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Bank of Japan

Digital Innovation and FinTech

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Haruhiko Kuroda

Governor of the Bank of Japan

Introduction

It is a great honor to have this opportunity to speak before the Paris Europlace Financial Forum.

When I look back on my teenage years, I was passionate about science and technology, and I dreamed of a future in which people enjoyed traveling to other planets and talking with friends around the world by videophone. After decades of technological development, interplanetary travel is unfortunately still some way off, but innovation in information technology has evolved far beyond people's expectations over half a century ago.

As a central banker, I am in a position to closely monitor the financial world, and recent developments in information technology, which are leading to wide-scale innovations in financial services, bring new excitement and challenges. Such innovations have the potential to significantly change the global landscape of finance and economies.

Thus, today I would like to talk about financial innovation, which is attracting attention around the world as "FinTech." I hope my remarks will serve as a bridge to the afternoon sessions.

Technological Innovation, Economic Growth, and Finance

Innovation is undoubtedly a main driver of economic growth, and thus it has always been the focus of economic policy.

Historical studies show that global economic growth was considerably slow until the medieval period. The growth rate surged in the modern era when new industrial technologies were widely applied to economic activities. The financial industry, which emerged shortly before the modern era, has played an important role in enabling subsequent technological innovations to drive the growth of various industries and economies.

By making use of sophisticated financial infrastructure, people discover promising new technologies. Then, with the support of finance, these new technologies attract money and resources, develop as an industry, and eventually spread widely and are used by many

people. Looking back at the history of the automobile and airline industries as examples, the creation of the Ford Model T and the flight of the Wright brothers happened in the early 20th century. Without finance, those industries, as well as many other relevant industries, could not have grown so rapidly and led to strong economic growth in the 20th century.

Information Technology and Financial Innovation

As such, technological innovations since the Industrial Revolution have generated many new industries. The financial industry has a longer history than even many manufacturing industries, because basic financial infrastructure such as money, ledgers, and accounting came into being before or during the medieval period. Nonetheless, ongoing innovations in information technologies are now expected to have significant impacts particularly on the financial industry and financial services.

There are various reasons behind such strong linkages between recent information technologies and financial services. First, finance is a sophisticated system of various information processing such as payment, settlement, investment decisions, and risk management. In this respect, the financial industry can be considered an "information industry." Second, some recent information technologies such as the "blockchain" and "distributed ledger technology," or DLT, have the potential to significantly affect money and ledgers, which are the basic infrastructure for financial activities.

Moreover, wide-ranging innovations, which may significantly affect financial services, appeared almost simultaneously around the time of the global financial crisis. First, smartphones such as the iPhone which was invented in 2007, enhanced the accessibility to various financial services. Then, in 2008 the new technologies of the blockchain and DLT were created. Moreover, artificial intelligence, or AI, and big data analytics have evolved greatly thanks to the dramatic increase in computing power.

In addition, since the global financial crisis, new entrants to financial services have been welcomed, particularly in those countries where public funds were injected to financial institutions. This environment has also supported the development of FinTech.

Promising Potential of Financial Innovation

Recent financial innovation, symbolized by the word "FinTech," has huge potential to change the structure of financial services.

First, FinTech can "globalize" financial services. Mobile phones and smartphones are now spreading rapidly in developing and emerging economies where financial services are not yet widespread. These new devices could substantially promote "Financial Inclusion," by enabling people in those countries to access financial services such as mobile banking. Indeed, the developing and emerging countries in Asia and Africa are keenly interested in FinTech and mobile banking.

Second, FinTech can "personalize" financial services. Mobile phones and smartphones are designed as "personalized" tools because they were originally portable phones. By using these devices as new access points for financial services as well as advanced big data analytics, it is becoming easier to provide customized and personalized services to each user.

Third, FinTech can "virtualize" financial services. With innovations in information technology, financial services providers can use the Internet, smartphones, cloud computing, and AI as new tools for their activities. Accordingly, tangible fixed infrastructure such as "brick and mortar" branches and ATM networks are no longer prerequisites for providing financial services.

New Issues Stemming from Financial Innovation

Although there are many upsides of financial innovation, it also raises new issues and challenges for us.

First and ironically, new information technologies have made sophisticated cyber-attacks possible. Moreover, with the widespread use of the Internet and smartphones for accessing financial services, financial networks are becoming increasingly "open." Accordingly, it is becoming much more important to take effective measures against cyber-attacks and maintain information security.

Second, financial authorities are extracting various information from the balance sheets of licensed financial institutions such as commercial banks. Furthermore, the authorities use regulatory tools, such as capital requirements and liquidity standards, to impose constraints on these balance sheets in order to maintain financial stability. However, these measures may not be very effective for non-bank FinTech firms, especially if they deal only with payment-related services, or if they match the supply and demand of funds without using their own balance sheet in their Peer-to-Peer, or P2P, lending. Thus, financial authorities are facing new challenges in terms of obtaining information and maintaining financial stability.

Third, there are debates on whether and to what extent new types of transactions such as high-frequency trading and algorithm trading enabled by recent information technologies tend to increase market volatility. Theoretically, if technological innovation makes transactions more efficient, it could also contribute to market efficiency by increasing liquidity, for example. Nonetheless, in view of the recent developments in various countries, policymakers must develop a deeper understanding of the impact of these new transactions on financial markets.

Even though new technologies bring new challenges, it may not be wise to try to stop technological innovation. I believe that policymakers should try to maximize the benefits and minimize the negative sides of technological innovation.

In some sense, technological innovation reflects the basic human nature of "intellectual adventure." I believe that human beings are inherently curious and search for better ideas to resolve problems, and that they have a genuine desire to communicate and share such ideas with other people. Thus, I do not think it is easy to suppress such human characteristics. I believe the reason why smartphones have instantly become popular worldwide is that they were originally designed to be "tools for communication," thus satisfying a basic human desire.

Moreover, if new information technologies are truly advanced ones, we should be able to utilize them also for enhancing information security and maintaining people's trust in financial transactions. To ensure that people support financial innovation and FinTech, it is

also important to improve biometrics authentication and cryptography technologies.

Some people argue that humans will eventually have nothing to do if information technologies advance so far and if computers and AI become more capable, but I am skeptical of such a pessimistic view. The invention of the automobile and airplane substantially reduced the demand for horse-drawn coaches and sailing ships. Nonetheless, if we look at society as a whole, those new technologies clearly have enabled human beings to make more use of their abilities. Today, we have this wonderful forum, connecting France and Japan and with many people attending from around the world. Without technological innovation, we could never imagine holding such an event.

Furthermore, I think it is very unlikely that financial innovation will take over the roles of humans. To reiterate, finance is a sophisticated bundle of information processing: it creates linkages between various entities such as between lender and borrower, and between payer and payee. Through such activities, finance enables people to allocate their limited resources to projects with higher productivity and growth potential. Thinking about this nature of finance, I believe that financial innovation will create an environment where everyone can share their creativity with others, thus contributing to economic development, as long as innovation really enhances the efficiency of financial services.

For example, if FinTech enables people in developing countries to access financial services, it would also help those people to use e-commerce and e-learning. This would increase opportunities for people wanting to raise their living standard and receive education. Moreover, if new information technology and FinTech help channel financial support to new ideas, it will help new businesses incorporating new ideas to develop. Through such activities, financial innovation and FinTech will eventually contribute to economic growth.

Initiatives at the Bank of Japan

In view of such potential of financial innovation, the Bank of Japan established its "FinTech Center" on April 1, aiming to facilitate the development of FinTech. The Bank has also built up its "FinTech Network" comprising a wide range of staff drawn from the relevant departments of the Bank. This FinTech Network promotes the sharing of information and

expertise related to Fintech in a cross-sectoral manner.

Meanwhile, private entities are now testing the application of DLT, which is a technology that symbolizes FinTech. In order for central banks to fulfill their responsibilities such as ensuring the stability of payments and settlements, it is becoming increasingly important to have a profound understanding of new technologies including DLT. Accordingly, the staff in the Payment and Settlement Systems Department of the Bank are deepening their understanding of such new technologies by test-driving distributed ledgers. Note that these trials by the Bank's staff simply aim to understand the mechanics of DLT, rather than applying it to the Bank's own liabilities or its payment and settlement systems.

The Bank, as the central bank of Japan, is dedicated to supporting the healthy development of FinTech, in order to enhance the welfare of financial service users as well as economic activities.

Concluding Remarks

In order to make effective use of financial innovation for developing financial markets and stimulating economic activities, it is important to continuously upgrade the basic infrastructure by using new technologies, while maintaining people's trust in financial services and security.

In this regard, both France and Japan have continuously adopted many new technologies while maintaining their cultural heritage. Also, these two countries have always tried to harmonize the old and the new. In my view, this attitude in France is symbolized by the Eiffel Tower, which sparked heated debate in the 19th century but now perfectly matches the landscape in Paris, as well as by the glass Pyramid in the center of the Louvre Museum. Above all, it is fascinating to see the two Triumphal Arches of Caroussel and Etoile, which were built in the age of Napoléon, arranged in a straight line toward the very contemporary Grand Arch of Defense. This wonderful scenery reminds me of the fact that financial services, which supported economic development in the modern age, are now experiencing wide-scale innovations with new information technologies and are poised to develop further. As long as France and Japan actively embrace new technologies, I firmly believe that

financial innovation will boost the development of the markets and the economies of France and Japan.

Thank you for your attention.