

Payment System Policy Roadmap – Vision 2020

May 2016



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Executive summary

In response to evolution of the payment systems environment, coupled with the rapid expansion in innovative payment services and the formulation of a new regulatory framework driven by the implementation of global financial standards, the Bank of Korea (BOK) has established its "Payment System Policy Roadmap – Vision 2020." Its aim in so doing is to present the Bank's policy directions to FMIs and the public, and to facilitate the putting of these policies into practice in a consistent manner.

The Roadmap is based upon a vision of ensuring the safety and efficiency of the payment and settlement systems so as to contribute to financial stability, and to pursue these systems' advancement. It comprises three strategic objectives and twelve accompanying workplans, with complete implementation scheduled by 2020.

Based on the Roadmap, the BOK plans to strengthen not only its role as a system overseer but its role as a catalyst as well, by providing a clear policy perspective and heightening its interactions with other relevant authorities and payment and settlement system participants.

Vision, strategic objectives and workplans

Vision	Ensuring the safety and efficiency of the payment and settlement systems so as to contribute to financial stability, and to pursue the systems' advancement
Strategic objectives	Workplans
Enhancement of payment and settlement infrastructures	① Constructing the next generation BOK-Wire ② Extending the BOK-Wire operating hours ③ Enhancing the local RMB clearing infrastructure ④ Furthering implementation of the PFMI
Promotion of innovation in payment services	⑤ Improving the convenience and safety of retail payment services ⑥ Responding to the rise of digital currencies and distributed ledger technology ⑦ Shortening the net settlement intervals in the retail payment systems ⑧ Promoting innovation in the payment services market
Strengthening of the central bank functions	⑨ Enhancing the oversight and risk analysis framework ⑩ Expanding the financial informatization project ⑪ Strengthening international cooperation ⑫ Strengthening research and enhancing the policy implementation framework

1. Background

The paradigm for payment systems is shifting, as innovative payment services are becoming more widely available due to the spread of Fintech and to changes in consumers' behaviors, and as new payment systems regulations have been adopted since the Global Financial Crisis. While the provision of payment services by IT companies has brought about evolutions in the bank-centered payment services market, consumers' expectations of simplified services have grown, together with their concerns about financial security. Furthermore, as the new international standards are being implemented, efforts to enhance the safety of financial market infrastructures (FMs) have continued while discussions on cross-border linkages of payment systems have also progressed.

Under these circumstances of rapid evolution in the payment and settlement environment, the Bank of Korea (BOK) has concluded that it is important to propose a vision for the payment and settlement systems from a long-term perspective, and to push ahead consistently with this vision. Over the course of the BOK's deliberations in this regard, it has been noted that major economies have also established and are pursuing long-term strategies for developing their payment and settlement systems, so as to also enhance their systems' efficiency and safety and facilitate the provision of diverse payment services.

Against this background, the BOK has decided to establish a "Payment System Policy Roadmap - Vision 2020", and to implement it fully by 2020 in order to respond in a pre-emptive and proactive manner to the changes in the payment and settlement paradigm.

2. Forecasts for domestic and international payment and settlement environments

2.1. Paradigm shift driven by accelerated fusion of IT and finance

The progress in development of IT technologies is expected to continue, to the point where ubiquitous payment service availability is ultimately achieved. While research on ways of utilizing distributed ledger technology is proceeding actively, innovations made in existing technologies, such as the Internet, smart mobile devices and near field communication, have accelerated. There is in addition a series of new technologies, including "biometric authentication" and "location-awareness", which are foreseen gradually being in a more widespread use. On the bases of such technologies, domestic and foreign IT companies are expected to rapidly expand their provisions of financial services through use of their own individual platforms.

2.1.1. Expanded entry of non-financial companies to payment services market

It is expected that non-financial companies such as telecom companies, smartphone manufacturers and platform operators will endeavor to expand their entries into the payment services market. It may in consequence come to be that the payment services market is divided into closed payment network-based services, provided by the existing financial industry, and open platform-based services provided by IT companies. This expanded entry of non-financial companies to the payment services market will lead to intensified competition between IT companies and financial institutions, and facilitate service development as a result.

2.1.2. Spread of digital currencies and distributed ledger technology

Various breeds of digital currencies (or virtual currencies) such as Bitcoin, based on block chains and distributed ledger technology¹, are expected to continue emerging. The widespread use of digital currencies is judged likely to cause fundamental changes in the payment and settlement systems, which are at present centered mainly on the central bank.

2.1.3. Enhancing consumer convenience

As consumers' expectations of payment service convenience grow, innovative payment services are making their appearance in response. Amid the diversification in types of and interfaces among payment services, an environment of ubiquitous service availability, overcoming all temporal and spatial restraints, will be fostered. The globalization of payment services is anticipated to progress as well, through cross-border linkages among retail payment networks.

2.1.4. Growing concerns about financial security and cyber threats

In line with the expansion in payment services focused on open networks and simplified settlement, it is expected that concerns about financial security and cyber threats will grow. In particular, due to leakages and losses of personal information stemming from hacking or theft, problems related to financial and customer information protection are increasing. Moreover, as new IT technologies are being integrated into financial services in relatively short periods of time, service providers may in some cases be unable to allocate sufficient time to verify the reliability and security of financial transactions using these technologies, which may give rise to more frequent cyber incident occurrence.

2.2. Growing demand for enhanced FMI safety and expanded system linkages

As the formulations and revisions of international standards triggered by the Global Financial Crisis have reached stages of conclusion, the relevant authorities in each jurisdiction are stepping up efforts to revise their arrangements so as to enhance the safety of their FMIs. In particular, the Principles for Financial Market Infrastructures (PFMI) are being adopted by a significant number of jurisdictions, in parallel with implementation efforts related to the global regulatory initiatives pertaining to clearing, settlement and reporting of OTC derivatives transactions. Industries are also in the process of standardizing the code frameworks and message formats to support these initiatives.

Along with these efforts, authorities and industries are expected to pursue replacement of systemically important payment and settlement systems that are now becoming legacy systems, through measures for either the improvement of existing systems or the construction of new ones.

¹ Distributed ledgers are digital ledgers of online transactions, distributed on online peer-to-peer (P2P) networks and shared and managed by all participants of the networks concerned.

In line meanwhile with the expansion in cross-border trade and the growth of global financial markets, combined with the adoption of global technical standards and the corresponding system improvements, cross-border linkages among FMIs are anticipated to expand, bringing about possibilities of increased interdependence.

2.2.1 . Implementation of international standards to strengthen FMI safety

While pushing ahead with adoption of the PFMI, authorities are actively discussing issues related to the elimination of regulatory arbitrage and to the ensuring of level-playing fields. In particular, jurisdictions are revising their respective regulatory frameworks and system arrangements in order to incorporate international standards, and the CPMI-IOSCO are carrying out additional discussions aimed at identifying areas where provision of additional guidance is needed to facilitate jurisdictions' PFMI implementation efforts.

It is anticipated that jurisdictions will in parallel adopt global standards on financial transactions (e.g. ISO 20022), as well as groups of identifiers for reporting, recording and aggregating OTC derivatives transactions in accordance with legal entity involved, product class and transaction type.

2.2.2. Enhancements or reconstructions of systemically important payment and settlement systems

It has been noted that major economies are in the process of either enhancing or reconstructing their systemically important payment and settlement systems – central banks' RTGSs, in particular. Going forward these processes will be concluded in conjunction with the adoption of global technical standards and with the constructions of back-up or substitute systems, to facilitate greater flexibility in responding to the changing financial environment.

2.2.3. Expansion of cross-border linkages among payment and settlement infrastructures

Countries in the Asia-Pacific region are expected to pursue cross-border settlement arrangements proposed to support intra-regional transactions in securities or foreign exchange. Relevant preparations and discussions are in progress under the umbrella of the ASEAN+3 Regional Settlement Intermediary (RSI) initiative. In 2015 central banks and CSDs in the region chose a CSD-RTGS linkage model, adoption of which will be pursued by regional countries through subsequent technical discussions and potential system constructions. In the retail dimension, likewise, it is expected that system operators in the region will further their discussions of constructing multilateral system linkages based on the regional network platform (referred to as "the APN hub"²).

² The Asian Payment Network, a forum composed of the private retail payment system operators of ASEAN+3 member countries, has been pursuing establishment of this regional hub as a medium- to

2.2.4. Rise of RMB as a cross-border settlement currency

Amid a continuous increase in transactions in and circulation of the RMB for settling cross-border trade, a growing demand for additional RMB clearing and settlement infrastructures is expected. Pursuit of more advanced infrastructures such as a KRW/RMB payment-versus-payment system may meanwhile be carried out in Korea. The ideal forms of supporting infrastructures and accompanying settlement procedures will however depend upon the future development of RMB settlement infrastructures, as well as other factors such as potential RTGS-RTGS and CSD-RTGS linkages between the two countries.

2.3. Demand for a strengthening of the central bank's role

The PFMI emphasize the importance of the central bank's role as a payment and settlement systems overseer. As the paradigm for payment services changes, amid the spread of Fintech and the rise of innovative payment services, it is expected that market demand for strengthening of the central bank's roles and functions will grow further, as ensuring the safety and efficiency of the payment and settlement systems becomes ever more crucial.

2.3.1. The central bank as a catalyst and a coordinator

Recently, market participants' interest in support for the Fintech industry and enhancement of retail payment convenience and safety has increased. Therefore, the central bank's role as a catalyst will grow to accommodate structural changes in the payment system environment and to support continuous innovation.

Further, as the number of new service providers wishing to use the existing retail payment systems increases, discussions on reforms of the participation arrangements and operational frameworks of the retail payment systems are expected to emerge. Under these circumstances, the central bank will be increasingly expected to serve as a coordinator aligning the diverse views of relevant stakeholders.

2.3.2. The central bank as an overseer

Demand will increase for pre-emptive and proactive oversight by central banks against new variants of risks. As domestic and cross-border linkages among infrastructures expand, new settlement risks arise – a process that accelerates with the degree of interdependence between the linked systems and the potential complexity of the settlement mechanisms, giving rise to a need for enhancement of the central bank's oversight framework. Moreover, in view of the distinctive risk profiles of non-financial firms in particular, there will be a need for central bank development of targeted oversight methodologies.

long-term goal.

2.3.3. The central bank as a member of the international community

It is expected that the roles and functions of Standard-Setting Bodies (SSBs) including the CPMI will expand further. The SSBs will take steps in the areas not only of promoting the relevant international standards, but of providing policy advice as well. It will therefore be more important for the central bank to participate in the related discussions, and to take into account the SSBs' advice and recommendations in the process of establishing its own payment and settlement policies.

Central banks in developing countries will meanwhile pursue modernizations of their payment and settlement infrastructures. In view of this prospect, requests by these banks for assistance are likely to increase. Specifically, developing country central banks may ask their counterparts in other economies for assistance in the courses of carrying out diverse projects for payment and settlement enhancement, including designing of the relevant systems, establishment of oversight frameworks and construction of the pertinent infrastructures.

3. Review of environment for payment services and financial market infrastructures in Korea

3.1. Evolution of payment services market

"Fast payment" has long been available in the Korean retail payment market, based upon the interbank shared network of the Korea Financial Telecommunications & Clearings Institute (KFTC), established jointly by the BOK and financial institutions in the late 1980s. As non-bank financial institution participation in the Electronic Banking System has expanded, and non-financial companies have also begun to provide related payment services through alliances with financial institutions, the market has demonstrated remarkable growth.

With the recent rise in demand for simplification of the authentication systems for electronic payments, together with the development of IT technology, government-led initiatives are actively pursuing policies to support the Fintech industry through relaxations of related regulations and other relevant measures. Discussions of entirely new types of payment services, such as digital currencies and distributed ledger technology, are at the same time being pushed actively ahead with.

Entries into the payment services market by a greater number of non-financial companies, such as payment gateways and ICT companies, have also grown rapidly. Numerous non-financial companies are competing in launches of innovative services. The related discussions and innovations are focused mainly on the enhancement of financial consumer convenience and relaxation of regulations, however, and there is thus a need for greater efforts devoted to strengthening the safety of these services.

3.2. Need for enhancing safety and efficiency of FMIs

As of March 2016 Korea's systemically important financial market infrastructures comprise i) BOK-Wire and the KFTC networks (the Payment systems); ii) the Korea Exchange (KRX)'s exchange-

traded and OTC product clearing systems (the CCP); and iii) Korea Securities Depository (KSD)'s securities depository and settlement systems (the CSD/SSS). With respect to the Trade Repository (TR), to take charge of the aggregation, management and compilation of data related to OTC derivative transactions, the KRX is in the process of building the relevant system, with completion targeted for 2016.

These FMIs have been assessed as in good overall observance with the PFMI. Notwithstanding this, a series of needed further improvements have been identified in relation to the following: allocation of financial resources in consideration of stress test scenarios, FMI support of financial stability, operational risk management in view of mutual interdependencies, and RTOs (Recovery Time Objectives) following disaster occurrence.

With respect to BOK-Wire, it has been noted that system enhancement or reconstruction is necessary due to its operational complexity and system obsolescence in consequence of its continued expansion of functions over the past two decades since 1994.

It is likewise imperative that the retail payment systems endeavor actively to accommodate the ongoing evolutions in the relevant environments, such as the rise of new payment services and the expansion in distributed ledger technologies.

In the cases of the CCP and the CSD/SSS, although the CCP has completed some of the procedures required for international recognition, by undergoing equivalence assessments by major economies, further improvement of its risk management framework remains necessary.

3.3. Need for enhancing the central bank's roles and responsibilities

The BOK has been serving as the RTGS operator, the FMI overseer and the catalyst that supports payment and settlement system innovation. In this regard, the following tasks are required:

- BOK-Wire needs to be greatly enhanced, to enable it to respond effectively to the diversification and sophistication of financial transactions between financial institutions, as well as to the surges in transaction value and volume.
- The BOK needs to strengthen its oversight role in identifying, analyzing and evaluating the relevant potential risks arising from the multiple phases involved and the growing complexity of the settlement structure caused by the spread of new payment services, and in inducing any needed improvements.
- As the lender of last resort and the oversight authority, the BOK, based upon its expertise and experience in the area of payment and settlement, needs to take the lead in promoting payment and settlement system development, through for example the introduction of new settlement systems and payment instruments and improvement of the existing systems. In parallel, the BOK needs to cooperate closely with other relevant authorities and with industry as well, by hosting conferences, seminars and workshops and participating in government task

forces, while also working to conduct increased research and offering policy suggestions geared toward advancement of the domestic payment and settlement systems.

It will meanwhile also be important for the BOK to participate in the discussions on global regulatory initiatives and the implementation of international standards, as a member of global central bank communities including the CPMI, EMEAP (Executives’ Meeting of East Asia-Pacific Central Banks), SEACEN (South East Asian Central Banks) and the CLS Oversight Committee. Further, the BOK may need as well to extend assistance for the modernization of payment and settlement systems of developing countries, and to support the establishment of cross-border retail payment system linkages, along with relevant central banks the Asia-Pacific region.

4. Payment system policy roadmap – Vision 2020

4.1. Vision and strategic objectives

To this end, the BOK has set forth a vision of ensuring the safety and efficiency of the payment and settlement systems so as to contribute to financial stability, and to pursue advancement of these systems. The BOK has also adopted the following three strategic objectives under the vision, with a view to putting it into practice in a consistent manner:

- **Enhancement of the payment and settlement infrastructures**
- **Promotion of innovation and progress in payment services**
- **Strengthening of the central bank functions**

In order to achieve these three objectives, the BOK has developed twelve accompanying workplans, with full implementation by 2020:

Vision, strategic objectives and workplans

Vision	Ensuring the safety and efficiency of the payment and settlement systems so as to contribute to financial stability, and to pursue the systems’ advancement
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Strategic objectives	Workplans
Enhancement of payment and settlement infrastructures	<ul style="list-style-type: none"> ① Constructing the next generation BOK-Wire ② Extending the BOK-Wire operating hours ③ Enhancing the local RMB clearing infrastructure ④ Furthering implementation of the PFMI
Promotion of innovation in payment services	<ul style="list-style-type: none"> ⑤ Improving the convenience and safety of retail payment services ⑥ Responding to the rise of digital currencies and distributed ledger technology ⑦ Shortening the net settlement intervals in the retail payment systems ⑧ Promoting innovation in the payment services market

Strengthening of the central bank functions	<ul style="list-style-type: none"> ⑨ Enhancing the oversight and risk analysis framework ⑩ Expanding the financial informatization project ⑪ Strengthening international cooperation ⑫ Strengthening research and enhancing the policy implementation framework
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4.2. Workplans

4.2.1. Constructing the next generation BOK-Wire

The BOK has initiated construction of the next generation BOK-Wire in a plan to enhance its safety and efficiency. The project will be pushed ahead with based upon the two key objectives of i) improving the operation and management process, and ii) adopting the latest IT technologies. System modules and architecture will also be designed and built, with the aim of enhancing participants' convenience and forming the foundation for potential cross-border system linkages that may accelerate with further progress in regional financial integration. Given the systemic importance of BOK-Wire, the BOK has taken a phased-in approach as follows:

- **Phase 1 (Review and design):** the BOK plans to establish a specific blueprint for redesign and construction of the system, while conducting comprehensive and in-depth reviews of the current BOK-Wire's technical elements, operational processes and risk management framework. In carrying out these steps the BOK will collect views from BOK-Wire participants and the market overall, which it will take into account in the ensuing process, while preparing a plan for revision of the relevant regulations pertaining to operation of BOK-Wire. The targeted completion date for this phase is the end of 2017.
- **Phase 2 (System construction):** Based upon the blueprint prepared in Phase 1, the BOK will carry out the actual system construction. When the work nears completion, participants will be asked to revise their own systems' connecting modules and supporting infrastructures, with multiple rounds of comprehensive tests to then follow. The targeted date for completion of this phase is end-2020.

In tandem with construction of the next generation BOK-Wire, the BOK will also push ahead with other BOK-Wire enhancement projects aimed at reducing large-value settlement risk. In particular, measures for improving BOK-Wire operation and management will be considered – with a view to easing the concentration of settlement at around the BOK-Wire closing window (i.e. 16:00~17:30), enhancing the framework for intraday liquidity provision, and improving the settlement mechanism in the liquidity saving mode.

4.2.2. Extending BOK-Wire operating hours

The BOK plans to extend the current BOK-Wire operating hours, as a means to ease the concentration of settlement at around the closing time, and to lay a foundation for cross-border

system linkages with overseas financial market infrastructures. The plan is also geared toward reducing the mutual credit exposures of retail payment system participants, by moving the conduct of large-value fund transfers from the retail payment systems to BOK-Wire.

The current BOK-Wire operating hours are eight hours and thirty minutes, from 09:00 to 17:30 – significantly shorter than those of large-value payment systems in major economies. Major economy central banks have maintained long operating hours, or extended them recently, in order to provide continuous settlement services for global financial institutions³.

The extension of the BOK-Wire operating hours is expected to have the effects of increasing participant convenience, strengthening the foundation for cross-border linkages with other countries, and reducing settlement risk for financial institutions.

Given that this issue involves not only the BOK but also the cooperation of the FMI participants and operating institutions, the BOK will pursue BOK-Wire operating hour extension in close consultation with these other parties.

4.2.3. Enhancing the local RMB clearing infrastructure

In preparation for a potential rise in RMB settlement demand arising from the RMB's increasing circulation as a settlement asset for trade and financial transactions, the BOK is planning enhancement of the local RMB clearing and settlement infrastructures in order to support safe and efficient settlement services. After stable operation of the RMB clearing bank's system has been ensured, the plan will be put into practice in accordance with the following phases:

- **Phase 1 (ensuring stable operation of the existing system):** The BOK will continue its efforts to ensure stable operation of the local RMB clearing system, by carrying out monitoring and assessment of its operation and risk management framework.
- **Phase 2 (construction of a PvP settlement infrastructure):** The BOK will consider constructing an advanced settlement infrastructure, supporting PvP settlement for RMB and KRW currency trades, so as to alleviate principal risk stemming from the time-lag inherent in the pairwise nature of foreign exchange settlement.
- **Phase 3 (construction of a cross-currency DvP settlement infrastructure):** This will be a long-term project. The baseline idea here is to build a trans-regional clearing and settlement infrastructure that enables cross-currency settlement of RMB-denominated fixed income products in exchange for KRW funds, and vice versa.

The specific timelines for building the PvP and DvP basis infrastructures will be set in consideration of the pace of increase in RMB transactions, and of the forms of global settlement infrastructures for RMB.

³ There have recently been cases of operating hour extensions to support retail payment systems operating 24 hours per day.

4.2.4. Furthering implementation of the PFMI

To enhance the safety and efficiency of the domestic FMIs, the BOK will respond actively to the SSBs' implementation monitoring/assessments on the one hand, while on the other hand also providing support to ensure the adoption of international standards such as the PFMI within the earliest possible time.

- **Pursuing enhancement of FMIs' risk management frameworks in accordance with international standards:** The BOK is committed to ensuring that the clearing and settlement infrastructures follow and put into place risk management in line with international standards, so that they can support domestic and cross-border financial transactions in a more stable manner. Specifically, the BOK, in preparation for the implementation monitoring/assessment, will recommend to the domestic CCP that it further enhance its resilience and recovery arrangements. Further, the BOK will identify market practices in relation to clearing and settlement, and based upon this suggest the adoption of desirable best practices.
- **Pursuing continuous improvement of FMI-related arrangements:** The BOK will continue to pursue improvements of the FMI-related arrangements, in collaboration with the relevant domestic FMI authorities. Improvements will include revisions of FMIs' systems for recovery and management in cases of emergencies, introduction of a global Legal Entity Identifier system in Korea, and establishment of a system for reporting of data on OTC derivatives transactions.
- **Establishing cooperative arrangements with relevant authorities:** The BOK will establish cooperative arrangements with FMI authorities domestically and abroad. It will formalize the frameworks for cooperation with the relevant authorities, in line with recommendations made by the CPMI-IOSCO and the IMF. It will moreover strengthen its frameworks for cooperation in oversight with foreign central banks, oversight authorities and international organizations, so as to achieve effective oversight of FMIs operating in multiple jurisdictions.

4.2.5. Improving convenience and safety of retail payment services

To actively accommodate the recent structural changes in the retail payment and settlement environments, while also supporting continuous innovation, the BOK will prepare and implement measures focused on enhancing retail payment system convenience and safety.

- **Enhancing convenience:** the BOK will monitor global retail payment trends, as well as systems related to retail payments and their operational arrangements, and continually pursue improvements in domestic retail payment system convenience. The Bank will in particular review the current statuses of development of Fintech industries domestically and abroad, as well as major economies' strategies in response, changes in retail payment customers' behaviors, and so on, and work to establish and implement measures to

accommodate the changes in the retail payment and settlement environment. Furthermore, in collaboration with the relevant institutions the Bank will implement measures to improve payment service convenience and efficiency, by for example supporting system participation by and development of new payment service providers, shortening the times required for funds transfers in some retail payment systems, etc.

- **Pursuing reliability and safety:** The BOK will continue to pursue policy measures aimed at securing the reliability and safety of innovative electronic payment services. To this end, the Bank will establish and implement measures for expanding pertinent statistics to help in identifying and preventing potential risks, as well as for oversight of such risks, and carry out assessments of service providers' measures to ensure the safety of electronic finance.
- **Strengthening cooperation:** The BOK will strengthen its cooperation with the relevant institutions and expand its measures for collecting the views of diverse stakeholders. It will expand its joint research with related institutions as well as external experts, together with its practical cooperation with operators and payment services providers, and work to continue relevant discussions with diverse stakeholders through interactions via conferences, workshops and seminars.

4.2.6. Responding to the rise of digital currencies and distributed ledger technology

As the circulation of digital currencies and the utilization of distributed ledger technology may bring about dynamic changes in the payment system and the financial system at large, the BOK will bolster its research on these issues and develop plans for responding to these changes.

- **Monitoring and research:** The BOK will monitor trends in global transactions in and usage of digital currencies, and conduct joint research, together with major domestic financial institutions and experts in this field, on the distributed ledger technology and its development and application in the payment systems. Specifically, the research will cover an optimal regulatory framework governing the issuance and circulation of digital currencies, based on analysis of the spread of digital currencies and its effects on not only the payment system but other aspects of central bank concern as well, such as monetary policy, financial stability and the financial markets.
- **Participation in relevant international discussions:** Given that digital currencies can be used as global payment instruments, free from the constraints of regional restrictions, the BOK will step up its participation in relevant international discussions (e.g. participation in the CPMI Working Group on Digital Innovation) and strengthen its cooperation with foreign central banks.
- **Securing appropriate oversight tools:** In response to the spread of digital currencies and distributed ledger technology, the BOK will commit itself to securing appropriate tools for oversight. In particular, it will devote efforts to obtaining the authority to require submission of pertinent data and/or statistics from major digital currency service providers,

with a view to minimizing payment and settlement system risk and maintaining financial stability.

4.2.7. Shortening of net settlement intervals

Korea's retail payment systems, the Interbank Shared Network for example, are operated on a 24/7 basis and conceived of as extremely convenient to customers since the funds are paid immediately after payment initiation. However, as the final settlement through BOK-Wire takes the form of Deferred Net Settlement (DNS) at 11:00 AM on the following business day, financial institutions in the retail payment systems are exposed to credit risk.

In consideration of this risk, the BOK plans to shorten the net settlement intervals in the retail payment systems – by means such as moving net settlement execution to an earlier timeframe or operating multiple net settlement windows during the same business day, to thereby reduce the duration and amount of credit risk exposure. This plan will be carried forward in parallel with the putting into place of the newly developed linked settlement between BOK-Wire and the Electronic Banking System. As shortening of the net settlement intervals will require cooperation from the related FMI operators and participants, the BOK will collect their views over the course of plan preparation and implementation. This project, when completed, is expected to also reduce financial institutions' collateral burdens, as their collateral requirements are calculated based on the sizes of their credit exposures.

4.2.8. Promoting innovation in the payment services market

In response to the paradigm shift in payment and settlement services, the BOK will develop measures for modification of current regulations making it difficult for new payment service providers to enter the market, while also pursuing improvements in the methods of retail payment system use.

- **Developing policy measures:** The BOK will develop policy measures to support market entry by new payment service providers and their innovative business operations, based upon which it will also provide the relevant authorities with policy advice as necessary. In particular, the BOK will develop measures for improvement of the regulatory frameworks including the registration requirements for electronic finance businesses and other relevant regulations, which unduly disadvantage prospective service providers attempting to enter the market by demanding they meet excessively high standards in terms of financial soundness and resources. The specific focus in establishing the measures will be on specifying and clarifying the substances of the pertinent regulations so as to create a more predictable business environment moving into the future.
- **Facilitating access and pursuing international standards:** The BOK will pursue enhancement of retail payment system participation arrangements. Consideration may for instance be given to assisting Fintech service providers' indirect participation in the retail payment systems based on open-based interbank platforms. The BOK will in addition engage in the international discussions (of the CPMI, ISO/TC68, etc.) on retail payment innovation and enhancement of financial safety.

4.2.9. Enhancing oversight and risk analysis framework

In the course of implementing international standards such as the PFMI, the BOK plans to enhance its payment and settlement system oversight function by improving its framework for oversight and risk analysis.

- **Enhancement of oversight framework:** The BOK plans to conduct a comprehensive review of the scope and details of its current oversight methodologies, and push ahead with improvements of its oversight framework in a phased manner⁴.
- **Improvement of risk analysis framework:** The BOK plans to pursue improvement of its risk analysis framework, by developing additional measures for quantifying risks. In particular, the BOK is considering development of a liquidity indicator to facilitate the monitoring of financial institutions' settlement behavior, and the building of a stress-based model enabling the identification of FMI credit and liquidity risks.
- **Strengthening statistical analysis:** The BOK plans to strengthen its framework for statistical analysis, by first expanding the coverage of its payment and settlement statistics. To achieve this goal the BOK will put a greater focus on examining the correlations between big payment data and key economic variables, while also expanding its compilation of statistics on payment and settlement instruments.

4.2.10. Expanding financial informatization project

In consideration of the spread of financial services provided by non-financial companies, the BOK will expand the scope of its financial informatization project, and in order to implement the related action plans effectively will also enhance the operational procedures of the Committee on Financial Informatization Promotion (CFIP)⁵.

- **Expansion of project related to standardization and safety measures:** The BOK will examine the statuses of the disaster recovery systems of domestic financial institutions, and their observances of international standards, and propose improvements as needed.
- **Expanding composition of CFIP:** The BOK plans to expand the CFIP's composition to include representatives from non-financial electronic finance service providers. Specifically,

⁴ Specific action plans under consideration are 1) the publication of an oversight report so as to further heighten the external credibility of its oversight activities; and 2) the conduct of parallel reviews by external experts during regular assessments of systemically important payment and settlement systems.

⁵ The CFIP, a consultative group of financial institutions chaired by the BOK Senior Deputy Governor, was established under the National Informatization Framework Act in order to carry out joint projects on financial informatization, standardization and safety measures. It consists of representatives from 29 institutions including banks, securities firms, credit card companies, insurance companies and other relevant institutions.

the scope of entities eligible to participate in the CFIP's key projects (such as joint projects related to standardization and security measures) will be enlarged, through revision of the relevant operating regulations, to also encompass non-financial firms including electronic finance companies and IT companies. The scope of those polled by the CFIP to collect business ideas and suggestions will also be expanded, by inviting non-financial firms and the general public to provide constructive proposals as well. In particular, non-financial firms will be added to the subjects of polls for exploring potential joint projects, and "requests for proposal to facilitate financial informatization" will be added, as a separate questionnaire item, to the BOK's payment instrument usage survey of the general public conducted each year.

- **Collecting views from diverse institutions:** Working-level entities under the CFIP, such as the Working Group on Standardization and the Working Group on Safety Measures, will commit themselves to collecting views from diverse institutions with regard to the CFIP's agenda settings. In particular, institutions other than the KFTC, such as the Financial Security Institute, Korea Securities Depository (KSD), Korea Securities Computing Corporation (KOSCOM) and start-up ventures, will be strongly encouraged to propose agenda items.

4.2.11. Strengthening international cooperation

The BOK plans to continue engaging in discussions on global regulatory issues taking place in the SSBs and various central bank communities (the CPMI, EMEAP, SEACEN, ASEAN+3, etc.) The BOK will also devote itself to providing central banks of developing countries technical assistance based upon its expertise and experience with respect to the formulation of FMI policies and payment system operation.

Within the Asia-Pacific region, in particular, discussions of regional settlement infrastructures such as cross-border linkages between FMIs are underway. And in this regard, the BOK plans to participate in the activities of relevant working groups and task forces, specifically concerning the ASEAN+3's Regional Settlement Intermediary (RSI) to support securities settlement in the region. The BOK will also step up its efforts to support expanding the coverage of the Cross-border Payment Network (for ATM and account transfers), a system of bilateral linkages between Korea and several counterpart countries⁶.

Meanwhile, the BOK intends to also continue its cooperation with central banks of developing countries. In particular, it will provide those requesting it with policy advice in connection with the

⁶ Since the initial adoption of such a linkage with Malaysia in December 2010, the KFTC has been providing travelers overseas with ATM withdrawal services based on a network of linkages to the retail payment systems of six economies including the U.S, the Philippines, Vietnam, Thailand and Indonesia. Since December 2014, a cross-border account transfer service has also been provided in cooperation with Vietnam, on a pilot basis.

design of payment and settlement system architecture; the formulation of relevant regulations; the establishment of oversight frameworks; and infrastructure construction.

4.2.12. Strengthening research and enhancing policy implementation framework

The BOK plans to strengthen its payment and settlement related research with a view to boosting its capacities for effective response to the evolutions of the financial market and payment and settlement environments, and for leading development of the domestic payment and settlement systems. In parallel, the BOK will commit itself to enhancing its policy implementation framework through both autonomous efforts and cooperative engagement.

- **Strengthening Research:** The BOK will strengthen its research on critical issues, to help it more swiftly and accurately identify trends in the rapidly evolving domestic and foreign payment and settlement environment, and based upon this, make policy responses as needed in a timely manner. Key focuses of the research will be issues such as the rise and spread of new breeds of payment services based on digital currencies, distributed ledger technology and big data, and the use of e-money in connection with retail payment. Further, the BOK will examine the possibility of a 'coinless society,' by conducting research on cashless society models in advanced economies.
- **Enhancing Policy Implementation Framework:** The BOK will devote efforts to enhancing its policy implementation framework, through autonomous efforts to pursue payment and settlement system enhancement as well as extending policy advice to the government authorities. In this respect, the BOK will work to present its policy perspectives by establishing a cooperative arrangement dedicated to payment and settlement with the relevant authorities. Diverse channels of engagement (such as seminars and conferences with relevant institutions, workshops inviting external experts, etc.) will also be utilized to achieve this goal. Further, the sections in the annual *Payment and Settlement Systems Report* concerning policy functions will be improved so as to satisfy the public need for and interest in information on payment and settlement issues.

5. Implementation Timeline

Strategic objectives / Workplans / Action plans	Year of Implementation				
	2016	2017	2018	2019	2020
I . Enhancement of payment and settlement infrastructures					
1.Constructing the next generation BOK-Wire					
① Planning for construction	←→				
② Construction of system			←→		
③ Testing and operation (end-2020)				←→	
2. Extending the BOK-Wire operating hours					
① Planning for extension	←→				
② Consultation with relevant in-house departments and participants	←→				
③ Implementation of extension		←→			
3. Enhancing the local RMB clearing infrastructure					
① Promotion of clearing system safety	←→				
② Establishment of PvP system (if necessary)		←→			
③ Establishment of cross-currency PvP system settling KRW and RMB currency pair (long-term plan)				←→	
4. Furthering Implementation of the PFMI					
① Inducement of clearing and settlement infrastructures in compliance with PFMI	←→				
② Pursuit of FMI improvements (jointly with relevant authorities)	←→				
③ Pursuit of establishment of cooperative arrangement with related authorities	←→				
II. Promotion of innovation in Payment Services					
5. Improving the convenience and safety of retail payment services					
① Improvement of retail payment system convenience	←→				
② Improvement of new electronic payment service safety	←→				
③ Enhancement of cooperation with relevant domestic and foreign institutions (continuing)	←→				
6. Responding to the rise of digital currencies and distributed ledger technology					
① Conduct of related monitoring and research (continuing)	←→				
② Participation in relevant international discussions, and enhancement of cooperation with foreign central banks (continuing)	←→				
③ Establishment of oversight measures	←→				

7. Shortening the net settlement intervals in the retail payment Systems					
① Establishment of plan	←	→			
② Consultations with in-house departments and relevant institutions		←	→		
③ Implementation of shortened net settlement intervals			←	→	
8. Promoting Innovation in Payment Services Market	←	→			
III. Strengthening of the central bank functions					
9. Strengthening oversight and risk analysis framework					
① Improvement of payment and settlement system oversight	←	→			
② Pursuit of oversight enhancement through risk quantification	←	→			
③ Expansion of statistics and research on payment and settlement instruments	←	→			
10. Expanding financial informatization					
① Pursuit of expansion of financial informatization (continuing)	←	→			
② Identification of joint projects for CFIP, and expansion of CFIP participants	←	→			
③ Diversification of institutions eligible to propose agendas of various working groups	←	→			
11. Strengthening international cooperation					
① Participation in discussions on global issues by international organizations, and provision of policy advice to developing country central banks (continuing)	←	→			
② Planning support for development of payment and settlement systems based on the Korean model.	←	→			
③ Responding to discussions on multilateral linkages of systems, through ASEAN +3 RSI, etc.	←	→			
12. Strengthening research and enhancing policy implementation Framework					
① Strengthening of research and study on critical payment and settlement system issues	←	→			
② Expansion of BOK policy functions in payment and settlement businesses	←	→			