation.

At the same time, some issues toward the practical use of these technologies have been addressed, taking into account the various experiments conducted and experiences in the crypto-asset market. The potential opportunities and issues are discussed below.

One of the advantages of using DLT and blockchain technology is being able to ensure the integrity of information displayed on a distributed ledger without having a trusted central management unit in place. Because of this, they are suitable for building a common infrastructure on which to share information with the parties involved, including (1) accurate information on holdings of digital assets and digital currencies and (2) authenticated information on the entities as well as details of trade and other transactions. Along with the above, in relation to payments, DLT and blockchain technology are perceived to have the following merits.

- Settlement is atomic (i.e., instant and simultaneous execution of all relevant settlements); 24/7 settlement can be achieved smoothly.
- Automation and streamlining of business processes are possible due to the standardization of smart contracts and ledgers.
- The time required for settlement can be minimized owing to the streamlining of business operations.
- Small-value investments are possible, as digital assets can be divided into small lots efficiently.

At the same time, the following risks and challenges have been raised.

- Are these technologies suitable for settling large volumes of transactions?
- How will the legal and business risks of smart contracts be managed?
- How should the legal stability of payment finality be understood?
- Would the governance and security of DLT platforms and blockchains be ensured appropriately?
- When connecting multiple DLT platforms and blockchains, is interoperability secured?

While expectations for potential opportunities and the challenges that need to be resolved seem to offset each other, it is crucial that the parties involved, from a long-term perspective, share insights on the realms in which technologies are highly applicable and demonstrate

favorable cost-benefit performance through practical implementation.

C. Direction of Efforts Aimed at Improving Payment Systems

Partly because efforts have been made over an extensive period to enhance the safety and efficiency of the domestic payment and settlement system, what is particularly drawing attention globally as current challenges facing payment systems is improvements in cross-border payments and settlements. In addition, payment instruments on digital platforms have become another area of interest in response to the emergence of new technologies surrounding payments. The direction likely to be taken by efforts in these areas is discussed below.

Improving Cross-Border Payments

While there are various issues surrounding cross-border payments, the need for improvement in areas such as cost, speed, and transparency are key topics of discussions progressing worldwide.

Standardizing payment messages is essential to achieving greater speed and efficiency for cross-border payments. In view of this, various countries are proceeding with efforts to adopt the ISO 20022 standard. Going forward, it is hoped that standardized information will be utilized not only for payments and settlements but also for creating mechanisms such as straight-through processing (STP) for AML/CFT checks or for confirming the existence of a receiving account ahead of the money transfer.

In the area of retail cross-border payments, a cross-border interlinking of 24-hour instant payment systems (fast payment systems, FPS) has been a topic for international discussions. Indeed, in some countries where cross-border payments such as workers' remittances from overseas play a crucial role, there have been cases of bilateral interlinking between FPSs. Meanwhile, some view multilateral interlinking arrangements across borders as more preferable than bilateral ones. Given that most FPSs are developed and operate with a focus on enhancing the speed of small-value domestic payments, the focal point lies in gaining the understanding of stakeholders on allocating costs to improve cross-border payments. As such, whether FPS interlinking will spread worldwide depends on the development of an arrangement that would allow the interlinking of multiple parties at a low cost.

A potential long-term solution in the area of wholesale payments involves putting central bank deposits and private bank deposits of various countries on a common platform, thereby facilitating cross-border payments and foreign exchange payments. It is possible that DLT will be technically useful in this case. This is because DLT is conceived to be easier for many countries to accept than centralized ledger technology in realizing such a concept. When creating a common platform using a conventional centralized ledger, the system would have to be located in a certain country. Many countries would feel uncomfortable with this, considering how heavily reliant they would have to be on another country's system in managing data on their own currency. Theoretically, DLT could serve as a tool to overcome this problem of centralized data management.

Payment Instruments on a Digital Platform

Various countries and regions have been engaging in discussions and conducting experiments related to payment instruments on a digital platform using DLT.

The basic thinking is that there are two options in this regard: (1) linking a conventional payment instrument with a DLT platform and (2) creating a new means of payment that can be used on a DLT platform. While the scope of system development might be reduced for the former, the latter takes a more straightforward approach. With regard to the latter, the focal point would be whether the means of payment provided on the DLT platform is bank deposits or other means such as stablecoins. In the former case, deposit currencies would be managed by utilizing DLT (recently referred to as "tokenization"), hence tokenized deposits. There is a limit to the safety and efficiency of a payment network that can be achieved simply by tokenizing private banks' deposits. It is possible, therefore, that the need will arise to tokenize not only private bank deposits but also central bank deposits and ensure a smooth conversion of the two on a common DLT platform.

In addition to the above, a possible future scenario may be for private banks to issue stablecoins with their own bank deposits as the underlying asset, enabling widespread distribution and settling of these on the public blockchain. However, there is the question of whether coins regarded as essentially equivalent to bank deposits could be passed on to people

other than the bank's own depositors. This would require consideration, not only from the perspective of anti-money laundering but also from other viewpoints including the effects on banks' information-producing function and the appropriateness of credit creation under the fractional reserve banking system.

Basic Thinking on a Common Platform

In April 2024, the Bank for International Settlements (BIS) announced the launch of Project Agorá, which brings together seven central banks -- Bank of Japan, the Federal Reserve Bank of New York, Bank of France (representing the Eurosystem), Swiss National Bank, Bank of England, Bank of Korea, and Bank of Mexico -- along with the participation of multiple private-sector financial institutions from each of these jurisdictions. While the project may require a long period of exploration and examination, it can be considered an experimental project with significant potential.

This is one of the experimental projects that explores wholesale cross-border payments on the aforementioned common platform. While there are some international experimental projects aside from this, many of these have been carried out on central bank deposits among multiple countries. The novelty of Project Agorá lies in the fact that the subject of exploration covers not only central bank deposits but also private bank deposits and is conducted among multiple countries.

In this experiment, making improvements in cross-border payments and settlements of foreign exchange transactions by financial institutions and firms are the primary use case borne in mind. Going forward, the project is thought to undergo a long period of consideration to assess whether it is sufficiently robust for practical use. If we actually aim at establishing a common international platform, it would be important to adhere to the following basic thinking from the perspectives of avoiding fragmentation of international monetary and payment systems, optimizing market efficiency, and ensuring the support of market participants.

First, a common platform should be open, transparent, and secure while being distributed in terms of monetary sovereignty. In other words, a common platform would be more effective

when it handles a wider range of asset types. It should be open and transparent in order to obtain participation by a large number of countries. A platform should also be secure in order to gain confidence in managing both central bank deposits and commercial bank deposits. It should also have a distributed structure from the standpoint of monetary sovereignty to enable each country to manage data on the currency it issues, if it wishes to do so. At the same time, from the perspective of operation and risk management, it would be necessary to consider what the optimal distributed data management frameworks and efficient governance structures are, as a centralized structure may at times prove efficient as well.

Second, a common platform should be designed to avoid harm to the price formation process and market liquidity of the relevant financial markets. The benefits of introducing a common platform will be greatly reduced if post-trade processing using the platform undermines the price formation process and market liquidity of the relevant financial markets. In order to avoid this problem, a common platform should allow for smooth access by a wide range of market participants. In addition, where a platform handles settlement of foreign exchange transactions, the platform needs to facilitate efficient price formation by accommodating foreign exchange transactions against reserve currencies. From the perspective of smooth access, the platform needs to ensure that various investors can access the platform indirectly via participating financial institutions, and that participating financial institutions provide services to enable such indirect access (tiered structure access) in a safe and efficient manner. It also needs to ensure that data formats and message protocols are standardized to allow for smooth flow of data from trading platforms and trade confirmation platforms. It should be noted that an automated market maker (AMM) based on prefunded liquidity and real-time settlement (i.e., no settlement lag) could have negative effects on the market liquidity of traditional financial markets. This is because the AMM and real-time settlement would restrain the supply side of tradable assets.

Third, a common platform should also provide functionalities that facilitate processes closely related to settlement. The existing pain points in cross-border payments reside in not only the settlement process itself but also other related operations. In particular, in order to process cross-border payments involving investors and corporations smoothly, account-owner validation using common identifiers should take place before payment initiation. Banks

involved in the payment chain -- a sender bank, intermediary banks, and a recipient bank -- should also be able to conduct AML/CFT checks efficiently. A platform should provide functionalities to support such processes, for example, an inquiry function for recipients' identifiers (or accounts) and a standardized process for processing data related to AML/CFT.

Fourth, a common platform should provide functionalities for ensuring smooth settlement, such as gridlock resolution mechanisms and intraday liquidity funding facilities. At present, foreign exchange transactions are settled daily with a relatively small amount of intraday liquidity, as CLS Bank provides a kind of multilateral netting effect for participants. If the amount of intraday liquidity needed increases substantially after the transition to a common platform, market participants would likely avoid using the platform for foreign exchange settlement purposes. Thus, a common platform should introduce functionalities for reducing intraday liquidity funding needs. This may include bilateral and multilateral offsetting,[2] splitting of settlement instructions into multiple instructions, and mechanisms for finding gridlocks and facilitating intraday liquidity funding.

D. Historical Wisdom Pertaining to the Division of Roles between the Central Bank and Private-Sector Entities

The division of roles between the central bank and private-sector entities can be understood to have developed as follows. Looking back in history, metal coins such as gold and silver coins, used as a means of payment, were accompanied by the inconveniences of delivery and in determining the quantity of gold and silver content. Consequently, many transactions were handled as payment on credit, and the practice of settling in gold or silver coins at regular intervals after netting of the deferred debt was devised. Nevertheless, widespread deferred payment led to an accumulation of settlement risk. Payment on credit also had its limits in terms of counterparty trust, which acted as a constraint on expansion of economic activity.

[2] "Offsetting" in this context has a different meaning from "netting." Netting usually means that outgoing payments and incoming payments are accumulated over a certain period of time and the netted positions are calculated throughout that period. Net credit and net debit positions are then settled at the end of the period, typically at the end of the day. On the other hand, offsetting means that a net position for a set of outgoing payments and incoming payments is calculated in real time. In the instant where the net position can be covered by the participants' available liquidity balance, those instructions are settled immediately and simultaneously.

Under such circumstances, some started issuing certificates of deposit backed by gold coins, which began to be used as a means of payment. Moreover, focusing on the fact that holders of the certificates would not request to withdraw their gold coins all at once, more certificates of deposit were issued, exceeding the amount of coins in the holders' custody, and were used for lending. This marks the origin of the current banknotes and bank credit creation.

Initially, there was no central bank, only private banks. Each private bank issued its own banknotes and created credit individually. This resulted in an over-issuance of banknotes and credit instability due to excessive lending. In terms of payments, general acceptability was not a feature of banknotes issued by private banks, as these banknotes were circulated only in certain areas and not throughout the country, which proved inconvenient. With a view to resolving such inconveniences in payments and appropriately managing the supply of money through credit creation, a central bank was established, allowing the central bank to, for example, issue central bank notes, handle interbank settlements, and control the volume of money supply.

As can be seen, payment methods have been born from private-sector entities in accordance with user needs. However, if the private sector's solution has issues or limitations in terms of functionality as a payment network (i.e., range of distribution and availability) or reliability, history is proof that public sector involvement has been required to facilitate overall economic activity. This should largely remain the case going forward.

History has taught us that the reasoning behind this is twofold. In order for the economy to develop in a stable and efficient manner, (1) it is crucial for private entities to demonstrate originality and ingenuity in the payment services they provide and (2) forms of currency and means of payment with general acceptability are necessary. With such forms of currency and means of payment, conversion of money with a wide range of private payment instruments will be conducted smoothly, avoiding inefficiencies in resource allocation accompanying fragmentation in the ecosystem as well as any cost burden imposed on users to overcome the fragmentation. Moreover, unless forms of currency and means of payment with general acceptability can be used smoothly, economic and social activity could be destabilized in the event of a significant shock. Formerly, generally acceptable forms of currency and means of

payment were cash (i.e., central bank notes and coins) for the general public and central bank deposits for private financial institutions. Nevertheless, if the use of cash or central bank deposits became inconvenient in a changing society, including the digital environment, the general acceptability of these payment instruments is bound to decline. Central banks therefore need to work continuously to maintain and enhance the user convenience of their currencies and payment services.

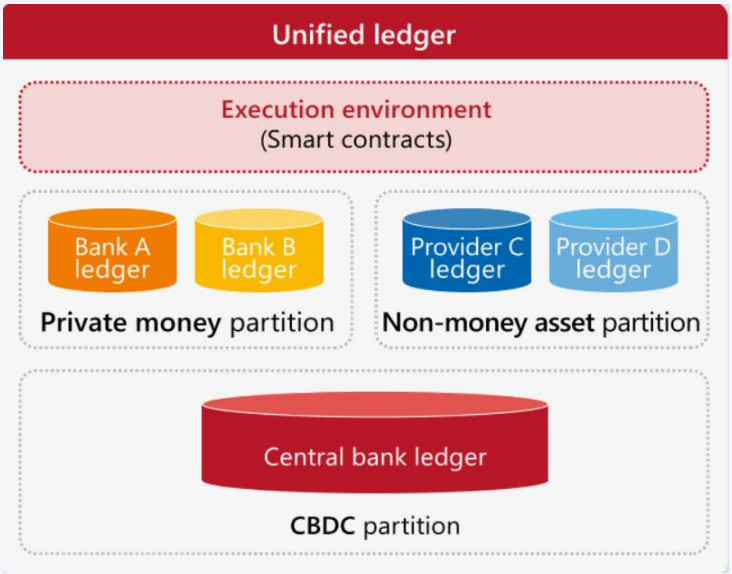
Taking these points into account, the feasibility of issuing general purpose central bank digital currency (CBDC) is being explored in many countries in the area of retail payments. Meanwhile, in wholesale payments, many countries are considering ways to improve cross-border payments along with the optimal means of payment on a digital platform utilizing new technologies. While it would be a prejudgment to draw any conclusions at this point on how these considerations will materialize, central banks and parties involved need to continue with their joint efforts in deliberating on the future of payments.

(Box 3) Project Agorá

Project Agorá (Greek for "marketplace") is an experimental project led by the Bank for International Settlements (BIS) aimed at improving cross-border payments. The project's primary area of exploration includes increasing the speed and lowering the costs of cross-border payments while preserving financial integrity through utilizing new technologies such as tokenization and smart contracts.

The project builds on the concept of the unified ledger, which was proposed by the BIS in 2023 (Figure 45). Under the unified ledger, central bank deposits and commercial bank deposits are placed on a common platform and integrated seamlessly. Project Agorá will explore how to achieve safe and efficient cross-border payments while utilizing this unified ledger and maintaining the two-tier structure of the monetary system.

Figure 45: Unified Ledger



Source: BIS, *Annual Economic Report*, 2023.

Project Agorá brings together seven central banks (Bank of Japan, the Federal Reserve Bank of New York, Bank of France [representing the Eurosystem], Swiss National Bank, Bank of England, Bank of Korea, and Bank of Mexico), along with multiple private-sector financial institutions from each of these jurisdictions. The BIS has issued a call for expressions of interest to private financial institutions, with the Institute of International Finance (IIF) acting as the convener.