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Bank of Japan

## **Central Banking in the Digital Age**

*Closing Remarks at the IMF-JFSA-BOJ Conference on FinTech*

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## **Introduction**

I would like to express my sincere gratitude to all the participants. It was a great pleasure for us, the International Monetary Fund, the Financial Services Agency, and the Bank of Japan, to hold such a large conference on financial innovation in Asia. Indeed, this conference symbolizes how the world has changed in this decade.

## **IT innovation and Changes in Finance and Economy**

Looking back on 2008, a decade ago, the biggest challenge to the IMF and financial authorities all over the world was how to tackle the global financial crisis. Smartphones were still in their very early stage. Crypto-currencies had not yet appeared.

Since then the world economic landscape has dramatically changed. The global economy has overcome the crisis and regained its growth momentum. With the rapid innovation of information technologies, the movement described as the "information revolution" or "data revolution" has developed globally, bringing new growth opportunities for financial services and economic activities. Asia has been particularly influenced by such IT innovation.

Let me pick up the issue of "financial inclusion" for example. This was a global social issue already as early as 2008. Since then the number of smartphones has skyrocketed, and many people, including those in emerging economies in Asia, have become able to access financial services via smartphones. IT innovation has promoted "financial inclusion" in a way which was not expected a decade ago. Such wider access to financial services is also stimulating various new economic activities.

Smartphones also produce a gigantic amount of data as people use smartphones everywhere in their daily lives. Such "big data" are becoming more and more important as intangible assets in a broad range of economic activities. Global "data-giant" companies, which have grown rapidly in recent years, often provide various services including financial ones free of charge, while utilizing big data gathered through these services for multiple purposes. Moreover, IT innovation has created new business

models, such as "the sharing economy."

### **New policy challenges**

IT innovation also raises various new challenges to financial authorities, including central banks. Among them, let me point out four issues.

#### *(i) Impacts on Financial Markets*

First, high-frequency trading, or HFT, utilizing algorithms and AI has recently increased its role in various financial markets. Financial authorities need to carefully examine how such trading strategies influence price formation, market volatility and liquidity, since they may have important implications in terms of market stability and the transmission mechanisms of monetary policy. Also in this context, the new role of central banks as "market makers of last resort" moves into the spotlight.

#### *(ii) Impacts on Real Economy and Prices*

Second, we should try to understand the impacts of IT innovation as well as IT-oriented new business activities, such as e-commerce and the sharing economy, on the real economy and price developments. Such issues are deep-rooted and wide-ranging, and not limited to the issue of statistics, such as the difficulty in measuring the growth of e-commerce and the overall retail sales due to the limited coverage of existing statistics.

Let me raise one of the fundamental challenges. Nowadays data-giant companies provide various free services because they use these services also for collecting data and utilize those data for their business. From the users' viewpoint, they actually give their own data to those companies in exchange for using these services, instead of paying fees. It is becoming more and more difficult to grasp such new economic activities by traditional analytical tools, such as demand and supply curves on price-quantity dimension.

### *(iii) Importance of Cyber Security and Data Protection*

Third, in accordance with IT innovation, cyber-security and data-protection are becoming more important for maintaining financial stability. Recently, data-giant companies have entered into financial services, and the utilization of big data has become more pronounced in financial businesses. In addition, various new instruments, including the internet and smartphones, are used for access to financial services. All of these developments emphasize the importance of cyber-security and data-protection.

### *(iv) Impacts on Currency, Payments and Settlements*

Lastly, we should carefully examine the impacts of IT innovation on currency, payments and settlements. "Crypto-currencies" and "central bank digital currencies" are now gathering great attention all over the world. Moreover, these issues also stimulate global discussions on to what extent central banks should provide their payment and settlement infrastructures to society. I would like to elaborate on these issues further.

## **Innovation and Currency System**

Looking back in history, many central banks, including the Bank of Japan, were established to overcome the turmoil caused by the issuance of multiple payment instruments in a disorderly manner, so as to restore stability of the monetary system. In order to fulfill such a mission, central banks were exclusively assigned the role of issuing "central bank money" with finality, namely, banknotes and central bank deposits. The modern currency system, which consists of a central bank and private banks, is characterized as "a two-tiered system."

In this two-tiered system, the central bank specializes in supplying banknotes and central bank deposits, while private banks perform the function of credit creation and provide deposit currencies as broader money. Through such activities, private banks provide payment services to the general public and allocate financial resources to the economy as loans and credits.

From the perspective of information processing, the emergence of central banks allowed people to get rid of the burden of evaluating the credibility of many payment instruments. The creation of central banks has substantially reduced the costs of information processing in payments and settlements. At the same time, private banks have contributed to efficient allocation of financial resources through their function of information processing. The modern two-tiered structure reflects the wisdom of human beings in history to achieve both efficiency and stability in the currency system.

In this regard, the issuance of central bank digital currencies for general use could be analogous to allowing households and firms to directly have accounts in the central bank. This may have a large impact on the aforementioned two-tiered currency system and private banks' financial intermediation.

Under the current system, the central bank allows direct access to its accounts only to a limited number of entities such as private banks. From the viewpoint of the usage of information, the central bank leaves the private sector the opportunities to utilize detailed data such as "who buys what" attached to daily transactions. At the same time, the central bank can obtain the information necessary to maintain the stability of payment and settlement systems through operating its wholesale settlement systems. The issuance of central bank digital currencies could also affect such a role-sharing structure for utilizing information.

To sum up, IT innovation raises many fundamental questions and challenges related to the currency system, the design of central bank infrastructure and the utilization of information attached to economic activities. I sincerely hope our understanding of these issues will be further deepened in the future.

### **Initiatives Taken by the Bank of Japan**

To tackle these new challenges, the Bank of Japan has recently been taking various initiatives in the fields of innovation and FinTech. In 2016 the Bank established its "FinTech Center." The Bank has also been conducting a joint research project called "Project Stella" with the European Central Bank to study the potential of distributed

ledger technology. Although the Bank of Japan does not have a plan to issue its own digital currency at this juncture, the Bank fully acknowledges the importance of deeply understanding innovative technologies not only for maintaining financial stability but also for seeking the possibility of applying them to central bank infrastructure in the future. Central banks should always be attentive to on-going innovation, and continue making efforts to provide the best infrastructure to society in accordance with the development of technologies.

I believe that this conference was very informative and fruitful for all participants. I sincerely hope that discussions on these issues will continue in various international forums, in order for innovations to contribute to the development of financial services and economic activities. At the end of my remarks, I wish each of you a safe journey home.

Thank you for your attention.