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## Fintech, cryptoassets, and central bank digital currency in the Republic of Korea

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**ADB Working Paper Series**

**FINTECH, CRYPTOASSETS, AND  
CENTRAL BANK DIGITAL CURRENCY  
IN THE REPUBLIC OF KOREA**

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**Abstract**

In this study, we describe the fintech and cryptoassets-related trends in the Republic of Korea and review the measures and assessments of the Government of the Republic of Korea and the Bank of Korea. We also provide discussion on central bank digital currency. Fintech in the Republic of Korea still accounts for only a small share of payment and settlement services, but it can induce changes in the financial industry. It is, however, unlikely that cryptoassets will become widely used and accepted in the near future, and the Bank of Korea is taking a cautious stance on central bank digital currency.

**Keywords:** fintech, cryptoassets, central bank digital currency

**JEL Classification:** G2, G15, O16

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# 1. INTRODUCTION

In recent years, financial innovation has been one of the most discussed economic issues in the Republic of Korea. In particular, fintech, cryptoassets, and central bank digital currency (CBDC) are drawing much attention from the public, as well as policy makers. Because these topics are closely related to the fundamental role of a central bank, the Bank of Korea has been watching the progress of financial innovation with great interest, and preparing for changes in the economic environment.

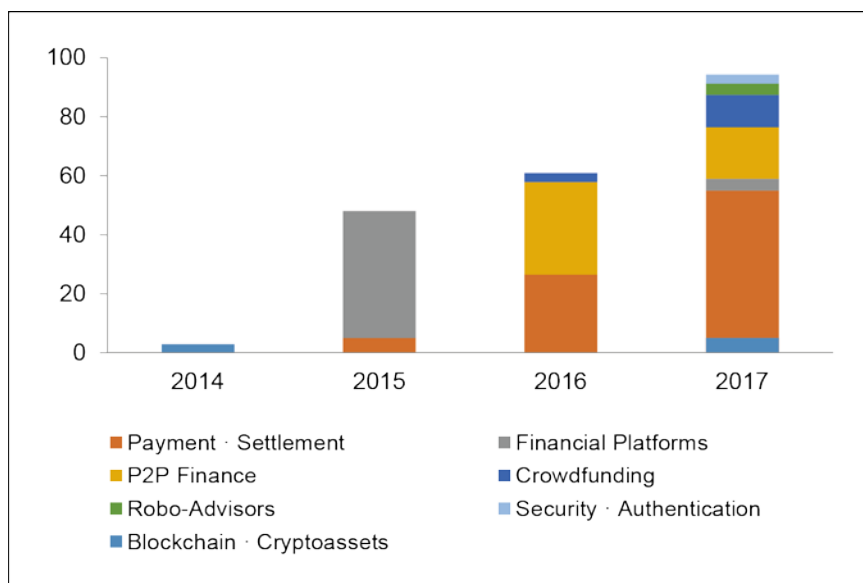
In this paper, we briefly introduce key features and progress around financial innovation by focusing on fintech, cryptoassets, and CBDC. We also review measures and assessments of the government, as well as the Bank of Korea, concerning these topics.

## 2. FINTECH

### 2.1 Ongoing Progress

The fintech industry in the Republic of Korea has been growing steadily since the mid-2010s. Now, fintech is gradually spreading into payment and settlement services, and further into peer-to-peer (P2P) lending, crowd funding, robo-advisors, etc. The total amount of investment in the fintech industry has increased as well, from W3 billion in 2014 to W100 billion in 2017 (see Figure 1). More than half of the investment in 2017 centered on payment and settlement services (Bank of Korea 2018b).

**Figure 1: Amount of Investment in Fintech**  
(W billion)



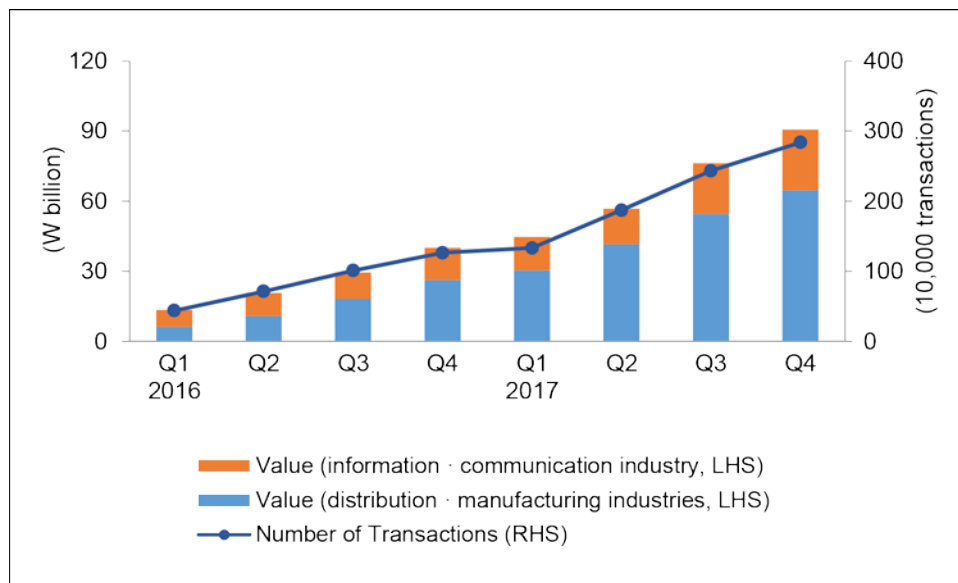
P2P = peer-to-peer.

Note: Based on startups attracting investments of W3 billion or more.

Source: Platium (2018).

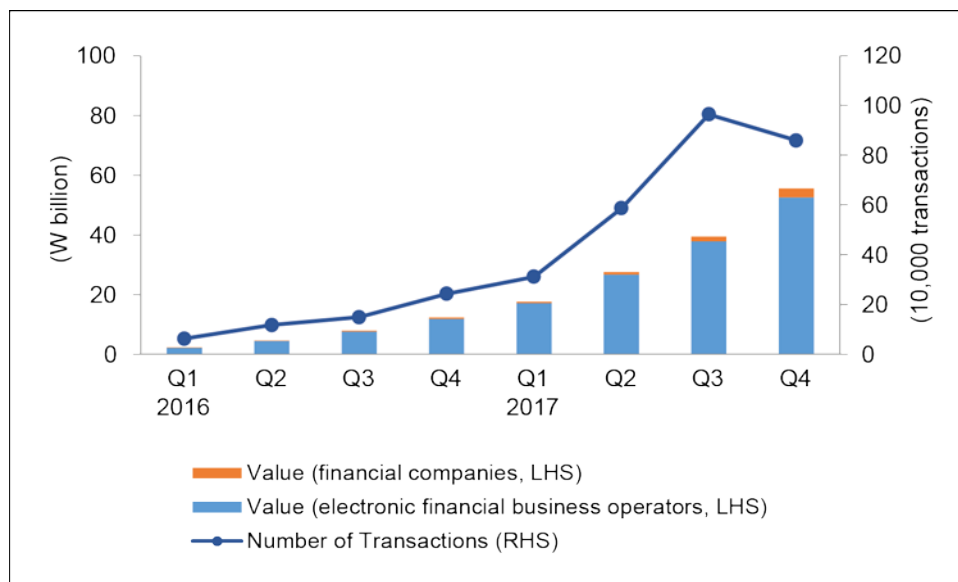
In 2017, the average daily usage of easy payment services was W67.2 billion, an increase of more than 150% compared to the previous year (see Figure 2). In the case of easy transfer services, the average daily usage jumped to W35.1 billion, an increase of more than 400% from 2016 (see Figure 3). The use of P2P lending and crowd funding has also been on an upward trend (Bank of Korea 2018b).

**Figure 2: Daily Average Values and Transactions Using Easy Payment Services**



Source: Bank of Korea.

**Figure 3: Daily Average Values and Transactions Using Easy Transfer Services**



Source: Bank of Korea.

## 2.2 Utilization of Fintech in Mobile Payment and its Background

Although its usage has markedly increased, fintech accounts for only a small share of each market and services and the utilization of fintech for payment and settlement services is not enough. Despite the recent entry of startups and multiple fintech companies into mobile point of sale (POS) payment services, in particular, credit cards<sup>1</sup> accounted for approximately 70% of mobile POS payments in the first half of 2018.<sup>2</sup>

This is attributed to the following reasons. First, the development of the POS payment market has centered on credit cards because of the government's policies to secure tax revenues. For example, the obligation to accept credit cards, the no-surcharge rule, and tax benefits have led to credit card-focused development. Second, the financial market infrastructure has been set up mainly for banking services. The real-time payment and settlement system was set up relatively early. Besides, the bank account ownership rate is very high. Finally, the regulatory framework has not been fintech-friendly. For instance, the obligation to use accredited certificates<sup>3</sup> was abolished in 2015. As a result, fintech firms have been entering the POS market in earnest since 2015.

## 2.3 Government Measures

The government has been trying to foster the fintech industry by, for example, loosening related regulations. In addition to abolishing the obligation to use accredited certificates, the government revised the Capital Market Act to embrace fintech and implemented regulatory sandboxes at the beginning of 2019. In addition, a further loosening of regulations, such as increasing the upper limits on money transfers, will be implemented soon.

# 3. CRYPTOASSETS

## 3.1 Recent Developments in Cryptoasset Markets

The cryptoasset markets in Republic of Korea have shown high volatility mainly reflecting regulatory changes at home and abroad (see Figure 4). In particular, they exhibited overheating between the first half of 2017 and early 2018. The gap between domestic and overseas cryptoasset prices, a phenomenon known as the "Kimchi Premium", indicated the degree of domestic cryptoasset market overheating. The "Kimchi Premium" for Bitcoin rose more than 40% for specific moments (see Figure 5). With the market cooling down since the beginning of 2018, however, this premium has disappeared. Since mid-November 2018, the price of Bitcoin is hovering around W4 million–W5 million, with sharply lowered trading volume.

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<sup>1</sup> Credit card information is stored in mobile applications.

<sup>2</sup> Although fintech firms provide remittance services that are more convenient for users, mobile money transfers processed by commercial banks account for 98% of the market over the same period.

<sup>3</sup> The accredited certificate is a kind of digital signature, which is required to use internet banking services and e-commerce.

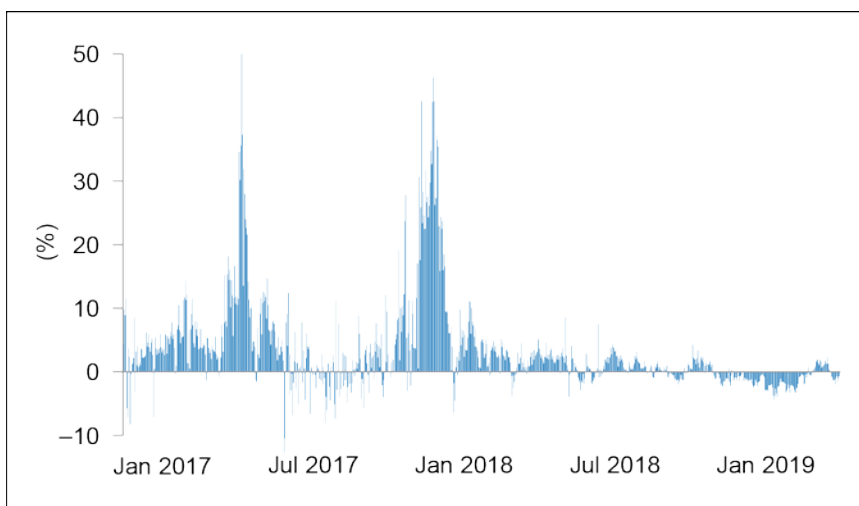


**Figure 4: Bitcoin Price and Trading Value**



Source: Bithumb.com, Cryptocompare.com.

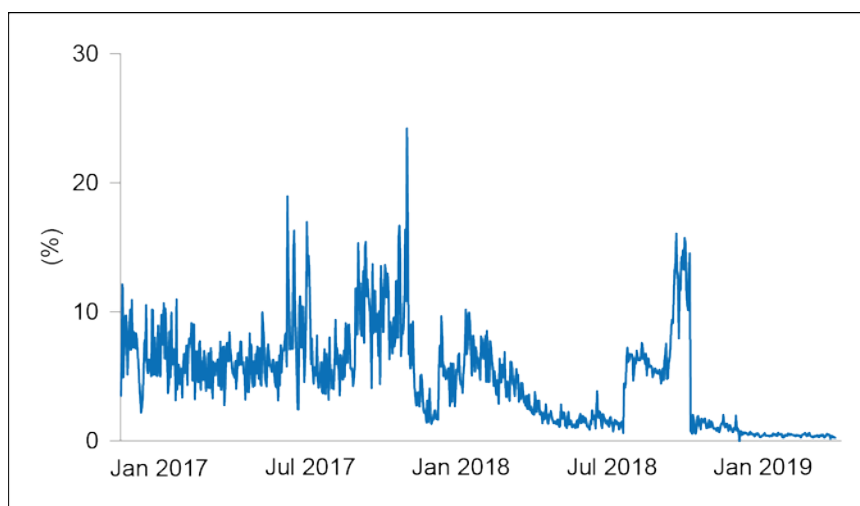
**Figure 5: Kimchi Premium**



Source: Coinmarketcap.com, Bithumb.com.

With the price of Bitcoin cooling, the won’s share in its trade with hard currencies has notably dropped (see Figure 6). The won’s share temporarily surged in Bitcoin trading in the second half of 2018 due to promotions at some cryptoasset exchanges, but soon dropped again and has remained at around 0.5% from January to April 2019, a low level considering the scale of the economy.<sup>4</sup>

<sup>4</sup> As of 2017, the Republic of Korea economy accounted for around 2% of the global nominal gross domestic product.

**Figure 6: Share of Won-Denominated Bitcoin Settlements**

Source: Coinmarketcap.com, Cryptocompare.com.

## 3.2 Government's Policy Response to Cryptoassets

The government has responded to the overheated market for cryptoassets, emphasizing consumer protection and prevention of illegal transactions. This includes banning initial coin offerings (ICOs) (September 2017), implementing a real-name cryptoasset transaction system (January 2018), and establishing anti-money laundering guidelines (January 2018).

### 3.2.1 Prohibiting ICOs

In September 2017, the government announced the ban on ICOs, citing their side effects: the overheating of markets due to heightened speculative demand, a growing risk of fraud, and consumer victimization. After the ICO prohibition, some local businesses moved their headquarters overseas, for example to Switzerland or Singapore, where ICOs were allowed. A government survey<sup>5</sup> in the second half of 2018 to see how those ICOs were conducted overseas concluded that the risk of investing in one remained high. As a result, the government announced in January 2019 that it would maintain its ban, and it provided several reasons for standing its ground: overseas ICOs did not offer the information people needed to make clear investment decisions, nor details about how or where the raised funds were going to be used, and none of the businesses provided any practical service.

While the government has maintained a cautious stance toward ICOs, it plans to fully support the advancement of blockchain technology and relevant industries.

<sup>5</sup> Between September and November 2018, the government carried out a survey of 22 businesses that had conducted their ICOs overseas and examined their white books and PR materials.

### 3.2.2 Anti-Money Laundering

On the international front, at the request of the G20,<sup>6</sup> the Financial Action Task Force revised its recommendations, and is seeking to revise its guidelines, in an effort to prevent money laundering or terrorist financing through cryptoassets, with the government also seeking to revise acts and laws accordingly. The government's existing guidelines adopted indirect regulations on financial firms that trade with the cryptoasset exchanges; however, recently proposed bills<sup>7</sup> include the imposition of direct money-laundering prevention obligations on cryptoasset dealers. In addition, before dealing with cryptoassets, dealers are required to report to the supervisory authorities. The bill also includes an article related to the cancellation of qualifications and penalties if the requirement is breached. Also, the supervisory authorities are unwilling to accept the report if the dealers use virtual accounts whose holders' real names are not verified. These are all seen to be steps that strengthen the real name system from past administrative guidance.

## 3.3 Assessment of Cryptoassets

### 3.3.1 Qualification as Currency

Whether cryptoassets are qualified to be currency can be assessed depending upon whether they carry out the functions of money, including being a medium of exchange, a unit of account, and a store of value.

A medium of exchange should be portable and widely accepted, as a currency is. Cryptoassets are portable, but their values are very volatile, making it unlikely they will be widely accepted within a short period of time. In addition, contrary to existing means of payment, such as cash or debit or credit cards, cryptoassets have a low competitiveness in terms of transaction costs and stability. Therefore, for now, they can be used as a medium of exchange within a very limited scope.

In addition, it is difficult for cryptoassets to play a role as a unit of account or a measure of value, due to their highly volatile market values. While the currency supply can be adjusted by the central bank, the supply of cryptoassets is determined in advance based on an algorithm. Therefore, it is difficult to maintain their prices or values.

Finally, since currencies, unlike cryptoassets, are highly liquid and stable, they can be used as means of storing value. In light of these three aspects, there is a low possibility at this point that cryptoassets would replace regular currencies.

### 3.3.2 Impact on Central Banking

The impact of cryptoassets on the macro-economy and the financial system has been meagre so far, as government measures,<sup>8</sup> including a ban on cryptoasset purchases, have limited financial institutions' exposure. Major central banks also perceived that the

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<sup>6</sup> At the G20 Financial Ministers and Central Bank Governors Meeting in March 2018, it was assessed that cryptoasset-related technologies can make the financial system more efficient and inclusive, but such technologies can also cause issues in terms of investor protection, tax evasion, money laundering and the use of funds for terrorism. Accordingly, the G20 asked the Financial Stability Board and the Financial Action Task Force to report progress related to the establishment of international standards related to cryptoassets.

<sup>7</sup> The Act on Reporting and Use of Certain Financial Transaction Information was brought before the National Assembly in March of this year and is pending as of May.

<sup>8</sup> The government prohibited financial institutions from purchasing cryptoassets and from acquiring collateral and equity investments via cryptoassets through measures announced on 13 December 2017.

likelihood of cryptoassets replacing existing legal tender or means of payment is very low, given their current status. However, it is necessary to note that central bank mandates, including financial stability and monetary policy, could be affected if cryptoassets were to gain more ground as investment assets and/or as a means of payment. The emergence of new payment services using cryptoassets would result in lower credit card fees, enhanced convenience of mobile payment services, and a cost reduction. Non-P2P payments of cryptoassets made through third parties, i.e., exchanges, could undermine the stability of existing payment and settlement systems by causing delays or the suspension of receipts due to intermediaries' credit and liquidity problems, or via cyberattacks.

Price volatility, price manipulation, and the possibility of a sharp contraction in transactions are regarded as inherent risks<sup>9</sup> to stability. In cases of an increase in the number of financial institutions directly investing in cryptoassets or holding related financial products, and with a growing interconnectedness between the cryptoasset market and existing financial institutions as a result of leverage in cryptoassets, the possibility of the inherent risks spreading to the overall financial system cannot be ruled out. However, given that the volume of cryptoasset investment is not large compared to other asset classes, and that the exposure of financial institutions is small, cryptoassets are at present deemed to have a limited impact on financial stability in the Republic of Korea.

The impact on monetary policy is also likely to be marginal, given the low share of cryptoassets in the economy, and the lack of any institutional foundation for their use as means of payment. Assuming that the demand for cryptoassets as an investment asset and as a means of payment would grow in the future, the effects of the reserve requirement adjustment would likely weaken, and the usefulness of monetary indicators would decline. However, considering that the share of bank lending replaced by cryptoassets would be small, and that the reserve requirement adjustment is less useful under the current interest rate-oriented monetary policy framework, such negative impacts would not be significant.

Currently, it seems unlikely that cryptoassets will become widely used in the economy and compete with legal tender anytime soon. However, it is necessary to monitor and study their development and economic impacts.

## 4. CENTRAL BANK DIGITAL CURRENCY

From the beginning of 2018, the Bank of Korea has been studying the possibility of issuing a CBDC by organizing a joint research taskforce. In early 2019, the Bank of Korea published a report and presented its views concerning CBDC. Considering broad impacts on the economy, as well as the financial sector, the Bank takes a cautious stance concerning the issuance of CBDC. The Bank also announced that there would be no possibility of issuing CBDC in the near future, though it will nonetheless continue to conduct in-depth research not only into CBDC, but also into distributed ledger technology (DLT) more broadly in preparation for any changes that might occur in the economic environment (Bank of Korea 2019a).

The following two subsections summarize the key messages of the report, and the last subsection introduces mock tests and research conducted by the Bank of Korea.

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<sup>9</sup> As cryptoassets are hard to appropriately price due to the controversy over their intrinsic value, and as ownership is concentrated on a limited number of market participants, price manipulation and a sharp contraction in trading can occur, depending on market conditions.

## 4.1 Policy Implications

First, CBDC would bring down the credit risk arising from the interbank market and would significantly reduce the cost associated with payment and settlement. However, as settlement would be concentrated on the central bank, the operational risk could increase accordingly. Competition for payment services between commercial banks and the central bank would be inevitable.

Second, CBDC can also cause fundamental changes in how a central bank conducts monetary policy. Once a positive interest is paid on CBDC, the interest rate is likely to work as a lower limit for commercial banks' loans and deposits. It could also be a benchmark for market interest rates. Meanwhile, it seems that the demand for reserves would become more volatile and harder to accurately predict because funds are more likely to move between CBDC and demand deposits.

Third, the issuance of CBDC could undermine financial stability and distort the role played by commercial banks. If people deposit some money into a CBDC account rather than into a commercial bank, the latter's funding costs would rise. This could lead to a decline in the supply of credit, which would challenge the role of commercial banks as a financial intermediary, and, in turn, undermine financial stability.

Finally, the issuance of CBDC expands the central bank's balance sheet, which increases the central bank's portion in the credit allocation in the economy, thus impairing its efficiency.

## 4.2 Legal Issues

The issuance of CBDC would require a legal basis. Since the current central banking system is based on currency and reserves, the issuance of CBDC as an electronic version of legal tender might not be consistent with the current Bank of Korea Act. In addition, it is unclear whether paying a positive (or negative) interest rate on CBDC would be viable. Other legal issues, such as privacy and abuse of power, may arise since the central bank can collect personal information from daily transaction data.

## 4.3 Mock Tests and Research

The Bank of Korea has been conducting mock tests of DLT-based interbank payment and settlement systems. Between September and December 2018, the Bank tested DLT on retail payment systems in an actual transaction environment between real buyers and sellers and with money transfers between participants in a permissioned network. The test generated some positive results regarding transaction processing efficiency, system resilience, and scalability. The test also confirmed that DLT can ensure settlement finality and anonymity. Such results imply that the permissioned DLT-based system would not fall behind the current retail payment systems in terms of dealing with the actual transaction volume. However, more evidence would be needed before applying DLT to actual payment and settlement systems. Bank of Korea will continue to investigate the possibility of application of DLT to its payment and settlement systems (Bank of Korea 2019b).

Bank of Korea also published research on the impact of CBDC. Kim and Kwon (2019), in particular, developed a monetary general equilibrium model to investigate how the introduction of CBDC affects financial stability. Without central bank intervention in the provision of credit to commercial banks, the introduction of CBDC can undermine financial stability. An increase in the quantity of CBDC raises the likelihood of bank panic via a reduction in credit, which, in turn, raises the equilibrium interest rate. However, it is shown in the paper that this problem could be fully addressed by lending the exact amount of money in CBDC accounts to the commercial banks, thereby recovering the decrease of credit provision.

## **5. CONCLUDING REMARKS**

Fintech in Republic of Korea still accounts for only a small share of payment and settlement services. That said, recent investment in the fintech industry shows a marked increase in, and paves the way for, changes in the financial industry.

It is unlikely that cryptoassets will become widely used and accepted in the near future, considering their limited competitiveness as means of payment and store of value.

CBDC has both a bright and dark side. It could reduce costs related to payment and settlement processes, while generating non-negligible financial stability issues. Bank of Korea takes a cautious stance and it announced that it would not issue CBDC in the foreseeable future.

The bottom line is that we cannot swim against the tide of financial innovation. We should maintain a balanced view of the opportunities and risks brought by financial innovation by monitoring and studying related issues.

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