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The Solution Strategies of Financing Constraint Predicament of Digitalized Empowerment of Micro-, Small and Medium-sized Enterprises

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Abstract: Micro-, small and medium-sized enterprises (MSMEs) have been an important part of our country's economy for many years. However, their survival and development are always affected by the phenomenon of financing constraints, which has resulted in non-negligible consequences for the development of the national economy. This paper utilizes with a large amount of data and information, and uses the method of induction and deduction to summarize the reasons for the financing constraint phenomenon from three levels, and puts forward corresponding solutions for different levels. The causes of financing constraints are divided into three levels. First, at the micro level, MSMEs cannot meet the expectations of investors and the requirements of mortgage loans. Secondly, at the industry level, due to the relative backwardness of the capital market. Finally, at the national level, local governments have not fundamentally solved the problems of financing difficulty and slow financing for MSMEs. In order to solve the above problems, this paper puts forward three different solutions. At the enterprise level, the enterprise should actively use digital technology to improve its own operating capability and operational compliance; Small and medium-sized banks should use new media and other technologies to strengthen ties with customers and improve service quality and data processing capabilities. At the industry level, big banks should help the small and medium-sized banks to accelerate the digital transformation. At the national level, local governments should provide policies including but not limited to financial support for the digital transformation of MSMEs.

Keywords: Financing constraints, Digital transformation, Micro-, small and medium-sized enterprises.

1. Introduction

1.1. Research background

Since the reform and opening up, China's private enterprises have mushroomed. With the introduction of new policies and ideas such as "The Belt and Road Initiative", "Business Startups and Innovation", private enterprises have experienced vigorous development. Since 2017, private enterprises have contributed more than 50% of the country's tax revenue, domestic private enterprises' gross domestic product, fixed asset investment and foreign direct investment have all exceeded 60%, high-tech

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enterprises have accounted for more than 70%, urban employment has exceeded 80%, and their contribution to new employment has reached 90%, gradually becoming an important pillar of our economy. The vast majority of private enterprises are micro-, small and medium-sized enterprises (MSMEs), with a total of more than 40 million, contributing more than 60% of China's GDP and more than 80% of employment. However, these enterprises usually have the characteristics of small scale and low degree of standardization, and have large information asymmetry with the outside world, which makes it difficult to meet the financing conditions of financial markets and obtain sufficient working capital through supply chain financing. Therefore, most of them are facing financing constraints to varying degrees.

With the increasing importance of MSMEs in the economic environment, the phenomenon of financing constraints has received great attention from scholars at home and abroad, and a large number of related literature on financing constraints has been published. Up to now, this field has become one of the most important research topics in the academic field. These researches have deeply analyzed the causes of this phenomenon in different economic environments, and combined with new technologies such as big data and the Internet, many innovative and practical solutions have been proposed.

A considerable number of MSMEs have excellent innovation capabilities and advanced science and technology. 65% of the total patents and 80% of the total new products in China are from MSMEs. However, due to financing constraints, their capital chains cannot support the continuous operation of enterprises, which leads to difficulties in their development and survival. Therefore, helping MSMEs to ease the financing difficulties is an important means to rejuvenate high-quality enterprises and promote the overall economic development of the country.

2. Literature review

2.1. Financing constraints

2.1.1. Influencing factors

Modigliani and Miller [1] proposed that in a perfect capital market, the capital structure has nothing to do with the value of the company, and the investment behavior of the company is separated from the financing behavior and only related to the investment demand of the company. However, due to the agency problem between management and investors, there is no perfect capital market in reality. In 1984, Myers and Majluf [2] first proposed the concept of financing constraint on the basis of the former, and summarized the information asymmetry as an important reason for the financing constraint. They proposed the theory that the availability of external financing was negatively correlated with the degree of information asymmetry, while the external financing cost was positively correlated with the degree of information asymmetry. In addition, the financial environment is also an important reason for financing constraints. In 1993, King and Levine [3] first proposed that countries with developed financial systems have higher growth opportunities. Subsequently, a large number of relevant literature was published to support this view. In a good financial environment, companies constrained by financing are more likely to obtain external financing [4]. Domestic scholars such as Wei Zhihua [5] also believe that corporate financing constraints are related to the good or bad financial environment. Political connections are also one reason for financing constraints. Politically connected firms have better access to finance and better access to resources and information, which in turn can ease financing constraints.

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2.1.2. Economic consequences

Financing constraints have a significant impact on the efficiency of corporate investment. Ameer [6] examined the investment rates of 519 non-financial listed companies in six Asian countries from 1991 to 2004 and found that tangible assets played an important role in explaining the increase or decrease in cash flow sensitivity of investments for companies in southern and eastern Asian countries. In addition, it also has a significant impact on corporate innovation. Due to external financing constraints, research and development investment mainly depends on the internal capital of the enterprise. This means that financing constraints also play a constraining role in the research and development of enterprises, limiting the innovation ability of enterprises [7]. Financing constraints also threaten the continuous operation of enterprises. Access to external financial resources has a positive impact on the growth of enterprises. Financing constraints are positively related to productivity growth in the short term. Constrained companies need to cut costs to generate resources that they cannot raise in financial markets, greatly increasing the possibility of enterprises withdrawing from the market [8].

2.2. Digital transformation

2.2.1. Related concepts

Verhofe et al. divided the digital transformation into three stages: office digitalization, process digitalization and company digitalization. Digitization of the office refers to the use of digital technology to transform the existing work tasks of the company into digital information in order to achieve cost-effective resource allocation, such as the use of digital forms in the ordering process and digital applications in internal financial reporting. Process digitization refers to the use of digital technology to change existing business processes, such as reducing customer communication costs by building online network platforms, and improving yield by collecting data through industrial robots and other equipment. Corporate digitalization refers to the use of digital technology to change the core business model of a company within a company in order to introduce a new value creation process. Digitalization includes IT in a broad sense. Apart from traditional information technology, it also includes "Big Data", "Cloud", "Artificial Intelligence", "Block Chain" and "Internet of Things" which are in the development stage [9].

Features. Digital transformation can improve enterprise efficiency. Loebbecke & Picot[10] believes that the use of big data technology for in-depth information mining, through artificial intelligence algorithms to speed up the decision-making process, can improve the decision-making efficiency. Data-driven companies are also more effective in improving productivity [11]. Digital technology can also significantly improve the profitability of enterprises. In 2018, Accenture research found that the revenue growth rate of enterprises using digital technology is 5 times that of other enterprises, and the sales profit margin is 2.4 times that of other enterprises. In addition, enterprises can also learn the relationship between click data of buyers' websites and actual purchase data through digital technology, thus reducing the cost of out-of-stock and inventory holding [12]. On the other hand, ordinary consumers can also participate in the research and development of enterprises based on the way of data to promote the innovation ability of enterprises [13].

2.2.2. Literature review

Since its development in 1958, research on the theory of financing constraints has made great progress. Scholars in various countries have a profound understanding of the influencing factors and economic consequences of financing constraints. However, easing or even solving the phenomenon of financing constraints is still a worldwide problem. Especially in most developing countries, the problem of financing constraints still plagues most MSMEs. In recent years, the rapid development of digital

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technology has had a profound impact on various industries. The application of digital technology in solving the problem of corporate financing constraints will inevitably become a new research trend. Although this concept has received wide attention, the two have not yet been effectively combined, especially in the use of digital technology to substantially reduce the information asymmetry of all parties in financing activities. Therefore, this aspect may become a new research field.

3. The financing status of MSMEs

3.1. Financing status

Enterprise financing is mainly through direct financing, indirect financing and private financing. However, these three ways have brought great resistance to financing activities for MSMEs because of their high restriction threshold or high financing cost.

3.1.1. Direct financing

Direct financing refers to the enterprises that have higher financing conditions and can meet the financing conditions by issuing stocks or bonds. Generally, they have reached a certain scale and have a perfect and standardized management system. However, the vast majority of MSMEs do not have a perfect and standardized management system, and the operating environment is unstable and the risks are high. Therefore, it is difficult to meet the high requirements of direct financing. Although some enterprises can still be listed on the small and medium-sized board and the growth enterprise market, they are also the best among the MSMEs and their management capabilities far exceed those of most MSMEs. Therefore, this approach is not universal.

Indirect financing. Indirect financing also has great resistance to MSMEs. The first is that large financial institutions such as banks usually give priority to large enterprises as lending targets, because large enterprises have more standardized financial information and larger loans. Providing loans to large enterprises can not only effectively avoid risks, but also reduce the corresponding costs through economies of scale. MSMEs are discriminated against in the financing market because they do not have the corresponding conditions. The second is that the restrictive conditions for applying for loans from financial institutions are too complicated for MSMEs to meet. More than 70% of China's MSMEs do not have their own factories and offices [14] and only rely on leasing for production and operation, which means that these enterprises cannot obtain loans in the form of mortgages of fixed assets and can only obtain other forms of loans by paying high interest rates, which greatly increases the financing cost. Third, the application for loans through financial institutions usually goes through a strict approval process, with the approval period ranging from 10 days to several months. This means that during the period when the loans enter the approval process, due to lack of funds, enterprises may miss some investment opportunities with a short time limit. Therefore, it is difficult for MSMEs to obtain funds from financial institutions.

3.1.2. Private financing

In recent years, with the popularization of financial management concepts and financial knowledge and the improvement of the legal system, many private individuals and units have a stronger willingness to lend idle funds. This is a good thing with many functions, that is, it relieves the fund demand of financiers, increases the income of investors and improves the efficiency of the use of idle funds in society. In addition, the efficiency of private financing is a huge advantage over the long audit period of large financial institutions such as banks. However, for MSMEs, the amount of money they give to investors has not been reduced. The high efficiency of private financing also means high

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interest rates, i.e. higher financing costs and financial risks. Therefore, this method is also difficult to become the main channel of financing.

3.2. Causes

The causes of corporate financing constraints in our country are quite complicated, which are mainly influenced by three factors: the corporate itself, financial market and government support.

3.2.1. Enterprise level

In the early days of the establishment of an enterprise, the managers lacked sufficient management experience, forecast of market changes, effective operation of funds and professional financial and compliance knowledge, which led to the problems of unstable operation, immature management system and irregular disclosure of financial information of MSMEs. These problems reduced the credit of the enterprise, thus causing discrimination in the financing market. Subsequently, affected by financing constraints, the enterprise was unable to obtain the necessary funds in a timely manner, was unable to effectively carry out innovative research and development, market research and other activities, and was unable to introduce high-quality financial, legal and management personnel to enhance the operation and management of the enterprise, resulting in a vicious circle that was difficult to solve.

3.2.2. Industry level

In addition, the financial industry's own degree of development is also an important reason for the financing constraints. Our country's small and medium-sized financial institutions, such as agricultural commercial banks and local commercial banks, mainly serve MSMEs. However, small and medium-sized financial institutions can only provide small-scale loans to enterprises because of their small size and support for a small amount of funds, which is insufficient to support the operation needs of MSMEs with a large base. Although large financial institutions have strong strength, due to their inherent bias against MSMEs, they have set extremely strict amount limits and approval conditions, which makes it difficult for MSMEs to obtain funds from large financial institutions. Although the securities market provides certain financing opportunities for MSMEs, the vast majority of enterprises are still unable to meet their high standards for entering the market.

3.2.3. National level

As an important part of the national economy, MSMEs have been protected and supported by the state for a long time. For example, they have been provided with certain tax incentives and other policies. However, on the most fundamental problem of financing difficulty and slow financing, they have failed to provide perfect laws and regulations and adequate policy support, which has led to the ineffective improvement of this dilemma.

4. The application of digitalized empowerment of MSMEs

Industry digitalization is based on digital science and technology, with data as the key element, value release as the core, and data empowerment as the main line, to digitalize, upgrade, transform and recreate all elements upstream and downstream of the industrial chain.

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4.1. The current state of digital transformation

Since China joined the Internet in 1994, China's digital economy has experienced four stages in the past 30 years. The first stage was from 1994 to 2003, marked by China's access to the Internet. The digital economy in this period is mainly characterized by information content services. Internet companies represented by news portals and search engines are rapidly emerging and growing. The period from 2003 to 2013 marked by the rapid development of electronic commerce is the second stage. The rapid development of Internet technology represented by the third generation of mobile communications (3G) has led to the emergence of a large number of new industries and new models. The Internet has begun to expand its application to various fields represented by commerce and trade, and social networks have begun to emerge. The third stage is from 2013 to 2019, which is marked by the construction of "Digital China" and the implementation of big data strategy and "Internet Plus" action. During this period, China's information development has entered a development stage with "Digital China" as the top-level design and a new generation of information technology and extensive integration of economy and society. The fourth stage is from 2019 to the present. The fourth plenary session of the 19th Central Committee of the Communist Party of China first took the data as the production factor as the symbol, and the digital economy entered the development stage with the data factor as the engine. At this stage, the digital economy is gradually becoming the key force leading the technological revolution and industrial transformation. The deep integration of data elements into all walks of life has continuously enhanced the penetration, promotion and use of traditional factors of production, and has continuously played a prominent role in enhancing total factor productivity. And in 2019, the scale of China's industrial digital added value was approximately 28.8 trillion yuan, accounting for 29% of GDP. Among them, the penetration rates of digital economy in service industry, industry and agriculture have reached 37.8%, 19.5% and 8.2% respectively, with remarkable results in digital development.

The current research in China focuses on three directions: the semantic content. For example, the National Standards Library has developed a content index comparison system for Chinese and foreign standards based on semantic recognition technology and rich domestic and foreign standard data. The application of knowledge mapping technology in the field of standards, for example, China Institute of Electronic Technology Standardization has proposed and approved IEEE Standard P2959 "Technical Requirements for Standard-Oriented Knowledge Mapping". Standard digital data sets, for example, China Institute of Standardization has taken the lead in drafting GB/T 22373-2021 Standard Document Metadata, and some industries have drafted special standard digital label sets. The formulation of relevant technical standards for the digitalization of standards in China is mainly completed by the National Information and Documentation Standardization Technical Committee and the National Information Technology Standardization Technical Committee.

4.2. Practical application of digital technology

4.2.1. Financier

For financiers, the digital transformation is mainly reflected in the transformation of operation and marketing methods. Under the trend of consumption upgrading, the online and offline channels are no longer separated. The whole channel layout requires the effective allocation of resources around personnel, goods and business premises from all parties in the supply chain to realize the whole channel operation. Based on the development of information technology and the Internet, new media platforms and content are growing rapidly. The new media era has accelerated the transformation from a mass society to a mass society. The brand's marketing model has also changed from one-to-many pan-marketing to one-to-one precision marketing. Brand advertising content is launched

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through new media platforms such as websites, WeChat, Weibo and short video Apps. These new measures have greatly improved the efficiency of enterprise resource allocation and widened the channels for product promotion.

4.2.2. Investors

In addition to enterprises, investors such as local small and medium-sized banks have also undergone digital transformation in different degrees and ways, among which Bank of Chengde and Bank Of Xi'an are representative.

Bank of Chengde has established a leading group for digital transformation and data governance, and has set up an office to build three capacity systems. The first is the business capability system, which focuses on customers, understands customers through customer insight and accurate images, and provides differentiated digital services starting from enhancing customer experience and stickiness, with a view to enhancing digital marketing, operation and wind control capabilities. The second is the data capability system, which focuses on data governance, promotes the establishment of data application architecture and platform architecture, lays a solid foundation for data standards, data quality and data security, and gradually improves data service and data application capabilities; The third is the construction of IT capability system. Based on the construction of the technology platform system, the data application system and business application system will be gradually improved and optimized.

Bank of Xi 'an made an attempt to operate private traffic with Tencent's enterprise WeChat and small programs. Relying on the enterprise WeChat, Xi 'an Bank seamlessly connects with customers on WeChat. Each employee has a two-dimensional code to record his micro-signals. After the customer adds the employee's enterprise WeChat friend, the bank can associate the customer's micro signal with the bank's customer relationship management (CRM) system through some technical means. In this way, the employee will be able to know the assets of the WeChat friend in the bank and what business he/she has run, and can also obtain the customer's portrait and label in the background. In this way, the operation of the private domain of the customer is realized through the connection of WeChat, which facilitates the employee to have a comprehensive understanding of the customer.

5. The solutions of digitalized empowerment of MSMEs financing constraints

5.1. Enterprise level

5.1.1. Financiers

First, the financier should actively introduce an advanced digital management business model, such as using new media and other means to promote its own products and services with high efficiency, and enhance its market competitiveness, so as to enhance the investor's confidence in the business prospects and investment willingness.

In addition, the financier should actively participate in the construction and upgrading of the financial sharing center, and cannot be satisfied with the primary financial sharing center which only focuses on the centralized processing of invoices, vouchers, accounting and payment. With the development of the enterprise, more attention should be paid to the upgrade of the financial sharing center. Using cloud technology to upgrade the financial sharing center is beneficial to reduce the labor cost and management expenses in finance, improve the efficiency and quality of financial work, and more importantly, improve the convenience and efficiency of financial information sharing with investors, and enhance their credit in the financing market.

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5.1.2. Investors

Investors should actively introduce new media and other efficient means of communication, such as corporate WeChat, etc., to strengthen ties with financiers, establish a sound information disclosure system, and control changes in operating strategies and financial conditions of investees by current events, so as to enhance understanding of financiers. This will not only safeguard their own investment safety, but also enhance mutual trust with financiers.

The second point is that investors should also use big data, cloud computing and other means to strengthen their ability to obtain, understand and analyze data, deepen the analysis of the investment value of the investment target enterprises, deepen their ability to judge the needs of customers and improve their service quality.

5.2. Industry level

Digital empowerment should not only be limited to the micro level, but should also establish an auxiliary model for big banks to help small banks at the meso-industry level.

Large banks have diversified business structures and perfect product systems, which can provide all-round product and digital support for small and medium-sized banks. As of April 2021, 14 large and medium-sized banks have established financial technology subsidiaries. With the systematic wind control system, diversified business models and prudent compliance awareness of the financial technology subsidiaries, better organizational guarantee can be provided for the digital empowerment of small and medium-sized banks. In addition, large banks can provide certain information security for small banks.

Using financial-level security measures such as unified user authentication, data transmission encryption, mobile APP shell protection, access control and single sign-on, large banks can provide small banks with security management and monitoring services in all fields, from physics, network, data and systems to applications, to meet the data and information security management needs of small and medium banks.

5.3. National level

Give policy support to the digital transformation of enterprises. We will strengthen policy coordination, address both the symptoms and root causes with precision, provide financial capital guarantee for the digital transformation of enterprises to the maximum extent, and implement differentiated fiscal expenditure policies on science and technology to enhance the role of fiscal expenditure on science and technology in promoting the digital transformation of enterprises. It should also classify and implement policies accurately, and develop a unique digital transformation path according to the enterprise's own resources. Specifically, in the selection of key areas for the fiscal science and technology expenditure policy, appropriate priority should be given to supporting non-state-owned enterprises, high-tech enterprises, enterprises in their initial and mature stages, and efforts should be made to reduce the cost and financial risks of their digital technology innovation, encourage more research and development investment, and boost the digital transformation.

6. Conclusion

The problem of financing constraints of small and medium-sized enterprises has been affecting the survival and development of enterprises and the development of regional economy for decades in the modern commercial development. Its essence is the information asymmetry caused by the agency system. The rapid development of digitalization provides a new direction to alleviate this problem.

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Using digital technology, financing can significantly reduce the information asymmetry with investors.

First, at the micro level, the way enterprises use digital technology mainly lies in using new media and "Internet Plus" to improve their operating level and profitability, enhance their investment value, and use cloud computing to build and upgrade financial sharing centers, improve their financial compliance and reduce information asymmetry with investors. Banks and other investors should actively use digital technologies such as new media to strengthen contact with customers or target customers and improve their own data acquisition and processing capabilities to improve service quality and reduce investment risks.

At the middle level, the entire financing market should establish a model of mutual help and assistance. Big banks should use their own technological and resource advantages to help small and medium-sized banks to make digital transformation and improve their information security and data management capabilities.

At the macro level, the government should actively encourage enterprises to carry out digital transformation, combine the digital development characteristics of different industries and different regions, and introduce various policies including financial support.

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