Table III.2 R3 CEV Consortium Members

<table>
<thead>
<tr>
<th>Country</th>
<th>Members</th>
</tr>
</thead>
</table>
| US      | ▪ Bank of America  
           ▪ BNY Mellon  
           ▪ Citi  
           ▪ Goldman Sachs  
           ▪ J.P. Morgan  
           ▪ Morgan Stanley  
           ▪ Northern Trust  
           ▪ State Street  
           ▪ US Bancorp  
           ▪ Wells Fargo |
| UK      | ▪ Barclays  
           ▪ HSBC  
           ▪ Royal Bank of Scotland |
| Canada  | ▪ BMO Financial Group  
           ▪ CIBC  
           ▪ Royal Bank of Canada  
           ▪ Toronto-Dominion Bank  
           ▪ Scotiabank |
| Japan   | ▪ Mitsubishi UFJ Financial Group  
           ▪ Mizuho Financial Group  
           ▪ Nomura  
           ▪ SBI Holdings  
           ▪ Sumitomo Mitsui Banking Corporation  
           ▪ Toyota Financial Services |
| Europe  | ▪ Swiss: UBS, Credit Suisse  
           ▪ Germany: Commerzbank, Deutsche Bank  
           ▪ France: BNP Paribas, Societe Generale, Natixis  
           ▪ Denmark: Danske Bank  
           ▪ Sweden: Nordea, SEB  
           ▪ Finland: OP Financial Group  
           ▪ Netherlands: ING Bank  
           ▪ Spain: Banco Santander, BBVA  
           ▪ Italy: Intesa Sanpaolo, Unicredit |
| Australia | ▪ Commonwealth Bank of Australia  
           ▪ Macquarie Bank  
           ▪ National Australia Bank  
           ▪ Westpac Banking Corporation |
| Brazil  | ▪ Bank Itau of Brazil |
| Korea  | ▪ Hana Financial Bank  
           ▪ Shinhan Financial Group |
| Chinese | ▪ AIA Group, Ping An Group |

Source: Eun-su P. and Kyu-na K.(2016)\textsuperscript{10}

C. Domestic and global use cases of Blockchain in the financial services industry and its Implications

Taiki Lee (tklee@kif.re.kr)

Blockchain is commonly referred to one type of distributed ledger. Bank of Korea defines as technology of recording and managing distributed ledgers which are shared across peer-to-peer network by all participants within the network, instead of storing and managing ledgers at a centralized system of a particular institution. According to Satoshi Nakamoto, the inventor of the bitcoin protocol, defines bitcoin as digital currency sent directly from one part to another and explains blockchain as a technology that prevents double-spending problem using peer-to-peer network.

Blockchain is seen as revolutionary innovation which offers security and transparency without the need for a trusted third-party intermediary from a centralized system. Blockchain has the potential to improve financial industry, such as in the areas of payment system, securities settlement and transactions. When blockchain technology is applied by solely using the internet without having a trusted third-party intermediary from a financial institution, the peer-to-peer financial transaction is published on a shared public ledger by participating parties. From the technological prospective, blockchain technology can enable various types of asset transactions such as cash, bonds, stocks, insurance, and lottery. Blockchain technology can also provide a service that can be used to confirm ownership rights and publish smart contracts.

As of July 2016, 50 banks including JP Morgan, HSBC, Citi, Barclays, BBVA, UBS and Mizuho Bank have joined the blockchain consortium led by startup R3CEV. The consortium is focused on the development of standards for blockchain technology and framework of protocols for financial markets.

Recently major banks including UBS have implement-ed a shared ledger database system which is an integral part of blockchain technology to reduce settlement

costs. Moreover, blockchain technology is used in real estate transactions, global remittance and also loyalty points to turn them into a de facto currency. A joint research is also taking place to facilitate blockchain technology to develop blockchain based public key certificates.

As interest in blockchain technology is surging in Korea, many Korean companies are turning its eyes toward blockchain technology development. Investment in bitcoin and other blockchain startups are on the rising trend and some domestic financial institutions are going into partnership with fin-tech startups.

In order to better facilitate blockchain based technology in digital financial transaction, revised regulation is necessary. For instance, regulation focused on a centralized system and current cash-based transaction laws need to be revised. It is important to cooperate with relevant industry and institutions to ensure that blockchain technology is applicable to the entire financial market system. Furthermore, it is important to develop a technology suitable for domestic financial institutions with developing a new blockchain based technology which can be applied together with the already existing blockchain based technology in bitcoin.

### Table II.3 Blockchain technology development cooperation with domestic companies

<table>
<thead>
<tr>
<th>Companies</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coinplug</td>
<td>Authentication and remittance service Partnership with KB bank</td>
</tr>
<tr>
<td>Korbit</td>
<td>Cooperation with NH bank, Hyundai Department store and HK Saving bank</td>
</tr>
<tr>
<td>Scalechain</td>
<td>Selection of Shinhan Futures Lab Private blockchain development</td>
</tr>
<tr>
<td>Blocko</td>
<td>Development of Shinhan Data system and authentication related service with JB bank</td>
</tr>
<tr>
<td>Coinone</td>
<td>- Acquired by Yello Financial Group - Cooperation with Daishin securities on insured Bitcoin deposits</td>
</tr>
<tr>
<td>Streami</td>
<td>- Development of Remittance service based on virtual money - Partnership with Shinhan Bank</td>
</tr>
<tr>
<td>Cloud14</td>
<td>- IoT BaaS provider</td>
</tr>
<tr>
<td>KB Financial G Roup</td>
<td>- Investment of 15 hundred trillion won to Bitcoin services company Coinplug</td>
</tr>
<tr>
<td></td>
<td>- blockchain based technology of global remittance service, personal authentication and document security service under review</td>
</tr>
<tr>
<td></td>
<td>- PoC completed for new global remittance service based on blockchain technology (2016.2.22.)</td>
</tr>
<tr>
<td></td>
<td>- Implementation of blockchain technology of global remittance will be in progress after consultation with financial authority</td>
</tr>
<tr>
<td>Shinhan Bank</td>
<td>- Cooperation with startup Streami (blockchain remittance service provider)</td>
</tr>
<tr>
<td>NH Bank</td>
<td>- Partnership with Bitcoin services company Korbit</td>
</tr>
<tr>
<td>KEB Hana Bank</td>
<td>- Building a blockchain platform in 1Q Lab (center to help growth of fintech startups) currently under review</td>
</tr>
<tr>
<td>Woori Bank</td>
<td>- Feasibility of blockchain technology implementation in fintech business unit under review</td>
</tr>
<tr>
<td>IBK</td>
<td>- Cooperation with Irience (fintech company) to implement iris recognition system</td>
</tr>
</tbody>
</table>

Source: Kim Dong Han (2015)\(^1\), Lee Ho (2016)\(^2\)

### Notes

1) Kim Dong Han, "Blockchain technology and its use cases in financial industry," Finance and Management Brief 5 49), Hana Finance Research, 2015.12