ISSN 2616-5902 Vol. 3, Issue 2: 38-43, DOI: 10.25236/AJBM.2021.030208

Research on the Financing Mode and Path Innovation of Small and Medium-sized Private Enterprises under the Background of Blockchain Finance

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Abstract: *Difficulty and expensive financing are important factors restricting the development of small and medium-sized private enterprises in my country. In the information age, new technologies represented by "Big Smart Cloud" have been integrated into all walks of life, but there are still many problems with how small and medium private enterprises use information technology to innovate financing models. This article takes my country's small and medium-sized private enterprises as an example. By summarizing the financing problems and factors of small and medium-sized private enterprises, it improves the corporate financing model from the macro, meso, micro, and realization methods respectively, and proposes an optimized path to innovate my country from a financial perspective. The financing model of small and medium private enterprises.*

Keywords: *Blockchain; small and medium-sized private enterprises; financing model; system design*

1. Introduction

Under the call of "supply-side reform" and "industrial upgrading", small and medium-sized private enterprises have strong practical significance and representativeness in my country's entire industrial chain system. The "lemon dilemma" of financing caused by opaque financial information hinders them an important factor for further expansion. In recent years of exploration, many scholars have proposed innovations in financing models and paths in the context of blockchain finance for small and medium-sized private enterprises.

Wang Dan [1] systematically analyzed the influence channels of credit policy on the credit decisions of small and medium-sized private enterprises on the basis of subdividing credit policies and credit decisions; Jin Shuying et al. [2] built a model based on blockchain accounting information generation path, To further explore the feasibility of optimizing the generation path of accounting information; Deng Honghong [3] compared the financing models of small and medium-sized private enterprises in China and developed countries, and combined with China’s national conditions to propose suitable methods for China’s small and medium-sized private enterprises to improve their financing capabilities and build a good financing model. Suggest. Lazanis[4] believes that blockchain can ensure the authenticity of accounting information and simplify the transaction process of the financial department; Mc Geer, Bonnie[5] believe that blockchain can be widely used in multiple organizations and platforms, and has broad development space and development. Potential, providing a broad application space for innovation and reform in the financial sector; Jun Dai, Miklos A. Vasarhelyi [6] compared blockchain technology with existing ERP technology, proposed a three-type accounting system, and analyzed it in the accounting industry Realize the new application mode of accounting and auditing under the blockchain.

From the above research, it can be seen that the research on blockchain is mostly focused on the construction of conceptual models, case analysis and future development prospects. However, scholars have only conducted In preliminary exploration, there are few studies that combine blockchain with the financing model of small and medium-sized private enterprises. Therefore, based on the perspective of blockchain finance, this article analyzes the financing models of small and medium-sized private enterprises in my country, in order to provide new ideas for the research of innovative small and medium-sized private enterprises' financing paths.

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2. Financing problems existing in small and medium-sized private enterprises

2.1 Single financing channels

The single financing channel is an important factor restricting the development of small and medium private enterprises in my country. At present, my country's small and medium private enterprises still use bank loans, equity bond investment and private lending as their main financing channels. As a disadvantaged group in my country, small and medium private enterprises are difficult to gain an advantage in the fierce market competition, so it is difficult in the short term. Achieve the expected goals and increase the difficulty of financing.

2.2 The financing cost is too high

The financing costs of enterprises due to financing mainly include agency fees, interest and various taxes and fees. Compared with large, small and medium-sized private enterprises, small and medium-sized private enterprises have limited scale and assets, and financial information is not transparent, so they cannot enjoy preferential loan conditions. The asset mortgage and third-party guarantee required for bank loans will incur high asset evaluation fees, notarization fees and other related expenses, which further increases the difficulty of financing for enterprises.

2.3 Incomplete guarantee system

Compared with large private enterprises, my country's small and medium-sized private enterprises cannot provide high-quality collateral due to their limited operating scale. The third-party institutions that provide guarantees for small and medium-sized enterprises are mainly funded by government departments. Due to the pressure of local finance, they cannot fully meet the financing needs of enterprises. In addition, the guarantors of small and medium-sized private enterprises often need to bear 100% of the guarantee risk, and the lack of strong supervisors in the guarantee system makes it more difficult for enterprises to obtain financing.

3. Factors of financing difficulties for small and medium-sized private enterprises

3.1 The credit standards of financial institutions are too high

As small and medium-sized private enterprises are in the growth stage of the business life cycle, not only are there many stages of investment, but also the amount of investment is large and the risk is high, making financial institutions have to raise the threshold for loans. The degree of informatization of small and medium-sized private enterprises is low, and credit problems are difficult to trace and measure. Therefore, based on the safety of funds, financial institutions pay special attention to the value of corporate collateral.

3.2 Weak government support

Small and medium-sized private enterprises in the growth stage, if they want to survive the fierce market competition, they must rely on the government's macro policy support to provide strong support for the enterprises. At present, the Chinese government has obviously insufficient support to improve the financing difficulties of small and medium-sized manufacturing enterprises. The entire SME market lacks vitality due to financing difficulties.

3.3 The company's own creditworthiness is not high

Compared with large-scale private enterprises, the lack of business scale and difficulty in tracing financial information results in low transparency of financial information of small and medium-sized private enterprises, lack of credibility, and information asymmetry, which increases the difficulty of financing, thus causing financial institutions to provide operating financial information materials to them The authenticity of it has generated great distrust.

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4. Research on innovation of financing model based on blockchain technology

4.1 Functional needs of innovative financing models

(1) Stability and freedom

A platform based on blockchain technology should have strong storage capabilities, computing capabilities, and stable transmission capabilities. On the one hand, it accepts the storage of a large amount of corporate information, and on the other hand performs calculations and verification, and uploads data to the chain at a near real-time speed.

(2) Platform security

The data on the chain cannot be viewed by a third party, and the hash value cannot be captured by a third party. At the same time, it is necessary to prevent 51% attacks and fully ensure the security of corporate financial data on the platform. Any entity with the correct hash value can verify the authenticity of the information on the chain.

(3) Efficient and easy to use

Financial data information is jointly maintained by small and micro enterprises at all nodes on the chain. When a platform based on blockchain technology fails, it will only temporarily affect the organization of new enterprises to join, and the original financial data can still be efficiently transmitted without being affected. Loss, and massive data will not affect the processing speed of the platform.

4.2 Overall design framework

Based on blockchain technology, this paper designs the following structure for the financial system of small and medium-sized private enterprises. The authenticity of financial data is ensured through blockchain technology hash encryption, smart contracts and other technologies, and then it provides strong support for financing (see Figure 1).

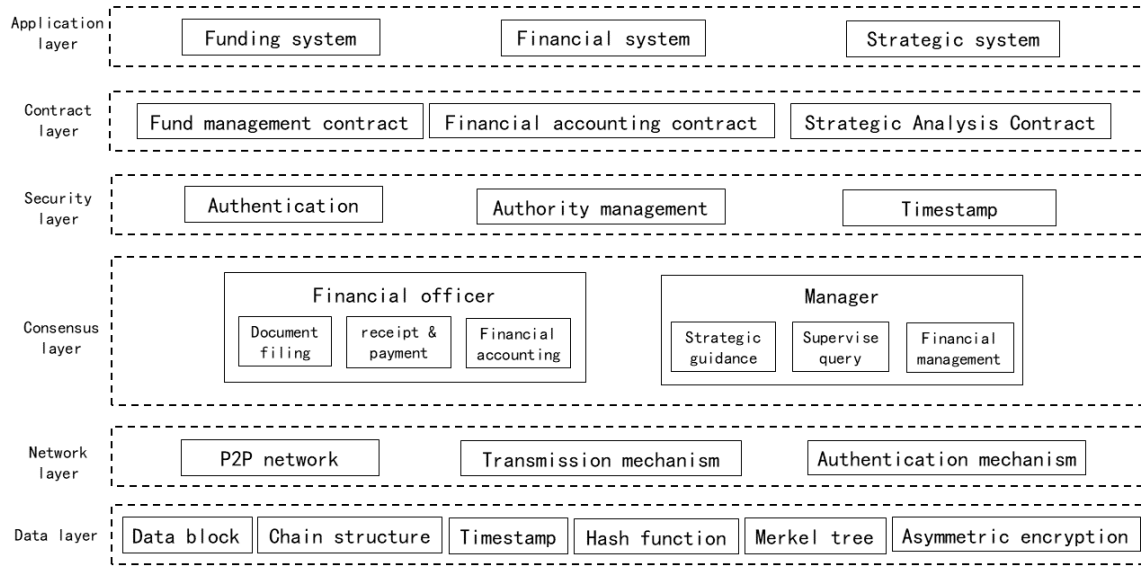

Figure 1 The overall framework of the financial system of small and medium-sized private enterprises based on blockchain technology

The general idea of doing research on financing model and path innovation of small and medium private enterprises under the background of blockchain finance is:

In the first step, the company makes transactions and generates financial data, which are broadcast to each node of the alliance chain. After the node is verified, the data is automatically uploaded to the chain and stored. The data information on the chain can be traced back and cannot be tampered with. At the same time, hash encryption is used to ensure information security.

The second step, to establish a financial block chain, a capital block chain and a strategic block chain on the basis of the corporate financial system, capital system and strategic system, and the three

ISSN 2616-5902 Vol. 3, Issue 2: 38-43, DOI: 10.25236/AJBM.2021.030208

form a shared center block chain alliance. The financial blockchain and the capital blockchain support each other and provide feedback, and at the same time provide data decision-making for the strategic blockchain, and the strategic blockchain is the highest authority of the financial sharing center, while supervising the financial blockchain and the capital blockchain Implementation.

The third step, that when the company needs financing, it can access the internal financial system of the company by opening the authority for the financial institution and the third-party guarantee department, and then verify the authenticity and integrity of the financial information provided by the company, and whether it provides funds for it in accordance with.

4.3 Infrastructure model

The financing model and path innovation strategy of small and medium-sized private enterprises is based on the blockchain technology as the basic framework. It mainly has six parts: application layer, contract layer, incentive layer, consensus layer, network layer and data layer. Starting from the specific structure of the corporate financial system, this article combines the underlying structure of the blockchain with the financing model to build an infrastructure model of "blockchain + financing model" (see Figure 2).

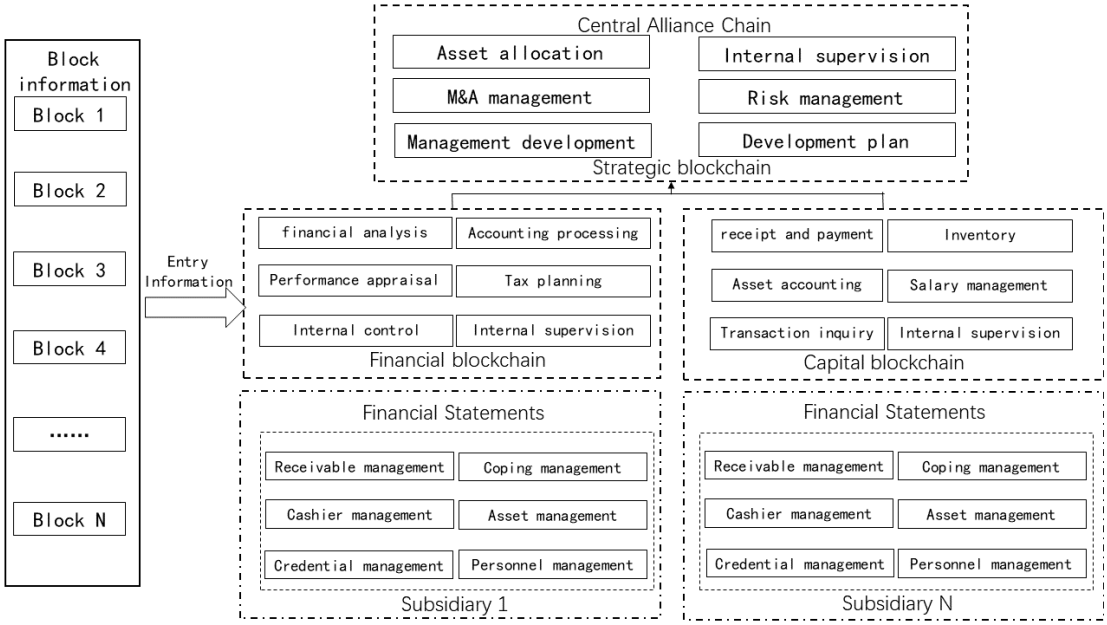

Figure 2 Financial system infrastructure of small and medium-sized private enterprises based on blockchain technology

Data layer: Mainly covers data algorithm, which provides the feasibility of blockchain technology operation, and is also the basic layer of blockchain structure, mainly including data blocks, chain structure, time stamp, hash function, Markle tree, asymmetric encryption technology.

Network layer: Information is mainly transmitted through the P2P network. Its main feature is to change from a centralized structure to a distributed structure, which greatly reduces the degree of centralization.

Consensus layer: It is mainly manifested as a consensus mechanism, which realizes the synchronization and consistency of the data records of all nodes on the blockchain, and ensures the transparency and data sharing of the blockchain system.

Security layer: Provide security assurance for the entire model, and ensure information security supervision through identity verification, authority management, and time stamp functions.

Contract layer: The smart contract concept in blockchain technology is introduced, which helps the entire financial system to intelligently manage. With the assistance of the security layer, the contract layer automatically completes data processing under inspection.

Application layer: Mainly reflected in the capital system, financial system, and strategic system.

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4.4 Specific optimization path

The construction of a financial system based on blockchain technology is mainly divided into three parts: financial data registration contract, contract data review, and financial data storage. This paper builds a financial system based on blockchain technology to provide strong support for the financing of small and medium-sized private enterprises, and then innovate their financing models and paths.

(1) Financial data registration contract

Financial data contracts are used for companies to record financial data. In the process of data uploading to the chain, by calling the fully deployed PRC, first check on the blockchain whether the user-initiated authentication message is a participant in the transaction. If the authentication fails, the company cannot be in the block. Register your own financial information on the Internet in real time; if confirmed, PRC will hash the digest according to the financial information content, and then write the information and the hash digest into a new block, and this hash digest will be returned to the client as the unique identifier of the piece of financial data . The contract is designed as follows:

Input: dataset, the object of transaction

Output: HashAbstract

```
procedure receiveDataset (dataset)
    if message.sender=writer then
        dataset=new Transaction( ); #Initialize transaction information
        dataset.name=dataset.name;
         dataset.time=this.time;
        dataset.content=dataset.content;
        HashAbstract=hash(dataset); #Generate a hash summary of the transaction data
        WriteToBlock(dataset,HashAbstract); #data unique hash abstract on the chain
        return HashAbstract;
    end if
end procedure
```

(2) Review of contract data

When verifying the authenticity of the financial information in the contract, you first need to enter: enterprise information P and its hash value H(P), transaction time T and its hash value H(T), transaction object S and its hash value H (S), the person in charge of each information signs Sn. Output: Audit information C and its hash value H(C). The review process is as follows:

Begin if check(Sn): #Verify the signature of the person in charge of the information

Then if Hi == Hash(K): #After the signature is correct, verify the hash value

Then D5.generate(C) #After the hash value is correct, generate audit information C

else: pop(K) # The financial data is wrong notice(Di) #Do not allow warnings on the chain

End if

else: pop(Sn) # Incorrect signature notice(Di) #Notify related companies

End if D5.send(K,C,H(C),Sc,D4) #Data and audit data are transmitted to the financial department and platform

End

(3) Financial data storage

When storing the financial information of an enterprise on the chain, you first need to enter: enterprise information P, transaction time T, transaction object S, and audit information C. Output: new block of private chain. The stored procedure is as follows:

Begin D4.get(K, C) #The financial department obtains financial data and audit data

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if check(H(C)) and check(Sc): Then New_tranction.Generate(P,T,S,C) #Generate new transaction data

H = Hash(New_traction) #Generate the hash value of the data

Si = Sign(H) #Signature of person in charge

End if #Generate new block

D4.Generate(new_block(H, pre_H, New_tranction, Si)) Link(new_block, Private_chain) #New block joins the private chain

End

Through the above three basic processes, the company's financial data is verified and stored, so as to ensure that its financial data is complete and true, and to provide an innovative reference for its financing path.

5. Conclusion

Small and medium-sized private enterprises are the backbone of the development of my country's real economy. They have strong development momentum and also play an important role in supporting employment and taxation. Blockchain technology can ensure the authenticity and integrity of the financial data of small and medium-sized private enterprises and provide a basis for them to obtain third-party investment. The application of blockchain technology can solve the problems of small and medium-sized private enterprises' low credit and high financing costs in the financing process, thereby expanding their financing channels and enhancing the persuasiveness of corporate financing to financial institutions. At the same time, it can improve my country's corporate financing guarantee system, prompting financial institutions to lower the threshold when providing loans. Based on the blockchain technology, this article provides an innovative path for small and medium-sized private enterprises to finance, and hopes to provide reference value for the research on the financing mode and path innovation of small and medium-sized private enterprises.

Acknowledgment

This article is the research result of the research and innovation fund project (key) of Anhui University of Finance and Economics,,(project number: XSKY2125ZD)

National Social Science Foundation project "Local Government Debt and Corporate Tax Burden (project number: 20BJY023, 2020.09-2023.09)".

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