Influencing Factors of SMEs' Financing in China: The Role of Microcredit Companies

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Abstract: The financing difficulties of small and medium-sized enterprises (SME) have always been a concern. Many scholars have studied their influencing factors, but with the participation of microcredit companies, the influencing factors will change. This study focuses on identifying the key factors influencing SME financing in the context of microcredit company participation. The study synthesizes previous research to identify nine key influencing factors and proposes corresponding hypotheses. A logistic regression model is then established to analyze survey data collected from SMEs in China. The results show that enterprise management standards, reputation, policy support, financial system completeness, and the degree of information symmetry are the most significant factors, all of which are positively correlated with credit availability. The research has also found that microcredit companies have expanded the financing channels for SMEs. The results showed that SMEs could substantially benefit from the expanded financing channels to gain vitality in the financing monopoly of large enterprises. Results also revealed that microcredit companies could help SMEs solve financing information asymmetry, tackle financing allocation constraints, and address structural deficiencies in financing systems. The findings provide significant insights into both theory and practice.

Keywords: Influencing Factors; Financing; Small and Medium-Sized Enterprises; Microcredit Companies

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1 Introduction

Small and medium-sized enterprises (SMEs) are the primary drivers of regional economic development. Following the global financial crisis, SMEs have been increasingly recognized as engines of growth and job creation [1]. SMEs' financing is so important that constraints in access to it prevent larger participation in the economy, hindering SMEs from expanding their business operations and leading to lower levels of labor productivity [2].

The government has highly valued the financing of SMEs in China. Despite the implementation of numerous supportive policies and measures, SMEs continue to face severe financing challenges due to their sheer numbers and varied business conditions. The managers of SMEs generally have low cultural quality, insufficient management level, low credit rating, and high business risk [3, 4]. Consequently, their loan applications frequently fail to meet banks' risk management criteria. In addition, SMEs often require small but frequent funding, resulting in high transaction costs and complex procedures [5, 6]. Many SMEs fail to innovate or adapt their business models in response to operational difficulties. As a result, banks are frequently unable to recover their loans, which fosters a negative perception of SMEs as high-risk borrowers and leads to lending reluctance [7, 8]. Since the COVID-19 pandemic outbreak in 2020, the survival challenges faced by SMEs have intensified, and the lack of funds has further complicated financing efforts [9-11].

The financing of SMEs is so important that many scholars have studied its influencing factors. The influencing factors can be roughly divided into internal factors

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and external factors. In terms of internal factors, improper management standards, poor reputation, and limited assets in SMEs significantly decrease their chances of securing financing [12, 13]. Additionally, the size and financial condition of SMEs are crucial factors to consider [14, 15]. Other aspects, such as the operational mode [16] and availability of collateral [17], also play a role in the financing process. External factors, including policy support [18], the completeness of the financial system [19], information symmetry [20], and the bank-enterprise relationship [21], play a crucial role in driving outcomes.

Microcredit companies provide microcredit services to SMEs, helping those who face financial discrimination and exclusion with comprehensive services and support. They can improve the efficiency of fund utilization and offer incentives to SMEs [22]. Once microcredit companies help SMEs solve financing difficulties, they can further promote regional economic growth and employment [23]. Although there has been extensive research on the influencing factors of financing of SMEs, with the participation of microcredit companies, SMEs' financing difficulties have been alleviated to some extent and the influencing factors may change [24, 25]. Therefore, the study on the influencing factors of financing SMEs with the participation of microcredit companies is novel and valuable.

This study specifically investigates the influencing factors of financing SMEs with the participation of microcredit companies. This study analyzes various internal and external factors affecting SMEs by reviewing existing literature and examining relevant texts. It proposes the hypothesis that these influencing factors are correlated with the availability of credit. The research employs a logistic regression model to evaluate the significance of these selected factors, ultimately identifying the key influences on credit availability for SMEs that engage with microcredit companies. The study aims to address the following research questions.

1. What factors substantially impact the financing of SMEs through microcredit companies?
2. How do microcredit companies help with financing issues for SMEs?
3. Is there a correlation between influencing factors and the availability of credit?

This study consists of 7 sections. The remaining sections are as follows: Section 2 deals with the literature review. Section 3 selects and extracts key influencing factors. Section 4 proposes research hypotheses. Section 5 introduces the methodology adopted and the data source. Section 6 analyses the results achieved. Section 7 discusses findings, implications for theory and practice, limitations, and conclusions.

2 Literature Review

2.1 Influencing Factors of Financing of Small and Medium-Sized Enterprises

The financing difficulties of small and medium-sized enterprises have always been a concern globally. Numerous researchers have examined the factors that affect SMEs' financing across various countries. In many countries, the availability of collateral and business information and the capacity of borrowing by enterprises have a significant effect on the likelihood of loan approval by financial institutions [26, 27]. The owner-manager factors count as well, such as firm management's education, experiences in the industry, awareness of funding, and business operations [28, 29]. Additionally, external factors influence access to financing, such as the structure of the financial sector, business support, and environmental regulations [30, 31]. Furthermore, various characteristics of enterprises, such as their location, industry, size, age, incorporation status, organizational structure, and credit balance, play a significant role. Research indicates that younger, smaller, and more innovative SMEs are more likely to face rejection when seeking financing [32, 33]. Additionally, studies reveal that COVID-19 has had a notably negative impact on access to finance [34].

In China, the financing of SMEs across various industries is highly regarded by scholars. Research indicates a positive correlation between the growth rate of an enterprise's primary business income, its overall growth, and its scale, as well as its financing efficiency. Conversely, there is a negative correlation between the asset-liability ratio and the non-debt tax shield [35, 36]. SMEs across different industries face various factors influencing their financing. For instance, in high-tech SMEs, improving the financial and technical environment enhances financing efficiency [37, 38]. In contrast, for environmental protection companies, macro factors such as regulatory supervision, legal standards, and environmental policies significantly impact their financing capacity [39-41]. Different lending technologies have varying effects on SMEs access to financing [42, 43]. Research on the factors influencing

the availability of financing for SMEs has developed significantly, with many scholars achieving well-established results through empirical studies. This research summarizes the key findings of several Chinese scholars regarding the factors that affect financing availability for SMEs. Table 1 is as follows.

Table 1 The relevant research perspectives and outcomes from the recent developments

Document title	Author, Year	Internal factor	External factor
Research on Financing Issues of Small and Medium-sized Enterprises from the Perspective of Financial Service Innovation	Meng Wei (2023)	Fixed assets, internal management standards, innovation consciousness	Financial system support, government policy, social credit environment, information asymmetry, single financing channel
Analysis of Factors Influencing the Financing Capacity of Small and Medium-sized Enterprises	Shen Hao (2023)	Enterprise scale, asset-backed, risk resistance ability	Information asymmetry, incomplete financial support
Study on influencing factors and countermeasures of micro-loans for small and micro enterprises in Tibet under epidemic prevention and control	Ma Xueping, Zhang Jinling (2022)	Small and micro business philosophy, institutional Settings, staffing; The scale of production and operation is large and the ability to bear risks is small; Business leadership; Is the industry a sunset industry or a sunrise industry?	The loan approval time is long and the procedures are complicated; Microcredit companies are small in scale and have little available funds. Access to credit is limited; Limited funding for the provision of escrow institutions; lending institutions are not clear about the operation of small and micro enterprises.
Research on financing of small and micro enterprises under supply-side structural reform	He Congxi, Li Xuan, Yin Liyuan, SHEN Hanbo, HU Kexin (2019)	Difficulties in direct financing (limited scale, large operating risks, low information disclosure), indirect financing (small and micro enterprises have poor reputations, fewer assets, and weak credit awareness of business owners), incorrect financing concept (poor management ability, poor internal control, and backward financial management)	The implementation of financial policies is difficult, the financing transaction cost is high, and the awareness of financial services is indifferent
Analysis of the financing problems of small and micro enterprises in Zhangzhou City based on the background of financial supply-side structural reform	Zhang Qing (2019)	The overall size of the scale is small, the a lack of corresponding mortgageable property, and the survival pressure is great	The imperfect capital market and credit system, the real strength of government policies, the malpractices of the financial system
Analysis of the availability of financing for small and micro enterprises on P2P platform	Zhang Yu (2019)	Education background; The location of the company; Real estate; The number of successful loans; Total amount of loans, overdue times, company size	N/A
Research on the influencing factors of financing availability of small and micro enterprises - A case study of incubated enterprises in Yangling Entrepreneurship Center	Zhang Jie (2018)	The maturity of enterprise development, the more employees, the better credit status, the better social relations of business owners, and the more familiar financing knowledge are conducive to improving the availability of financing	N/A
Research on financing availability of SMEs from the perspective of P2C network lending	Deng Fanfan (2018)	Business credit standing; The solvency of the enterprise; Enterprise scale; Proportion of unrestricted assets, etc	N/A
Research on influencing factors of loan availability for P2P small and micro enterprises	Li Junjie (2017)	The amount borrowed; The number of loans; Term of loan; Monthly repayment of principal and interest; Age; Income level; Real estate; Car industry	Borrowing rate
Study on influencing factors of financing ability of small and medium-sized enterprises in Anhui Province	Zhu Xinxin (2016)	Enterprise scale; Internal accumulation level; Enterprise development ability; Short-term solvency	Tax effect
Research on bank loan systems of small and medium-sized enterprises from the perspective of social network	Zhou Yuliang (2016)	Enterprise R & D capability; Financial ability; Learning ability; Ability to change; Comprehensive effect of financing	Market power; Guarantee ability
County small and micro enterprises	Zhang Jun-	Weak controllability, high production	There are great limitations in financing

Document title	Author, Year	Internal factor	External factor
financing situation and countermeasures	shan, Yan Lei (2015)	risk coefficient, opaque financial system, short life cycle, insufficient credit accumulation	methods and channels, and the credit guarantee system is not perfect
Research on Influencing factors of credit availability of small and medium-sized agriculture-related enterprises -- based on a survey of small and medium-sized agriculture-related enterprises in Sichuan Province	Pan Lijun (2013)	Enterprise scale; Type of enterprise; Fixed assets ratio; Current ratio; Credit rating; Net interest rate on assets; How long the business owner has been in the industry	The closeness of the relationship between enterprises and banks
On the reasons and ways of financing difficulties of small and micro enterprises	Ma Shengxiang (2012)	In line with the poor development of financing methods of small and micro enterprises, there is no clear financial management system, and unfamiliar with financing policies, some small and micro enterprises have poor credit, few assets, and weak credit awareness	Social environment: the positioning of small and micro enterprises is not clear, and the understanding is not enough attention; The policy is strong in principle, poor in target, difficult to implement, and poor in effect; Insufficient effective financial support
Influencing factors of credit availability for small and medium-sized enterprises	Zhou Hongwei, Wang Jing (2012)	Entrepreneur characteristics; Enterprise Characteristics	Credit contract characteristics; Characteristics of credit relationship

2.2 Financing of SMEs with the Participation of Microcredit Companies

Starting from the main credit characteristics of microcredit, Jonathan Morduch defined microcredit as a credit method that directly provides high-interest rates, unsecured assets, and small amounts, and maintains a high repayment rate to the poor [44]. With the development of finance, many microcredit companies have been established. They mainly target enterprises in need because it is difficult for SMEs to obtain funds from large financing institutions such as banks. Therefore, microcredit has gradually been accepted and recognized by the public, and its definition scope has also expanded [45].

The involvement of microcredit companies can significantly improve financing opportunities for SMEs [46]. Firstly, this approach helps address the issue of information asymmetry in financing for SMEs. Banks are unable to obtain the financial, operational, and credit information of SMEs quickly, nor can they analyze their prospects accurately [47, 48]. Enterprises whose loan applications are rejected by banks can acquire suitable financial products from microcredit companies [49, 50]. Second, addressing financing allocation constraints is crucial for SMEs. Banks tend to allocate their limited resources to high-quality, large enterprises that have a substantial scale and strong reputations in order to minimize risks while maximizing profits and minimizing costs and workload. [51]. However, microcredit companies' services focus on SMEs, So SMEs don't have to worry about financing restrictions [52, 53]. Third, it is beneficial for SMEs to address structural deficiencies in financing systems. Equity financing usually has a series of strict standards, so most SMEs find it difficult to meet the requirements of financing risk control systems [54, 55]. Microcredit companies have expanded financing channels for SMEs, enabling them to choose the most suitable financial products through a wide range of financing platforms [56].

2.3 Literature Summary

The fundamental theories of information asymmetry, financing availability, and credit market failure are well-established and closely connected to the financing of SMEs. Given this foundation, there has been significant global interest in the factors influencing SMEs' financing. As a result, many Chinese scholars have conducted related research and have reached various conclusions on the topic.

In recent years, the participation of small credit companies has improved the financing challenges faced by SMEs in several ways. Many studies have examined the impact of microcredit companies on SMEs' financing. However, the financing environment for SMEs has evolved, leading to changes in the influencing factors as well. There remains a notable gap in research in this area. Therefore, this study aims to identify the main factors affecting SMEs' financing in the context of microcredit company participation. It employs logistic regression to

calculate the key factors and explores the relationship between credit availability and these influencing factors.

With the participation of small credit companies in recent years, the financing difficulties of SMEs have been improved in various aspects. Many papers have studied the impact mechanism of microcredit companies on the financing of SMEs. However, in this context, the financing environment of SMEs has changed, and the influencing factors have certainly changed accordingly. There is still a slight lack of research in this area. Therefore, in the context of the participation of microcredit companies, this study selects the main influencing factors of financing SMEs, calculates the key factors through logistic regression, and explores the relationship between credit availability and influencing factors.

3 Selection and Extraction of Key Influencing Factors

In-depth interviews were conducted with business managers and credit audit managers from various microcredit companies in Jiangsu to identify the key factors influencing the credit loan approval process for SMEs. The credit evaluation process of microcredit companies differs significantly from that of commercial banks. Commercial banks mainly examine the data of various accounts of enterprises, mainly for enterprises with large scale and relatively strong funds [57]. The financial data from this part of the enterprise is transparent, indicating that the information shared between the bank and the enterprise is accessible. Consequently, the issue of information asymmetry is relatively minor. Microcredit companies primarily rely on qualitative data when assessing SMEs, as their main clientele consists of newly established SMEs. Many of these businesses lack standardized financial records, experience significant data loss, and have unclear information, which often leads to information asymmetry. Hence, microcredit companies should consider the overall situation of business owners and enterprises [58]. Based on the literature, typical cases, opinions of financial experts, and the overview in the "Introduction" section this study holds that the internal factors and external factors affect the credit availability of SMEs. While maintaining the main examination criteria based on the integrity, availability, and scalability of data, the internal factors are selected to investigate enterprise management standards, enterprise scale, enterprise financial status, enterprise reputation status, enterprise debt status, number of employees, enterprise operation age, loan understanding degree, enterprise funding source, enterprise collateral status, enterprise operation mode, enterprise profitability, and enterprise assets status. The external factors are selected to study policy support, financial system completeness, information symmetry degree, banking industry scale, and bank-enterprise relationship.

3.1 Source of Factor Text

The data in this section is sourced from various literature websites, including China National Knowledge Infrastructure (CNKI), Web of Science (WOS), and Google Scholar. Over the past five years, a total of 940 results have been found from searches on the topic "Influencing Factors of Financing for Small and Medium-Sized Enterprises with the Participation of Microcredit Companies."

Because of the anti-crawling mechanism of the literature websites, it is difficult to batch crawl the main text of its literature, and it has the risk of being blocked, so the text data mining in this section is the abstract part of 940 literature on the literature websites. For example, in CNKI, we can select all the literature, successively click Export and analysis - Export literature - Search new (citation format) - Export, and download a Txt file containing the author, title, source, year, and abstract information. Use Python software to write the code, remove the irrelevant part of the text content, and keep the summary part only.

3.2 Extraction of Key Factors

When performing word segmentation in Python, the Jieba user dictionary was introduced, and the Jieba word segmentation was used to segment the abstract content. Later, the 18 influencing factors to be investigated are selected as the designated words, and the word frequency statistics are carried out. Since the same words appear less frequently, the synonyms of each influencing factor are included in the statistics, and the total is taken as the word frequency of the influencing factor. The Python code is shown in the appendix. The statistical results of word frequency are shown in Table 2.

Table 2 Word Frequency

Enterprise reputation status	535	Enterprise collateral status	67
Enterprise scale	413	Enterprise operation age	61
Enterprise financial status	270	Enterprise asset status	50
Enterprise management standard	246	Enterprise funding source	47
Policy support	208	Enterprise profitability	39
Information symmetry degree	165	Bank-enterprise relationship	36
Banking industry scale	134	Number of employees	32
Financial system completeness	122	Enterprise operation mode	25
Enterprise debt status	70	Loan understanding degree	14

Finally, the top 9 influencing factors in word frequency statistics are selected, namely, enterprise reputation status, enterprise scale, enterprise financial status, enterprise management standard, policy support, information symmetry degree, banking industry scale, financial system completeness, and enterprise debt status for follow-up research. Among these nine influencing factors, five are classified as internal factors: management standards, enterprise scale, financing status, reputation, and debt level; reflecting the enterprise's own characteristics. The remaining four factors such as policy support, financial system completeness, degree of information symmetry, and banking industry scale are classified as external factors, representing environmental conditions beyond the enterprise's control.

4 Theoretical Analysis and Research Hypotheses

4.1 The Effect of Internal Factors on Credit Availability

Undoubtedly, internal factors within the enterprise can affect its various conditions, thereby affecting its credit availability. This section proposes the hypothesis that enterprises' internal factors will produce a significant effect on credit availability.

4.1.1 The Impact of Enterprise Management Standards on Credit Availability

In the life cycle of enterprises, the management standard of enterprises will constantly change due to changes over time, information asymmetry in the changing market environment, and other reasons. Therefore, enterprises will have different financing needs at different stages of the life cycle according to their management standard. According to Ping and Pan [59], good management standards can help enterprises stand invincible in fierce market competition. It can also increase their economic benefits, expanding their business scale, reducing production costs, enhancing their competitiveness, and ultimately improving their financing accessibility. When enterprises gradually grow up, operate in the market for a longer period, and gradually accumulate credibility, enterprises will begin to get rid of the initial management standard and seek broader financing channels, then they will use external intermediary equity (venture capital) or through commercial banks or financial companies to carry out debt financing. Based on the literature analysis, the following hypothesis is proposed:

H1a: Enterprise management standard produces a positive effect on credit availability

4.1.2 The Impact of Enterprise Scale on Credit Availability

The low comprehensive strength of SMEs leads to the low availability of financing. It is believed that SMEs have fewer funds, small scale, and limited debt capacity, so the probability of obtaining loan approval decreases. Also, it is believed that the scale and nature of enterprises have an important impact on the availability of financing, and the larger the scale and nature of state-owned enterprises, the higher the financing availability of SMEs. Zhang [60] concluded that the size of the enterprise, the profitability of the enterprise, the growth of the enterprise, the solvency of the enterprise, and its market competitiveness are the significant factors that affect the financing of SMEs. Based on the literature analysis, the following hypothesis is proposed:

H1b: Enterprise scale produces a positive effect on credit availability

4.1.3 The Impact of Enterprise Financial Status on Credit Availability

It is pointed out that small enterprises are usually small

in scale, mostly deal in cash and their profits cannot be maintained continuously, it is difficult to form a sound and reasonable management system within the enterprise. For example, they cannot introduce professional talents to deal with financial matters, and they often rely on accounting firms in society to deal with some major matters. General financial information is not properly recorded. As a result, the quality of the financial statements of enterprises is very poor, and banks often judge a company's credit rating and loan qualification through financial statements [61, 62]. In the face of non-standard statements, even if the data looks like it meets the loan requirements, the bank will hold a more cautious attitude towards these enterprises. Due to the uncertain future development of enterprises and large investment risk, micro, small and medium-sized enterprises face difficulty to obtain investment from professional investment institutions in the market, and mainly rely on endogenous investment from shareholders and entrepreneurs. Based on the literature analysis, the following hypothesis is proposed:

H1c: Enterprise financial status produces a positive effect on credit availability.

4.1.4 The Impact of Enterprise Reputation Status on Credit Availability

Berger and Udell [24] believe that in the life cycle of an enterprise is the reputation of an enterprise that will constantly change over time due to information asymmetry in the changing market environment, and other reasons. Therefore, enterprises will have different financing needs at different stages of the life cycle according to their reputation changes. In small enterprises, this characteristic is particularly obvious, often the financing needs and financing methods of these small enterprises will continue to change because of the continuous growth of enterprises, the improvement of their strength, and thus weakening the asymmetry of information. Those enterprises with a short existence and relatively small scale usually have serious information asymmetry in the credit market, which makes the financing of these enterprises mainly rely on trade credit with other cooperative enterprises, or rely on their own internal financing and angel investment. Some researchers believe that SMEs have many problems in their operation due to their low talent accumulation ability and high credit risk, and banks are cautious about lending to SMEs. Lu [63] thought that bank loans have a high threshold, mainly due to a lack of trust in the risk resistance, mortgage, guarantee, and preservation capabilities of SMEs, resulting in a low reputation evaluation of SMEs in the financing process. Banks tend to adopt a conservative approach in reviewing financing applications for small and medium-sized enterprises. Based on the literature analysis, the following hypotheses are proposed:

H1d: Enterprise reputation status produces a positive effect on credit availability.

4.1.5 The Impact of Enterprise Debt Status on Credit Availability

It is analyzed the survey data of 50 SMEs and concluded that the basic operating characteristics of enterprises, such as the indebtedness and profitability of enterprises, the constraints of financing conditions, and the efficiency of bank lending have a great impact on the financing availability of small and micro enterprises. Hua Bin [64] found that a certain proportion of debt can strengthen the financial leverage efficiency of enterprises, but at the same time, it faces financing risks brought by debt. When making financing decisions, it is necessary to determine a reasonable amount of financing debt, establish a sound enterprise debt management indicator system, and effectively improve the ability of enterprises to prevent and resolve debt risks. Zhang Bing [65] believes that the internal accumulation level, debt repayment ability, profitability, and development ability of enterprises are negatively correlated with enterprise financing, indicating that SMEs with higher levels of these four indicators have lower levels of external debt, less dependence on external financing, and greater potential for internal financing. In addition, the degree of industrial cluster and the level of debt also have a significant impact on the availability of financing. The more concentrated the enterprise and the lower the debt level, the higher the financing availability. Based on the literature analysis, the following hypotheses are proposed:

H1e: Enterprise debt status produces a positive effect on credit availability.

4.2 The Effect of External Factors on Credit Availability

The credit availability of the enterprise is not only influenced by its internal status but also by the external environment. This section proposes the hypotheses that enterprises' external factors will produce a significant

effect on credit availability.

4.2.1 The Impact of Policy Support on Credit Availability

The direct financing support of the government is mainly manifested in government funding, subsidies, and tax incentives. It is believed that a good government-enterprise relationship can effectively promote enterprises to obtain government funding and subsidies. It is found in their empirical study that enterprises with a government-enterprise relationship are more likely to receive preferential tax policy support from the government than enterprises without a government-enterprise relationship. By reducing tax rates, enterprises' cost support is reduced and indirect financing support is realized.

The influence of government-enterprise relationship on debt financing at home and abroad is mainly reflected in bank loans, and less attention is paid to the issuance of bonds by enterprises, most research conclusions show that enterprises with better government-enterprise relationships are more likely to obtain bank loans or other preferential policy support. The advantages of enterprises with government-enterprise relationships in obtaining bank loans are not only reflected in the availability but also the duration and cost. The advantageous position of state-owned enterprises in financing compared with private SMEs belongs to the phenomenon of political financing dominance.

Feng Qian et al. [66] believe that both fiscal subsidies and tax incentives can promote the improvement of enterprise financing efficiency, and fiscal subsidies, through direct subsidies as a pre-incentive, have a stronger overall promoting effect on corporate financing efficiency than tax incentives. Different policies can be adopted at different stages of life to assist SMEs in financing.

Based on the literature analysis, the following hypothesis is proposed:

H2a: Policy support produces a positive effect on credit availability.

4.2.2 The Impact of Financial System Completeness on Credit Availability

First of all, the current regulatory authorities are very strict on the risk control of banks, which leads banks to automatically reject those high-risk loan projects, even though high risk means high return. Second, in the existing environment, banks do not have enough understanding of corporate information, and often banks can only judge whether an enterprise is in a normal operating state or has gone bankrupt. This lack of information leads to a severe information asymmetry that forces banks not to lend to risky small businesses. Ii is believed that SMEs can’t obtain financing from financial institutions due to the imperfect financial system in China and the government's intervention in financial institutions through macro means. Zhong Chenglin et al. [67] found that the digital development of financial institutions effectively promotes the development of financing capabilities of SMEs, and the promotion effect varies depending on the coupling form. Only when the coupling digital form between peripheral and core financial institutions reaches a high level of high coupling, will its marginal promotion effect on the formation of financing capabilities of SMEs be maximized.

Based on the literature analysis, the following hypotheses are proposed:

H2b: Financial system completeness produces a positive effect on credit availability.

4.2.3 The Impact of Information Symmetry Degree on Credit Availability

Scholars generally believe that information asymmetry is the main point of SMEs in credit financing. It is concluded that SMEs have fewer financing channels, and asymmetry is one of the main reasons for the financing difficulties of SMEs, and other reasons are secondary reasons. Information asymmetry makes it impossible for financial institutions to distinguish borrowers with repayment ability from the many loan applications when providing credit funds. It is pointed out that because small enterprises have the problem of information asymmetry in the credit market, they may take advantage of this to hide a lot of important information in the process of applying for loans and after obtaining loans, resulting in adverse selection problems and moral hazard. However, traditional banks cannot solve the problem of information asymmetry, so the cost of providing loans to small enterprises is high, which makes small enterprises unable to obtain sufficient funds. Second, developing capital markets for SMEs will not alleviate the financing problems of domestic small businesses. Because most of the small enterprises in China are labor-intensive enterprises and the capital market has very high requirements for enterprises, it is

difficult for these small enterprises to meet the requirements of a listing. Third, development loan guarantee agencies may not be able to address information asymmetries unless they have sufficient motivation and capacity to identify and monitor the small enterprises that guarantee them. In addition, due to China's current economic situation, market competition is not enough, many mechanisms are still distorted, and there is no perfect social justice mechanism and credit system, and these are not conducive to the establishment of a good information transmission and sharing environment so that the information asymmetry problem cannot be solved.

Wei Shiru et al. [68] summarized that SMEs generally face investment and financing constraints. At the same time, due to the existence of high information asymmetry, SMEs are more likely to encounter difficulties in credit allocation and lower credit levels, and therefore face stronger financing constraints. In the context of the rapid rise of the digital economy, listed companies must strengthen information disclosure to adapt to the market economy reduce financing costs, and obtain more capital flow by improving the level of the digital economy.

Based on the literature analysis, the following hypotheses are proposed:

H2c: Information symmetry degree produces a positive effect on credit availability.

4.2.4 The Impact of the Banking Industry Scale on Credit Availability

It is concluded that almost all big banks are joint-stock banks with the characteristics of modern joint-stock enterprises. The procedures before and after the approval of loans are carried out by standard procedures, and the information based on which loans are made is based on hard information. Loans are also constrained by principal-agent. This also explains why it is harder for small businesses to get loans from big banks. At the same time, the vast majority of credit officers at big banks do not have equity in the bank but are just ordinary employees who lack the incentive to work harder and get more. However, many small banks are private banks. The system is not perfect, and the staff engaged in loans has greater subjectivity, so soft information can play a better role in loan decision-making. In addition, many staff members own shares or have a profit-sharing mechanism, and profit-driven staff members are therefore more inclined to quickly extend loans to small and medium-sized business owners with whom they are associated. Some empirical studies showed that large banks can only approve loan applications to large enterprises with a long life with formal financial records, while small enterprises rely on established bank-enterprise cooperation. Yao Xueqi [69] indicates a U-shaped relationship between banking concentration and financing constraints for SMEs. SMEs often rely on soft information to establish long-term business relationships with banks, and obtain external financing through "relational loans" rather than "transactional loans". Compared to large banks, small banks have a "comparative advantage" in financing for SMEs.

Based on the literature analysis, the following hypotheses are proposed:

H2d: The banking industry scale produces a positive effect on credit availability.

5 Research Design

5.1 Model Selection

This chapter selects the Binary Logistic Regression Model to analyze the influencing factors of credit availability of SMEs. Logistic Regression Models are the most mature classification models. In this chapter, we assume that the dependent variable Y is a random variable with only 0 and 1. 1 represents the approved amount with probability P and 0 represents the unapproved amount with probability 1-p. The respective variables are X_1, X_2,……, X_n. Then the regression form of the Logistic Model is:

$$Y = \alpha + \beta_1 X_1 + \cdots + \beta_n X_n + \mu \tag{1}$$

Among them:

$$Y = logitP \tag{2}$$

$$logitP = \ln \frac{p}{1-p} \tag{3}$$

Among them, $\frac{p}{1-p}$ is the ratio of the probability of the approved and the unapproved, called the advantage ratio (hereinafter denoted as the OR value). The greater the value, the greater the probability of the approved. $logitP$ is the logarithm of the advantage ratio.

So:

$$\ln \frac{p}{1-p} = \alpha + \beta_1 X_1 + \cdots + \beta_n X_n + \mu \tag{4}$$

Here, α is the constant term, n=9, and X_i is the explanatory variable. β is the regression coefficient of each explanatory variable, i = 1, 2,....., 9. μ is the error term.

The Logistic Regression Model in this chapter analyzes the corresponding variables by estimating the advantage ratio. For the binary categorical variables, the advantage ratio is $\frac{P(Y=1)}{P(Y=0)}$ and the advantage ratio is $\frac{P(Y_i=1)/P(Y_i=0)}{P(Y_j=1)/P(Y_j=0)}$. According to this ratio, the comparison of variables affecting the loan appropriation of small loan companies can be quantitatively analyzed when controlling the relevant influencing factors.

In addition, taking β_1 as an example. If X_2, X_3, ⋯, X_9 is constant and the change in X_1 is ΔX_1, we can get the change in the logarithmic dominance ratio:

$$\ln OR = \beta_1 \Delta X_1 \quad (5)$$

Namely:

$$OR = e^{\beta_1 \Delta X_1} \quad (6)$$

When β_1 (then OR >1), the OR value increases, and the corresponding grant probability increases, and vice versa. Therefore, by observing the OR value of each factor in the regression analysis, we can know the influence of the factor on whether to lend.

5.2 Data Source and Variable Interpretation

This chapter has developed a survey questionnaire based on the 9 influencing factors identified in the previous text. The questionnaire content includes the following aspects: How are the management standard, financial status, reputation status, and debt status of the enterprise? How are the local policy support, financial system completeness, information symmetry degree, and banking industry scale? There are 5 options, of which "1" represents very bad, "2" represents relatively bad, "3" represents average, "4" represents relatively good and "5" represents very good. At the same time, representing the enterprise scale, the annual operating income of the enterprise will be asked. There are also five options, of which "1" represents an annual income less than 3 million yuan, "2" represents an annual income between 3.01 million yuan and 10 million yuan, "3" represents an annual income between 10.01 million yuan and 20 million yuan, "4" represents an annual income between 20.1 million yuan and 50 million yuan and "5" represents an annual income over 50 million yuan. Finally, when asked if the enterprise has recently obtained financing, there are only two options, of which "0" represents no and "1" represents yes. The questionnaire was distributed to many SME managers in Jiangsu, and ultimately 134 valid responses were received.

Table 3 Variable Interpretation

Variable category	Variable name	Value Description
Dependent variable	Credit availability	0-Unavailable, 1-Available
Independent variable	Enterprise management standard	very bad, relatively bad, average, relatively good, very good
	Enterprise financial status	
	Enterprise reputation status	
	Enterprise debt status	
	Policy support	
	Financial system completeness	
	Information symmetry degree	
	Banking industry scale	
	Enterprise scale	1-≤3 million yuan, 2-3.01~10 million yuan, 3-10.01~20 million yuan, 4-20.01~50 million yuan, 5-≥50 million yuan

6 Analysis of Empirical Results

6.1 T-test and Chi-square Test

In logistic regression analysis, not every independent variable may be related to the dependent variable, so in the first step, we need to screen independent variables by t-test and chi-square test.

From the variable description table above, it can be seen that, among 9 independent variables, enterprise management standard, enterprise financial status, enter-

prise reputation status, enterprise debt status, policy support, financial system completeness, information symmetry degree, and banking industry scale are continuous variables. The higher their scores, the stronger their degrees. Enterprise scale is a categorical variable that is divided into 5 categories based on annual income.

When the independent variable is continuous, an independent sample t-test is needed to test whether there is a significant difference in independent variables between enterprises that have obtained financing and those that have not. By performing the corresponding operations in SPSS, we can obtain the following results (shown in table 4).

In the table, we can see that the P-values (Sig. (2-tailed)) of enterprise management standard, enterprise reputation status, policy support, financial system completeness, and information symmetry degree are less than 0.05, so we can make a preliminary judgment that these 5 independent variables indicate a significant impact on the dependent variable. The P-value (Sig. (2-tailed)) of enterprise financial status, enterprise debt status, and banking industry scale is far more than 0.05. Therefore, their impact is not significant enough and we will remove them in the following analysis.

When the independent variable is a categorical variable, a chi-square test is needed to test whether there is a significant difference in independent variables between enterprises that have obtained financing and those that have not. By performing the corresponding operations in SPSS, we can obtain the following results (shown in Table 5).

Table 4 Independent Samples Test

Variable		Sig. (2-tailed)
Enterprise Management Standard	Equal variances assumed	<0.001
	Equal variances not assumed	<0.001
Enterprise Financial Status	Equal variances assumed	0.304
	Equal variances not assumed	0.321
Enterprise Reputation Status	Equal variances assumed	<0.001
	Equal variances not assumed	<0.001
Enterprise Debt Status	Equal variances assumed	0.702
	Equal variances not assumed	0.704
Policy Support	Equal variances assumed	<0.001
	Equal variances not assumed	<0.001
Financial System Completeness	Equal variances assumed	<0.001
	Equal variances not assumed	<0.001
Information Symmetry Degree	Equal variances assumed	<0.001
	Equal variances not assumed	<0.001
Banking Industry Scale	Equal variances assumed	0.676
	Equal variances not assumed	0.692

Table 5 Pearson Chi-Square Test

Variable	Asymptotic Sig. (2-sided)
Enterprise Scale	0.978

In the table, we can see that the P-value (Sig. (2-tailed)) of enterprise-scale is 0.978, far more than 0.05, so we can make a preliminary judgment that enterprise-scale cannot indicate a significant impact on the dependent variable. We will also remove it in the following analysis.

6.2 Collinearity Diagnostics

In the above t-test and chi-square test, we retained 5 independent variables that have a significant impact on the dependent variable, but we also need to ensure that the correlation between these 5 independent variables is not too high, otherwise, multicollinearity will occur, which will affect the final result. Therefore, next, we need to perform collinearity diagnostics on these 5 independent variables. By performing the corresponding operations in SPSS, we can obtain the following results (shown in table 6).

Table 6 Collineartiy Diagnostics

Variable	VIF
Enterprise Management Standard	1.599
Enterprise Reputation Status	1.563
Policy Support	1.559
Financial System Completeness	1.922
Information Symmetry Degree	1.461

In the table, we can observe that the VIF values of all 5 independent variables are less than 5, indicating that there is no severe multicollinearity between them, and further analysis can be conducted.

6.3 Binary Logistic Regression Analysis

After removing independent variables that are not significantly related to the dependent variable and ensuring that there is no severe multicollinearity between the retained independent variables, binary logistic regression analysis can be conducted. We conducted binary logistic regression analysis on the data in SPSS and obtained the following results.

Table 7 Omnibus Tests of Model Coefficients

Omnibus Tests		Sig.
Step 1	Step	<0.001
	Block	<0.001
	Model	<0.001

Table 8 Hosmer and Lemeshow Test

Hosmer and Lemeshow Test	Sig.
Step 1	0.857

From Table 7, it can be seen that the Omnibus test of the model coefficients passed the significance test (P<0.001), indicating that the regression model is effective. Table 8 showed that in the Hosmer-Lemeshow test, P=0.857>0.05, indicating a good fit between the model and the actual data.

Table 9 Classification Table

			Predicted		
			Credit Availability		Percentage Correct
			Available	Unavailable	
Observed	Credit Availability	Available	28	4	87.5
		Unavailable	3	99	97.1
	Overall Percentage				94.8

Table 9 lists the observed and predicted values. From the classification table, it can be seen that the model has a prediction accuracy of 87.5% for 32 available samples and 97.1% for 102 unavailable samples. The overall prediction accuracy has reached 94.8%, illustrating that the model's prediction performance is pretty good. Among the 134 valid samples, 102 haven't obtained financing, and 32 have, with a credit availability of 23.9%. It can be easily seen that the credit availability of SMEs is relatively low, and it is difficult for SMEs to obtain financing from lenders.

Table 10 Binary Logistics Regression Analysis

Variable	Sig.	Exp(B)
Enterprise Management Standard	0.015	3.137
Enterprise Reputation Status	0.005	4.383
Policy Support	0.005	4.562
Financial System Completeness	0.016	3.341
Information Symmetry Degree	0.021	3.647

As can be seen from the table, the P-values of all 5 independent variables are less than 0.05, confirming the preliminary judgment made earlier. As a result, we can conclude that under the significance level of 5% (P < 0.05), the significant factors affecting the availability of credit for small and medium-sized enterprises include: enterprise management standards, enterprise reputation status, policy support, financial system completeness, and information symmetry degree. The specific results are analyzed as follows:

(1) Enterprise Management Standard

The significant coefficient P=0.015 < 0.05, so enterprise management standard has a significant impact on credit availability. Exp (B) is 3.137, namely OR = 3.137, which means that for every unit increase in enterprise management standard, the probability of SMEs obtaining financing increases by 2.137 times. This shows that the higher the enterprise management standard of SMEs, the higher the possibility of microcredit companies lending to SMEs. In other words, enterprise management standard produces a positive effect on credit availability, and hypothesis H1a is correct.

(2) Enterprise Scale

Enterprise scale did not pass the chi-square test, so it has no significant impact on whether SMEs obtain financing, meaning that hypothesis H1b fails. The reason may be that enterprises of different scales have their advantages and disadvantages. For larger enterprises, the amount of funds required is too large, the review process is more complicated and the requirements are stricter. For smaller enterprises, loan risks are higher, and lending institutions are unwilling to bear these risks.

(3) Enterprise Financing Status

Enterprise financing status did not pass the t-test, so it has no significant impact on whether SMEs obtain financing, meaning that hypothesis H1c fails. The reason may be changes in industry prospects and market demand. Some financing institutions may focus more on the poten-

tial of the enterprise, rather than just the current financial status.

(4) Enterprise Reputation Status

The significant coefficient P=0.005 < 0.05, so enterprise reputation status has a significant impact on credit availability. Exp (B) is 4.383, namely OR = 4.383, which means that for every unit increase in enterprise reputation status, the probability of SMEs obtaining financing increases by 3.383 times. This shows that the higher the enterprise reputation status of SMEs, the higher the possibility of microcredit companies lending to SMEs. In other words, enterprise reputation status produces a positive effect on credit availability, and hypothesis H1d is correct.

(5) Enterprise Debt Status

Enterprise debt status did not pass the t-test, so it has no significant impact on whether SMEs obtain financing, meaning that hypothesis H1e fails. When financing institutions consider providing financing, they usually evaluate the debt structure and solvency of the enterprise. If the enterprise's debt structure is reasonable and its debt-paying ability is strong, even if the enterprise has a certain debt burden, financing institutions may still be willing to provide financing.

(6) Policy Support

The significant coefficient P=0.005 < 0.05, so policy support has a significant impact on credit availability. Exp (B) is 4.562, namely OR = 4.562, which means that for every unit increase in policy support, the probability of SMEs obtaining financing increases by 3.562 times. This shows that the more policy support SMEs have received, the higher the possibility of microcredit companies lending to SMEs. In other words, policy support produces a positive effect on credit availability, and hypothesis H2a is correct.

(7) Financial System Completeness

The significant coefficient P=0.016 < 0.05, so financial system completeness has a significant impact on credit availability. Exp (B) is 3.341, namely OR = 3.341, which means that for every unit increase in financial system completeness, the probability of SMEs obtaining financing increases by 2.341 times. This shows that the higher the financial system completeness, the higher the possibility of microcredit companies lending to SMEs. In other words, financial system completeness produces a positive effect on credit availability, and hypothesis H2b is correct.

(8) Information Symmetry Degree

The significant coefficient P=0.021 < 0.05, so the information symmetry degree has a significant impact on credit availability. Exp (B) is 3.647, namely OR = 3.647, which means that for every unit increase in information symmetry degree, the probability of SMEs obtaining financing increases by 2.647 times. This shows that the higher the information symmetry degree, the higher the possibility of microcredit companies lending to SMEs. In other words, the information symmetry degree produces a positive effect on credit availability, and hypothesis H2c is correct.

(9) Banking Industry Scale

The banking industry scale did not pass the t-test, so it has no significant impact on whether SMEs obtain financing, meaning that hypothesis H2d fails. The reason may be fierce competition within the banking market. Even if the banking industry shrinks in scale, multiple banks compete to provide loans and financing services, which can lower the financing threshold and enhance the credit availability of SMEs.

7 Conclusion

This article first elaborates on the background of the research topic and proposes the research topic: a study on the influencing factors of financing of small and medium-sized enterprises with the participation of microcredit companies. Subsequently, this article reviews the relevant literature at home and abroad, sorting out the theoretical basis and influencing factors of financing SMEs, as well as the impact of the participation of microcredit companies. Based on references and expert opinions, this article designs internal and external factors for financing SMEs. Through word frequency analysis, five internal factors are ultimately selected to study and examine, including enterprise management standard, enterprise scale, enterprise financial status, enterprise reputation status, and enterprise debt status, as well as four external factors, including policy support, financial system completeness, information symmetry degree, and banking industry scale. Next, the data sources were explained and research hypotheses related to the influencing factors and credit availability were proposed. The logistic regression model was established for the influencing factors of credit availability. Through calculation, the descriptive analysis was conducted on the variables, followed by the empirical analysis of the factors influencing the credit availability of SMEs. Through the analysis of empirical results, conclusions can be drawn and we can get the most significant influencing factors of financing of small and medi-

um-sized enterprises with the participation of microcredit companies.

As a result, the main influencing factors of financing of small and medium-sized enterprises with the participation of microcredit companies studied in this article include enterprise management standard, enterprise scale, enterprise financial status, enterprise reputation status, enterprise debt status, policy support, financial system completeness, information symmetry degree, banking industry scale. Through logistic regression analysis, we found that the significant ones are enterprise management standard, reputation status, policy support, financial system completeness, and information symmetry degree. The corresponding hypotheses are valid, and the significant influencing factors are indeed related to credit availability. About how microcredit companies help with financing issues for SMEs, the answer is multifaceted. The participation of microcredit companies is beneficial for SMEs to solve financing information asymmetry, tackle financing allocation constraints, and address structural deficiencies in financing systems. The most direct point is that microcredit companies have expanded the financing channels for small and medium-sized enterprises, allowing them to gain vitality in the financing monopoly of large enterprises.

This study has certain theoretical and practical implications. In terms of theory, although the influencing factors of financing SMEs have been extensively studied, the financing difficulties of SMEs have been alleviated to a certain extent with the participation of microcredit companies, and the influencing factors may change. This article introduces the participation of microcredit companies and explores the influencing factors of financing SMEs through an actual survey questionnaire, which has reference significance for future research. In terms of practice, study on the influencing factors of financing can help SMEs identify the reasons for financing difficulties so that they can prescribe targeted solutions, improve their weaknesses, and thus promote the alleviation of the financing difficulties.

Admittedly, there are limitations in our research. Firstly, even though we have investigated multiple enterprises in Jiangsu and learned about the influencing factors of financing under the participation of microcredit companies, there may be differences in the financing environment in each region. It remains to be debated in depth whether the conclusions drawn from this study apply to other regions. Secondly, judging the importance of influencing factors solely based on the significance level of the logistic regression model is somewhat unilateral. Whether other methods can be used to enrich the comprehensiveness of this study can also be an exploration direction for future research.

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