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How Smart Contracts Reduce the Cost of Financing in Small and Medium-Sized Enterprises in China

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Abstract:

Smart contract is a type of contract that exercised automatically if requirements are met in trades, the data on chains is available at all time and no edit or central authority intervene is allowed. In China, SMEs often face high requirement of lending from bank, information asymmetry and region difference when financing. In this research, it is proved that smart contracts reduce SME financing cost via lowering human labour and spend time, which is one of reasons that smart contracts and blockchain are welcomed in SMEs. The government should set related regulations on smart contracts and technical designers need to improve systems in the future so that more SMEs could get benefits during financing programs.

Keywords: Smart contracts, Blockchain, SME Financing

1. Introduction

Smart contract, which refers to self-executing contract on blockchains. It can automate and authenticate processes in a supply chain or in an exchange of goods or services. Smart contract is mainly associated with cybercurrencies and believed as a fundamental building block for decentralized finance and non-fungible token applications. It has features: Automation, Immutability and Transparency.

Automation

The automation of smart contract is reflected in its self-executing program that automatically carry out the terms of an agreement when specific, pre-determined conditions are met without needing a central authority or legal system. This process leads to faster execution, increased efficiency, and reduced potential for human error in contract fulfillment.

Immutability

Immutability is the property of an object, value or data that prevents it from being changed, deleted or modified after it is created. In smart contract, due to its deployment on blockchain, whose records of transactions in the ledger cannot be modified. Hence, changing the data on smart contracts is also impossible.

Transparency

On smart contracts, the code and all transactions are recorded on a public or permissioned blockchain, making them accessible to all relevant parties. It improves the trust between parties to verify actions and allows for easy auditing to avoid cheating in trades.

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2. Significance of smart contracts to small and medium-sized enterprises (SMEs) financing

2.1 Problems in SMEs financing

In SMEs financing, enterprises usually gain funds from typical approaches: collateral-based lending, information-based lending and viability-based financing. For most of SMEs, they may have difficulties during financing events. For example, some enterprises are lack of resources as collateral in collateral-based lending, such as lands and property. Secondly, the bank usually sets strict requirements, like high cost of application, registration fees and review standard. It reduces success rate of SMEs financing. For instance, most of banks in China prefer to grant loans to large companies due to less risk (Wonglimpiyarat, 2015). Gap of information also brings problems to SMEs financing. Information asymmetry refers to an economic situation where one party in a transaction has more or better information than the other, giving them an unfair advantage that can distort market outcomes and lead to market failures. According to Abdelhafid and Mohammed(2019), opportunistic and exploitative behaviours from some SMEs, like providing fake information, results in inappropriate allocation of loans and influence financing events of SMEs who offer real information. Additionally, most of SMEs exist high uncertainty in the future. In viability-based financing, if the bank provides funds by only relying on its current status, the funds may be mismatched to SMEs that may underperform in the future. Furthermore, traditional contracts between bank and enterprise are usually hard to be cancelled, which may result in waste of money for banks.

2.2 Role of smart contract in SMEs financing

By analysing smart contract, there are significance to be noticed. Due to features of artificial intelligence, smart contracts are applied in decentralized finance and have protected rights of traders in recent years. Deeper analysis on smart contracts can provide new understanding of AI tools in business and improve public attitude towards blockchain. Additionally, smart contracts will be run automatically if requirements are met, without legal or secondary market system. Via code detection and behaviour monitoring, it can decrease the total risk and enhance trust between corporates. Analyzing data on blockchain can understand more information of contract performance, usage patterns and overall effectiveness, which drives development of smart contract. The research will also investigate weakness of existing smart contracts and provide related strategies to improve it, which reflects better decisions for investors, governments and users.

2.3 Situation in China

In China, nearly 99% of businesses are small and medium-sized enterprises, in 2015, they made up 53.4% of total assets in China(ECOVIS, 2021), which have provided job opportunity to workers. For example, from 1998 to 2003, nearly 19 million workers were reemployed by SMEs after being fired from sate-owned enterprises. The total assets, annual business revenue and net profiles are still rising. However, SMEs in China often face challenges during financing, for instance, lack of human resource, funds and technology, intellectual property, which are believed as one of the biggest difficulties in business governance. In artificial intelligence field, Chinese government has regulated appliance of digital technology in business for 20 years. According to Godwin(2025), digital technology has been admitted in E-Commerce Law, which was passed in 2005. In 2020, The Civil Code published by 2020 required to ensure electronic data interchange and e-mail contents be capable and accessible at any time. Recently, smart contracts have applied in contract design, product design and transaction design in Chinese enterprises and official institutions. For example, digital yuan(e-CNY) issued by central bank introduced smart contracts in 2023, such as automatic payments in Meituan app (Gkritsi, 2023). However, existing legal systems such as contract law are still lack of acknowledge to smart contracts and regulations to AI contracts are developing, where needs a framework to control the risk. For SMEs, the managers usually introduce smart contracts to supply chains finance and innovations on blockchain, some of startup companies apply smart contracts to run financing, in order to avoid large loss.

3. Problem modelling on smart contracts of SMEs in China

3.1 Database and Model

The database in the research is based on a set of data about average interest rate, non-performing loan rate on official website and information of smart contracts platforms(Etherscan & Dune Analytics) and finance market(Bloomberg Terminal, S&P Capital IQ). Stochastic frontier analysis (SFA) model will be applied in the research, :

$Ci=f(Xi)+wi+vi-ui$

Ci: the financing cost(interest rate)

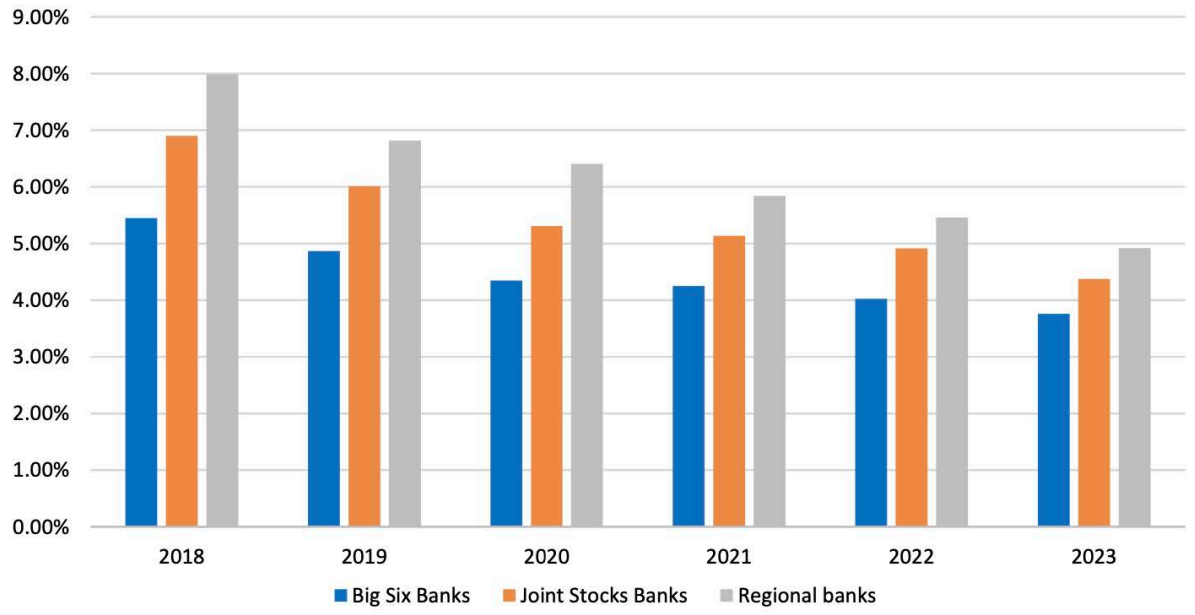
F(Xi): the reasonable cost depended by enterprise information

Wi: inefficiency rate from lender

Ui: extra cost caused by information disadvantage(borrower)

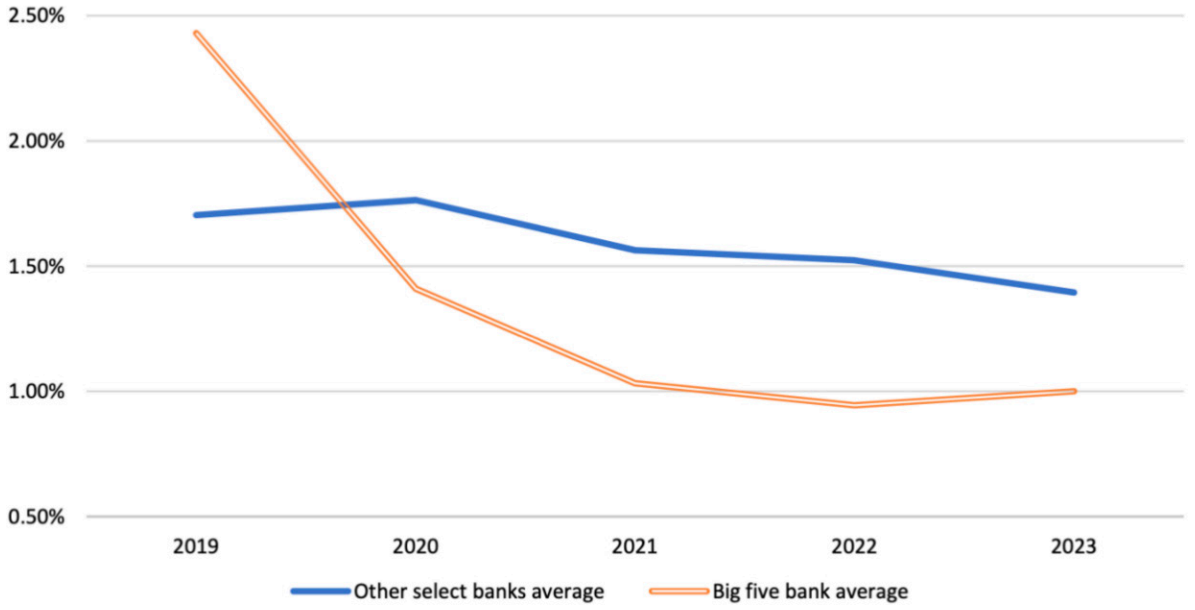
Vi: random errors

3.2 Critical data



Note: Some banks disclose SME lending rates for total SME lending, while others do so only for inclusive SME loans.
Source: Bank financial disclosures.

Figure 1 SME Lending Rates



Source: Bank financials. Note: Limited sample due to lack of SME NPL disclosures. Bank of China is excluded from the Big Six banks.

Figure 2 SME NPL Ratios

The data from NUS research shows SME lending rates in recent 7 years, no matter large banks, joint stock banks and regional banks, the lending rate for SMEs tends to drop gradually. It lowers difficulty of SME financing and increases liquidity in the market.

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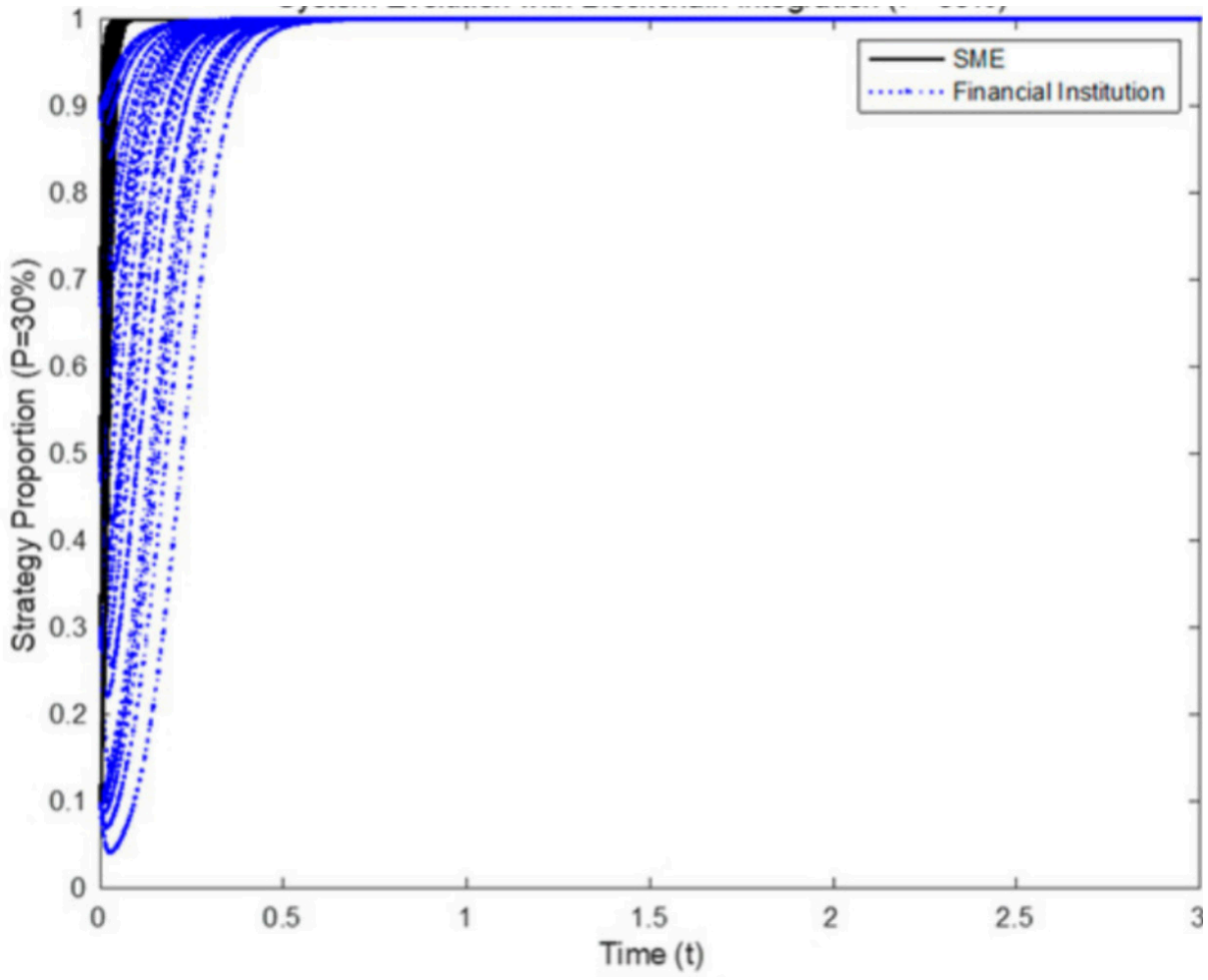

Figure 3 System Evolution with Blockchain Integration

According to research from Wang et al(2024), blockchain technology is more preferred by SMEs than financial institution. Because after applying blockchain technology in SMEs finance can solve two important problems: hard to meet finance requirements and costly expenses. In traditional finance institutions, Chinese SMEs often face challenges when applying for funds.

3.3 Results

By investigating data of traditional SME lending rates and system evolution of blockchain technology in SMEs and financial institution, it can be believed that smart contracts in blockchains assist with funding in SMEs in China. It may be chosen as initial finance option by managers in the future.

4. Recommendation to improve smart contracts

Although there is weakness still in smart contracts, the government and technique can enhance its function or regulations by applying strategies. First of all, the government should recognize that blockchain-based smart contracts have legally binding and enforceable in commercial courts to support SMEs via official ways. Besides, encouraging SMEs to participate in events that apply smart contracts, such as supply chain loans and automated invoice factoring, tax deductions and subsidize audit costs are available approaches. The government should also define standards on smart contracts. For example, standards about disclosure and publicity of data need a simple level to apply in different platforms and business events. Due to lack of awareness to blockchains in some corporates, the government needs to launch related education resources for them.

From technical perspective, the technique designer should distinguish each part's function, because not all parts in smart contract should be automated. Human intervene is also important in For example, loan covenant information like debt-to-equity ratio usually requires human audit to avoid large mistakes, while daily functions like interest payments can be fully automated. Secondly, designers should protect users privacy, such as using privacy-fo-

cused public chain layers for necessary trades of SMEs.

5.Conclusion

In conclusion, smart contracts reduce SME financing cost via decreasing NPL ratios because all related business data can be detected before financing. It reduces human labor costs. SMEs are major business type in China, although it often has challenges in financing events due to lack collaterals and funds. With the development of blockchain and smart contracts, it provides more financing opportunities for SMEs in China, which ensure security and efficiency. In the future, the government and technical designers of smart contracts platform should improve the process blockchain-based SME financing to reduce the risks which SMEs often face currently.

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