Distributed Ledger Technology and Designing "Trust"

Remarks at the Third FinTech Forum

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(English translation based on the Japanese original)

Introduction

It is a great pleasure to welcome you all today to the third meeting of the FinTech Forum. Today, I would like to share with you the Bank of Japan's view on Distributed Ledger Technology, or DLT, and on issues in adopting it in the financial industry.

I.   Technologies supporting FinTech and Ledger Systems

FinTech, as the wording itself indicates, is supported by various technologies such as cryptographic technology, network communication technology, software technology, biometric authentication technology, etc. The essential elements of FinTech are to make the most of such technologies to expand financial services globally and enhance customer convenience.

Among these various technologies, DLT is drawing much attention due to its wide application range and the scale of its impact.

It is said that the history of the ledger which records transactions is very old, and can be traced back to the ancient Mesopotamia. There are also indications that, in the ancient Babylonia ruled by King Hammurabi in the 18th century B.C., ancient officials, under the Code of Hammurabi, recorded transactions on clay tablets, solidified some important transactions – if not, dried in the sun –, and stored those tablets. Thus, commercial activities were conducted under an extremely centralized system with immutable ledgers and governmental controls. Over thousands of years, we have ensured the security and stability of transactions by using such centralized ledger systems.

Furthermore, in recent years, an innovative idea has been raised to place the ledgers in cyber space and control them by various means. DLT is the technology that supports such ideas, but from another point of view, it can be said that such ideas have come up because of the well-developed technology in the areas of cryptography, communication, and the Internet.

II.   Securing "Trust" for Centralized System and Distributed System

Whether a system is centralized or decentralized, securing "trust" for the ledger is an important issue in order to ensure the security and stability of transactions. However, there is a difference between a centralized system and a decentralized system as to what are the keys to secure "trust."

In the case of the centralized system, the trust in the management entity becomes a key since a specific entity manages the ledger in a centralized manner. The proper management of the ledger by a trustworthy entity constitutes trust for the ledger. In ancient Babylonia, as I mentioned earlier, the officials with authority solidified clay tablets to prevent manipulation and kept them in order to secure trust.

On the other hand, in the case of the distributed system, since multiple entities manage the ledgers in a decentralized manner in cyber space, it becomes a key to establish a mechanism to record correct transactions with consistency in multiple ledgers rather than building trust on a specific entity. In this regard, DLT adopts a mechanism to record transactions by building consensus among participants. However, the concrete form of consensus building is not necessarily the same. For example, in the case of Bitcoin, which has the largest trading volume among digital currencies using DLT, a public-type mechanism is adopted to share synchronized information among unspecified participants and repeat confirmation work under the scrutiny of the public. Meanwhile, some initiatives have been sought for ways in private-type mechanism to form a consensus based on limited membership, mainly in the financial industry.

In any case, "trust" is much more important in the financial industry than in other fields. In order to make full use of DLT in the financial industry hereafter, how to design it as a trustworthy mechanism will become a big challenge.

III.   To ensure "Trust" for DLT

Now, let me introduce my personal view on issues in designing a framework for DLT to

be trusted.

The first point is the importance of ensuring "resiliency in emergency responses."

Cyber space is always exposed to threats such as hacking. The DLT system is said to be relatively resilient as it has multiple ledgers, however, it is very important to engage constantly in taking measures against threats. In addition, it is also an important challenge to handle the aftermath in the event that the record of a ledger is manipulated by malicious bodies. If such responses are not appropriate, this inadequacy may influence the credibility of the framework utilizing DLT. Let me cite a specific example. Last year, there was an incident in which an enormous amount of digital currency was drawn from a digital currency-based investment fund by hackers exploiting its system's vulnerability. At this time, in order to recover the money, the operator of the digital currency rewound the payment records, which could normally never occur. There are still different opinions about the propriety of this response, but in any case, we should aware that if such incidents occur frequently, it may spoil the credibility on the technology and the framework, and consequently hinder the development of FinTech.

The second point is the importance of considering application field confirming and being aware of both of the advantages and disadvantages of decentralized system.

There is absolutely no doubt that DLT is an unprecedented innovative technology, however, based on the level of its technology at this stage, it cannot be said to have yet reached the absolute superiority required to fully replace the current centralized system. For example, the DLT system, on one side, has strength in high fault resistance, but on the other side, there is also the challenge that it needs time to build consensus, especially when it has many participants. In such circumstances, we should design the system appropriately, taking steps such as the prevention of duplicate payments and ensuring information confidentiality by confirming and being aware of both the advantages and disadvantages of the decentralized system – especially the public and private types in the decentralized system – in accordance to the users' needs, and by taking into account the level of technology and other various elements for participants to use with security.

As a third point, I would like to emphasize the importance of financial institutions' deep

understanding of the technology.

I have to admit that most of the core elements of DLT are now developed by IT vendors and FinTech firms, which are resources outside of financial institutions. Under such circumstances, financial institutions, as financial service providers, need to deeply understand the technology and strive to advance its services, including the improvement of customer convenience, when utilizing DLT. This is because, without any deep understanding in the technology, it is difficult to constantly provide high-value-added services and respond properly and responsibly to any problems. This is not limited to DLT, but since DLT is a new technology, we need to be strongly aware of the importance of understanding the technology.

IV. Initiatives at the Bank of Japan

A central bank has a responsibility to provide an appropriate social infrastructure with a deep understanding of the advanced technology of the times in order to function properly. DLT in particular is a technology that has a wide range of possibilities to be utilized in various areas. The European Central Bank and the Bank of Japan announced last December that it will launch a joint research project which will study the possible use of DLT for market infrastructure. The Bank recognizes the need to conduct research and analysis on FinTech continuously, in view of the possibility that the Bank itself may apply FinTech technologies to its operations in the future.

The FinTech Forum has welcomed a variety of participants from IT vendors and start-ups in addition to the financial institutions. In order to acquire trust in technology that supports FinTech, it is extremely important to achieve positive and interactive communication among a broad spectrum of entities that goes beyond the realms of the industry. I would like to close my remarks now by wishing that today's FinTech Forum will contribute to all the participants in terms of sharing new insights and perspectives.

Thank you for your attention.