

Digital Financial Inclusion in China



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Introduction

The four requirements for financial inclusion are accessibility, affordability, comprehensiveness, and business sustainability. Accessibility means that financial services are available to customers anytime and anywhere and can effectively reach target customers through various channels. Affordability refers to financial services that are affordable for those who have moderate financial needs. Comprehensiveness means that financial services shall be provided for those who are both unbanked and underbanked, and that financial services meet basic financial needs (such as bank accounts, transfer, remittance, and credit) and higher needs (such as for asset value maintenance and appreciation, insurance, and guarantee). Business sustainability encompasses financial inclusion institutions that are financially viable without government subsidies. This reflects a fundamental feature of financial inclusion: it should be market-based rather than provided as a charity. As the traditional practice of financial inclusion struggles to meet all four of the above-mentioned requirements, new breakthroughs are needed if there is to be significant development of financial inclusion.

PART ONE

**Development Background of
Digital Financial Inclusion**

I. Ushering in the Era of Digital Financial Inclusion

Technological progress is an important driving force for financial innovation. In this century, the most significant development of financial inclusion has largely been due to the application of new technology in finance. Especially in recent years, the application of digital technology in the financial sector has lent wings to financial inclusion. Hence, the concept of “Digital Financial Inclusion” came into being. “Digital Financial Inclusion” refers to a digital channel that extends formal financial services to members of the unbanked and underbanked community. “Digital” refers to technologies that include the computer, information communications, big data processing, and cloud computing, collectively. In short, “Digital Financial Inclusion” refers to financial inclusion driven and realized by digital technology.

1. The Early Stage: Internet-based Traditional Financial Business

In the early stage of digital financial inclusion, traditional financial institutions began to send messages via the Internet and process transactions online, resulting in reduced need for physical outlets and human services. With the first generation of Internet technology and the popularity of smart phones bringing the rapid development of mobile payment, a large portion of offline financial services has been brought online, providing transaction services and delivering financial services via online channels. The typical modes include Internet banking, mobile payment, peer-to-peer (P2P) lending, among others. A major breakthrough for financial inclusion has been in the field of payment. Financial inclusion used to focus on deposits and loans, but basic financial transactions were the most common financial need for vulnerable groups. These transactions should preferably be simple, cheap, and convenient. A suitable payment system was thus essential; however, impoverished households had little access to digital payments in the past, and many people did not even have a bank account. The integration of digital technology with finance has brought about many innovations to fill this gap. Many promising examples have emerged in sub-Saharan Africa, notably, Kenya’s “M-Pesa” mobile payment service.

Case M-Pesa (Kenya)

M-Pesa is a mobile phone-based money transfer service launched in March 2007 by Safaricom, a mobile network operator in Kenya. Considering that only about 20% of adults in Kenya had bank accounts at launch, this service does not require users to have bank accounts. Mobile users in Kenya can redeem their remittances for regular money at any M-Pesa outlet. Due to the convenience of the payment and settlement system, within just four years, more than 15 million Kenyans have become M-Pesa users, with a transaction volume of billions of Kenyan shillings. Although M-Pesa has not yet reached much beyond Kenya’s borders, it is pointing in a promising direction—advancing financial inclusion through the integration of digital technology with the financial sector.

2. The Present Stage: Technology-driven Innovation in Financial Services to Address Consumer Needs

In recent years, with the gradual application of digital technology, especially Internet-based technology, in banking, securities, and insurance sectors, traditional financial institutions have seen more diverse channels and means for message delivering and business processing, and as a result have experienced reduced operational costs and wider coverage of financial services. This integration of technology and finance is blurring the line between the two, thus creating a new form of business. Financial innovation is no longer simply the sum of the traditional financial business and digital/internet elements; it is more about innovative financial product design or remodeled financial services led by non-financial institutions and driven by technological innovation.

In this present stage, “financial technology” (FinTech) or “Internet finance” are the buzz words in China. Regardless of the name, it is driven by the Internet or mobile Internet, big data, and cloud computing to realize innovation in financial services and solve real-time needs. To a large extent, it can meet the needs of digital financial inclusion.

Case PayPal (USA)

In the United States, PayPal is a typical example of technology-driven innovation in digital financial inclusion that addresses consumers’ needs. Established in the United States in 1998, PayPal is a third-party payment platform, a transaction gateway provided by a solid and reputable independent third party which has signed an agreement with banks. PayPal originally only aimed to take a slice of the pie of the payment business of eBay, the largest e-commerce auction website in the United States. Yet, within just a few years, it became the most influential third-party payment system globally. As a non-banking institution, PayPal cannot generate interest income for its users. In order to attract deposits, PayPal linked its accounts to money market funds. With simple procedures, users can receive income from money market funds, thus expanding the functions of the third-party payment platform. The designer of PayPal may not have had the same social mission as Professor Mohamed Yunus, the founder of Grameen Bank, to promote financial inclusion, yet its convenience, affordability (compared with Visa, MasterCard, and other established payment systems), and security have made it a driving force for financial inclusion.

II. Digital Financial Inclusion Development in China

1. Digital Financial Inclusion Urgently Needed for Economic Development in China

The progress of China’s financial system is widely recognized; however, the coverage and depth of its financial services need to be improved. There also exists a mismatch between China’s pyramid-

shaped economic structure and its inverted pyramid-shaped financial structure. In terms of the number of enterprises, small and micro enterprises account for about 96% of the total; they create about 60% of jobs, 50% of tax revenue, and 40% of GDP. However, they only receive less than 10% of financial services. This structural asymmetry has constituted obvious constraints on China's economic development. At the top of the pyramid are large and medium-sized enterprises, government agencies, financial institutions, high net worth individuals, and the affluent and middle class, who are already oversupplied with financial services. The main part of the pyramid is made up of those who are either underbanked or even unbanked, including nearly 200 million households, 70 million micro-enterprises and self-employed, and more than 5 million small businesses and 100 million working-class households. MSMEs and enterprises related to agriculture, rural areas, and farmers are likely to only account for about 8% of loans. In China, the majority of households can only get loans from the private sector, and three-quarters of rural households have to rely on private or even underground channels.

2. Progress of Traditional Financial Inclusion in China

Both public and private sectors in China have been committed to promoting the development of financial inclusion. In the 1990s, the Chinese government launched a microfinance pilot project in China in cooperation with foreign non-governmental organizations. In 1996, funded by the World Bank, Qinba Mountain Poverty Alleviation Project was launched, which included a microcredit pilot project in Guizhong, Sichuan and Ankang, Shaanxi province by the Human Resources Development Center in Western China. Later, China Foundation for Poverty Alleviation (CFPA) initiated the explorations as a pilot institution of microcredit poverty alleviation. Finally, it transformed into an independent microcredit institution called ZhongheNonxin Credit Project Management Co., Ltd. in 2008, which has become China's largest not-for-profit microfinance institution (MFI). China has also gradually relaxed regulations on market access for microfinance institutions in recent years, and has adopted many incentives. Additionally, there are many micro-credit pilot projects in the private sector, most of which duplicated international microfinance models and tried to innovate in China's context. However, on the whole, these projects progress rather slowly and there are still huge unmet financial needs in China. Furthermore, some projects carry major potential risks.

3. Digital Financial Inclusion: A Common Value Pursuit of Both Traditional Financial Institutions and Emerging Internet Financial Institutions

The current trend in China is extensive integration of digital technology with finance. In addition to emerging Internet financial institutions, traditional financial institutions are also integrating mobile Internet, big data, cloud computing, and other technologies with financial services. Digital technology has played an exceptional role in financial inclusion.

The integration of digital technology with financial services demonstrates the following four features that have promoted inclusion: First, it has lowered the threshold of financial services and enhanced

financial availability. For example, the Industrial and Commercial Bank of China (ICBC) Its Internet loan product, Wangdaitong, under its “e-ICBC strategy,” which was officially launched in 2015 and has so far issued 1.85 trillion yuan to MSMEs with a outstanding portfolio of nearly 230 billion yuan.

Second, this integration has significantly reduced financial institutions’ operational costs, and thus contributed to its sustainability. It demonstrates that the provision of financial services at lower prices is possible. Since the second half of 2015, commercial banks have begun to offer free online transfer services; traditional financial institutions have made a solid step toward inclusion by making use of integrated Internet technology in order to realize commearcial sustainability.

Third, it has provided convenient and customized financial services to better meet the diverse needs of customers. The “Cloud Flash Payment” (Yunshanfu), a near field communication (NFC)-based payment solution launched by UnionPay, revitalized the traditional acquiring market. More and more customers now have much lower balances; small value transactions that require no PIN or signature have greatly enhanced transaction convenience.

Fourth, it helps to reduce the information asymmetry and provides new solutions for risk management in the field of financial inclusion practice. On one hand, technological innovation, such as biometric identification, has enhanced the efficiency of authentication; on the other hand, big data can help guarantee the accuracy and effectiveness of risk identification. NFC technology, promoted by ApplePay and SamsungPay, uses fingerprint recognition as a mean of authentication. Increasingly sophisticated biometrics will provide new solutions for remote account opening and risk identification. It is especially significant for improving the availability of financial services in countries and regions with poor financial infrastructure.

4. Digital Technology-Facilitated Overtaking of Financial Inclusion in China

Thanks to the application and popularization of digital technology, financial inclusion in China is growing rapidly, and is even outpacing developed countries in the following four areas: popularity, affordability, comprehensiveness, and sustainability.

In terms of online payment, AliPay and WeChat Pay have served millions of users—several times the number of active PayPal accounts globally. Although PayPal has acquired Braintree and Paydiant, two payment service providers, its 25%¹ growth rate of payment transactions is far behind that of mobile payment transactions by banks and third-party institutions in China².

In terms of financing, Lending Club, a peer-lending platform, issued nearly 16 billion US dollars in loans between 2009 and 2016; Sofi, a firm that emphasizes social finance, has issued 6 billion US dollars; Prosper, another person-to-person marketplace, issued 5 billion US dollars; Zestfinance, which has been

1. According to the PayPal 2015 annual publication data.

2. According to the "Operation of the Payment System in 2015", the transaction number of bank mobile payment increased by 206%

widely publicized in China, issued less than 100 million dollars. By contrast, Ant Financial Service, Alibaba's finance arm, has provided total loans over 600 billion yuan, close to 100 billion USD, to MSMEs in the past five years—over six times larger than loans provided by Lending Club.

In terms of wealth management, the well-known US-based Wealthfront manages 3 billion USD in assets, and Motif, an online brokerage, attracted 200,000 investors. While in China, the average daily number of users logging on Eastmoney.com, a similar platform, has already exceeded 10 million. Additionally, more than 260 million accounts have invested in Yu'E Bao, an online money market fund with a total asset of 100 billion US dollars managed by Tianhong Asset Management.

In terms of Internet insurance, three insurance companies, ZhongAn, Huatai, and PICC, jointly sold 30.8 billion in return shipping insurance policies on November 11, 2015—a record high of policies sold in a single day.

III. Risks of Digital Financial Inclusion

Jaime Caruana, General Manager of the Bank for International Settlements (BIS), noted in his opening remarks at the second G20 Global Partnership for Financial Inclusion (GPFI) Conference on Standard-Setting Bodies and Financial Inclusion, “The fast-growing field of digital finance offers huge opportunities to low-income people traditionally excluded from formal financial services. The regulatory, supervisory, and standard-setting challenges—and likewise the solutions—include those we currently face, and others we can only imagine as billions of new digital finance users go online. The participating bodies have the opportunity—and indeed the responsibility—to prepare the standard-setting world for both the risks and the rewards of the digitization of financial services.”

CGAP argues that compared to traditional retail financial services, the risks of digital financial inclusion lie not just in the introduction of new market players but also in the reconfiguration of roles and risks in the market (both new and existing).

Digital financial inclusion services bring risks along with social and economic benefits, including the inherent risks of the financial sector and additional risks from using digital technology.

1. Inherent Risks of Finance

Digital technology does not change the inherent financial nature of digital financial inclusion. The difference between innovation in finance and other areas is that the requirement for financial security is much higher, yet consumers usually do not understand the risks of financial innovation. Therefore, compliance should be the prerequisite of innovation in digital financial inclusion. Some institutions, like E-zubao and Zhongjin, who engaged in illegal fund-raising activities in the name of “Internet Finance” and “Financial Inclusion,” end up scamming people out of their money. These scandals have cast a shadow over financial innovation.

Case E-zubao Scandal

On December 8, 2015, the Ministry of Public Security officially launched its investigation into P2P lending platform E-zubao. On the 505th day of its establishment, E-zubao had already vacuumed up 74.7 billion yuan from 890,000 investors, making it the fourth largest P2P platform following Lufax, FirstP2P, and Hongling Capital. Thick-and-fast advertising was the main reason for its fast growth. In the first half of 2015 alone, E-zubao spent 1.5 billion yuan on commercials. In addition to advertising, E-zubao hired about 50,000 so-called “financial planners” for aggressive marketing. E-zubao promised an annualized yield of 9% to 14.6%, doubled the average yield of the financing lease sector (7% to 8%). However, considering the financial planners’ commission and platform operating costs, it meant the cost of its products would range from 15% to 20%.

According to the preliminary investigation in October 2015, 309 borrowing companies issued loan targets, but 292 had changed their registered capital before borrowing, accounting for 94.5% of the total. The loan targets were usually very large; on average, 49.5 million yuan. Each target involved over 500 people, and the average investment was 82,000 yuan per person. Yet, the majority of the loan targets were fake and many borrowing companies were actually shell companies registered by Rencheng Group, the parent company, which was also suspected of money laundering.

Financial risk prevention and control should focus on consumer protection at the micro level and financial market stability at the macro level. The bottom line is financial compliance. The financial inclusion system involves payment, wealth management, credit, insurance, and other financial areas; each area needs a sound regulatory framework, put in place by regulators and sectoral self-regulatory organizations. For example, regulation of payment platforms should cover customer prepayment management, real-name system management, and merchant management; regulation over the wealth management business should cover liquidity risk management, investor appropriateness, information disclosure, and customer funds depositories.

2. Digital Technology-related Risks

Technological innovation not only promotes the development of digital financial inclusion, but also brings additional risks in three main areas.

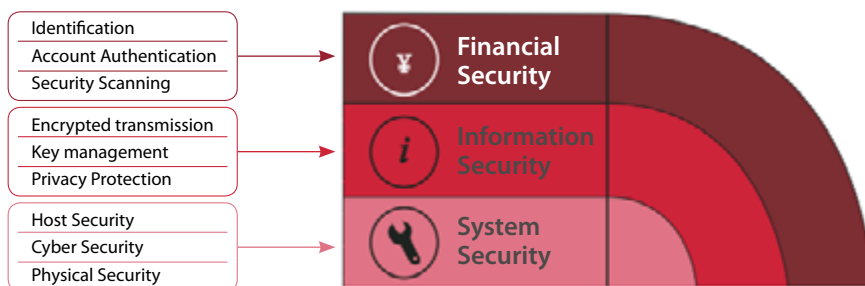


Figure 1-1 Three Technical Security Levels of Digital Financial Inclusion

a) System Security

Compared with traditional finance, digital financial inclusion features a wider application of technology and higher reliance on automated systems. However, compared to traditional financial institutions, most emerging Internet companies have not operated very long, usually have small investments, and their system stability needs to be improved. Compared with offline physical outlets, a major test of the stability of remote financial services systems is their resilience in the face of a spike of high-frequency transactions.

One example is November 11—Singles Day, a big sales day for e-commerce in China. In order to solve this pain point, since 2013, AliPay began to use cloud computing to effectively improve transaction processing and reduce operational costs. Baidu and Tencent also announced in the last two years that they will begin research and development in this area, and application of cloud computing.

However, system security issues are not uncommon among Internet start-ups. In 2015, a number of P2P lending platforms suffered from short-term crashes when instantaneous trading volumes overloaded their systems. It might be worse, when customers heard the news, they just run away from the platform. In the worst case scenario, such an event could lead to bankruptcy of the platform, exerting a negative impact on socio-economic stability.

Therefore, to guarantee sustainable development of digital financial inclusion, it is essential to effectively protect the safety of physical facilities, communication networks, and operations of the host, guarantee reliable and uninterrupted operation, and organize effective contingency plans to prevent man-made and natural disasters.

b) Information Security

According to Information Technology Security Evaluation Criteria (ITSEC), information security mainly includes information confidentiality, integrity, and availability, known collectively as the C.I.A. elements, and are universally recognized principles.

In the era of big data, the value of personal information is increasingly obvious. Large amounts of data are the core assets for businesses and users, or become a target of cyber-attacks. In recent years, cyber-attacks aimed at stealing data have become more frequent. The authenticity and validity of financial institutions' data make them more valuable; however, their information security is particularly vulnerable. A large number of users use the same account name and password on multiple websites; therefore, in the case of an information leak, even if it is from a non-financial organization, information security of the financial sector could be compromised.

In 2014, when an information leak from a well-known domestic travel service website occurred in China, a large number of users reported loss of their credit cards used on the website. Others modified their online banking and payment platform PINs.

Such incidents are also common overseas. Not even giants like Google, Amazon, Visa, and PayPal are immune.

In January 2014, the Republic of Korea saw its worst personal information leak in history: 40% of the population's credit card information was leaked, including then-President Park Kwai Chung and former President Lee Myung-bak and other dignitaries. Many media outlets used phrases like "people are in panic" to describe the seriousness of the situation. Koreans queued at banks to replace their credit cards.

As digital financial inclusion aims to serve an even broader customer base, information security is as relevant as it is to traditional finance, if not more. In order for digital financial inclusion to protect consumer rights and interests, and safeguard financial stability, it must establish a long-term information security mechanism to ensure the protection of personal information, and an effective link between business, technology, and internal control.

c) Financial Security

Financial security is where digital financial inclusion differs most from the regular Internet industry. The financial security of traditional financial institutions usually relies on face-to-face Know your customer (KYC) requirements in order to make sure that the business is handled by the customer himself/herself and is based on his/her own will.

Take credit cards for example. To issue a credit card, a card sales staff has to take following three principles: first, visit the applicant's work place; second, see applicants sign on the form by themselves; and third, verify the application materials. When the customer swipes the credit card, the cashier of the merchant has to check the signature against the one on the back of the credit card to confirm the transaction is made by the cardholder.

In the digital age, financial services are increasingly handled online. Finding a way to implement KYC practices to avoid account theft has become a major challenge. However, digitization brings opportunities along with challenges. Big data and biometrics are effective tools to identify risks. Many institutions around the world have already made some useful explorations and achieved some success.

The FICO credit score is the most commonly used credit score in the United States. It is used by the three national credit bureaus and appears on their credit report; FICO has become a synonym for credit score. The FICO model uses millions of data samples to first determine such indicators as the consumer's creditworthiness, morality, and payment ability. Then each indicator breaks down to several grades. The weighted average is the final FICO credit score. The scoring range is between 300 and 850. A borrower with 680 or above is regarded as credible and can easily access loans.

On April 6, 2016, the UK's first digital-only bank, Atom, received a banking license from the Bank of England and is under the regulatory supervision of the Prudential Regulation Authority (PRA) and Financial Conduct Authority (FCA). The app-based bank has no physical outlets and is built exclusively for mobile. With the lifting of regulatory restrictions, the bank plans to provide customers with products such as term deposits, loans, debit cards, and credit cards by the end of 2016. All these can be done on the app with great ease. As for KYC—financial regulators' main concern for a digital bank—this is addressed by

face and voice biometrics. The bank was granted a limited license by regulators in June 2015, and now it is licensed to offer unrestricted banking services to individuals and corporate clients.

In China, personal information theft and peddling has gradually become an “industry” in the black market. Criminals are obtaining more and more consumers’ personal information in the process of scams, which includes social engineering³ used in phone fraud. Early “challenge-response authentication” mechanisms based on elements such as an account password, bank card password, or SMS verification code have gradually revealed their drawbacks, including frequent fund theft of all kinds. However, the defense capacity of financial security is also increasing. Multi-dimensional data can be used to cross-verify customer identity, such as data on location, device, behavior, preference, and social networks. Biometrics has also raised the bar for identity theft. In the foreseeable future, a combination of the two will effectively protect the user’s account.

To conclude, the development of digital financial inclusion will bring many benefits to the community, but it will impose additional requirements on practitioners for risk management. Striking a balance between development and security becomes a common challenge for both regulators and market players.

3. Social engineering: A way to achieve self-interest by manipulating a victim’s psychological weakness, instinctive reaction, curiosity, trust, greed, etc. Incidences of this are rapidly increasing.

PART TWO

Explorations of Digital Financial Inclusion

I. Defining Service Providers and Products of Digital Financial Inclusion

Digital financial inclusion has been developing rapidly in China—some areas of the country are even leading the world. However, summarizing the practice in China is not that easy. Before we evaluate financial inclusion, we must first identify its actors and how they are executing it. We can do this by defining service providers and products related to digital financial inclusion.

Broadly speaking, digital financial inclusion refers to the digital channel that extends formal financial services to the un- or underbanked. Digital channel collectively refers to technologies such as the computer, information communications, big data, and cloud computing. Next, we will define the service provider and products of digital financial inclusion, respectively.

1. Defining Digital Financial Inclusion Services

Traditional finance focuses on four services: payment, savings, loaning, and insurance. Digital finance still focuses on the above-mentioned sectors, with digital technology integration a defining feature of each. Given that digital finance must be supported by digital credit, we add the latter as the fifth. Each will be discussed in this section, but first we address the following questions regarding the classification of some digital financial inclusion products:

First, we must understand the inclusion of micro-equity financing into micro-financing products. This differs from the international classification, which generally only puts micro-credit under micro-financing, whereas this study includes both micro-debt financing and micro-equity financing under that category. The reasons are as follows: First, small- and micro-enterprises—especially start-ups and the self-employed—not only need loans to support their short-term capital turnover, but also need equity as a long-term stable means of financing. In the 21st century, thanks to technological progress, more and more people are joining the ranks of entrepreneurs and innovators, and the demand for private startup financing is increasing. But micro-credit alone can hardly meet this demand. Another reason is that digital information technology has made micro-equity investment possible. The global phenomenon of crowdfunding has enabled individuals to engage in micro-equity investment, which was practically impossible before the age of application of the Internet and big data technology. The inclusion of micro-equity financing into the category of micro-financing is largely a result of technological progress.

Second, we examine the inclusion of small consumer credit into micro-financing products. Financial inclusion does not prevent the poor from getting loans for consumption purposes. With the rapid development of consumer credit, controversy arises: whether consumer credit should be included in the category of financial inclusion because it may involve consumption of high-income groups. However, we find that as digital information technology has greatly reduced the transaction cost, it has also significantly lowered the line of credit. Those who use small amounts of consumer credit are usually new graduates

who have little access to credit cards. Digital consumer credit can reach those people who previously had little access to credit because of the high cost associated with traditional finance. Therefore, according to the definition of financial inclusion, the small provisions of consumer credit should and must be included. Unfortunately, in official statistics on consumer credit, it is often difficult to distinguish small distributions of consumer credit precisely. The status quo analysis later in this chapter does not strictly follow this standard.

Digital financial inclusion services can be categorized as shown in Table 2-1.

Table 2-1 Digital Financial Inclusion Service Classification

Category	Subcategory
Payment	
Saving	
Micro-financing	Micro-credit
	Small and micro loans
	Small consumer credit
	Crowdfunding
	Equity crowdfunding
	Product crowdfunding
Micro-insurance	
Digital credit	

2. Defining the Digital Financial Inclusion Service Provider

Digital financial inclusion service providers provide financial inclusion services that are integrated with digital information technology. For the purposes of this study, we will divide financial institutions into a traditional category and an emerging category—i.e. those with a digital information technology background. The difference between the two categories in terms of digital application is as follows: traditional financial institutions apply digital technology in traditional micro-finance businesses while emerging financial institutions are digital technology-based micro-finance businesses.

a) Traditional financial institutions engaged in the financial inclusion sector

The financial inclusion sector in China includes financial institutions such as banks, micro-loan companies, mutual financing organizations, non-profit micro-credit institutions, insurance companies, and guarantee companies. See Table 2-2 for details.

Table 2-2 China's traditional financial institutions engaged in financial inclusion

Category	Subcategory	Typical Institutions
Banks	commercial banks	Postal Savings Banks, four state-owned commercial banks, joint-equity commercial banks, urban commercial banks, rural commercial banks, rural credit cooperatives ^
	policy banks	China Development Bank, Agricultural Development Bank
Micro-loan companies		
Mutual financing organizations	Governmental Organizations	Peasants' mutual funds
	Non-governmental Organizations	Rotating Savings and Credit Association (ROSCA) (ignored in DFI statistics)
Non-profit micro-credit institutions	Credit organizations sponsored by government agencies	Such as CFPA Microfinance sponsored by China Foundation for Poverty Alleviation
	Credit organizations sponsored by social organizations	Chifeng Zhaowuda Women's Sustainable Development Association sponsored by the All-China Women's Federation
	NGOs (unincorporated organizations)	Such as micro-credit institutions under foundations
Insurance and guarantee companies	Loan guarantee companies	Companies providing loans to agriculture, farmers and the rural areas, and to medium, small and micro enterprises

b) Emerging Internet Financial Institutions Engaged in Financial Inclusion

At present, digital financial services providers in China include third-party payment platforms, P2P lending platforms, crowdfunding platforms, comprehensive Internet financial organizations, and digital credit-reporting organizations. We have included a comprehensive list of Internet financial organizations according to their different platform bases, including e-commerce platforms, social platforms, portal websites, etc. See Table 2-3 for details.

Table 2-3 China's Emerging Financial Institutions Engaged in Financial Inclusion

Category	Subcategory	Typical Institutions
Third-party payment companies		Alipay, WeChat Pay, UnionPay Online
P2P lending platforms		PPDAI, Renrendai
Crowdfunding platforms	Equity crowdfunding, product crowdfunding	JD Dongjia
Comprehensive Internet financial institutions	E-commerce-based	Ant Financial, JD Finance, Suning Commerce
	Industry-based	Haier Capital, Xiaomi, Da BeiNong Smart Platform
	Social-website-and-portal-website-based	Tencent, Qihoo 360, Baidu
Internet insurance organizations	Online insurance companies	Zhong An Insurance
	Internet mutual insurance platforms	Xinmei Mutual Life Insurance
Digital credit-reporting platform		Zhima Credit-report

II. The Status Quo and Development of Digital Payment

Payment is required to complete a commercial transaction. With the development of electronic technology in the 20th century payment methods have evolved from barter to cash and also involved non-cash instrument like checks, bank cards, and telephone credit. In the 21st century, with the development of information technology, online and mobile payments have also become important payment methods in modern society.

Online and mobile payments have enhanced the convenience and availability of micro-payments, improved the payment environment for microfinance development, and promoted the development of microfinance products, including micro-savings, micro-lending, and micro-insurance. As a result, digital payments constitute the foundation of digital financial inclusion and its further development. From the perspective of convenience, digital payments can streamline payment procedures and reduce the transaction costs. For example, by using AliPay, WeChat Pay, and other third-party payment services, people can easily transfer a small amount of idle funds to Yu'E Bao to generate investment income, or easily buy return shipping insurance for 0.5 yuan, or obtain a loan ranging from a few hundred yuan to tens of thousands yuan from Weilidai. From the perspective of availability, digital payments can significantly improve the availability of financial services in remote areas, solve the "last mile" problem of financial services, and eliminate geographical discrimination in financial services.

Currently, banks and third-party platforms in China are the main players in digital payment market.

1. Digital Payment Offered by Banks

a) Digital Payment Products Offered by Banks

In the context of emerging Internet finance, major commercial banks in recent years have built one-stop financial service platforms through integration of high-quality resources, to constitute a symbiotic Internet financial environment and provide customers with comprehensive and efficient financial services. Meanwhile, banks are strengthening collaboration with Internet companies to achieve complementarity and expand channels for offering quality products and services.

With the increasing popularity of terminal equipment (computers, mobile phones, etc.), banks are able to increase their efforts to promote digital payment products. In recent years, China's UnionPay and commercial banks continue to innovate with new payment methods, and actively use NFC and QR Codes and other advanced digital technology to improve the ease of payment. The variety of payment products include UnionPay's "Cloud Flash Payment", ICBC e-payment, and Minsheng Payment. Some banks have launched their own products by integrating convenient and fast digital payments with specific financial scenarios, such as "BOC cross-border e-commerce direct link." Table 2-4 lists some of the digital payment innovation products from commercial banks in China.

Table 2-4 Digital Payment Innovation Products from Commercial Banks

Financial Institutions	Products	Introduction
China UnionPay	Cloud Flash Payment	A payment method based on smart phones, and NFC, HCE, and Token technologies
	mPOS	mPOS is a smart phone, tablet, or dedicated wireless device that performs the functions of a cash register or electronic point of sale terminal, including card reading, PIN input, data encryption, and decryption, and message display.
	Cardless Payment	The Non-face-to-face bank card payment is completed by UnionPay card holders providing bank card number, mobile phone number, ID information, and other transaction elements through the Internet, mobile phone, television or IVR voice to the card issuer, which verifies the information and authorizes the transaction.
Industrial and Commercial Bank of China (ICBC)	ICBC e-Payment	Payment is completed by entering a pre-set static payment password on the mobile bank app. The current number of users exceeds 45 million.
	QR Payment	An O2O non-contact mobile payment completed simply by scanning a QR Code. This product was released in July 2016.
Construction Bank of China (CCB)	Dragon Card Cloud Flash Payment	A non-contact mobile payment method based on the "CCB Suixinyong" app and UnionPay POS machine with the flash payment function.
	e-Shangmaotong	A platform that provides comprehensive financial services like funds settlement, liquidation, custody, and credit funds supervision for large-scale e-commerce market and its SME members

Table 2-4 (Cont.) Digital Payment Innovation Products from Commercial Banks

Financial Institutions	Products	Introduction
Agriculture Bank of China (ABC)	Zhifutong	Zhifutong links the client's billing account by an agreement and provides inquiries, transfers, payment, and other banking services through the smart payment terminal.
	Huinong Yinxuntong	A mobile payment financial services product for rural areas developed together with a mobile communications company. The biggest advantage of the product is that it offers convenient and safe payment services via mobile phones; it is not restrained by communications, transportation, electricity, and other factors.
	Jinyitongbao	A merchant-based mobile payment tool. The merchant needs to install ABC's mobile terminal and an MPB ("mobile payment box") device, which is blue-toothed to the Jinyitongbao app.
Bank of China (BOC)	BOC cross-border e-commerce direct link	Provides online payment services for individual consumers who buy overseas products via e-commerce platforms, and online RMB payment, cross-border sub-accounts and liquidation, international balance of payments declaration, anti-money laundering, and other service packages for cross-border e-commerce importers and third-party payment companies.
	BOC Great Wall e-Flash Pay	Smart phone-based O2O digital consumer solutions using NFC-based HCE and Token technologies
	BOC Yishang	A convenient payment method integrated with a variety of financial applications; it can also help users quickly find BOC outlets, discount merchants, and ATM machines.
Minsheng Bank	Minsheng Pay	C2B whole network online acquiring service with favorable processing fees. It also supports payment from gateways of other banks, and certified payment from the mobile terminal or PC side of over 200 banks.
	Hanglv Fast Pay	A payment method linking the Minsheng debit card with a virtual account that can be used directly at travel service platforms without going through third-party companies.
	Mashang Pay	A non-contact mobile payment method by scanning the QR code
China Everbright Bank (CEB)	Sunshine e-Pay	An IC card-based payment tool app developed together with communications operators and UnionPay; it loads an electronic cash account, debit account or credit account on the SWP-SIM chip of mobile phones.
China Merchants Bank (CMB)	All in One Mobile	A mobile financial product. The "All in One Mobile" user has a "copy" of all their All in One Card/credit cards on the secured chip of their mobile phones, and can enjoy a variety of services that could only be processed with the physical cards in the past.

b) Transaction Volume of Online Payment Products

According to China Payment and Clearing Association, in 2015 China's commercial banks handled 36.371 billion online payment transactions with a total amount of 201,820 trillion yuan, up by 27.29% and 46.67%, respectively, over the previous year (See Figure 2-1). In 2015, domestic banks handled a total of 13.837 billion mobile payment transactions, with a total amount of almost 11 trillion yuan, up by 205.86% and 379.06%, respectively.

As of the end of 2015, the total number of people using domestic bank online payment tools was a little over 1 billion—a Year over Year (YoY) increase of 41.61%. As of the end of 2015, the number of people using domestic bank mobile payment tools was 974 million—a YoY increase of 93.25%.

In recent years, both online payment transaction volume and the number of users have maintained a good momentum of growth. Meanwhile, in line with the trend of mobile Internet, the digital payment field has shown a demonstration effect for the digital financial inclusion process within the traditional financial sector.

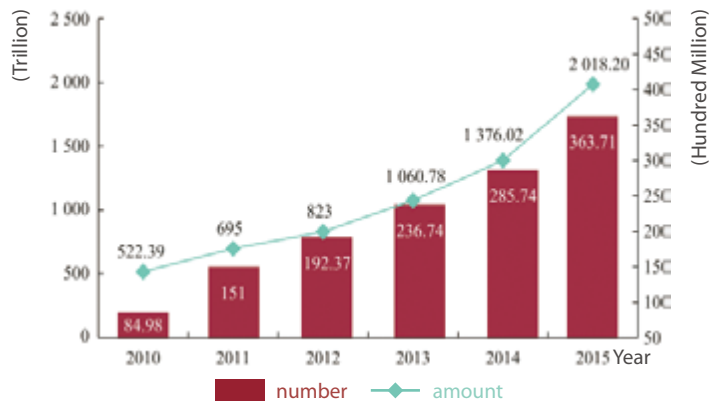


Figure 2-1 Online Payment Transactions by Domestic Banks

(Source: Payment & Clearing Association of China)

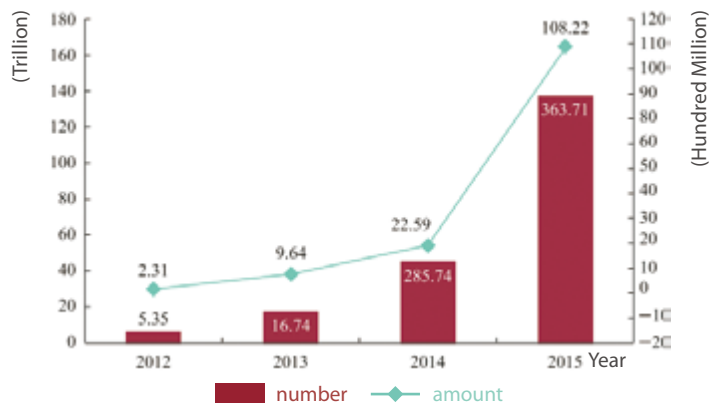


Figure 2-2 Mobile Payment Transactions by Domestic Banks

(Source: Payment & Clearing Association of China)

2. Digital Payment Offered by Non-Bank Payment Institutions

Non-bank payment business can be traced back to 1999 when PayEase took the lead in launching online payment in China. Later, non-bank payment institutions continued to innovate payment methods to promote system-wide reform, especially in the field of online and mobile payment. In 2004, Alipay took the lead in initiating an escrow service, which solved the trust issue between buyers and sellers, and facilitated the rapid development of e-commerce. In the first year of mobile payment, 2012, WeChat Pay and Alipay Wallet both launched mobile payment platforms, followed by NFC payment, QR Code payment, pay by voice, and fingerprint payment, along with other advanced digital payment methods.

Non-bank payment institutions have maintained rapid momentum, with ever-increasing payment volume. With continuous innovation of digital payment technology, especially mobile payment technology, digital payment methods are increasingly diversified, application uses continue to expand, and digital payment is gradually replacing cash payment.

Case Alipay, from a Payment Tool to a Life Tool

Alipay was created in 2004 and 10 years later Ant Financial Services Group was borne based on Alipay's tremendous development. Alipay solves trust issue between Taobao buyers and sellers by providing an escrow service.

The development of Alipay is driven by technology and effectively addresses specific needs and improves users' experience, which has advanced digital financial inclusion in the field of payment.

Take the introduction of instant payment in 2011, for example, which was designed to address the inefficiency of payment services on e-commerce platforms. An immediate success, it enhances the level of digital financial inclusion and has become the standard product for all payment institutions, including Tenpay and China bank Payments.

In 2013, Alipay made an attempt to provide voice-based and QR Code-based non-cash payment processing services to small and micro merchants not covered by POS services. After the security and feasibility of QR Code payments were established, Alipay began to provide convenient payment solutions for a huge number of small and micro merchants, especially in rural areas, solving the last mile problem of financial services.

Since 2010, the Taobao 11/11 Shopping Carnival has created massive trading needs on November 11 every year, placing a high demand on concurrent payment processing volume per second. It is still on the rise year over year. To meet real-world needs and reduce transaction costs, Alipay explored the use of cloud computing to replace the original "IOE" (IBM, Oracle, EMC) system architecture. It has proven that cloud computing can effectively and efficiently meet this demand. In recent years, Alipay has gradually transformed from a payment tool to a life tool by unleashing new opportunities for use. Take the medical field, for example, where hundreds of institutions have been linked to Alipay, and users can make an appointment, and complete registration, payment, and other processes through the app. By linking with the medical insurance provider in Shenzhen and other cities, it has built the very first health insurance

mobile payment platform in China. The 12 million insured in Shenzhen have consequently halved their hospital time.

Additionally, Alipay is embedded in the city bus system, agricultural tools, visa processing, hotel and travel services, and many more everyday situations, effectively solving pain points and improving the consumer experience.

Case WeChat Pay Growing and Learning from Social Settings

WeChat Pay is an Internet payment product developed jointly by WeChat, a free chat software service of Tencent and Tenpay (Tencent's third-party payment platform). With WeChat, users can communicate with each other and buy goods and services from WeChat merchants.

WeChat Pay platform provides four types of services: consumer, wealth management, life, and financial services. Simply by linking a bank card with WeChat and completing the identity authentication, the user can turn a smart phone with the APP into a versatile wallet.

During the 2015 Spring Festival, WeChat Pay paired with its "Red Packet" successfully expanded its market share with support from the CCTV Spring Festival Gala's powerful media platform. Now, together with Alipay, WeChat Pay has dominated mobile payment in China. In 2014 Alipay and Tenpay accounted for 49.6% and 19.5% of the third-party Internet payment market in China respectively. Compared to Q2, Tenpay's market share increased by 10.6%.

a) Non-bank Payment Application Opportunities

In recent years, as consumers use non-bank payment services more frequently, its application opportunities are also expanding into retailing, wealth management, tourism, e-commerce, films, and entertainment, among many others.

Table 2-5 Non-bank Payment Application Opportunities

Payment Scenario	Payment Apps	Introduction
Top-up	Alipay, Tenpay, Quick Money	Top-up covers landline telephone, broadband, and mobile charges, as well as payments for public utilities such as water, electricity, and gas charges.
Tourism and e-commerce	Alipay, Tenpay, China PNR, All in Pay	Non-bank payment services not only provide payment services for travel products, but also value-added services such as credit granting, sub-accounts, and capital return for aviation, hotels, scenic areas, etc.
Wealth management	Alipay, Tenpay, Quick Money, Yeepay	Fund direct sales, insurance product sales, credit card repayment, etc.
Films and entertainment	Alipay, WeChat Pay, Baidu Wallet	Ticket payment includes movies and performances; entertainment payment is mainly for games.
Other markets	Alipay, PayEase	Education payment includes campus card and examination registration fee, etc.

b) The Scale of Non-bank Payment Transactions and Users

In terms of digital financial inclusion, non-bank payment services mainly include Internet and mobile payment. According to the China Payment and Clearing Association, non-bank payment institutions in 2015 handled 33.399 billion Internet payment transactions totaling 24.19 trillion yuan, a YoY increase of 55.13% and 41.88%, respectively. Non-bank payment institutions also experienced 39.861 billion mobile payment transactions totaling to 21.96 trillion yuan, a YoY increase of 160% and 166.5%, respectively.

A total of 2.636 billion accounts were opened for clients by non-bank payment institutions, a YoY increase of 20.15%. The number of clients using NFC-based payment was 204 million, a YoY increase of 78.95%, and the number of NFC merchants was 739,979, a YoY increase of 978.11%.

Both the transaction volume and the number of users have maintained a double-digit growth. Particularly in the mobile payment business, the YoY growth of transaction volume increased by 1.5 times and the growth of NFC merchants a staggering 10 times.

Compared with traditional bank payments, non-bank payment volume is still relatively small, and banks rather than payment institutions are still the main players. However, in terms of growth rate, the latter outpace the former by a large margin. This fast growth is partly due to its small base, its great user experience, and close integration with real-life needs.

Non-bank payment institutions are typically more oriented towards digital financial inclusion. These institutions have a large number of users, and yet each payment amount is small. Additionally, the main targets of offline NFC are new users not covered by the POS service, which effectively expands non-cash payment opportunities.

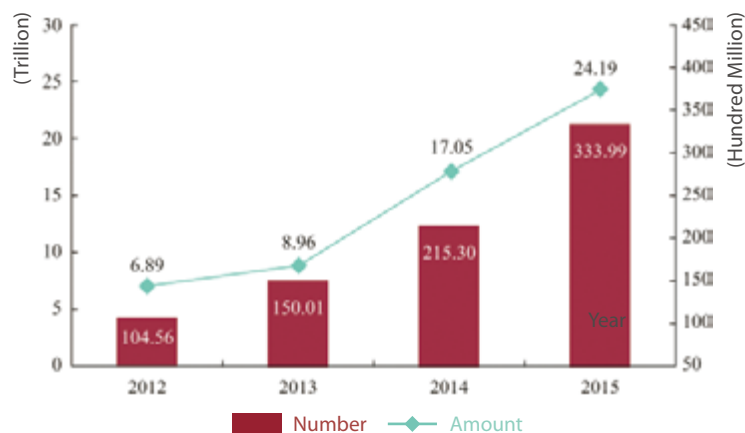


Figure 2-3 Internet Payment Transactions by Domestic Non-bank Payment Institutions

(Source: Payment & Clearing Association of China)

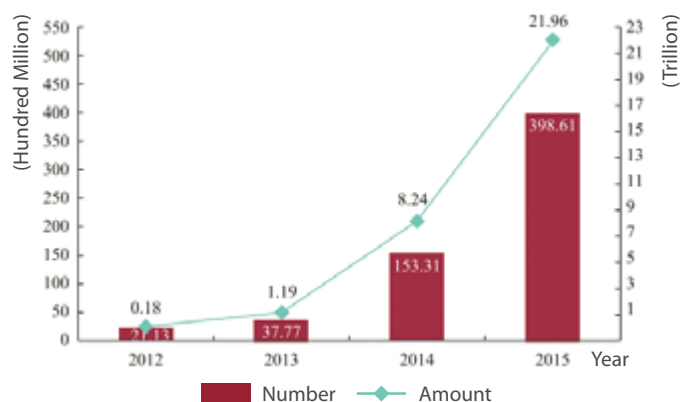


Figure 2-4 Mobile Payment Transactions by Domestic Non-bank Payment Institutions

(Source: Payment & Clearing Association of China)

c) Security of Non-Bank Payments

Non-bank payment services generally establish a risk compensation mechanism for the loss of funds incurred by consumers in their payment activities with consumers' rights and interests in mind. When the risk of fraudulence is high, institutions also risk their reputations and increased operational costs to cover for compensation. China's leading payment institutions like Alipay and Tenpay are at quite ahead of their foreign counterparts in terms of payment security. Alipay's announced capital loss rate remains at less than one per hundred thousand. Yet, the loss rate of PayPal, Visa, and other payment service providers is higher by several orders of magnitude. One reason is that foreign payment service providers have much higher fees to cover greater losses. Big data also contributes to improved risk identification.

3. Electronic Payment Offered by Agriculture-related Financial Institutions

Increased electronic payment presence in rural areas is one of the most important features of digital financial inclusion. The financial institutions that have deep roots in rural areas are mainly credit cooperatives (including rural commercial banks transformed from credit cooperatives) and postal savings banks. Accessibility to electronic payment through these two institutions has greatly benefited farmers by providing convenience, which may indicate an eventual transition towards online and mobile payment. However, the two aforementioned institutions did not disclose their payment business data, so it is difficult to understand the whole picture. This report explores the benefits brought to farmers based on the study of "GuiShengtong," introduced by Tiandong County Rural Commercial Bank in Guangxi.

Case "GuiShengtong", a Pro-farmer Electronic Payment Product of Tiandong, Guangxi

"GuiShengtong" is a non-cash payment product that was introduced by the Tiandong County Rural Commercial Bank in Baise City, Guangxi Zhuang Autonomous Region. The Tiandong County Rural Commercial Bank established convenient "GuiShengtong" outlets to provide payment convenience for farmers; it is regarded as a major measure of financial poverty alleviation. The outlets offer comprehensive

services, including small amount deposit and withdrawal, transfer and remittance, subsidy collection, and agent payment services. Rural financial stations can now provide loan and credit services, and financial consumer rights protection, but not cash and treasury services. “GuiShengtong” outlets have helped fill the void of non-cash payment services in rural areas.

“GuiShengtong” has brought great convenience to local farmers and facilitated digital financial inclusion in rural areas. As of December 2015, “GuiShengtong” has brought 166 terminals, covering all 162 administrative villages. Of these terminals, 161 were official outlets and five were rural financial service stations. In 2015, “GuiShengtong” handled a total of 21,000 inquiries, 25,300 withdrawals worth 10.55 million yuan, 11,000 deposits worth 5.8 million yuan, 6000 transfers worth 26.98 million yuan, and 5000 consumption transactions worth 19.88 million yuan. These figures are a telling example of “GuiShengtong”'s contribution to the development of the rural payment environment.

“GuiShengtong” has made it possible for farmers to enjoy efficient and convenient financial services without leaving their villages. Prior to 2012, farmers had to take a bus to a nearby town and take a day off work to meet their deposit and withdrawal needs. Now, “GuiShengtong” outlets effectively shorten the time for farmers to handle banking services and saves on any opportunity cost incurred. Payment efficiency has been greatly improved. Now farmers can, at their doorsteps, check their bank account, deposit and withdraw cash, collect their grains subsidy, subsistence allowances, agricultural insurance, and other subsidies, and transfer remittances to their migrant relatives and children in schools. They no longer have to queue in township banks to withdraw cash. As a result, cash safety is also greatly enhanced.

4. Summary

Digital payment has developed in China as a result of the digitalization of traditional banking and non-bank payment institutions. Bank cards and online banking are the foundation of China's digital payment. Furthermore, banks have introduced bank cards and online banking—the foundation of China's digital payment. By making it easier to access bank gateways, non-bank payment institutions can provide gateway, certified, and QR code payments, among other diverse payment solutions. Transitional electronic payment for rural areas has also seen rapid development. At present, China has nearly the highest digital payment coverage.

III. The Status Quo and Development of Internet-Based Financial Products

More and more financial products are Internet-based and sold through Internet channels, including many traditional financial products. After Yu'E Bao, a well-known micro-wealth management product, was released, financial products of this kind are now usually referred to as “Internet finance products.” There are four distinct features of Yu'E Bao and other new phenomenal financial products:

First, a low investment threshold. Compared with the 50,000-yuan investment threshold of traditional financial products sold by banks, the threshold of new products is particularly low, making wealth management accessible to everyone. Some are even as low as 0.01 yuan, such as Yilicai of E-Fund Management Co., Ltd, and Xianjinbao of China Universal Asset Management.

Second, high liquidity. Traditional financial products usually have a lockup period where redemption is not allowed until maturity. However, new financial products are highly liquid and allow T+0 trading. High liquidity incentivizes people to invest at any time, enhancing capital turnover.

Third, appealing returns. The investment income of new financial products is higher than current savings interest rates. In addition to better returns, savers experience low risks and seldom incur losses. Those profiles suit the needs of most low-net worth individuals.

Fourth, multiple functions. New financial products serve many functions in addition to investment including e-payment, credit card repayment, and transfer, inter alia. Traditional financial products can only be used for investment.

New financial products with the above-mentioned characteristics are referred to as Internet financial products, which are considered very inclusive. These products are possible through Internet, online micro-payment, and other digital technologies.

Internet financial products have a large market and target the general public, which has created pressure for a large number of traditional financial institutions, telecom operators, P2P platforms, and new Internet companies to develop a variety of similar products.

1. Internet Financial Products Developed by Traditional Banks

Since 2005, wealth management products—a focus of commercial banks—have enjoyed rapid development in China. After Yu'E Bao was launched in 2013, similar Internet financial products emerged and took market share from traditional products. However, banks also began to sell Internet financial products through electronic channels (such as online banking, direct banks), and gained some market share in the Internet financial market.

Table 2-6 Internet Financial Products Developed by Traditional Banks

Products	Issuers	Current Size (Billion)	Gains Yesterday Per 10,000 Shares (Yuan)	7-Day Annualized	Threshold (Yuan)	Redemption Limit Per (Million)	Redemption Condition
The Shopkeeper Wallet	China Industrial Bank	69.033	0.83	2.65%	0	30	Real Time (Conditional)
Minsheng Ruyibao (Hui)	China Minsheng Bank	39.409	0.79	2.56%	0	5	Real Time (Conditional)
Huoqianbao	China Ping'an Bank	33.705	0.63	2.38%	1	0.05	Real Time (Conditional)
Pinganying (Nan)	China Ping'an Bank	25.857	0.76	2.46%	0	1	Real Time
Pinganying (Ping)	China Ping'an Bank	20.511	0.74	2.94%	0	1	Real Time
Mingsheng Ruyibao (Min)	China Minsheng Bank	19.939	1.22	2.71%	0	5	Real Time (Conditional)
CITIC Xin (Jia)	China International Trust and Investment Corporation	17.095	0.65	2.42%	0	No Limit	Real Time
CITIC Xin (Xin)	China International Trust and Investment Corporation	14.926	1.02	2.56%	0	No Limit	Real Time
ICBC Xinjinbao	Industrial and Commercial Bank of China	4.982	0.67	2.45%	100	No Limit	T+1
Xingyebao	China Industrial Bank	3.188	0.50	1.88%	0	0.05	Real Time
CMB Zhaozhaoying	China Merchants Bank	2.451	0.76	2.53%	0	No Limit	Real Time
TianJinBao	China Bohai Bank	11.119	0.99	2.40%	0	No Limit	Real Time

2. Internet Financial Products Developed by Fund Companies

Fund companies, like banks, facilitate purchase and consumption to sell money market fund products online. With the innovation of the industry, Internet companies, banks, telecom operators, and fund companies have developed Internet financial products. The fund company serves as the fund manager, while Internet companies and other partners integrate fund products with their business to create innovative financial products. For example, Yu'E Bao leverages idle capital in AliPay for investment; "Huafei

Bao” leverages idle funds in cell phone plans for investment. In contrast, Internet financial products sold by fund management companies alone only grow moderately because of poor customer retention and lack of direct appeal to mass market clients.

Table 2-7 Internet Financial Products Developed by Fund Management Companies

Products	Issuers	Current Size (Billion)	Gains Yesterday Per 10,000 Shares (Yuan)	7-Day Annualized	Threshold (Yuan)	Redemption Limit Per (Million)	Redemption Condition
Xianjin kuaixian	ICBC Credit Suisse Asset Management	152.91	0.70	2.47%	0	1	Real Time
HowBuy Chuxuguan	HowBuy	152.91	0.70	2.47%	1	0.2	Real Time (Conditional)
China AMC Huoqitong	China AMC	64.1	0.69	2.42%	0	0.2	Real Time
China Universal Xianjinbao	China Universal Asset Management.	39.409	0.79	2.56%	0	5	Real Time
Zengzhibao	CCB Principle Asset Management	38.184	0.87	2.54%	0	0.5	Real Time
Huoqile	Harvest Fund	36.187	1.00	2.66%	1	0.25	Real Time (Conditional)
Xianjinbao	China Southern Fund	25.857	0.76	2.46%	100	0.5	Real Time
E Fund E Wallet	E Fund Management	18.451	0.70	2.53%	1	0.5	Real Time (Conditional)
Guotai AMC Superwallet (Guo)	Guotai AMC	14.344	0.95	2.54%	100	0.5	Real Time (Conditional)
Bank of China Huoqibao	Bank of China Investment Management	10.185	0.64	2.62%	1	0.3	Real Time (Conditional)
GF Zhengquan taojin	GF Securities	10.118	0.98	2.74%	0	0.1	Real Time
GF Fund Qiandaizi	GF Fund Management	9.757	0.88	3.53%	0	0.1	Real Time
Bosera Xianjinbao (Bo)	Bosera Funds	8.833	1.36	3.62%	100	0.5	Real Time
Great Wall Money	Great Wall Fund Management	8.804	0.76	2.33%	100	0.2	Real Time
NCF Yinuobao	NCF	7.212	1.08	2.22%	0	0.05	Real Time
Baoying Money	Baoying Fund	4.619	0.80	2.20%	0	0.5	Real Time
Zhaocaibao	China Merchants Fund	1.954	0.78	2.79%	0	0.5	Real Time
Fuqianbao	Fullgoal Fund	1.649	1.09	2.72%	0	0.05	Real Time (Conditional)

Table 2-7 (Cont.) Internet Financial Products Developed by Fund Management Companies

Products	Issuers	Current Size (Billion)	Gains Yesterday Per 10,000 Shares (Yuan)	7-Day Annualized	Threshold (Yuan)	Redemption Limit Per (Million)	Redemption Condition
Tiantianbao	Bank of Beijing Scotiabank Asset Management	1.295	0.73	2.78%	1,000	0.2	Real Time (Conditional)
ZL Xianjinbao (Yin)	ZL Fund	1.17	0.62	2.30%	100	0.5	Real Time
ZL Xianjinbao (Hai)	ZL Fund	0.934	1.10	3.15%	100	0.5	Real Time
Huoqiyiing	Hexun	0.934	1.10	3.15%	1	0.1	Real Time (Conditional)
Beilibao	Galaxy AMC	0.906	0.49	2.10%	100	0.1	Real Time
Tiantianlicaibao	Fullgoal Fund	0,722	0.62	2.32%	100	2	Real Time
Wanjia Xianjinbao	Wanjia Asset	0.67	0.60	2.59%	1	0.1	Real Time (Conditional)
BOC Xianjinbao	Bank of Communications Schroder Fund Management	0.646	0.59	2.15%	100	0.5	Real Time (Conditional)
Bosera Xianjinbao (Bo)	Bosera Funds	0.544	0.66	2.45%	100	0.5	Real Time
Rongtong Xianjinbao	Rongtong Fund	0.456	0.66	2.28%	0	5	Real Time (Conditional)
Dacheng Qianguai	Dacheng Fund	0.451	0.83	2.34%	0	0.1	Real Time (Conditional)
Huatai-PineBridge Xianjin	Huatai-PineBridge Investments	0.42	0.61	2.29%	1	0.5	Real Time
Weiqianbao	HuaAn Funds	0.385	0.56	2.66%	100	0.2	Real Time
Xianjinzenglibao	Fullgoal Fund	0.295	0.60	2.20%	1	0.1	Real Time (Conditional)
UBS SDIC Money	UBS SDIC Fund Management	0.29	0.87	2.59%	100	0.2	Real Time (Conditional)
Guotai AMC Superwallet (Guo)	Guotai AMC	0.227	0.42	1.58%	100	0.5	Real Time (Conditional)
Manulife Teda Money	Manulife Teda Fund Management	0.227	0.68	2.34%	100	0.2	Real Time
E Tongbao	Zhonghai Fund	0.214	1.97	2.53%	100	0.2	Real Time
Changsheng Tianlibao	Changsheng Fund	0.178	0.71	2.31%	1	0.3	Real Time
Lion Fund Tianlibao	Lion Fund Management	0.164	0.78	2.53%	0	1	Real Time
Xianjindai	SWS MU Fund Management	0.093	0.63	2.13%	1,000	0.5	Real Time

3. Internet Financial Products Developed by Telecom Operators

At present, the three major telecom operators in China have launched Internet financial products. Compared with financial institutions, telecom operators have a huge customer base they can access.

Table 2-8 Internet Financial Products Developed by Telecom Operators

Products	Issuers	Current Size (Billion)	Gains Yesterday Per 10,000 Shares (Yuan)	7-Day Annualized	Threshold (Yuan)	Redemption Limit Per (Million)	Redemption Condition
China Telecom Tianyibao	China Telecom	39.409	0.79	2.56%	0	0.05	T+7 to 15
Hejubao	China Mobile	1.856	1.39	3.17%	0	0.05	Real Time
Wobaifu	China Unicom	1.649	1.09	2.72%	0	0.05	Real Time (Conditional)
China Unicom Huafeibao	China Unicom	0.133	0.66	2.28%	100	No Limit	T+1

4. Internet Financial Products Developed by Emerging Financial Organizations

Emerging financial organizations are the inventors and major players of Internet financial products. Their Internet background in, e-commerce, SNS and search engines, gives them an advantage in innovating Internet financial products.

Table 2-9 Internet Financial Products Developed by Emerging Financial Organizations

Products	Issuers	Current Size (Billion)	Gains Yesterday Per 10,000 Shares (Yuan)	7-Day Annualized	Threshold (Yuan)	Redemption Limit Per (Million)	Redemption Condition
Yu'EBao	Alipay	816.312	0.65	2.36%	1	0.05	Real Time (Conditional)
Baidu Baizhuan	Baidu	64.1	0.69	2.42%	1	0.2	Real Time
Lingqianbao (Hui)	Suning	39.409	0.79	2.56%	1	0.14	Real Time (Conditional)
Weicaifu Cunqianguan	Sina Weicaifu	39.409	0.79	2.56%	0	No Limit	T+1

Table 2-9 (Cont.) Internet Financial Products Developed by Emerging Financial Organizations

Products	Issuers	Current Size (Billion)	Gains Yesterday Per 10,000 Shares (Yuan)	7-Day Annualized	Threshold (Yuan)	Redemption Limit Per (Million)	Redemption Condition
NeteaseXianjinbao	Netease	39.409	0.79	2.56%	0	5	Real Time (Conditional)
WechatLicitong (Hua)	Tencent	36.036	0.71	2.53%	0	0.06	Delayed
Baidubaizhuanligun	Baidu	16.997	0.64	2.36%	0	0.05	Real Time (Conditional)
Yongjinbao	Tencent	12.369	0.72	2.64%	0	No Limit	T+1
WechatLicitong (Hui)	Tencent	10.998	1.00	2.98%	0	0.25	Delayed
Lingqianbao (Guang)	Suning	10.723	0.68	2.35%	1	0.14	Real Time (Conditional)
JD Xiaojinku (Peng)	JD	4.78	0.64	2.36%	1	0.05	Real Time (Conditional)
JD Xiaojinku (Jia)	JD	3.39	0.67	2.47%	1	0.05	Real Time (Conditional)

Case Yu'EBao, Pioneer of Wealth Management for All

Yu'E Bao, which launched in June 2013, is an investment product offered by Ant Financial. Alipay users invest their idle money into a fund called Tianhong Zenglibao, managed by Tianhong Asset Management Co. The product is known for its easy use, minimum threshold, zero fees, attractive returns, and liquidity. In addition to the wealth management function, Yu'E Bao can also be used directly for shopping, transfer, payment, repayment, and other consumer payments. It is regarded as a cash management tool in the era of mobile Internet. Here we examine several important features of Yu'E Bao:

First, zero threshold. Compared to the threshold of traditional banks of at least tens of thousands yuan (with hundreds of thousands yuan, you are regarded as wealthy clients and with millions of yuan, you can enjoy private banking), Yu'E Bao lowers the threshold to as low as 1 yuan, which creates unprecedented financial opportunities for the general public.

Second, Yu'E Bao's characteristic as a "pocket-money wallet," which links payment with wealth management. Yu'E Bao along with Alipay enjoy a seamless link to offer both wealth management and payment services. Alipay has accumulated a large number of user resources, continues to expand its applicability, and subsequently has promoted the inflow of users' deposits. The idle funds can generate investment income while the balance on Yu'E Bao can still be used directly for shopping, transfer, payment, repayment, and other consumer payments.

Third, zero fee. Neither top-up and withdrawal of Alipay nor transfer-in and transfer-out of Yu'E Bao charge any fees. This makes it easy to link Yu'E Bao with bank accounts. It offers a much higher return than banks' demand deposit accounts; its clients can easily enjoy high return with light investment.

Yu'E Bao is a huge success. According to the "2013 China e-Banking Survey," 87% of Internet users have heard of Yu'E Bao. As of June 12, 2016, Yu'E Bao has attracted a total of 290 million clients covering 2,749 counties in China and generated 58 billion yuan in income for them. It has effectively increased the property income for ordinary people in China. With the help of mobile Internet, Yu'E Bao is quickly penetrating into tier-3 and tier-4 cities as well as rural areas in China, and now has over 90 million clients.

Case Huafeibao, Crossover Collaboration between Operators and Fund Companies

China Unicom and Anxin Fund in May 2014 formally launched Huafei Bao, their crossover collaboration product. Shenzhen Unicom cooperated with Anxin Fund to leverage idle funds in cell phone plans so that their clients can invest in Anxin Cash Management Monetary Fund A. This way, Unicom can both attract more people to use their plans and guarantee automatic monthly payment to the plans.

To use Huafei Bao the client puts an equivalent amount of the plan fee in Anxin Cash Management Monetary Fund, which will freeze the corresponding fund share and automatically pay for the plan to Unicom on a monthly basis. Like before, the subscriber will have to pay a lump sum in advance; but different than before, the sum will be used to invest in the fund, which unfreezes the plan payment on a monthly basis. In the past, the subscriber had to pay a portion of the plan charge every month despite the prepaid lump sum. However, the Huafei Bao subscriber does not need to manage this as Huafei Bao can automatically pay for the plan to Unicom on a monthly basis. For example, if you have paid a lump sum of 5,000 yuan and your monthly plan charge is 200 yuan. In the first month, Huafei Bao automatically pays 200 yuan for your monthly charge and the balanced 4,800 yuan as wealth management product in the fund and generates income for you. In the second month, another 200 yuan is automatically paid and the remaining 4,600 yuan plus the income generated in the previous month will continue to generate income.

Huafei Bao helps consumers to generate income from a frozen fund and also saves them from the trouble of paying phone bills. Additionally, Huafei Bao is easier to manage than Yu'E Bao and traditional money market funds because the redemption is predictable and the liquidity is more stable. As contract funds are frozen, transferred to fund shares, and can only be unfrozen on a preset date on a monthly basis, the fund manager can optimize the investment portfolio based on the yields of different money market instruments. This is not possible for other Internet financial products or traditional products, because fund managers cannot accurately estimate redemption demand so they must have a reserve fund.

5. Summary

Digital information technology has made finance possible by lowering the threshold in China from 50,000 yuan to 1 yuan. Now wealth management products are literally for anyone at any time. The emergence of Yu'E Bao is undoubtedly a milestone in the development of finance for MSMEs. It

is a product that embodies the true spirit of financial inclusion, as it has no threshold or cost. Because both traditional and new financial institutions participate in the financial products market, competition has further promoted its development and lowered the threshold of traditional financial institutions, improving inclusiveness.

IV. The Status Quo and Development of Digital Finance

Microfinance is a core financial service of financial inclusion. According to the World Bank, only 21% of the credit demand is met by formal financial institutions globally. In China, the loan balance for MSMEs accounted for less than 30% of financial institutions' total loans, although they are a major source of tax revenue and jobs. As the cost per loan is rather high, traditional financial institutions generally are reluctant to provide loans to MSMEs, low-income groups, and rural residents. Thanks to the development of Internet technology, credit costs are greatly reduced and a wider availability of loans is now possible. Since the 1990s, with the rapid development of digital information technology, various types of institutions, including traditional financial institutions, have been actively applying digital information technology in the field of MSMEs finance, pushing digital finance inclusion in China to a new level. In China, institutions engaged in MSMEs finance are divided into two categories: traditional financial institutions and emerging Internet institutions. The former mainly include commercial banks, micro-loan companies, mutual funds, non-profit microcredit institutions; the latter mainly includes comprehensive Internet financial platforms, P2P lending platforms, and crowdfunding platforms.

This report focuses on relatively mature platforms that are consistent with goals of digital financial inclusion with controllable risk. In this report, traditional financial institutions mainly refer to commercial banks, and emerging Internet institutions mainly refer to comprehensive Internet financial platforms. At the end of this report, we will also discuss the risks and regulation of controversial P2P lending and crowdfunding platforms.

1. MSMEs Finance by Banking Institutions

a) MSMEs Loans

Between 2010 and 2015, MSMEs loans by banking institutions in China grew rapidly; the outstanding portfolio maintained a 15% growth rate. By the end of 2015, it reached 17.39 trillion yuan (See Figure 2-5). Meanwhile, agriculture-related loans also grew (See Figure 2-6).



Figure 2-5 The Outstanding Portfolio of China's Banking Financial Institutions to MSMEs

Source: CBRC



Figure 2-6 China's Banking Financial Institutions' Balance of Agriculture-related Loans

Note: Agriculture-related loans include loans to rural households, rural areas (county-level and below), and agriculture.

The study found that, except for most Village and Township Banks (VTBs), almost all MSMEs loans of commercial banks are applying digital information technology to varying degrees.

All state-owned commercial banks, joint-stock commercial banks, city commercial banks, and the vast majority of rural commercial banks have online banking and telephone banking services to help borrowers apply for and repay loans easily through these terminals. Some banks offer cards with multiple functions such as deposit, payment and settlement, loan application, and repayment. Lastly, most of the commercial banks and joint-stock banks have mobile banking, which offers even more convenient loan application and repayment services. From the survey, we can see that digital information technology is applied throughout the whole process of loan application, review, issuance, and recovery. The main benefits of the new methods of banking are as follows:

First, it streamlines the process and saves money. At least 90% of the sampled banks offer online application and review service for small and micro businesses. It streamlines the process and cuts the approval time down to 3 to 7 days.

Second, it reduces risk. Most of the loans issued to small and micro businesses are unsecured loans. To monitor risk and improve loan quality, banks mainly rely on big data from e-commerce platforms, telecom operators, supply chain finance, and bank card use, inter alia. Examples include BOC's Online Tongbao and Wo Finance, CCB's Shanrong e Loan, SPDB's Heli Loan, and Woyidai.

Third, it reduces financing costs for clients. The payment convenience of online banking, mobile banking, and bank cards enables most banks to provide revolving loans to MSMEs; as borrowers can make loan repayments at will, it is both convenient and reduces interest costs.

b) Consumer Credit

According to the People's Bank of China, as of the end of 2015, China's consumer credit outstanding portfolio was 18.9 trillion yuan, a YoY increase of 23.3%. From 2011 to 2015, the consumer credit balance grew at a high of an average annual rate of 23%.



Figure 2-7 Outstanding Portfolio China's Consumer Credit

Source: Statistical Communique of the People's Republic of China on the National Economic and Social Development, National Bureau of Statistics of China

Consumer credit provided by commercial banks mainly consists of credit card consumption and personal consumption loans. The intensive application of digital information technology is reflected by increasingly enriching channels and greater usability.

In 2014, the Industrial and Commercial Bank of China vigorously launched its e-platform "Rong e Gou," together with "Xuandai," a consumer financial product. At the end of 2015, the trading volume of "Rong e Gou" exceeded 500 billion yuan; the number of "Xuandai" clients was 430 with a loan balance of 200 billion yuan.

The Construction Bank of China also launched its Shanrong e-platform with Shanrong e-Dai, offering consumer financial services.

The China Merchants Bank (CMB) expanded its financial service market by buying into Didi Dache (a mobile platform taxi-calling application). On January 26, 2016, CMB became a strategic investor of Didi Chuxing when its wholly-owned subsidiary, CMB International, bought into the company. According to the data of Didi, since its establishment in June 2012, registered users have exceeded 250 million, and registered drivers have exceeded 14 million. In 2015, 1.43 billion orders were completed, making Didi the

largest mobile travel platform in China. By buying into Didi, CMB can initiate all-around cooperation in capital, payment and settlement, and credit. This means Didi passengers can use CMB credit cards to pay fares, and Didi drivers can be registered at CMB outlets and buy cars in installments. Both the payment and consumer credit side of CMB have promising prospects.

2. Microcredit on Comprehensive Internet Financial Platform

This paper attempts to analyze the microcredit business of three types of comprehensive Internet finance.

a) Internet Microcreditbased on E-commerce

Such financial organizations developed from their parent companies' e-commerce business and then gradually became independent providers of financial services, represented by Ant Financial Services Group of Alibaba, JD Finance and Suning.cn of the Suning Group in China.

Case MYbank—Technology-driven and Serving Scenario Need

Ant Microcredit, initially known as Ali Micro-credit Company, launched its business focusing on big data credit in June 2010. It was designed to provide small loans for small- and microenterprises of Alibaba B2B and Taobao. In October 2014, Ant Financial Services Group was founded and Ali Micro-credit merged into Ant Financial Services Group and was renamed Ant Microcredit. The main loan products of Ant Microcredit for small- and microenterprises include order loans and credit loans issued to Taobao and Tmall business, and Ali credit loans to the Alibaba B2B platform. At the end of June 2015, MYbank was founded and the Ant Microcredit business was merged with MYbank.

MYbank mainly uses Internet technology to exchange underlying data with Alibaba, Taobao, and Alipay. It matches more than 100 indicators of small- and microenterprises on Internet platforms (e.g., cash flow, growth status, credit record, transaction condition, sales growth, warehouse goods turnover, complaints, and disputes) with the external customs, tax and electricity data. It uses this information to conduct a loan evaluation with a big data credit evaluation model to achieve the "360 experience": the borrower spends 3 minutes filling in the application form online and obtains credit loans in 1 second, with zero working staff involved. All these can be done online, effectively addressing the financing difficulty and slow approval of loan applications from small- and microenterprises.

Different from that of traditional banks, MYbank's risk management model involves analyzing massive amounts of Internet data. Data mining and model development methods are no longer limited to traditional statistics—more and more machine learning methods are being used. Additionally, data analysis is being used to discover the underlying nature of a business, thereby increasing efficiency. Access to historical data on e-commerce platforms such as Alibaba, Taobao, and Alipay, including the basic information and transaction data of the online shops, the buyer member information, browsing data, and data from the Wangwang messaging platform has led to MYbank's mastery and application of merchants'

Internet behavior data. Through in-depth analysis of these data, MYbank has developed a series of models, including borrowers' credit scoring, sales forecasting, post-loan early warning, and default and collection model, which cover all aspects of marketing and risk management.

The data-driven business model makes it possible for MYbank to identify and manage risks more accurately, and improves service efficiency and reduces the cost of service. Compared to traditional banks where approval and the lending cycle may take several weeks, MYbank can conduct risk appraisal and credit extension for borrowers in advance and issue loans a few minutes after receiving the application. Relevant data show that MYbank's data-based credit model can maintain the unit operation cost within two yuan or so, which is much lower than the lending cost of traditional financial institutions.

As of June 2016, MYbank and Ant Microcredit had provided more than 700 billion yuan of loans to over 4 million small- and microenterprises. According to empirical analysis conducted by the Ant Financial Services Group, businesses supported by loans witnessed more rapid growth compared to those without loan support, indicating that access to finance significantly promote economic development.

Case Small Loans of JD Finance

JD Finance, which separated from JD.com in October 2013, relies on the JD e-commerce ecosystem, and their big data and the credit system. JD Finance mainly provides small- and micro-enterprises and individuals with financing, and financial, payment, and crowdfunding services. Small and micro business loans provided by JD Finance are largely used in supply chain finance, including Jing Baobei (a financing product of supplier), Jing Xiaodai (small loan of JD), Movable Property Financing, and Enterprise Vault (a wealth management product for enterprise).

In October 2013, JD Supply Chain Finance launched its first product "Jing Baobei"—a supply chain factoring financing business through various Internet features. It has the advantages of a low threshold, low costs, and high efficiency. Jing Baobei can approve and issue loans within 3 minutes, and facilitate daily interest payments so that loans can be repaid by clients at any time. At present, Jing Baobei mainly serves JD mall suppliers and customers from other e-commerce platforms, and has provided services for nearly 2,000 JD mall suppliers. Customers' transaction value on JD increased by more than 200% and the financing amount ranges from 10,000 yuan to more than 100 million yuan. Additionally, the default rate is less than 0.05%, far below the industrial average. The outstanding performance of Jing Baobei makes it possible for JD to further tap the corporate wealth management environment. In May 2016, JD Finance launched the "enterprise vault" to provide wealth management services for corporate customers.

JD's most famous personal consumer credit product is "IOU." In February 2014, JD launched IOU—the first Internet consumer financial product in the industry. While shopping on JD.com, consumers can enjoy credit services of "payment after consumption, real-time approval of loan application, and repayment by installments." After IOU was launched, users' average monthly consumption increased by more than 100%. By end of June 2015, JD IOU turnover increased by 600% over the previous year, with an average monthly

growth of 97%. According to statistics, IOU's users are aged 18-86; those born after 1985 account for 70%. IOU provides credit support for younger individuals who have not built any credit yet. After launching IOU, JD has continuously launched a series of IOU products, such as "JD Coin," "JD Xiao Bai Ka (JD White Card)," and "JD Bullion," which have gradually been applied in more consumption fields other than JD.com, such as in tourism, house leasing, education, and vehicle purchasing. Consumers will gradually be allowed to use "IOU" to repay in installments.

b) Small Loans of Industrial Chain Finance

With the development of digital information technology, more and more domestic enterprises with industrial backgrounds have launched e-finance arms, including well-known enterprises such as Haier group, Mi, Dabeinong Group, and Chia Tai Group.

Case Micro-loan of Haier

Relying on digital information technology, Haier Finance, which is affiliated with household appliance giant Haier Group, has vigorously developed the market of industrial finance and consumer finance. In the field of industrial finance, it established the Internet financial platform Hairongyi to provide e-financing and wealth management services for small and medium-sized enterprises in the supply chain. The products include: "Xiaojinlian", which provides Haier's associated enterprises, partners, and agricultural production e-financing services combined with Haier Industrial Finance; and "Xiaojinxie", which provides high-quality enterprises with short-term liquidity loans that cover food, agriculture, transportation, intelligent manufacturing, health care, modern service, and green finance.

Haier Finance provides consumer credit for customers to purchase goods. It relies on its 30,000 offline sales outlets, approximately 160 large-scale domestic home furnishing stores of Red Star Macalline, and hundreds of thousands of nationwide outlets of its strategic partner, China Telecom. As of 2015, Haier Consumer Finance had provided hundreds of thousands of residents in 321 cities with a series of household financial services, such as home decoration, furniture, education, health care, travel, 3C (Computer, Communication, Consumer Electronic), and house renting services. Relying on the data resources of 1.5 billion users accumulated over the previous three decades and consolidating big data from its partners, such as China Telecom and Red Star Macalline, Haier Consumer Credit has developed a relatively complete user tag library through cross validation of data. After matching these tags with the its pre-approved credit risk control model, qualified users may obtain a pre-approved line of credit of 200,000 yuan.

c) Small Loans of Network Financial Organizations based on Social Networking Platforms and Portal Websites

In addition to the network financial organizations with e-commerce and industry background, network financial organizations based on social networking platforms and portal websites have also shown their strength in finance, particularly Tencent, Qihoo 360, and Baidu.

Case Tencent's Micro-loan

Tencent's microloan products mainly include Weilidai and Touhaodai. As the first loan product launched by Tencent's WeBank, Weilidai is a kind of online consumption credit product with a credit amount of 500 to 200,000 yuan and a daily interest rate of 0.02% to 0.05% (annualized interest rate is 7.3% to 18.25%). WeBank gives its clients a credit rating based on their social networking and transaction records over instant chat tools QQ and WeChat, and provides Weilidai for clients above a certain credit rating. As of early 2016, Weilidai had more than 6 million clients and issued 35 billion yuan of loans—300 million yuan per day. Loans issued by WeBank in 2016 are estimated to exceed 100 billion yuan⁴.

Eighty percent of the Weilidai funds come from more than 20 banks that have established a partnership with WeBank, most of which are city commercial banks. Combining city commercial banks' capital advantage and Tencent's advantages in big data, this cooperation pattern makes it possible for city commercial banks to tap small-amount retail businesses and for WeBank to operate a large-scale microcredit business under the asset-light strategy. This reflects WeBank's position as a financial services company that connects commercial banks with consumers. "WeBank does not consider itself a simple bank, and Weilidai is a kind of valuable innovation to the resource sharing mode. WeBank is responsible for selecting customers, loan issuing, and risk control."⁵

Tencent's other consumer credit product, "Touhaodai," is a kind of personal consumer loan product based on clients' social behavior. When the user has more than 100 WeChat friends, they can apply for loans of 20,000 to 150,000 yuan based on their social contacts.

3. P2P Online Lending

Both big data technology-supported consumer finance and small loans for MSMEs have witnessed rapid and healthy development in recent years. Internet finance serves the modern economy by reducing financial idling. Meanwhile, effective and dynamic risk control data have made risk identification and control more timely and efficient. In contrast, two other kinds of digital finance models have filled some of the gap of traditional financial markets, namely P2P online lending and crowdfunding. However, because there are not mature risk evaluation and management mechanisms in the financial industry yet, many problems occur in the process of rapid development.

a) Basic Attributes and Characteristics of P2P Online Lending

Compared to credit products provided by traditional financial institutions, P2P online lending has made major breakthroughs in meeting borrowers' financing needs and investors' demands for wealth management.

Individuals or SMEs who seek for loans are faced with various difficulties in obtaining loans in the

4. Overview of WeChat Earnings, <http://www.askci.com/news/finance/20160518/1443195004.shtml>

5. <http://finance.qq.com/a/20160426/060210.html>

traditional loan market. This is because they might lack appropriate collateral and credit data, small loan size, and don't have the benefit of economies of scale. Therefore, rural households, the self-employed, and small- and microenterprises are essentially excluded from traditional credit services. Even if some institutions provide loans for them, they usually cannot meet these groups' needs for flexibility due to the lengthy review and approval time, high product pricing, and long standardized loan period. P2P online lending platforms, however, provide borrowers with a multi-dimensional credit evaluation system and give corresponding credit rating to borrowers or loan projects, which helps borrowers send a credible signal to the credit market and provides a basis for investment decision-making. In Chinese and American markets, where P2P online lending witnessed the most rapid development, borrowers of P2P lending are mainly individuals and small- and microenterprises. These groups are typically excluded from traditional financial institutions and can only have their financing needs satisfied at the cost of a higher interest rate. By fixing this issue, P2P promotes financial inclusion.

For investors, P2P lending platforms provide investment opportunities completely different from those in traditional finance. On a P2P platform, investors may choose investment opportunities based on their risk preferences and financial strength. Additionally, the single project investment threshold of most P2P platforms is not high, providing investors with choice among many opportunities and meeting their personalized financial needs.

P2P online lending—an innovative Internet financing model—provides more flexible options for both supply side and demand side. This facilitates the financing of transactions that cannot be carried out in some traditional financial markets and allows for high levels of inclusion.

b) Development Progress of Online Lending in China

Founded in 2007, PPDai is the first P2P online lending platform in China. It was not until 2010 that rapid development truly began for the online lending industry. According to a Citibank report released in early 2016, China has the largest number of P2P platforms with a P2P transaction amount at about \$66.9 billion in 2015, four times that of the United States', making it the second largest market in the world.

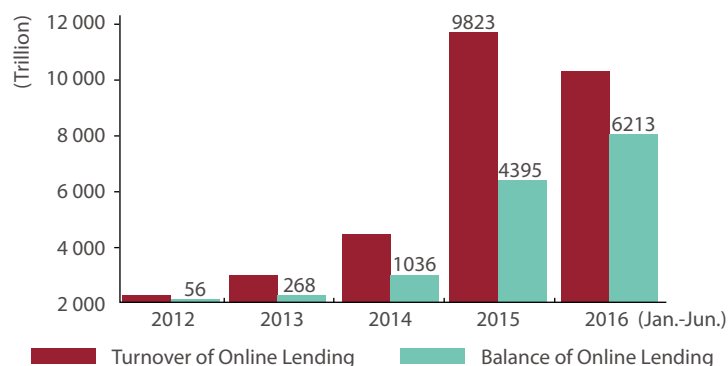


Figure 2-8 Turnover and Balance of P2P Online Lending

Source: www.wdzj.com

The development history of China's online lending can be divided into two stages. The first stage, from 2010 to 2015, is when online lending witnessed rapid growth. The second stage, which began in 2016, is now when online lending will experience healthy development under standardized supervision and regulation.

First Stage (2010-2015): This stage is characterized as a period of rapid growth for unconventional development. According to the "Annual Report of China Online Lending Industry in 2015," released by www.wdzj.com and www.yingcanzixun.com (Ying Chan Consulting), by end of December 2015, there were a total of 2,595 online lending platforms in China. This number had increased by 1,020 over the previous year; five years ago, there were only 10. The online lending transaction was growing faster in number than that of online lending platforms. These amounts from 2011 to 2015 were 21.2 billion yuan, 105.8 billion yuan, 252.8 billion yuan, and 982.3 billion yuan, respectively by year, with a Compound Annual Growth Rate (CAGR) of more than 100%. Over the same period, the number of online lending platforms with problems reached 896 in the year of 2015, 326% higher than that of 2014.

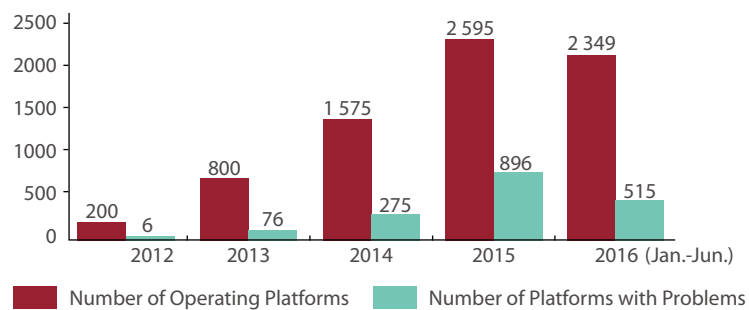


Figure 2 - 9 The Number of P2P Online Lending Platforms and the Number of P2P Online Lending Platforms with Problems

Source: www.wdzj.com

Second Stage (2016-present): This stage features healthy development of standardized supervision and regulation. As a new financing model, P2P online lending was initially not incorporated into traditional financial regulatory frameworks, and many platforms disappeared after cheating clients, damaging investors' interests, and destroying the industry rhythm. At the end of 2015, the "Interim Measures for the Management of Business Activities of Online Lending Information Intermediaries (Draft)" was issued, marking the beginning of standardized regulation of the industry. This Interim Measures document stipulates the basic principles for P2P online lending. Meanwhile, China's Banking Regulatory Commission (CBRC) and the Ministry of Industry and Information Technology (MIIT), in cooperation with the local regulatory authorities, began to rectify and clean up P2P platforms by requiring existing platforms to register and conduct standardized operations according to the Interim Measures.

c) P2P Online Lending Risk and Regulation

Due to the complexities of financial services, financial innovations come with new risks. P2P online lending is different not only from the indirect financing model of banking, insurance, and trust financing, but also different from bonds, stocks, and other direct financing methods in the capital market. Internet financing has a large number of scattered clients, so its risks differ from those of traditional finance. The risks of P2P online lending come from two aspects: borrowers and intermediary platforms. Borrowers' risks are controlled by relying on the identification and rating intermediary platforms. As a result, measures introduced by various countries to standardize P2P online lending mainly target the P2P platform.

The United States and the United Kingdom issued measures for the supervision of the P2P industry after 2012. The US and UK represent two different regulatory models: "strict supervision" and "loose supervision," respectively. In the US, creditors' rights on P2P platforms are regarded as a valuable security. Under the supervision of the Securities and Exchange Commission (SEC) in the United States, P2P platforms are required to register with the SEC and provide certificates of creditors' rights and relevant materials regularly. Under such strict supervision, the operating costs of platform enterprises are relatively high. In UK, however, P2P platforms are under the supervision of the Financial Conduct Authority (FCA), which focuses on the transaction behavior of P2P platforms. According to the "Measures for the Supervision of Online Crowdfunding and the Issuance of Non-Readily Realizable Securities through Other Media" issued in 2014, British regulators have no minimum capital requirements for P2P platforms, requiring only relevant licenses. At the same time, however, this document emphasizes the information disclosure mechanism of these platforms and provides stipulations on platform enterprises' code of business conduct, minimum capital requirements, customer funds protection rules, dispute resolution, and guarantee repayment plan in case of platform collapse.

Compared to developed countries, the situation in China is more complex. On one hand, there are a large number of such platforms with different levels of quality in China; on the other hand, the traditional financial regulatory system is imperfect and it is difficult to incorporate new financial forms into the existing regulatory scope. For many reasons, a large number of P2P platforms have experienced ongoing problems with widely distributed risks. A few examples include the defaults of Pan-Asia, E-Zubao, and Zhongjin, which have some common characteristics: First, "deceptive" innovation. In the absence of financial compliance measures and enforcement, they carried out a variety of illegal activities in the name of innovation. Second, "inferior" innovation, meaning that they lacked strong innovation capacity, sound business flows, and reliable technical support. Finally, these organizations were unable to effectively solve the practical pain points in a social context or effectively identify risk with data. Due to inferior "financial innovation" problematic institutions may violate rights of financial consumers, which has an adverse impact on social and economic development by causing distrust amongst actors in Internet finance. We should strictly regulate the behavior of P2P platforms to guide healthy and sustainable development of the industry and effectively protect the interests of investors.

4. Online Crowdfunding

Crowdfunding refers to a group of individuals who fund a project, person, or company to support its creation, innovation, and production and operation activities, using physical products or equity with an expected return on investment. Depending on the type of return, crowdfunding can be classified into product, equity, or public welfare crowdfunding. Product crowdfunding, also known as incentive crowdfunding, provides products relevant to the project as the return on investment. It is now the largest and relatively most mature form of crowdfunding in the world. For equity crowdfunding, returns are the company shares obtained directly or indirectly after successful fundraising. As this form is related to the initial public offering (IPO) of stocks, the relevant entities' rights and obligations are relatively complex and restricted by the laws of the capital market, which is still at the initial stage in various countries worldwide.

a) The Basic Attributes and Characteristics of Crowdfunding

Product crowdfunding is financing activity that occurs at a stage when initiators have creativity and ideas, but with high risk and uncertainty. It is difficult to know in advance whether the returns will be obtained as planned and whether quality of the product is good, thus the initiators struggle to get financial support from the traditional financial market. Equity crowdfunding refers to fundraising from different sources in the form of equity. In existing capital markets in various countries, equity fundraising is strictly supervised, making it very difficult for small- and microenterprises to raise funds from ordinary investors through the issuance of shares. Equity crowdfunding provides a solution to this problem.

First, crowdfunding is open-ended. All enterprises and individuals may become initiators of crowdfunding as long as they have creative ideas and can launch potential projects to attract supporters. Additionally, it is open to investors. In the capital market, the enterprises, as the investment objects, are not selected by the investors, but by the securities companies and stock exchanges. In the field of private equity, the threshold for individual investment is too high for most investors. Thus, equity crowdfunding provides an opportunity for small- and microenterprises to get equity financing, and individuals with only a small amount of capital can also enjoy the return on equity investment.

Second, crowdfunding expands the scope of tradable equity financing. Transaction cost caused by information asymmetry between operators/managers and stockholders is an important factor that determines the scope of equity financing. In publicly traded capital markets, for the sake of protecting the interests of investors from problems of asymmetric information and moral hazard, regulatory departments focus on regulating operators' behavior. They achieve this through requiring that professional institutions, securities companies, accounting firms, and the media get involved. Additionally, they explicitly stipulate the obligations of enterprises with publicly offered shares, such as regular information disclosure and inspection and supervision of corresponding institutions. While ensuring investors' interests, these measures cause a high fixed cost to equity financing transactions, making equity financing in public markets the only financing channel for large-scale mature enterprises. As a result, a large number of innovative small- and microenterprises struggle to get the support they need. Crowdfunding platforms

have shortened the distance between the project initiator and investor. It also facilitates efficient information collection and presentation, and project follow-up by integrating with social networks so that the crowdfunding project initiator and investor can get involved at a relatively low cost.

b) Development Status of Crowdfunding in China

In July 2011, China's first crowdfunding website, Demohour, began operating. In the same year, China's first batch of equity crowdfunding websites, including Angel Crunch, officially opened. So far, crowdfunding has a history of five years in China. From 2013 to the end of 2016, the number of crowdfunding platforms under normal operation has increased rapidly; by the end of June 2016 the total number of platforms reached 370.

Although the amount of fund raised by the crowdfunding industry is not comparable to P2P online lending, its growth rate is high. From 2013 to 2015, the total fund raised was 335 million yuan, 2.156 billion yuan, and 11.424 billion yuan, respectively. In the first half of 2016 alone, 7.941 billion yuan was successfully raised.

Table 2-10 Number and Financing Amount of Crowdfunding Platforms Nationwide in China from 2013 to the First Half of 2016

Year	Total Number of platforms	Number of product crowdfunding platforms	Number of equity crowdfunding platforms	Amount of successful financing (100 million yuan)
2013	29	n/a	n/a	3.35
2014	142	56	53	21.58
2015	283	66	130	114.24
First half of 2016	370	136	144	79.41

Source: "National Crowdfunding Industry Report 2015" and "Semi-annual Report of National Crowdfunding 2016" of Ying Chan Consulting

In the first half of 2016, the domestic crowdfunding industry raised a total of nearly 8 billion yuan and the number of investors reached 54.43 million. The proportion of product crowdfunding exceeded that of equity crowdfunding. Product crowdfunding contributed 52.03% to funds raised while equity crowdfunding contributed 45.38%; as for the number of investors, the former accounted for 39.35% and the latter 0.07%. This pattern is related to the restriction of legal shareholder numbers of equity crowdfunding.

c) Crowdfunding Risk and Supervision

Equity crowdfunding supervision is a global challenge. Online crowdfunding is characterized by

openness, publicity, and small amounts of money. However, in order to protect the interests of external equity investors, various countries impose many restrictions on public offerings of shares. Equity crowdfunding supervision, therefore, needs to find the balance between encouraging innovative enterprises' equity financing and preventing operators' moral risk. Furthermore, it needs to strike a balance between protecting investors' interests and expanding the equity investment channels of low net worth investors.

In this regard, the regulatory approach that made a major breakthrough is the "Jumpstart Our Business Startups Act" signed by Former President of the United States, Barack Obama, which is regarded as the world's first Internet finance regulation act. The financing procedures of capital market are complex and the cost is high under existing regulatory frameworks, which restricts the financing channels of newly founded enterprises. The Jumpstart Act provides some exemptions for equity crowdfunding-based financing of newly founded small enterprises, and relaxes relevant requirements for financing approval, registration procedures, information disclosure of enterprises, and investor access. The introduction of this act serves as an example for other countries to innovate their supervisory Internet finance regulations.

Currently, China's supervision of equity crowdfunding is conducted under the framework of the "Private Equity Crowdfunding Management Approach (Trial) (Draft for Comments)" issued by the Securities Association of China in 2014. In accordance with the existing regulatory rules of private equity investment, financiers shall not issue securities publicly in any form; issue securities to non-specific investment objects; exceed 200 total shareholders; and the minimum investment in individual financing project shall not be less than one million yuan. Additionally, there is a high threshold for individual investors: financial assets should be no less than three million yuan nor should the average annual personal income be less than 500,000 yuan in the previous three years. In fact, these regulations on private equity supervision are inconsistent with the principle of openness, small amount of funds involved, and large number of investors available through online crowdfunding. In practice, many crowdfunding platforms strive to address these problems by establishing partner companies or investment funds. Departments within the China Securities Regulatory Commission (CSRC) are actively exploring new regulatory measures.

5. Summary

Microcredit is a cornerstone of Global Financial Inclusion and one of the fields which people are most concerned about. Traditional financial institutions that use digital information technologies expand the channels and application opportunities of microcredit. Meanwhile, emerging Internet institutions are exploring MSMEs finance services that can effectively meet the needs of consumers, through financial compliance, new technology application, and by meeting customers' diverse needs. Microcredit is an important area for the development of digital financial inclusion. However, financial regulatory institutions struggle to find a balance between establishing a sound long-term supervision mechanism and encouraging sufficient innovation.

V. The Status Quo and Development of Digital Insurance

The application and development of digital technology in China's insurance industry can be summarized in three points. First, the digitalization of sales and insurance product service channels, i.e. the sales and after-sale services of insurance products through a long-distance digital network. Second, the emergence of new digital insurance institutions, including third-party Internet platforms, professional Internet insurance companies, and digital mutual insurance organizations. Third, the innovation of new digital insurance products—the insurance products developed with Internet-based digital technology.

1. Digitalization of Sales and Insurance Product Service Channels

Personal and brokerage agency sales are the main traditional ways to sell insurance products. With the development of digital technology, online marketing has become a major aspect of insurance sales. Currently, most domestic insurance companies have developed their official websites for online direct sales and a large number of enterprises have enabled applications over mobile terminals. According to the data of Insurance Association of China, Internet insurance revenue has increased significantly in recent years and the Compound Annual Growth Rate (CAGR) reached 189% in the past five years. From 2013 to 2015, China's Internet property insurance revenue was 23.67 billion yuan, 50.57 billion yuan, and 76.8 billion yuan, respectively for each year. Internet life insurance income was 6.42 billion yuan, 35.32 billion yuan, and 146.5 billion yuan, respectively per year, with growth rate far higher than the industrial average.

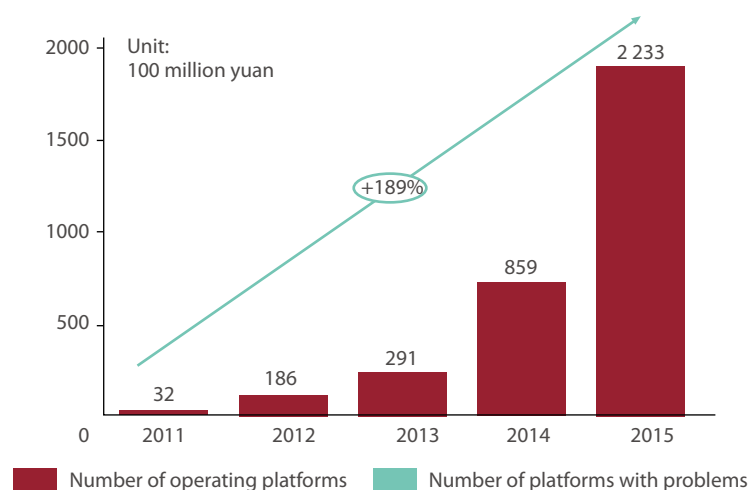


Figure 2-10 Internet Insurance Premium Size and Growth Rate

Source: Insurance Association of China

From January to June 2015, insurance companies recorded insurance premium incomes of 2.738 billion yuan through mobile terminals (APP, WAP, and WeChat), accounting for 7.54% of the total, with an increase of 3.52% compared to December 2014. Online marketing of insurance products creates more

access channels, supplemented by convenient and efficient digital insurance application purchasing processes, which greatly enhances national awareness and popularity of insurance.

2. The Emergence of New Digital Insurance Institutions

In addition to the digital transformation of traditional insurance companies, many digital and innovative institutions have entered the insurance market in recent years. Such institutions' insurance products and services are not essentially different from traditional ones, but their organizational structure, operation models, and product development are rooted in digital technology; their product connotation is more flexible and versatile; their insurance services are more generally applicable and easier to access; and their insurance amount is smaller. There are three types of such organizations in China, namely third-party Internet insurance platforms, professional Internet insurance companies, and digital mutual insurance organizations.

a) Third-party Internet Insurance Platforms

Providing insurance-related services through an independent third-party Internet platform is another important characteristic of digital insurance in China. Some of these platforms have the advantages of large cash flows and a large number of users, and some provide comprehensive and professional services or expand access to products and sales channels. In cooperation with insurance companies, these platforms have significantly expanded the coverage and depth of insurance services, enriching both the demand and supply side. Third-party Internet insurance platforms fall into the following categories: comprehensive sales platforms that provide products from different insurance companies; e-commerce platforms that provide purchasing access to insurance products and services; information platforms that provide services to compare prices; and agent platforms that host professional personnel trainings.

Table 2-11 The Third-party Internet Insurance Platforms

Types	Represented by	Main business characteristics
Insurance supermarket	Huize, Dateba	flow inlet, sales of insurance products
Agent platform	Baobao Network, winbaoxian	Hold professional trainings of sales agents, provide promotion tools over mobile terminals
Scenario platform	Ant Financial Service, Ctrip	Embedded scenarios, customized development
Price Comparing platform	Pony car insurance, Zuihuibao	Provide car washing and refueling, handle traffic violation and other ancillary services on commission
Product design	WKbins, order insurance	Customized development
Service output	Vobao, Chetong	Reconnaissance staff recruitment and certification examination, implementation of LBS-based crowdsourcing exploration
Data driven	Ant Finance, Doctor Tang	Based on transaction data and intelligent hardware data, provide personalized pricing and services

Agent sales is the most important sales channel of traditional insurance companies. As an Internet insurance training platform, Baobao Network provides several services, such as a 30-day training for new insurance agents; mobile Internet services and products, such as video downloads of insurance companies' training courseware; online simulations of the qualification exam; and exercises to role-play as insurance agents; WeChat marketing; and micro business cards. By providing better learning materials and more efficient marketing tools, this helps insurance agents improve their proficiency with digital technology.

Case Ant Financial Services: Third-party Insurance Platform

As one of the most comprehensive third-party insurance platforms, Ant Financial Services Group, provides the most basic large-flow sales channels. More importantly, in cooperation with traditional insurance companies, Ant Financial Services Group designs small, digital insurance products to promote the popularization of insurance across large regions. Ant Financial's insurance platform provides a technical base and data capability for its partner insurance companies. Based on the platform's big data and cloud computing ability, insurance companies can design different products for various clients at different prices—the insurance premium is sometimes even less than one yuan. Insurance based on Ant Financial's platform cover scenarios of a consumer's life. For example, back freight insurance and account security insurance users exceed 100 million. Back freight insurance granted 308 million insurance policies on November 11, 2015 alone. At a very low cost, back freight insurance effectively solves the problem of back freight in the process of returning goods on e-commerce platforms such as Taobao and Tmall. As a result, people no longer believe insurance is an expensive financial service and has become an assistant for online shopping, which promotes further e-commerce development. Compared to traditional insurance products, micro insurance services provided by Ant Financial Services Group has a rather low threshold. This has allowed insurance to serve people's daily life, and played a role in promoting the popularization of insurance among users.

As of the end of 2015, the Ant insurance platform had 76 insurance partners, including 30 property insurance companies, 37 life insurance companies, 2 health insurance companies, and 7 insurance agencies. As of the end of 2015, more than 2,000 insurance products were delivered to 330 million users through Ant Financial Services Group's insurance platform.

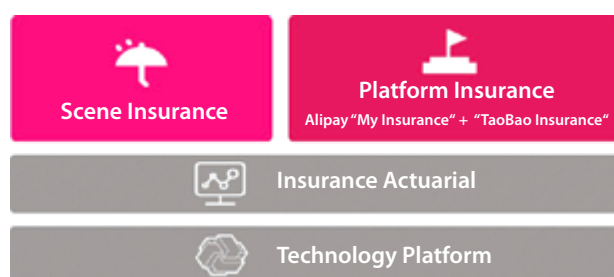


Figure 2-11 Insurance Platform of Ant Financial Services Group: Building Platform + Providing Cover for Different Scenarios

b) Professional Internet Insurance Companies

Professional Internet insurance companies are insurance companies that specialize in online insurance and have a license issued by the China Insurance Regulatory Commission (CIRC). Unlike traditional insurance companies that have affiliated agency restrictions, professional Internet insurance companies are not restricted by branches if they meet CIRC requirements and can provide insurance services nationwide through the Internet. So far, four companies have received the “Internet insurance license” issued by the CIRC, namely ZhongAn Online P & C Insurance Co., Ltd, Taikang Online, Answern Property & Casualty Insurance Co., Ltd, and Yi’an Insurance.

Table 2-12 Licensed Internet Insurance Companies in China

Company name	Opening Date	Business Scope	Premium Income
			Jan-May 2016 (ten thousand yuan)
ZhongAn Online P & C Insurance Co., Ltd	2013-11-06	Automobile insurance, travel insurance, accident insurance, health insurance, bulk/group insurance; innovation insurance, MiPhone accident insurance, Weixiaobao (rights protection fee insurance), fraudulent bank card money loss insurance, return shipping insurance	108,700
Taikang Online	2015-11-08	Health insurance, accident insurance, financial insurance, characteristic insurance	6,896.40
Answern Property & Casualty Insurance Co., Ltd	2016-01-18	Automobile insurance, small and micro business property insurance, liability insurance, online payment security insurance	48.00
Yi’an Insurance	2016-02-06	Enterprise / family property insurance, freight insurance, liability insurance, credit guarantee insurance, registration insurance, financial security insurance (bank card fraudulent insurance)	366.20

As the first licensed Internet insurance company, Zhong An Insurance does not have offline sales teams or branches, but provides underwriting and claims entirely through the Internet. So far, the company has cooperated with more than 100 companies and launched more than 200 kinds of products based on industry needs.

Taikang Online is the second Internet insurance company in China and the first Internet insurance company that is initiated by traditional, offline insurance companies. Its predecessor is the first Internet insurance e-commerce platform—Taikang Online, built in 2000. Relying on its experience in the insurance industry and on the Internet platform, Taikang Online mainly provides Internet property insurance services. Since its inception, Taikang Online has launched a cancer insurance product requiring a premium

of only 9.9 yuan. Taikang Online also offers family property insurance requiring a premium of only 50 yuan, and a micro mutual product, which addresses people's negative impressions of insurance by enabling interaction between people on the platform. These innovative products have fragmented insurance liability, reduced users' purchase threshold, and assumed the responsibility of popularizing insurance amongst the public.

Companies that have developed innovative "fragmented and customized" online insurance products have greatly expanded insurance coverage and have lowered the access threshold. Digital technology and the Internet have had a profound impact on the insurance industry.

c) Digital Mutual Insurance Organizations

As a traditional form of insurance, mutual insurance has a longer history than joint-stock insurance and has a market share of 27.1% globally. Characterized by "risk and revenue sharing," mutual insurance is widely applied in high risk areas. The risk guarantees of mutual insurance for middle- and low-income groups can be viewed as a kind of not-for-profit financial inclusion.

The development of the Internet and other information technology is injecting new vitality into the mutual insurance business. Mutual insurance is in line with the Internet philosophy of openness and sharing. The Internet has greatly shortened the distance between people and can reduce transaction and trust costs, improve management and governance efficiency, and gather people with the same insurance needs to provide more convenient conditions for the development of mutual insurance.

The China Insurance Regulatory Commission (CIRC) approved the establishment of the first domestic mutual life insurance organization, Trust Mutual Life, on June 22, 2016. Co-founded by nine institutions including Ant Financial Services Group, Trust Mutual Life specializes in developing pension, health insurance, and other long-term protection products instead of high price insurance products, aiming to provide convenient, affordable, and inclusive insurance services for people whose insurance needs are not well satisfied. This further reflects the sharing and public-welfare nature of finance. In accordance with the requirements of CIRC, Trust Mutual Life is actively establishing a "technology + community" model with "mutual aid + insurance" as its core, which is the latest practical exploration of "financial inclusion" and a "shared economy."

In addition to mutual insurance, there is the Internet-based not-for-profit "mutual-aid program" which is not an insurance service but works in similar way. Existing mutual-aid programs are focused on providing support for people suffering from cancer or other major illnesses. The platform include a large number of members connected through the Internet and organizes them so that when one member gets ill or suffers from cancer or an accident, after being approved by the platform, all the members of the organization are required to provide an equal amount of money to help them. Because of its large membership base, management of member access, management and operation of the platform, implementation, authentication, and appraisal process must all be impartial and transparent.

Table 2-13 Digital Mutual Insurance Organizations in China

Company	Founding date	Operation situation	Products and business characteristics
E mutual-aid	Oct. 2014	650,000 members; 14 million yuan of funds; provided financial assistance of 5.9 million yuan for 22 people	Membership fee: 9 yuan; donation: no more than 3 yuan per person per time, at most 600,000 yuan; Design independent audit committees and independent third-party evaluation mechanisms; Information disclosure: monthly disclosure of all cases
Anti-cancer commune	June 2011	230,000 members; provided financial aid for 4 people	No membership fee is required; when a member suffers from cancer, all other members are required to donate 2-10 yuan per person for him, at most 350,000 yuan; in addition to the basic anti-cancer, major illness and death communes, college student commune and female care commune are established, etc.
Quarkers	July 2014	178,000 members; 1.65 million yuan of funds; provided financial aid for nobody so far	Membership fee: 9 yuan; donation: no more than 3 yuan per person per time, at most 300,000 yuan; In addition to major illness and accident mutual program, it has developed the mutual programs for the elderly and female students' unexpected pregnancy; Introduction of law firms and notary agencies to enhance credibility

3. Innovation of New Digital Insurance Products

The design of insurance products is limited by the cost of obtaining information on characteristics and behavior of insurance applicants and the cost of operationalizing product sales and insurance compensation. The advancement of digital technologies, such as the Internet, big data, and cloud computing have greatly enhanced the availability of information and reduced the cost of information collection, analysis, and transmission. Digitalization has been key to many active innovations in Internet-based insurance products, especially in the mobile Internet-based Chinese insurance market.

China's new digital insurance products fall into three categories. First, these products take advantage of the Internet's flexibility and dynamic interaction to distribute the risks of traditional insurance products and create small premium products. Take a diabetes insurance user for example, if their daily exercise reaches a certain level, the day's premium can be reduced. Auto insurance users only need to pay the premium for driving days. Such products remove certain "small" risk and design the "small" insurance for it. Second, digital insurance uses the Internet to break geographical restrictions, gather scattered people with the same risk, and create new insurances such as high temperature insurance, moon watching insurance, and the whole society bodyguard. Third, innovative insurance products in the Internet economy include back freight insurance for online shopping and electronic account security insurance.

4. Summary

Internet-based digital technology has not only produced innovations in the insurance industry, but has also made the entire industry more efficient, equitable, and pervasive. Big data has guided business decision-making and improved business processes ranging from pricing to risk control to claims. The application of digital technology has reduced operating costs and promoted the reform of the insurance business. From the perspective of consumers, products are more accessible thanks to digital technology, and supply and demand are more integrated, which enhances the national awareness and recognition of insurance.

With the Internet and digital technology, insurance has subtly tapped into people's economic lives, promoting the development of China's insurance industry and the practice of financial inclusion in China. With credit and payment products at the core, traditional financial inclusion emphasizes meeting the basic capital needs of low-income customers. These needs include the purchase of production and living materials, and payment needs, but traditional financial inclusion fails to provide sufficient coverage of insurance needs. Along with the development of Internet insurance, financial inclusion has achieved a higher goal—not only meeting users' most basic financial needs for fund liquidity, but also the higher-level financial needs of low-income customers for insurance.

VI. The Status Quo and Development of Digital Credit Reporting

Credit reporting is one of the most basic links in the chain of financial development; the degree of its development underpins the stable operation of the financial system and the level of financial development. A developed credit reporting system helps improve social credit consciousness, establish sound restraint and incentive mechanisms, alleviate information asymmetry, improve financing convenience, and promote credit consumption. The improvement of credit investigation systems enhances the level of development in financial inclusion. With the continuous development of credit investigation and reporting, credit files have been gradually created for groups without credit records to facilitate their access to financial services. In particular, small and micro financial institutions such as microfinance companies and P2P Internet banking platforms can accumulate financial clients by connecting them with developed credit reporting systems.

The first step in credit reporting is to prove that “you are you” and then describe “what kind of person you are” as accurately as possible. In the era of Internet, increasingly frequent online activities and Online-to-Offline (OTO) activities generate massive amounts of data. Digital credit investigation refers to the multi-dimensional analysis and accurate identification and description of credit reporting objects through artificial intelligence, cloud computing, machine learning, and other digital technologies based on big data. Compared to traditional credit investigation and reporting, the use of digital technologies

has many advantages, such as a wide range of data sources, strong capability to identify fraud, and the provision of accurate and timely credit ratings. Digital technology can promote the development of credit investigation and reporting, thereby accelerating the process of financial inclusion.

1. Market Structure of Digital Credit Investigation and Reporting

The government is in charge of China's credit investigation and reporting system, jointly driven by the market. As of the end of April 2015, the Central Bank's credit reporting system had collected the information of more than 860 million people and nearly 20.68 million enterprises and organizations. This credit investigation and reporting system comprehensively collects the information of enterprises and individuals, mainly their bank credit information, but also public information on social security, provident funds, environmental protection, tax arrears, and civil adjudication and enforcement. This information is shared with various lending institutions, such as commercial banks, rural credit cooperatives, trust companies, finance companies, auto finance companies, and microfinance companies. The information inquiry terminals of credit investigation and reporting systems are distributed throughout outlets of domestic financial institutions and the credit information service network covers the whole country. This coverage forms a credit investigation and reporting system with enterprise and individual credit reports at its core. Credit reports issued by the credit reporting center have become the "economic identity card" of domestic enterprises and individuals.

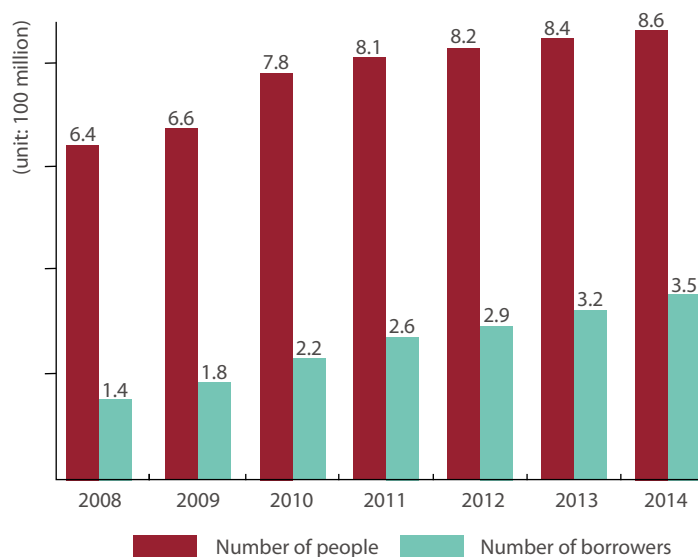


Figure 2-12 Number of People and Number of Borrowers Covered by the Personal Credit Consulting System

Source: BCG China personal credit report (2015)

Although the Credit Reporting Center of the Central Bank of China has established the world's largest credit registry, only 380 million people have credit records, accounting for 44% of people covered by the

registry system. This ratio is far lower than that of the United States (Figure 2-13) and there is still room for future growth. In addition, the data sources of the Central Bank's credit reporting system are relatively simple, including personal information, credit information, and public information. With the rapid development of the credit economy, the proportion of credit transactions keeps rising. Thus, timely and accurate credit products covering a wide range of areas are urgently needed to meet the diversified market demands that rely merely on the Central Bank's credit reporting system. In 2007, the "Several Opinions of the General Office of the State Council on the Construction of Social Credit System" was given the mandate to build a domestic social credit system. It promised to "cultivate and develop a variety of legal credit service agencies with functions complementary with each other and market credibility, and collect, process, and provide credit information according to law." In January 2015, the People's Bank of China (PBOC, the Central Bank of China) issued the "Notice on Promoting the Preparatory Work of Personal Credit Reporting" (hereinafter referred to as the Notice), which requires eight agencies, including Sesame Credit and Tencent Credit, to make preparations for personal credit rating business. This marked the beginning of domestic credit reporting marketization and brought new opportunities for domestic credit investigation and reporting. The government's guidance and encouragement together with the Internet create favorable conditions for in-depth application of digital technology in credit investigation and reporting.

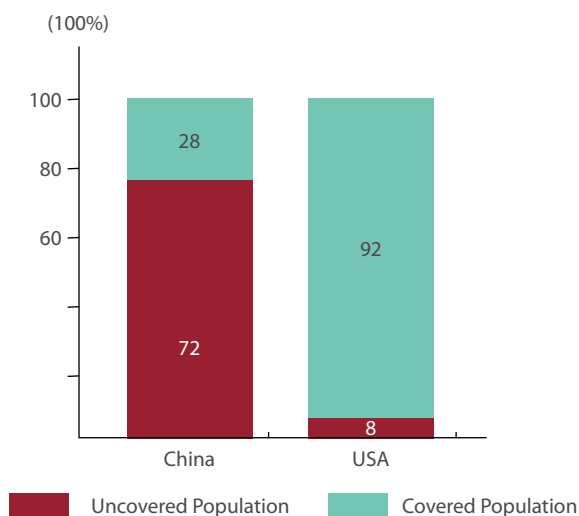


Figure 2-13 Comparison of Population Covered by the Credit Reporting Systems in China and the United States

China uses a business credit registry system and personal credit reporting audit system. So far, there are a total of 136 credit reporting agencies in China, of which 6 are engaged in personal credit investigation and reporting, 106 specialize in business credit investigation and reporting, and 24 are engaged in both personal and business credit reporting. According to their official websites, a total of 79 credit rating agencies use digital technology in their business operations. Thirty-five of these are located

in Beijing and Shanghai (Figure 2-14), accounting for 60.8% of the total. Beijing and Shanghai are the financial centers of China with high levels of financial development. These hubs have a high threshold requirement for credit investigation and reporting, which is regarded as a basic financial service and has led to the establishment of many credit information service agencies. The presence of talent and human capital in Beijing and Shanghai is the main reason for the prosperity of digital credit rating businesses. In contrast, Tencent Credit is located in Shenzhen rather than Beijing or Shanghai because it has a unique personal social business background and can provide unique personal social contact data. The development level of financial services, regional human resources, and industry background determines a regional credit rating industry's growth.

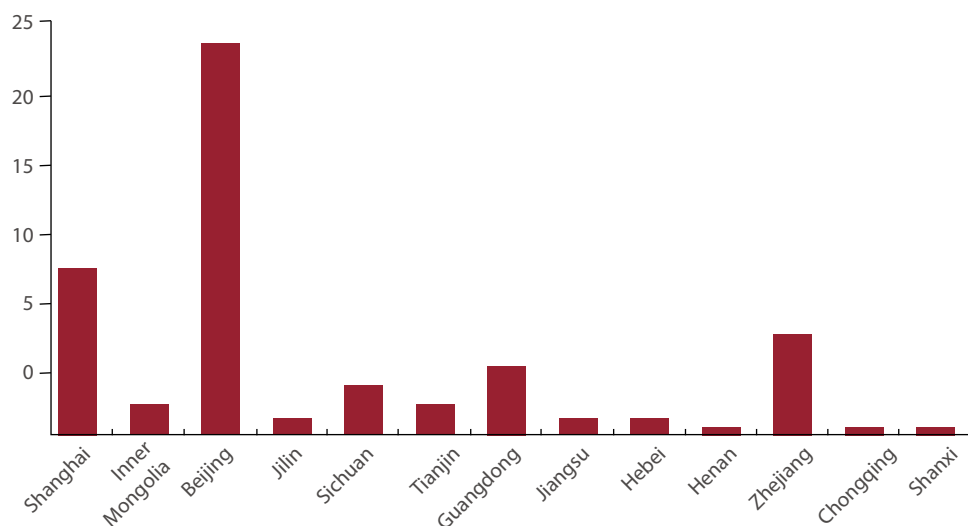


Figure 2-14 Regional Distribution of Credit Reporting Agencies with Digital Technology

In terms of the number of agencies, the digital credit reporting industry has begun to take shape, but not yet matured. The credit reporting system is still imperfect and immature, far from meeting market demand. In the personal credit reporting market, according to incomplete statistics, only Sesame Credit and Koala Credit can issue more than 100 million personal credit reports. Most credit rating agencies have not grown into well-known brands yet. Only Sesame Credit has a well-known and widely used personal credit score, Sesame Score. In the developed personal credit market of the United States, however, there are three well-known credit rating agencies: Experian, Equifax, and TransUnion. In the corporate credit market, however, there are no credit rating agencies as well-known as Sesame Credit because small- and microenterprises have not been deeply involved in Internet finance in China yet. By contrast, in the United States' business credit market, there are world-famous capital market credit rating agencies such as Standard & Poor's, Moody's, and Fitch Group, and well-known business credit evaluation agencies such as Dun & Bradstreet. With the involvement of more small- and microenterprises in Internet transactions, online trading, services, online lending, and equity crowdfunding, there is more and more

multidimensional data available, which will promote the development of a domestic business credit reporting market.

With a variety of business models in the credit market, the competition between business models is actually competition between data acquisition and data analysis ability, mainly the former. Whoever can obtain a wide range of multi-dimensional data from a large number of people can gain a competitive advantage. Additionally, data processing and analysis capabilities are important factors that affect competitiveness. In the context of big data, data processing and analysis capabilities have a higher threshold for entry, requiring greater levels of talent and technology. Therefore, the main difference between business models lies in the differences of data acquisition and analysis processing. EnfoDesk divides personal credit reporting agencies into three categories: traditional personal credit rating agencies, Internet personal credit rating agencies, and third-party data service providers. Traditional personal credit rating agencies include Intellicredit, China Chengxin Credit, and Pengyuan Credit, which obtain relevant data from external traditional financial agencies and P2P Internet financial platforms. They use their credit rating models accumulated in previous years to form a credit product system; these credit evaluation products mainly serve financial institutions. Internet credit rating agencies include Sesame Credit, Tencent Credit, Qianhai Credit, Koala Credit, and Sinoway Credit. Relying on external supplemental data and data from their own industries, such as e-commerce and financial data from Sesame Credit and social contact data from Tencent Credit, they have multi-dimensional data that allows for applicability of their credit products in a wide range of fields. The Sesame Credit Score, for example, provides credit services for its users and businesses in several contexts that include providing credit cards, consumer finance, financial leasing, mortgage loans, booking a hotel, house renting, car rentals, dating services, classified information, student services, and public services. Allwin Credit, 91 Credit, and Juxinli belong to third-party service providers, which mainly obtain data from external sources and do not have credit reporting products or issue any credit reports. Such credit rating agencies mainly serve financial agencies who have mature risk control models and only need external data providers to offer data verification services.

In the corporate credit reporting market, some credit rating agencies obtain data from their own industrial databases to create credit files for SMEs and give them a credit rating. For example, the main data source of Alibaba's corporate credit system is the data from 300 million transactions on its e-business platform, which are used to serve more than 10 million micro-, small-, and medium-sized enterprises (MSMEs). Many corporate credit rating agencies use traditional credit reporting models and obtain their data from external sources or their partners to conduct a credit rating. Some only collect data and provide data inquiry and verification services, but do not give a credit rating. Most corporate credit rating agencies have developed risk management, management consulting, and other value-added services to enhance profitability.

2. Application of Digital Technology in the Credit Reporting Process

As big data-based digital technology has become more relevant, more and more enterprises have begun using it for credit reporting. In the personal credit rating business, big data technology, artificial

intelligence, biological recognition, and machine learning technology are applied to varying degrees. For corporate credit rating, most credit rating agencies only use big data technology. The difference in the application of digital technology in personal and corporate credit rating business is a result of the difference of the data used.

According to the official websites of 136 credit rating agencies, we found that 79 such agencies have begun to use big data, artificial intelligence, and other digital technologies for credit investigation and rating; 2 do not use digital technology; and 56 do not have official websites, but that does not mean they do not use these technologies. It indicates that at least 58% of the credit rating agencies examined are optimistic about the advantages of digital technology. Among the 136 credit rating agencies, 30 have a personal credit business, including 2 without clear information and 28 that use digital technology for credit rating. All corporate credit rating agencies examined, excluding those without official websites, use digital technology.

As for the kind of technology used, we carried out the same frequency analysis on the technical terms used on official websites. We found the word “big data” occurs most frequently, indicating that most credit rating agencies use big data technology. We find this is because structured data-based credit reporting is the main business model of the Central Bank’s credit rating system, which is mature and scaled. Social credit rating agencies mainly use non-structural big data credit rating as an important supplement to the Central Bank’s credit system. In addition to the term “big data,” the terms “cloud computing,” “machine learning,” and “people” also occur frequently in eight personal credit rating agencies approved by the government in 2015. This indicates that these agencies are using advanced technologies for credit investigation and rating. This is because these agencies usually have access to industrial data, which includes e-commerce, offline life, online social activity, and online lending data. Additionally, the above data are complex and require advanced digital technology to analyze in order to draw a holistic and accurate “portrait.”

Almost all of the 51 credit rating agencies using digital technology use only big data and cloud computing technology rather than more advanced digital technologies such as machine learning. This might be because credit rating end-users are enterprises, Internet data are inadequate, and the data width and dimension are not as complex as that of personal data. It can be seen from the above analysis that the kind of technology used for credit rating is determined by the credit rating end-users—enterprises or individuals, and the data’s characteristics and degree of complexity.

3. Characteristics of Digital Credit Reporting

Credit investigation and reporting is a process of data acquisition, data processing and analysis, the formation of credit products, and their application in finance, consumption and business operations. Clarifying the characteristics of digital credit rating and their links in the abovementioned process helps us to understand its development. In this section, we mainly analyze data sources, credit products, and

application opportunities. The application of digital technology in data processing has been discussed in the preceding text in detail.

a) Extensive and Multidimensional Source of Data

Traditional personal credit data come mainly from basic personal information, loan information by traditional financial institutions, and public information. However, in credit rating that uses digital technology, Internet data, which are massive and cover a large number of people, has become an important source of data. According to the “Statistical Survey Report on the Internet Development in China” issued by the China Internet Network Information Center (CNNIC), as of June 2016, there were a total of 710 million Internet users in China with an Internet penetration rate that reached 51.7% (Figure 2-15). Internet data are multi-dimensional, covering e-commerce and Internet banking transaction data, search and other browsing data, micro-blog data, and instant messaging data. Online shopping, online takeaway, travel booking, and Internet finance have developed well after reaching scale (table 2-14). According to the latest data of Tencent, the number of monthly active users of QQ, an instant messaging service, has reached 823 million, and the number of daily active users of WeChat, a similar service, is up to 570 million. Among the eight personal credit rating agencies approved by the government, Sesame Credit and Tencent Credit’s main source of data are Internet generated data, supplemented by traditional structured data, which are used to provide a holistic “portrait” of the clients. The other six agencies seldom use Internet data. In the corporate credit rating business, among the 69 digital enterprise credit rating agencies, 47 disclosed their data sources, of which 21 used Internet data—mainly online loans and e-business data.

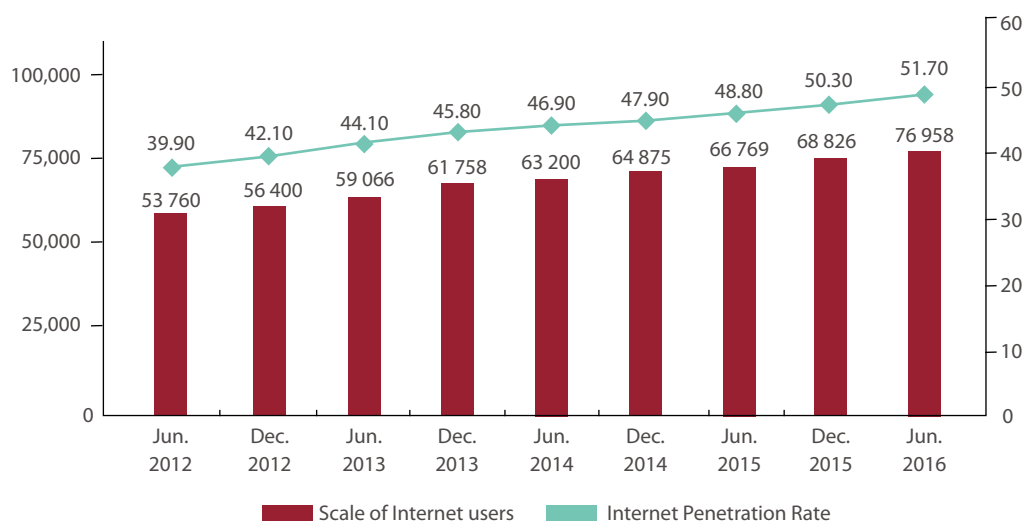


Figure 2-15 Scale of Internet Users and Internet Penetration Rate in China

Table 2-14 Usage of Internet APPs of Chinese Internet Users from December 2015 to June 2016

APPs	Internet APPs		Mobile Internet APPs	
	Users (ten thousand)	Usage rate of Internet users	Users (ten thousand)	Usage rate of Internet users
Instant Message	64177	90.4%	60346	91.9%
Search engines	59258	83.5%	52409	79.8%
Online payment	45476	64.1%	42445	64.7%
Online shopping	44772	63.1%	40070	61.0%
Online bank	34057	48.0%	30459	46.4%
Travel booking	26361	37.1%	23226	35.4%
Online takeaway	14966	21.1%	14627	22.3%
Online stocks or funds	6143	8.7%	4815	7.3%

b) Increasingly Diverse Credit Products

Credit rating agencies mainly provide anti-fraud and credit evaluation products. Some credit rating agencies also provide credit intermediate products (e.g., credit standardization data) and data inspection services, such as 91 Credit. A large number of corporate credit rating agencies also provide value-added services, such as credit risk management, management consulting, and business account management services. The extent to which products are offered vary greatly. Some credit rating agencies provide a comprehensive range of credit products, such as Pengyuan Credit, and some provide a single credit product, such as those that only provide credit reports; some provide credit products with broad uses and some provide credit products for certain industries. For example, Tianchuan Credit specializes in offering financial credit ratings for rural supply chains.

c) Increasingly Diverse Application Opportunities

Personal credit products are useful in almost all aspects of personal finance and life. Personal finance includes consumer credit, personal micro-credit (P2P lending and online lending), and insurance, such as the well-known Ant Borrowing and Ant Check Later. General applications cover all aspects of daily life; these products can be relevant in contexts of travel, hotel, marriage, dating, employment, house mortgages, and car rentals. Corporate credit products are applied to many fields, such as lending for financial institutions, investment, supply chain finance, consulting, procurement, bid and tender, market access, and trade.

4. Development Trend of Digital Credit Reporting

a) Continuous Application of Digital Technology

With increased Internet penetration, the probability of fraud also increases. Addressing this risk may

require the application of biometric technology, artificial intelligence, and other advanced technology for anti-fraud activities. Additionally, Internet activities will generate enormous amounts of multi-dimensional, unstructured data—the main source of data for credit rating, which requires machine learning and other digital technologies. Digital technology is an essential tool to collect and analyze a wide range of multi-dimensional and real-time credit data in order to provide clients with high-quality credit products.

b) Sharing Mechanisms Need to be Established

Credit agencies must obtain sufficiently comprehensive information and have strong capabilities to apply digital technology in order to accurately determine their clients' credit status. All credit agencies should promote data sharing and cooperation to remain competitive. Regulators of the credit industry should actively guide enterprises to establish sharing mechanisms and avoid conservative, low-level competition in order to improve the overall development of the credit industry and boost economic development.

Case

Sesame Credit—A Pioneer of Digital Financial Inclusion in the Field of Credit Investigation and Rating

In 2015, Sesame Credit provided inquiry services for more than 300 million people and conducted credit evaluations for 30 million people without traditional credit records. Within one year, its inclusive financial value, which relied on advanced technologies, was evident and has become a supplement to the traditional credit rating system.

Based on traditional data and Internet-based big data, Sesame Credit carries out anti-fraud activities by means of biometric technology to create a comprehensive credit portrait using an artificial intelligence algorithm. This has resulted in the Sesame Score—a credit product that connects with various services so that everyone can share the value of credit.

Five data sources of Sesame Credit include online shopping, financial, public security (including the population census register from the Ministry of Public Security and list of delinquents released by the Supreme People's Court), public service (including academic degrees released by the Ministry of Education, business registration, and social insurance information), and Sesame Credit's partners' data. Currently, more than 90% of data comes from sources other than Alibaba.

Recently, Sesame Credit's data scientist team used an improved GBDT (Gradient Boosting Decision Tree) to find the associations between data points to predict strong credit. Additionally, Sesame Credit used a logistic regression linear algorithm to examine various characteristics represented by the data and how they relate to obtain an interpretable and accurate linear prediction model. A person's consumer behavior towards certain products, for example, might reflect their stability and sense of family responsibility, but this alone does not necessarily relate to their credit. However, if this is combined with data that indicates that the consumer often takes part in various charity activities, then the combination of those two characteristics may show a strong positive correlation with the consumer's personal credit.

In other words, the cross analysis between weak variables helps improve the credit predictability of the model.

With authorization from users, Sesame Credit carries out comprehensive processing and assessment of various dimensions of data and gives an objective personal Sesame Score (ranging from 350-950). Five dimensions are examined, which include a users' credit history, behavior preference, contractual capacity, identity peculiarities, and interpersonal connections. Continuous data tracking shows that the higher the score, the better the credit and the lower the default rate. A high Sesame Score can help users access more efficient and better financial services.

Sesame Credit is mainly used in financial and credit services, and some anti-fraud and credit decision-making situations that rely on ID authentication in everyday life. These situations that require credit might include booking a hotel, renting a house, purchasing a travel package, dating services, and obtaining a visa. A high Sesame Credit Score can help users get more efficient and better services. In the future, Sesame will explore other uses according to market demand and provide more convenient services for people with good credit.

5. Summary

Digital credit reporting agencies use many big data-based tools, such as cloud computing, artificial intelligence, machine learning technology, and other digital technologies to carry out multi-dimensional analysis to accurately conduct credit investigations. Compared to the traditional method of carrying out a credit investigation, taking a digital approach can craft a holistic portrait of the object of investigation and cover a larger client base. Although China's regulatory authorities are cautious about issuing business licenses for personal credit rating, the digital credit reporting market still has unique advantages, including the ability to promote digital financial inclusion and expand coverage of credit products.

PART THREE

Social and Economic Value of Digital Financial Inclusion

I. Digital Financial Inclusion Provides Social and Economic Value by Improving Equity and Efficiency

Economics pursues the balance between efficiency and fairness of the allocation of resources. Promoting social fairness is a key aspect of financial inclusion in addition to the social and economic value of improving efficiency.

Efficiency in the sense of economics refers to better allocation of resources, usually described as a Pareto improvement. It can be inferred therefrom that financial efficiency refers to the allocation of financial resources. As finance is the blood flowing through the veins of the economy, financial efficiency largely determines the operational efficiency of an economy.

Efficiency in digital financial inclusion can be divided into micro-organizational, meso-economic industrial, and macro-economic and social efficiency.

Micro-organizational efficiency refers to the efficiency improvement of inclusive financial institutions brought about by the application of digital technologies that improve the quality of products and services and reduce costs.

Mesoeconomic efficiency refers to the positive impact of digital technology's application in the financial industry.

Macro-economic and social efficiency refers to the better allocation of social financial resources, from the perspective of society, that occurs as a result of the development of digital financial inclusion.

II. Microeconomic Efficiency: The Improvement and Expansion of Financial Products and Cost Reduction.

1. Digital Technology Enriches the Financial Inclusion Product System

The development of digital technologies, especially big data, cloud computing, and mobile Internet technology has significantly improved the service capabilities of financial enterprises. First of all, through relying on massive user data combined with local characteristics, industrial features, and users' characteristics, digital technologies have gradually tapped users' needs and enriched the contents of financial products and services. Additionally, by using mobile Internet technology, digital technologies provide users with round-the-clock services and ubiquitous, convenient financial services. Finally, the maturity and application of digital technology improves the stability and security of financial services. Technologies such as cloud computing, fingerprint identification, face identification, and speech recognition may ensure the fund and information security of clients when they use financial products. These changes are particularly prominent in the fields of payment, wealth management, credit, insurance, and credit score reporting.

a) Payment Service

After the “Regulatory Measures on the Payment Services of Non-Financial Institutions” (People’s Bank of China Order [2010] No. 2) was issued in 2010, non-bank payment services have witnessed rapid development and effectively expanded opportunities to apply non-cash payment uses, especially for people exchanging small amounts. This effectively complements services of traditional financial institutions by addressing the difficulty of the “last kilometer” of financial delivery. The traditional financial industry represented by China UnionPay and commercial banks have innovated in order to remain competitive and serve the needs of the market.

b) Wealth Management

With the rapid development of digital technology, the cost of delivery and management has greatly reduced, which means that wealth management is no longer exclusive to high net worth (HNW) customers. Ordinary people can now also enjoy convenient and high-quality wealth management services as long-tail customers.

c) Credit Business

Digital technology has both enhanced the delivery capability of credit businesses and improved the capability for risk identification. Traditional and emerging Internet financial institutions are making continuous innovations to their products and services in order to provide a variety of enterprises and individuals with suitable credit services.

d) Insurance Business

The application of digital technology can significantly reduce operating costs for the insurance industry, promote the innovation of insurance products, and enable ordinary people to enjoy higher-level financial services such as insurance protection.

E) Credit Reporting Services

Digitalized credit investigations can provide a more comprehensive portrait of the credit evaluation subject and cover more users and clients. As a result, this innovation greatly enhances the financial accessibility of credit by making it easier to retrieve a credit score, particularly for small- and microenterprises.

2. Digital Financial Inclusion Reduces Transaction Costs

Digital financial inclusion provides Internet-based services that greatly reduce transaction costs, thereby improving the efficiency of financial services. It is estimated that the operating cost of a standard physical outlet is close to 2 million yuan per year; if Internet-based technology is used, the cost is significantly lower. With the development of mobile Internet, the marginal cost of expanding Internet financial services is close to zero.

a) Reduce Transaction Costs and Risks to Reduce Explicit Economic Costs

By using the Internet's systematic monitoring technology to analyze the behavioral characteristics reflected within customer data, financial institutions can improve their risk management capacity and reduce losses due to fraud, leakage, and the cost of supervision and risk control.

According to a survey conducted by the Global Partnership for Financial Inclusion (GPFI), the Mexican government can reduce costs by US\$1.3 billion per year by distributing wages and subsidy payments electronically. A McKinsey study on India noted that a similar program run by the Indian government could reduce costs by about US\$22.4 billion per year.

According to an estimate by the Boston Consulting Group (BCG), Internet and mobile payment services provided by non-bank payment agencies can reduce transaction costs by more than one trillion yuan from 2011 to 2020 (Figure 3-1).

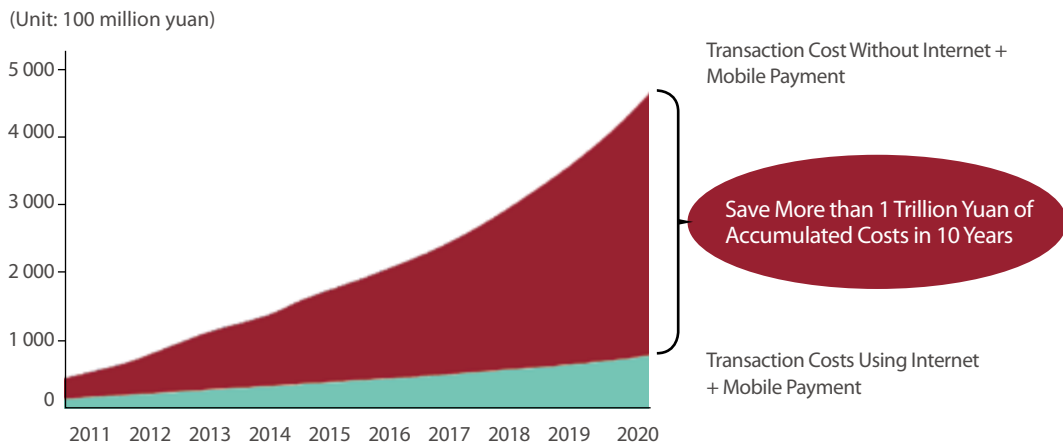


Figure 3-1 Transaction Costs Reduced Through Use of Internet and Mobile Payment Services Provided by Non-bank Payment Agencies

(Source: BCG)

b) Promote Information Sharing and Reduce Costs that Result from Information Asymmetry

Due to its convenience, the Internet has collected a vast amount of information on users and relevant products and companies, which greatly reduces the cost of obtaining information necessary for financial transactions. Customer data also provides insight into the dynamics of consumer behaviors, which are observed using big data technology; can result in targeted marketing; and significantly reduces costs of loan monitoring and risk management.

The Internet has also broadened the consumer's vision. Online search capabilities facilitate screening and comparison of financial businesses, which reduces time and energy costs in the process of consumption.

3. Lowering the Financial Threshold and Expanding the Service Scope of Financial Inclusion

Digital technology helps remove some of the barriers to entry to access financial services and promotes financial inclusion by expanding coverage.

a) Help Solve SMEs' Difficulty in Funding

Small- and medium-sized enterprises (SMEs) account for more than 98% of total enterprises in China, but they have continuously struggled to access financial services. Using a big data risk control model, digital technology has automated management of loan financing and reduced costs, which addresses traditional financial institutions' pain points when issuing loans to small- and microenterprises.

Supply chain finance (SCF) is a specialized field within commercial banks' credit business (at the bank level) and a financing channel of enterprises (enterprise level), especially for SMEs. Specifically, banks provide financing, clearing, and wealth management services for their clients (core enterprises). Additionally, they provide clients' suppliers with the convenience of timely delivery of loans or provide their distributors (core enterprises) with advance payment and inventory financing services. In short, it is a financing model that allows the bank to connect core enterprises with upstream and downstream enterprises to provide flexible financial products and services.

Supply chain finance within domestic commercial banks has witnessed rapid development in recent years. At the same time, banks are exploring new financial services structures that are characterized by the organic integration of big data with information flow, capital flow, and logistics. Banks serve as the platform and matchmaker, which has helped to effectively solve the financing difficulty of SMEs and extend the depth of bank services to achieve a win-win result.

b) Expand the Boundary of Financial Services and Promote the Development of Rural Finance

Rural finance has been a weak aspect of China's financial system. Traditional rural financial services are mainly based at physical outlets of financial institutions and provided by rural credit cooperatives. Development of other financial institutions in rural areas is not sufficient to meet rural consumers' needs. However, in recent years e-commerce has developed rapidly in these areas as well. Digital technology infrastructure and data available from e-commerce platforms provide favorable conditions for the development of digital financial inclusion in the countryside.

Since 2012, the Central Bank of China has gradually launched mobile payment pilot projects in rural areas of 20 provinces. In 2013, it established a safe and credible service platform for mobile finance, which provided important infrastructural support for financial inclusion in rural areas that depend on mobile terminals.

According to Alipay data in 2013, Yushu Tibetan Autonomous Prefecture of Qinghai, Ali District of

Tibet, and the Huangnan Tibetan Autonomous Prefecture of Qinghai—which could hardly enjoy the services of traditional financial institutions in the past—had the highest proportion of wireless payments.

Since 2015, MYbank has successively launched a pilot project of pure credit loan, “Wangnong Loan,” for rural residents in 65 counties of 17 provinces, including Hebei, Shandong, Heilongjiang, Yunnan, and Gansu. This injected fresh impetus into the financial services sector for sales of agricultural supplies and farm apparatuses in the countryside, and the sales of agricultural products nationwide. Before that, in cooperation with Alipay and third-party agricultural insurance companies, MYbank launched the first domestic Internet weather index insurance, wind index insurance, and provided timely compensation for the loss of crops due to the impact of the typhoon “cuckoo.” This became the first batch of Internet insurance products that paid out compensation since new regulations of Internet insurance came into effect on October 1, 2015.

III. Meso-efficiency: Digital Financial Inclusion Promotes the Development of the Financial Industry

1. Promoting the Transformation and Advancement of Traditional Financial Institutions

The rise of emerging IT-driven Internet financial institutions has promoted the transformation and advancement of traditional financial institutions. After the wealth management product Yu’e Bao (an investment product issued by the Alipay) and other Internet financial products appeared, they were quickly used by the general public due to their convenience, flexibility, low threshold, and relatively high returns. As a result, capital flows out of traditional financial institutions such as banks, reduced demand deposits—a major challenge for the profit pattern of traditional financial institutions. Coupled with external factors such as a money shortage in 2013, it was said that “the cold winter of the banking industry is coming.” In this context, traditional financial institutions needed to strengthen business innovation, improve service equipment and business systems through digital technology, launch diversified, flexible financial products, clarify the delivery of business information, build an effective client communication service, and create more intelligent and user-friendly services.

The development of digital technology also created new space for the growth of traditional financial institutions. In terms of the development path of the banking industry, almost all innovative efforts are based on the use of digital technology. In particular, with the popularization of Internet technology, traditional financial institutions have carried out large-scale updates and transformations of their core business processes. The implementation of new tools such as the credit card, and Internet and mobile banking has transformed how accounts are settled. For example, cash and check clearing have become paperless. Additionally, IT-based automatic credit extension systems, customer information systems, and

other risk management and decision-making systems are gradually replacing traditional risk management methods. The application of these technologies in the financial sector has enabled financial institutions to establish intelligent business outlets and provide users with diversified products and services more quickly and efficiently, and with stronger risk control capability.

Table 3-1 Information Technology's Support for Innovations in the Banking Industry

Time	Innovative Business	Core Technology Applied
1950s	Credit card	Magnetic stripe
1960s	Back-stage automation system	Telephone
1969	Automatic Teller Machine (ATM)	Electromechanical integration technology
1970s	Point of Sale (POS), Society for Worldwide Interbank Financial Telecommunication (SWIFT) system	Computer technology
1980s	Family bank, customer online service systems	Computer technology
1990s	Online bank	Internet
Early Twenty-first Century	Mobile banking, digital banking	Internet, mobile communication technology, etc.
Since 2010	Digital money, supply chain finance, etc.	Internet technology, block chain technology

Source: Based on information drawn from the Internet

2. Changing Financial Business Patterns and Promoting the Disintermediation of Financial Transactions

The application and development of digital technology in the financial sector lowered the threshold for participation and enabled Internet companies with advanced technology to enter the financial sector, thereby changing the competitive nature of the market. Through various digital asset trading platforms, both parties in a transaction can directly gather funds and match projects at a low cost, accelerating the process of financial disintermediation.

a) The Impact of the Platform Effect on the Traditional Financial Industry

Information plays an important role in the financial market: the Internet platform gathers massive amounts of information, achieving an organic convergence between supply and demand for information. Under the traditional financial model, there is significant information asymmetry between the financial institution and borrowers. To address this issue, financial institutions have established effective links between suppliers and demanders of capital. However, those demanding are often only passive receivers of financial services, including limited product categories, that can hardly meet clients' diversified financial needs.

With the development of digital technology, the situation has greatly improved. The popularity and

application of digital technology in the financial sector has built a natural platform economy. Specifically, digital technology can be used for building a digital financial platform where users can pool resources. As a result, such a platform can serve as an effective link between user data and financial resources, thereby constructing a transparent, efficient, and convenient financial intermediation channel.

b) The Long-tail Effect and the Disintermediation of Financial Transactions

From the perspective of customers, digital financial inclusion mainly serves micro-, small-, and medium-sized enterprises, the general public, and vulnerable groups. Because these groups make up the vast majority of the market by number, digital financial services reflect a long-tail effect.

These groups are characterized as numerous but with a relatively small amount of discretionary funds and a lack of financial knowledge. They usually also have a low degree of social security and at best may only have access to an imperfect credit reporting system. However, this large group of “small” clients can add up to “big” business, which cannot be ignored. Furthermore, the financial needs of these people are increasingly diversified with the development of the economy and rural areas in China. Traditional financial institutions provide few financial services for such groups and insufficiently meet their increasingly diversified financial needs. Digital financial inclusion is gradually filling the financial services gap for ignored markets, and has provided them with comprehensive financial services such as wealth management, loan, credit score reporting, and insurance, inter alia.

IV. Macro-efficiency: Digital Financial Inclusion Promotes Financial Reform

Currently, digital financial inclusion is mainly embodied by payment, wealth management, credit, and insurance services. These businesses provide a large number of quasi-currency financial products for the financial market. Thanks to the large number of clients and the convenience of digital technology, these products are highly liquid, which speeds up currency circulation in the market. This also affects the deposit and loan interest rate structure of traditional financial institutions, and accelerates the process of interest rate marketization. Furthermore, the growth of digital technology and the increase in internet users have boosted the development of Internet payment services. More and more users have become Internet payment customers, laying the technical foundation and user base for the development of digital money.

1. Accelerating the Marketization of Interest Rates

The marketization of interest rates is an important precondition for promoting the market-oriented allocation of financial resources and is an important part of China’s economic system reform. In 2013, the Central Bank of China announced the liberalization of loan interest rate control, marking the move to market-determined loan interest rates. The marketization of loan interest rates was a small yet key step rather than a substantive one. The marketization of deposit interest rates also needs to be implemented

in order to break the banking monopoly on interest rates. The Central Bank of China relaxed its control over the deposit interest rate ceiling in 2015, and it is undeniable that digital financial inclusion played an important role in this process.

Relying on digital means, digital financial inclusion builds a connection between the monetary fund market and the Internet, and eliminates information asymmetry through the platform effect. Additionally, it opens up information and capital channels between those who supply and demand funds, and between different markets, which obscures the physical boundaries of the financial industry. As a result, users can utilize their fragmented capital flexibly and choose to invest in the money market fund.

In addition, digital financial inclusion is also endowed with payment functions, thereby handling and affecting currency. Therefore, the emergence and development of digital financial inclusion has significantly diverted the deposit business of traditional financial institutions. Although the policy of abolishing the deposit interest rate ceiling issued by the Central Bank of China last year will help the banking industry take measures to alleviate the impact of Internet finance to some extent, the policy promotes competition among financial institutions in the wealth management market in the long run. In response, banking institutions will certainly launch appropriate wealth management businesses and boost their innovation of digitalized products and services, thereby promoting the development of digital financial inclusion.

2. Promoting the Development of Digital Money

The ties between the world's major economies have been increasingly close since the 1980s; the trend of economic globalization is prominent as the global financial market has overcome geographic constraints. With the development of information technology, electronic money appeared to meet the demands of long-distance financial transactions where paper money was insufficient. In the current payment field, people's payment methods are increasingly showing evidence of digitalization, and digital money has become a necessary payment and investment method. Relevant data show that the replacement rate of traditional financial services with e-banking in China reached 79% in 2013.

In the past two years, China has launched a development plan focused on the use and adoption of digital money. Relying on block chain technology, digital money will gradually replace paper money at a lower cost, higher rate of efficiency, and greater convenience in the future.

Conclusion

In recent years, the international community has gradually recognized that financial inclusion has made a significant contribution to supporting economic growth, promoting employment, alleviating poverty, and achieving social equity. As a hotspot of financial innovation in recent years, digital finance embodies the continuous integration of finance and technology, and exemplifies the recent digitalization and mobility of traditional and emerging Internet finance. Digital finance is characterized by sharing, convenience, low costs, and low barriers to entry, and promotes financial inclusion.

China's economy has transformed over the past five years from a demographic-dividend and investment-driven economic growth model to a new economy driven by innovation and consumption. Digital finance that focuses on inclusion powerfully supports the normalization of this new economy. With the development of digital finance, services have consistently improved and the financial needs of consumers, and micro-, small-, and medium-sized enterprises have gradually been met. Consumers have access to a safe, convenient, and efficient payment experience, enjoy reliable wealth management services with low access thresholds, and personal credit rating systems have gradually improved. Additionally, small- and microenterprises have access to convenient and low-cost financing channels, and flexible and diversified financial solutions.

However, innovation is often accompanied by risks. Further discussion is required to debate the role of government supervision, industry self-regulation, market organizations, and research institutions to continuously explore the application of digital technology. These institutions must balance the push for innovation with ensuring stable financial markets and protecting the rights and interests of consumers. Their aim should be to equilibrate inclusion, security, and sound development.

The wave of digital financial inclusion is advancing. It not only satisfies current economic development needs, but there is an important growing momentum is growing to promote reform of the supply side in China.

