

Blockchain application and outlook in the banking industry

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Abstract

Blockchain technology is a core, underlying technology with promising application prospects in the banking industry. On one hand, the banking industry in China is facing the impact of interest rate liberalization and profit decline caused by the narrowing interest-rate spread. On the other hand, it is also affected by economic transformation, Internet development, and financial innovations. Hence, the banking industry requires urgent transformation and is seeking new growth avenues. As such, blockchains could revolutionize the underlying technology of the payment clearing and credit information systems in banks, thus upgrading and transforming them. Blockchain applications also promote the formation of “multi-center, weakly intermediated” scenarios, which will enhance the efficiency of the banking industry. However, despite the permissionless and self-governing nature of blockchains, the regulation and actual implementation of a decentralized system are problems that remain to be resolved. Therefore, we propose the urgent establishment of a “regulatory sandbox” and the development of industry standards.

Keywords: Block chain, Decentralization, Banking industry transformation

Introduction

Block chain is currently a concept that has received significant attention in financial technology (FinTech). It combines several computer technologies, including distributed data storage, point-to-point transmission, consensus mechanisms, and encryption algorithms. It has also been identified as a disruptive innovation of the Internet era. However, as block chain is a major breakthrough in data storage and information transmission, it might fundamentally transform the existing operating models of finance and economy, which might lead to a new round of technological innovations and industrial transformation within the FinTech industry.

Different types of block chain industrial consortiums have emerged in order to promote the development of block chain technology and its applications, the R3 block chain consortium being the most influential among them. It has brought together over 40 of the world's leading financial institution, including Bank of America, Citigroup, Morgan Stanley, Deutsche Bank, and Barclays Bank. As of May 2016, Ping An Bank and China Merchants Bank (CMB) have also joined the R3 block chain consortium, thus strengthening the exchange and cooperation of top financial institutions in the block chain technology. Additionally, We Bank, Ping An Bank, CMB Network Technology, among others, have formed the China Financial Block chain Consortium. The major financial institutions have a relatively positive attitude toward improving the back-end processing efficiency of block chain technology, and place significant emphasis on its potential to reduce operational costs.

Block chain technology is expected to transform the banking industry

The banking industry in China is currently facing multiple pressures, including a decline in profits and an increase in risk, and has entered a new state of change and development. The sudden Internet finance boom has also led to numerous challenges in the traditional banking business. Consequently, commercial banks need to rely on new technological growth to accelerate product and service innovations, thereby adapting to new customer demands and competitive environments.

Internal and external issues of the banking industry**Impact of macroeconomic situation and policies**

Since 2015, macro economy has entered a “new normal,” wherein economic growth continues to decelerate, while interest rate liberalization is essentially complete, and their combined effects are becoming increasingly apparent. On one hand, there has been a trend towards narrowing interest-rate spread and declining the profitability of commercial banks. On the other hand, there has been increasing credit risk and nonperforming assets.

Internet finance boom with increased market share

In recent years, booming Internet finance has accelerated the marketisation of the financial sector. The endless emergence of Internet financial products has led to the substantial diversion of household saving deposits and increased banks’ cost of debt. According to monitoring data for national Internet FinTech platforms, as of the end of August 2016, the number of Internet financial platforms had reached 8490 and the number of active users 618 million. The latest data released by the China Internet Network Information Center indicated that, as of June 2016, the number of Internet users in China was 710 million. As such, the percentage of Internet finance users accounts for 87% of total Internet users in China.

Endless financial innovations and diversification of investment and financing

In recent years, there has been a boom in the financial markets, increased product varieties, and continuous financial innovations. The focus of capital markets range from derivatives to asset securitization, and then to P2P, crowd funding, and others.

According to statistics by the Central Depository & Clearing Co. Ltd., in 2015, the total asset securitization products issued nationwide were worth RMB 603.24 billion, equivalent to a growth of 84%; their market stock was RMB 770.395, equivalent to a growth of 129%.⁶ In 2016, the asset securitization market will progress toward the scale of trillion RMBs.

Lack of information on banking customers leading to difficulties in creating credit

The lack of information is the most prominent problem in the bank credit information system. On one hand, this has limited the business expansion of commercial banks, causing SMEs and individuals to have difficulties obtaining loans from banks. On the other hand, this has also led to the frequent occurrence of non-performing loans, and commercial banks have difficulties in screening and controlling loan quality.

Block chain technology can revolutionize the underlying technology of banking businesses

In view of these internal and external issues, the banking industry required new sources of growth in order to reverse the current downward trend. It is worth noting that the advancement of

FinTech is an inevitable trend. If Internet finance, characterized by its revolution in application scenarios, is known as FinTech 1.0, then we are currently at FinTech 2.0, which emphasizes the revolution in the underlying technology. The greatest disruption of Internet finance for the traditional banking industry lies in enriching application scenarios and using big data analytics as foundation, in order to provide more personalized and convenient services to attract more customers. However, a large number of scenarios have already been developed, and innovations in scenario applications are becoming increasingly difficult. Therefore, new growth can only be achieved with genuine technological breakthroughs.

Needless to say, block chain can become the core, underlying technology of the financial sector in the future. Presently, even BAT has already begun to implement block chain. Hence, given its considerable lag behind the current FinTech 1.0, the banking industry should utilize the advantages of its resources and size, in order to actively conduct research and testing of block chain applications. This will enable them to become the pioneers of technological applications that can lead and participate in the formation of new business landscapes, hence, continuously improving the capacity and content of high-value financial services and fostering new momentum for growth in the industry

Specific application scenarios for block chain technology

Payment clearing system: distributed clearing mechanism

Interbank payments often rely on processing by intermediary clearing firms, which involves a series of complicated processes, including bookkeeping, transaction reconciliation, balance reconciliation, payment initiation, etc. Therefore, the process involved is lengthy and costly. Using cross-border payments as an example, as the clearing procedures for each country is different, a remittance requires nearly 3 days to arrive. This demonstrates the low efficiency and immense volume of occupied funds involved

Point-to-point payment can also be implemented using block chain technology, thus eliminating the intermediary link of third-party financial institutions, which will greatly improve service efficiency and reduce the transaction costs of banks. This will also enable banks to satisfy the requirements for rapid and convenient payment clearing services for cross-border commercial activities. McKinsey has made an estimation which shows that the cost of each transaction in Cross-Border business can be greatly reduced due to the application of block chain

Bank credit information systems

The ineffectiveness of bank credit information systems is mainly due to the following: first, the scarcity and poor quality of data makes it difficult to judge the situation of personal credit; second are difficulties in inter-institutional data sharing; third is the unclear ownership of user data, leading to difficulties in circulation due to concerns for privacy and security. Although the solutions to these problems will require the cooperation and participation of different stakeholders, block chain technology can provide some assistance in addressing these issues.

Establishing data ownership

Every individual produces massive amounts of data on the Internet, which is extremely valuable as proof of their credit situation. Nevertheless, these data are currently being monopolized by

large Internet companies. Hence, individuals are unable to establish their ownership or utilize these data. Additionally, in order to protect user privacy, data flow is difficult to achieve between these companies, which leads to the formation of data islands.

Block chain technology can perform data encryption, which can help us control our own big data and establish ownership. This can further guarantee that the information is genuine and reliable, while also reducing the costs of data collection by credit agencies. Using blockchain technology, big data can become credit resources with clear personal ownership, and even establish the foundation of future credit systems.

Promoting data sharing

Block chain can facilitate the automatic recording of big data by credit agencies, while also storing and sharing encrypted forms of the customer's credit status within institutions. This enables sharing credit data. The following block chain credit solution has been proposed: during the "know your customer" process, banks should store customer information in their own database, and then employ encryption technology to upload summary information for storage in the block chain. When there are query requests, the original data provider can be notified using the block chain and a query can be performed. Therefore, all parties can search external big data, while also not divulging their core business data: Restructuring existing credit information system by block chain credit

Encryption technology can ensure that the summary and original information are consistent, thereby preventing the provision of false information that can mislead their counterparts. Within the framework of customer information protection regulations, the block chain is able to realize the automated encryption and sharing of customer information and transaction records. This helps eliminate redundant work involved in KYC between banks.

Distributed innovations in financial transactions

Supply-chain finance involves an extensive amount of manual inspections and paper based transactions. The process also has numerous intermediaries, a high risk of illegal transactions, high costs, and low efficiency. Block chain technology can drastically reduce manual interventions and employ smart contracts in order to digitize procedures that rely heavily on paperwork. This would greatly improve the efficiency of supply-chain finance and reduce manual operational risks. With the supplier, buyer, and bank as the main trading parties, and the sharing of contractual information on a decentralized distributed ledger, smart contracts can ensure that payments are made automatically once a predetermined time and result is reached.

Obstacles to implementing block chain technology in the banking industry

True disintermediation requires complete decentralization as its foundation. Decentralization from a purely technical perspective does exist in some models. For example, for Bitcoin and other digital currencies, complete decentralization enables them to perform operations without the need for intermediaries. However, in the real world, many scenarios need to be safeguarded by a certain extent of centralization, especially when applied in the financial sector. Hence, we need to shift from a technical to a regulatory perspective. Achieving true decentralization is extremely challenging and could even be impossible; thus, true disintermediation cannot be

achieved. Therefore, this point should be given due consideration when implementing block chain technology. In order to meet the needs of reality, more centralized consortium and private block chains can be derived from completely decentralized public block chains. Table 3 shows the comparison of the different categories of block chains.

Although block chains have a technological advantage over banks as credit intermediaries, it is still too early for this technology to completely disrupt the existing financial system. Therefore, a “multi-center, weakly intermediated” scenario is likely to emerge (Chang and Han 2016). This is where banks use block chain technology to improve their payment clearing systems and overcome certain obstacles in information communication, while also forming consortiums, thereby consolidating their position.

Is there an efficiency problem?

The efficiency problem of block chains will need to be discussed in two parts. The efficiency of single transactions is influenced by technology and the degree of centralization. As transaction and clearing occur simultaneously, each transaction will need to be verified by all the nodes in the entire network, which is detrimental to its speed. This impact will become especially prominent when the nodes of the block chain increase. On the other hand, the decreased in the efficiency of single transactions would improve transaction security. Moreover, the simultaneity of transactions and clearing would eliminate the problems of subsequent reconciliation. Overall, this brings undeniable improvements to the overall efficiency of banks.

Regulatory sandbox

The regulatory sandbox originates from the UK, which intends to give a more flexible space for innovations. The sandbox delineates a restricted scope with simplified market access standards and procedures. Given that consumers’ rights are safeguarded, FinTech innovation enterprises or businesses are permitted to rapidly implement operations, and are allowed to expand within the testing conditions of the regulatory sandbox. Currently, the UK, Australia, and Singapore have announced the establishment of FinTech regulatory sandboxes. Calls for regulating block chains continues to increase, industrial bigwigs urges establishment of sandbox mechanisms. Although China has proposed similar ideas for “flexible regulation,” these have not been sufficiently standardized. Hence, their development should be accelerated in order to provide a controlled testing environment for the growth of block chain technology

Industry standards

As a core, underlying technology, more caution is required in the regulation of block chain technology. Although the Bitcoin system has not been hacked in the 7 years since its establishment, the hacking attack on the DAO raised alarms. Several companies are now researching block chain technology, and the security of this technology still needs to be tested using authoritative standards

Recently, Standards Australia has submitted a request to the International Organization for Standardization to develop global standards for block chain technology. The R3 block chain consortium is also exploring the formulation of industry standards for interbank applications. In China, the block chain technology research group of the Interbank Market Technology Standards

Workgroup was established in August 2016. This workgroup is to conduct prospective research on interbank market block chain technology, regulations, and legal framework.

Information access mechanisms

The immutable nature of block chain systems is a guarantee of its authenticity. That is, once a piece of information enters the system, it cannot be modified. This eliminates the subsequent problems of fraud, but also implies that preliminary inspection of information needs to be more cautious. Therefore, stricter information access mechanisms need to be established, and the data on each node will need to be reviewed to ensure that fraud behaviors do not emerge. Once a transaction is initiated, it cannot be reversed. Hence, its authenticity and reliability needs to be verified in order to avoid accidental losses.

Conclusions

Block chains could revolutionize the underlying technology of the payment clearing and credit information systems in banks, thus upgrading and transforming them. Block chain applications also promote the formation of “multi-center, weakly intermediated” scenarios, which will enhance the efficiency of the banking industry

It is worth noting that the problems of regulation, efficiency, and security have always sparked extensive debate in the process of each new financial innovation. However, history is not stopped by current obstacles, as the technical, regulatory, and other problems of block chain technology will ultimately be resolved. Hence, the prospect of integrating block chain technology into the banking industry will most likely occur in the near future

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