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THE INFLUENCING FACTORS OF CREDIT BEHAVIOR OF AGRICULTURAL SMALL AND MICRO ENTERPRISES IN WESTERN CHINA

ABSTRACT

Small and Micro Enterprises represent a vital component of China's economy, playing an increasingly significant role in driving economic growth, fostering innovation, and maintaining regional balance. However, financing constraints have long been a major impediment to their development. This challenge is particularly acute for Agricultural Small and Micro Enterprises (ASMEs) in remote western regions of China, which have struggled to find effective solutions to their funding difficulties. This study aims to systematically identify the key factors influencing the credit behavior of agricultural small and micro enterprises (ASMEs) in western China, with the objective of addressing their persistent financing constraints. To systematically investigate the underlying causes of these persistent financing challenges, this study examines 253 ASMEs in Western China, employing a comprehensive methodology that combines descriptive statistical analysis with logistic regression modeling. The results demonstrate that institutional credit constraints from financial institutions manifest primarily in three aspects: the availability of qualifying mortgage collateral, the standardization level of financial statements, and specific requirements regarding loan maturity periods. The analysis confirms that both the provision of adequate collateral and the maintenance of standardized financial documentation significantly improve the likelihood of securing financing. Conversely, financial institutions show a distinct preference for short-term lending to ASMEs, creating additional challenges for enterprises requiring longer-term capital. Beyond these institutional constraints, the study identifies that maintaining strong bank-enterprise relationships—particularly through banking diversification, meaning establishing connections with multiple financial institutions—can effectively mitigate information asymmetry and enhance the probability of successful financing. Furthermore, the research indicates that regions with a higher concentration of small and medium-sized financial institutions tend to foster more competitive financial environments, ultimately benefiting ASMEs' credit access. These findings not only illuminate the multidimensional financing barriers confronting agricultural small and micro enterprises but also provide valuable empirical evidence to support financial institutions in optimizing their service structures and assist government agencies in formulating targeted support policies.

Keywords: agricultural micro and small enterprises, credit availability, influencing factors, Western China, bank-enterprise relationship, financing behavior, information asymmetry, pecking order theory

JEL Classification: G21, G32, D63

INTRODUCTION

The number of small, medium, and micro enterprises (SMMEs) in China has exceeded 20 million legal entities and more than 60 million individual businesses, becoming an important part of China's economy. These enterprises play an important role in promoting economic growth, creating jobs, and contributing tax revenue (Wenkai et. al., 2024). According to the fourth national economic census series report, SMMEs contribute 80 % of China's employment, more than 60 % of GDP, and more than 50 % of tax revenue. At the same time, they are also the main force of China's innovation. According to the data, SMMEs account for 82 % of new product research and development, 74 % of

technological innovation, and 66 % of patent inventions in the field of independent innovation, contributing about 70 % of the country's patent invention rights.

According to the tax declaration data of the state administration of taxation, by the end of September 2024, there were 81.56 million small and micro enterprises (SMEs) in China, accounting for 96.5 % of the total number of business entities in China.

Among them, the growth rate of new households in wholesale and retail, transportation, sports and entertainment, agriculture, forestry, animal husbandry, and fishery industries has reached more than double digits (Jianhuan, 2024). Given the importance of SMEs to the economy of the country, financing issues in such enterprises are relevant to the sustainable development of these businesses. Notwithstanding such significance, the problem of financing difficulties still exists, especially the financing problems of agricultural small and micro enterprises (ASMEs) need more attention, so as to realize the strategy of rural revitalization in China.

There are many problems in the development of SMEs in developing countries, among which financing has always been one of the main constraints on the development of SMEs (Gerba et. al., 2016). Because SMEs find it difficult to obtain loans from formal financial institutions, most enterprises have to turn to private lending (Kariuki & Namusonge, 2024). However, China's private lending system is not perfect, which can easily lead to social risks. The turmoil caused by the events has greatly affected the stability of local society (Manfeng & Long, 2019). Although the Chinese government has issued a number of policies to encourage financial institutions to lend to SMEs in recent years, the financing constraints of SMEs have not been effectively solved. Therefore, it is particularly important to study the credit financing behavior of ASMEs in the background of rural revitalization, which is helpful to understand the influencing factors of financing behavior of these businesses in order to promote their healthy development.

China's ASMEs have the characteristics of simple production technology, low output, a single market, and a small share, and the profits of products or services provided are low (Ling & Liping, 2017). Generally, they have market share in specific regions, and the regional characteristics in the marketing process are distinct (Liu & Lu, 2024). The economic development in the eastern and western regions of China is not balanced, and the distribution of ASMEs in the whole country is also uneven. The number and quality of ASMEs in the southeast coastal provinces are much higher than those in the central and western provinces (Lin, 2016). Compared with agricultural large and medium-sized enterprises, ASMEs have fewer employees and narrower sources of funds (Gajigo, 2013). Many ASMEs have weak profitability, difficulties in capital flow, weak financial stability, backward equipment and facilities, almost no technological R&D and process innovation capabilities, and a lack of sufficient funds for leapfrog and multi-field development (Effiong et. al., 2017). Due to the weak market competitiveness and weak capital base, the vast majority of ASMEs have poor anti-risk ability, a poor living environment, and a short average life cycle. This is why we take Xinjiang ASMEs in western China as the research object and analyze the influencing factors of their credit behavior.

LITERATURE REVIEW

SMEs are a concept that has emerged in recent years; it is a general term for small enterprises, micro enterprises, family workshop enterprises, and individual industrial and commercial households. SMEs were originally affiliated with the category of small and medium-sized enterprises. Until 2011, the Ministry of Industry and Information Technology and four other departments of China issued the "Small and medium-sized enterprise classification standard" according to the enterprise capital. Macmillan first proposed the financing problem of small-scale enterprises in the "Macmillan Report" submitted to the British government in 1931. Since then, the problem of financing constraints of SMEs has been a hot topic for scholars in various countries. Based on existing research, the main influencing factors of enterprise credit include: education and experience of the owner, age and size of the firm, business sector, capital base, capital sources, net production income, cost expenditure, and interest rate level (Al-Afifi, 2019). At present, China's interest rate marketization has not been fully realized. Therefore, this paper does not consider the factor of interest rate level in the research process, and analyzes it according to the theoretical hypothesis.

The Impact of Owners' Ability on Credit Availability

Entrepreneur-managers are frequently seen as having their own styles when making financing and strategic choices, along these lines engraving their capabilities on the organizations they oversee (Eniola, 2018). Mittal & Raman (2020) confirm that the pecking order theory holds true for SMEs. It has been found that owners who chose external financing as their priority belong to the highly educated bracket, whereas people who are less educated are all inclined towards internal financing (Neves et.al., 2024). It clearly depicts how education plays a crucial role in determining the financing behavior

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of entrepreneurs. Haileselasie (2009) also presented an empirical investigation of MSE owners' financing preference in light of the Pecking Order Hypothesis: factors such as ownership type, acquisition type, level of education of the owner, and reason for business startups are found to be major determinants of MSEs' financing preferences. Generally, from the regression result, Awlachew & Motumma (2017) concluded that the age of owners and the age of enterprises were the most determinant factors for financing preferences of SME owners. Since ownership and management in ASMEs are not separated, entrepreneurs serve as both owners and operators. They are responsible for making major decisions and handling internal management as well as external communication. Therefore, the personal characteristics of entrepreneurs can directly influence the business decisions of financial institutions. Entrepreneurs with high educational levels and extensive management experience can facilitate the development of credit business. Therefore, we can put forward the following research hypothesis:

Hypothesis 1: *The higher the personal ability of the leaders of ASMEs, the higher the availability of credit.*

The Impact of Credit Contract Characteristics on Credit Availability

The characteristics of a credit contract include three aspects of mortgage collateral, financial statements, and loan terms: Mortgage collateral can directly influence the success rate of SMEs when applying for loans, as many of these enterprises have weak economic foundations and low standards of financial management (Amene, 2017). Financial institutions often struggle to fully understand the operational status of these enterprises, leading to high approval costs. If SMEs are able to provide collateral, they can significantly enhance their chances of obtaining a loan. Collateral helps reduce the information asymmetry between banks and enterprises, enabling financial institutions to effectively mitigate credit risks (Abara & Banti, 2017). Even if SMEs default, they can minimize losses through the collateral agreement. Additionally, collateral provided by SMEs serves as a means to improve their credit rating and demonstrate their economic strength. Collateral can have positive effects on the development of credit operations (Haron et. al., 2013).

Financial statements can indicate the credit availability of ASMEs. During the loan approval process, financial institutions need to understand the financial situation of the enterprises for risk management (Fufa, 2016). Financial statements can provide multiple indicators, such as annual revenue, annual profit, and cash flow, which reflect the current operating status, business structure, and market potential of the enterprises (Gamage et. al., 2013). Financial information can help enterprises achieve accurate market positioning. Additionally, financial institutions can use financial statements to evaluate the enterprises' position in the industry and assess their debt repayment capacity (Kira et. al., 2012). Financial statements assist financial institutions in making credit decisions and provide a basis for evaluating the future trends of the enterprises (Awlachew et. al., 2017). ASMEs with sound financial statements are more likely to receive loan approval from established financial institutions, such as commercial banks, and secure external financing from legitimate sources.

The loan term is also a part of the features of the credit contract. For financial institutions, the longer the loan term, the greater the risk, the higher the management cost, and the weaker the liquidity of the funds (Khan et. al., 2024). Since the life cycle of ASMEs in China is relatively short, the medium to long-term loan business requires financial institutions to pay more management costs and face greater market risks (Zhao et. al., 2022). Therefore, commercial banks and other regular financial institutions are not inclined to provide medium-to-long-term loans to ASMEs. Short-term loans for ASMEs are easier to obtain approval for. For the above reasons, we can make the following hypothesis:

Hypothesis 2: *The more favorable the credit characteristics of ASMEs are, the higher their credit availability will be.*

The Impact of Bank-Enterprise Relationship on Credit Availability

The relationship between banks and enterprises can directly affect the success rate of enterprise loan applications (Fatoki & Asah, 2011). Financial institutions can rely on long-term bank-enterprise relationships to understand the enterprise's current operations and development direction, alleviate market information asymmetry, and effectively reduce credit risks (Nguyen et. al., 2015). A good and stable bank-enterprise relationship can reduce the credit management costs of financial institutions and alleviate the pressure of credit risks for financial institutions, while bringing positive impacts on enterprises to effectively obtain the desired credit (Moro et. al., 2013). In the research process of this paper, analysis was conducted from the perspectives of the scale and length of bank-enterprise relationships. One is the scale of the bank-enterprise relationship, i.e., the more banks with which an enterprise maintains a cooperative relationship, the better the quality of credit services it can obtain. The wider the enterprise's financing channels, the less constrained it will be by the bank's credit standards, ensuring that the enterprise can obtain sufficient external channel capital; The other is the length of the bank-enterprise relationship, i.e., the longer the cooperative time between an enterprise and its main cooperative bank, the smaller the information asymmetry conflicts between the two, the higher the bank's trust in the enterprise, and the formation of a good "relationship-based lending" can effectively improve the enterprise's loan application success rate and

provide financial support for the enterprise's development and expansion. Therefore, we can put forward the following research hypothesis:

Hypothesis 3: *The better the ASMEs' relationship with banks, the higher the availability of credit.*

The Impact of Enterprise Characteristics on Credit Availability

The economic foundation of SMEs has an impact on the satisfaction of their credit needs. When the asset strength of the enterprise is strong, the cash flow is sufficient, and the financial stability is higher, the credit demand of the enterprise is usually not high (Yang & Shen, 2022). However, as market competition becomes increasingly fierce, enterprises gradually explore developing in multiple fields or launching diversified products or services through debt financing, expanding their scale under the premise of controlling risks, thus increasing their credit demand (Zhang et. al., 2025). Economically stronger SMEs often have more collateral, which makes them more likely to meet the credit requirements of commercial banks and other regular financial institutions (Melesse, 2019). Such enterprises are also more inclined to engage in credit cooperation with regular financial institutions that offer lower interest rates (Petros, 2017). On the other hand, if the SMEs have a weak economic foundation and poor financial stability, their chances of obtaining loans from regular financial institutions are not high due to limited collateral and guarantee (Abor & Biekpe, 2009). As a result, these enterprises can only maintain credit cooperation with non-standard financial institutions with relatively high interest rates during their survival and development process. Therefore, it can be seen that the asset size of ASMEs has a significant impact on whether their credit needs can be met and how they are met.

The annual revenue of SMEs has a direct impact on whether their credit needs can be met (Zhibo & Yue, 2012). Enterprises with larger annual revenue have stronger liquidity and adequate cash flow, so their credit needs are not high (Rao et. al., 2019). If a company has a higher annual revenue, it indicates that its competitiveness in the market is recognized, its strategic planning is of a higher degree of rationality, its credit level and debt repayment standards meet the loan authorization standards of financial institutions, and if the company needs to finance its further development through external sources, it can apply for loans from regular financial institutions with lower interest rates to obtain additional financial resources (Yang et. al., 2024). On the other hand, SMEs have lower annual incomes, which means they possess weaker financial flexibility, insufficient cash flow, and lower market competitiveness. Their credit ratings, financial stability, and debt repayment standards do not meet the requirements of regular financial institutions (Watson et. al., 2010). Therefore, they can only seek cooperation with informal financial institutions to supplement their financial resources. It can be seen that the size of an enterprise's annual revenue has a significant impact on whether its borrowing expectations can be realized. Companies with larger annual revenues are able to obtain more formal financing at lower interest rates, which further drives their future development.

Enterprise growth potential refers to the prospects of a company's future development. Financial institutions in credit approval not only evaluate the current assets of the enterprise, but also pay attention to the trend of the company's future development (Nouman et. al., 2024). For potential enterprises with market development, financial institutions will recognize their ability to repay debts, resulting in a higher success rate for their loan applications (Beck & Demirguc-Kunt, 2006). On the other hand, if financial institutions do not recognize the development potential of these enterprises and believe that their profitability and ability to repay debts will decline in the future, they will abandon credit cooperation with them. For these reasons, we can make the following hypothesis:

Hypothesis 4: *The higher the comprehensive strength of ASMEs, the higher the availability of credit.*

The Impact of the Development of Small and Medium-sized Financial Institutions on Credit Availability

In contrast to large commercial banks, small and medium-sized financial institutions place greater emphasis on providing credit services to SMEs, offering additional funding to these enterprises. Data statistics show that the proportion of loans to SMEs provided by small and medium-sized financial institutions is higher than that of large commercial banks. In the process of adjusting their business structure, small and medium-sized financial institutions are also more inclined to develop credit services for SMEs (Mbere & Safitri, 2024). This is mainly due to the fact that these institutions pay more attention to the development of grassroots markets, utilizing "relationship-based lending" to alleviate market information asymmetry, improve the relationship between banks and enterprises, and ultimately enhance market analysis and the accuracy of credit approval (Banerjee & Duflo, 2014). However, some researchers in the academic community argue that relationship-based lending is not the only way to improve the financing environment for SMEs (Nidi et. al., 2016). Transactional lending models, such as leasing loans and factoring loans, can also alleviate the information gap between banks and enterprises, and large commercial banks have more experience in managing these transactional lending methods. In addition, the large commercial banks have a clear advantage in terms of funding and network, which can better promote the development of

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ASMEs. In China, whether small and medium-sized financial institutions should provide sufficient support for the financing of ASMEs through adjustments in business structure and policy preferences is a topic of controversy in the academic community (Gu et. al., 2024). This study will use the number of small and medium-sized financial institutions in the region as a measure of their support for ASMEs, and will further explore the credit accessibility of these enterprises through empirical analysis. Therefore, we can put forward the following research hypothesis:

Hypothesis 5: *The more developed the local financial institutions, the higher the credit availability of ASMEs.*

AIMS AND OBJECTIVES

This study aims to systematically identify the key factors influencing the credit behavior of agricultural small and micro enterprises (ASMEs) in western China, with the objective of addressing their persistent financing constraints. Specifically, it seeks to empirically analyze the impact of enterprise owner characteristics, credit contract terms, bank-enterprise relationships, firm-specific attributes, and the development of local financial institutions on credit availability. Through a survey of 253 ASMEs in Xinjiang, the research further examines their credit demand patterns and borrowing behavior choices. The ultimate goal is to derive evidence-based recommendations for ASMEs, financial institutions, and policymakers to improve credit access and support the sustainable development of these enterprises in the context of rural revitalization.

METHODS

Respondent Selection

Compared to the previous definition of ASMEs in the academic community, some researchers have redefined these enterprises as private enterprises based on their characteristics in China. During the research process, this paper found that some literature defines these enterprises as economic entities with an asset size not exceeding 1 million Yuan (RMB) (Bulibuli et. al., 2023). Therefore, this paper takes it as the standard, formulates the corresponding questionnaire, and takes Urumqi as the main research area, supplemented by Changji and Korla areas in the Xinjiang region, China, and uses the sampling survey method to carry out the research. Then, these survey data are described and analyzed by the Statistical Package for Social Sciences (SPSS, version 28.0, IBM, Chicago, IL, USA) software.

Investigation Content

This paper analyzes the credit behavior of ASMEs. The content of the questionnaire is mainly divided into three levels: First, the current situation of operation. Investigate the owners' ability, employees' comprehensive quality, industrial characteristics, self-owned funds, and production scale of ASMEs; Second, loan demand. Investigate the degree of borrowing demand, expectation, expectation period, and financing purpose of ASMEs; third, lending behavior. Investigate whether ASMEs engage in financing behavior based on their financing demand, as well as the financing channels and interest rates.

Sample Statistics

By entrusting college students to carry out this survey in their spare time, a total of 300 questionnaires were distributed, of which 150 were distributed in Urumqi, 50 in Changji, 50 in Korla, and 50 in other places. A total of 274 questionnaires were collected, with a recovery rate of 91.3 %. A total of 253 valid questionnaires were collected, with an effective sample rate of 84.3 % (Table 1).

Table 1. Survey Sample Description. (Source: descriptive statistical analysis of survey data)

Sample	Category	Number	Percentage	Cumulative percentage
Educational background of the manager in charge of the enterprise	Elementary school or below	23	9.09%	9.09%
	Junior high school	72	28.46%	37.55%
	High school	104	41.11%	78.66%
	College degree or above	54	21.34%	100.00%
Average educational level of employees	Elementary school or below	13	5.14%	5.14%
	Junior high school	105	41.50%	46.64%
	High school	101	39.92%	86.56%
	College degree or above	34	13.44%	100.00%

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Table 1. Continued.

Sample	Category	Number	Percentage	Cumulative percentage
Industry	Wholesale and retail of agricultural products	46	18.18%	18%
	Agricultural product processing	73	28.85%	47.03%
	Agricultural product business services	27	10.67%	57.71%
	Scientific research and technical services	10	3.95%	61.66%
	Agricultural production	97	38.34%	100.00%
The duration since the entries were founded	Under 1 year	14	5.53%	5.53%
	1-3 years	83	32.81%	38.34%
	3-5 years	80	31.62%	69.96%
	Over 5 years	76	30.04%	100.00%
The range of enterprise asset size	Under RMB 100,000	54	21.34%	21.34%
	RMB 100,001-500,000	106	41.90%	63.24%
	RMB 500,001-1,000,000	93	36.76%	100.00%
	Over RMB 1 million	0	0.00%	100.00%
The annual operating income range of the enterprise	Under RMB 100,000	112	44.27%	44.27%
	RMB 100,001-500,000	98	38.74%	83.01%
	RMB 500,001-1,000,000	41	16.21%	99.21%
	Over RMB 1 million	2	0.79%	100.00%

RESULTS

Credit Demand Characteristics

Through the statistics of 177 ASMEs with credit demand, it is found that they mainly have the following three financial demand characteristics: First, expectations are high. The survey found that there were 40 enterprises with credit expectations of less than RMB 100,000, 68 enterprises between RMB 100,000 and RMB 300,000, and 38 enterprises between RMB 300,000 and RMB 500,000. Although 83.05 % of the credit expectations of ASMEs are less than RMB 500,000, compared with the annual income of ASMEs, the expectations are higher, which also shows that the accumulation of self-owned funds of ASMEs has been difficult to meet the development needs. It is urgent to obtain capital supplement through external channels to expand the scale of production; Second, mainly in the short term. Most enterprises have a loan demand period of less than 5 years, of which 46.89 % have a loan demand period of 1 to 3 years, 15.25 % have a loan period of less than 1 year, and 28.25 % have a loan period of 3 to 5 years. In general, the demand period of ASMEs is mainly in the short and medium-term, which is related to their short production cycle and the simplification of products or services. At the same time, it also reflects that such enterprises have a relatively great demand for working capital due to insufficient profitability; Third, the use of credit. The credit use of ASMEs is mainly divided into production and non-production, of which 114 use funds for production and 63 use funds for non-production, accounting for 64.4 % and 35.6 % respectively. This shows that the main use of such enterprise credit is for production purposes. By increasing the purchase of materials and purchasing production equipment, the production scale is expanded, and the market profit is gradually increased, which provides a certain basis for the business promotion of financial institutions (Table 2).

Table 2. Credit Needs of ASMEs. *(Source: descriptive statistical analysis of survey data)*

Sample	Category	Number	Account	Cumulative percentage
Expected value of borrowing demand	Under RMB 100,000	40	22.60%	22.60%
	RMB 100,001-300,000	68	38.42%	61.02%
	RMB 300,001 to 500,000	39	22.03%	83.05%
	Over RMB 500,000	30	16.95%	100.00%

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Table 2. Continued.

Sample	Category	Number	Account	Cumulative percentage
The term of the borrowing demand	Under 1 year	27	15.25%	15.25%
	1-3 years	83	46.89%	62.14%
	3-5 years	50	28.25%	90.39%
	Over 5 years	17	9.60%	100.00%
Productive Use	Buying raw materials	54	47.37%	47.37%
	Buying machines	26	22.81%	70.18%
	New factories building	18	15.79%	85.97%
	Operating expenses	11	9.60%	95.57%
	Others	5	4.30%	100.00%
Non-productive use	Invest in stocks and bonds	4	6.35%	6.35%
	Pay back a loan	17	26.98%	33.33%
	Invest in real estate	24	38.10%	71.43%
	Others	18	28.57%	100.00%

Characteristics of Credit Behavior Choice

Through the statistics of the borrowing behavior choices of 177 ASMEs, it is found that they mainly have the following three characteristics: First, among the 177 ASMEs with borrowing needs, 79 received credit support, accounting for 44.9 %, which indicates that the probability of satisfaction is not high. This is mainly due to the fact that commercial banks often set stricter approval standards in the process of credit business promotion. At the same time, the reasons for the low credit satisfaction rate of such enterprises also include their weak strength, the imperfect credit system of financial institutions, and insufficient policy support. Secondly, among the 177 ASMEs with borrowing needs, 31 enterprises have obtained more than 50 % of the expected value, accounting for 17.51 %. This shows that most enterprises not only have narrow financing channels, but also face the phenomenon of low financing credit lines. In addition to internal financing, enterprises will also obtain low-interest and interest-free funds from relatives and friends through borrowing in the development process. However, this part of the fund is usually small, and the credit line of commercial banks is not high, which restricts the rapid development of such enterprises. Third, at present, most of the capital replenishment of ASMEs is realized through private lending, and the proportion of commercial bank loans is only 17.51 %. This is mainly due to the high requirements for authorization and approval of commercial banks, and the lack of targeted loan projects. At the same time, it is also necessary to provide asset mortgages. In the survey, more than 60 % of enterprises said that the above three reasons are all there, which indicates that the credit business of commercial banks is cold in ASMEs (Table 3).

Table 3. Borrowing Behavior Choices of ASMEs. *(Source: descriptive statistical analysis of survey data)*

Sample	Category	Number	Percentage	Cumulative percentage
The realization ratio of borrowing expectations	Under 10%	40	22.60%	22.60%
	10%-20%	59	33.33%	55.93%
	20%-50%	47	26.55%	82.49%
	Over 50%	31	17.51%	100.00%
Source of financing	Relatives and friends	67	37.85%	37.85%
	Corporate fundraising	44	24.86%	62.71%
	Intermediary company	36	20.34%	83.05%
	Commercial bank	30	16.95%	100.56%
Forms of loan	Mortgage loan	57	32.20%	32.20%
	Credit loan	82	46.33%	78.53%
	High-interest loan	38	21.47%	100.00%

The selection of samples is more in line with the development status of ASMEs in Xinjiang, China. The data of ASMEs are obtained by questionnaire, and descriptive statistics are carried out by a Logistic model as follows (Table 4).

Table 4. Descriptive Statistics of Variable. Note: Variables are selected according to the literature review and ASME's reality. Source: Descriptive statistical analysis of survey data. *(Source: descriptive statistical analysis of survey data)*

Variable		Mean	Standard deviation
Dependent variable	Access to ASME's credit (Y)	0.5981	0.4874
Characteristics of enterprise owners	Education level (X1)	1.9325	0.9342
	Years of management experience (X2)	2.4546	1.6339
Characteristics of credit contracts	Mortgage collateral (X3)	0.4805	0.4987
	Financial statements (X4)	0.5637	0.5021
	Loan term (X5)	1.4885	0.8901
Relationship between the enterprise and the banks	Relationship width (X6)	2.3625	1.2124
	Relationship length (X7)	2.2954	1.2408
Enterprise characteristics	Total assets (X8)	2.6372	1.3405
	Net profit (X9)	2.4788	1.1814
	Sales growth rate (X10)	1.9623	1.3415
Development of local financial institutions	The Number of local small and medium-sized financial institutions (X11)	2.1784	1.5210

By considering the influence of all the above variables on the dependent variables, the initial model is obtained (Table 5).

Table 5. Logistic Model Regression Initial Estimation. Note: ***, **, and * indicate the variables are significant at 1%, 5% and 10% significance level, respectively. *(Source: Logistic regression model output)*

Variable	Preliminary Evaluation Results		
	Coefficient	Wald Value	Probability
Education level of enterprise owners	0.0078	0.0008	0.9634
Years of management experience	0.2351	1.9237	0.1647
Mortgage collateral	3.0216***	21.6508	0.0000
financial statements	1.7258***	8.1695	0.0037
Bank-enterprise relationship width	0.5843**	5.2062	0.0124
Bank-enterprise relationship Length	0.1171	0.2732	0.5625
Total assets	0.0903	0.0582	0.7918
Net profit	0.1624	0.1589	0.6704
Sales growth rate	0.0042	0.0004	0.8797
Number of local small and medium-sized financial institutions	0.3429*	3.1685	0.0723
Loan term	-0.8134**	5.1067	0.0201
Constant	-4.0281***	6.8543	0.0035
Cox & shell R2		0.5253	
Nagel ker ke R2		0.7807	

In order to test the fitting degree of the equation, Hosmer and Lemeshow tests were performed. The results showed that the null hypothesis was no deviation in fitting (Table 6).

Table 6. Hosmer and Lemeshow Test.

Step	Chi-squared	df	Sig.
1	6.373	8	.605

Hosmer and Lemeshow's test showed that the chi-square value was 6.373, and the corresponding prob value was 0.605, which was greater than 0.05. Therefore, the original hypothesis that there was no deviation between the fitted equation and the real equation was accepted, indicating that the model estimation was reasonable. Then the accuracy of the model prediction was tested (Table 7).

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Table 7. Predicted Accuracy.

Observed		Predicted		Percentage Correction
		y		
		0	1	
y	0	94	5	94.95
	1	3	150	98.28
				97.07

It can be found that the prediction accuracy reaches 97.07%, so it can be said that the model's prediction is relatively accurate and reasonable. Based on its corresponding probability value, the backward elimination method is used to gradually eliminate non-significant variables, and then the fitting is performed to obtain the final estimate (Table 8).

Table 8. Logistic Regression Model Final Estimation. Note: ***, **, and * indicate the variables are significant at 1%, 5% and 10% significance level, respectively. (Source: Logistic regression model output)

Variable	Final Inspection Results		
	Coefficient	Wald's value	Probability
Education level of enterprise owners	——	——	——
Years of management experience	——	——	——
Mortgage collateral	2.8747***	21.9815	0.0000
Financial statements	1.8662***	9.9774	0.0012
Bank-enterprise relationship width	0.5173**	5.0917	0.0218
Bank-enterprise relationship length	——	——	——
Total assets	——	——	——
Net profit	——	——	——
Sales growth rate	——	——	——
Number of local small and medium-sized financial institutions	0.3063*	2.9361	0.0878
Loan term	-0.7149**	4.6553	0.0324
Cox & Shell R2		0.5026	
Nagel ker ke R2		77.1432	

As shown in Table 8, five variables were selected in the final model, namely mortgage collateral, financial statements, loan term, bank-enterprise relationship, and the number of local small and medium-sized financial institutions. This result shows that H2, H3, and H5 hypotheses are supported, while H1 and H4 hypotheses are not supported.

The Credit Constraint of Financial Institutions is the Main Factor Affecting Financing

The results show that three major factors in credit contracts have improved, indicating that the credit constraints of financial institutions can have an impact on financing for ASMEs.

First, the coefficient of return for enterprises with mortgage collateral is 2.8747, indicating that if ASMEs can provide mortgage collateral that meets the conditions set by financial institutions, it can positively impact their financing. This may be due to the imperfect market economic system in China, which creates certain difficulties in credit investigations, leading to insufficient trust from financial institutions in enterprises, particularly ASMEs. From a risk management perspective, financial institutions require these enterprises to provide mortgage collateral to enhance the bank's ability to withstand risks and effectively reduce the bad debt rate. Currently, some financial institutions have implemented a lifetime liability system in their loan management, so credit staff are more inclined to focus on enterprise default risks and take risk avoidance for the potential default situations and bank default losses of enterprises. Overall, the mortgage collateral for ASMEs is insufficient, which directly leads financial institutions to tighten lending due to prudence.

Second, the regression coefficient of financial statements is 1.8662, which indicates that financial statements can bring a positive impact on the availability of corporate credit. The reason for this is mainly because commercial units pay attention to relevant content in financial statements when reviewing loans, and analyze indicators such as net profit, cash flow, and

accounts receivable turnover. However, most ASMEs have not established a complete financial management system, and their financial statements are not very standardized in the early stage of development. ASMEs often exhibit characteristics such as having fewer fixed assets, difficulties in quantifying intangible assets, challenges in obtaining working capital, low debt repayment capacity, and a lack of self-funding. These factors, along with the limited capital of ASMEs, have led financial institutions to question their ability to secure additional funding and to perceive lending to these enterprises as carrying certain risks. In the credit business of financial institutions, they pay more attention to enterprises with more complete financial management mechanisms and more standardized financial statements, as these enterprises usually have stronger financial stability, professional employees in the finance department who can manage the borrowed funds better. At the same time, financial institutions often need to spend more on the approval costs and face higher credit risks for ASMEs with incomplete financial information and unstandardized financial statements. Therefore, financial institutions generally do not approve the loan application of such enterprises with poor financial statements.

Third, the coefficient of the loan term is -0.7149, indicating that financial institutions are more concerned about the loan terms of ASMEs and are more willing to cooperate with those that have short-term loan demands. This is primarily because ASMEs have limited repayment capacity, and for loans with longer terms, they may struggle to repay on time due to market risks, difficulties in fund turnover, and other factors. ASMEs face higher interest rates on medium to long-term loans, and financial institutions must also increase their regulatory costs due to risk concerns. Data shows that over 90% of the loans extended to ASMEs by financial institutions have a loan term of no more than three years.

Bank-Enterprise Relationship is Significant to Financing

The regression coefficient of the relationship between banks and enterprises is 0.5173, indicating that a better relationship facilitates ASMEs in obtaining loans from financial institutions to meet their financing needs. However, some researchers in academia also point out that enterprises maintain less contact with financial institutions, which is conducive to obtaining "relationship loans." This may be due to specific aspects of China's financial industry credit management regulations, particularly the complex approval processes, lengthy approval times, and varying authorization limits imposed by banks. These factors can increase the operating costs for ASMEs that maintain close contact with multiple banks. However, this approach can also help them overcome the limitation of relying on a single bank, thereby obtaining more credit opportunities. During this study, it was found that financial institutions tend to exhibit "following the crowd" behavior. If one financial institution in a certain area has established a successful credit relationship with an ASME, other financial institutions will automatically perceive that enterprise as low-risk and provide loans to it.

Regional Small and Medium-Sized Financial Institutions are Conducive to Financing

The coefficient of the regression for the number of small and medium financial institutions in the region is 0.3063, indicating that the greater the number of small and medium financial institutions in the region, the greater the likelihood that ASMEs will be able to meet their credit needs. The main reason for this is that the number of small and medium-sized financial institutions has increased, indicating that the local economy is doing well and there is a higher demand for credit in the market. The total amount of loans that financial institutions can provide is also growing, meaning that ASMEs can obtain a greater total amount of financing. Additionally, the increasing number of small and medium-sized financial institutions will also make the financial industry more competitive, which will make small and medium-sized financial institutions pay more attention to the loan needs of ASMEs in market expansion. By improving management mechanisms and optimizing business structures, they will focus on the business growth of ASMEs. However, whether small and medium-sized financial institutions can form a good "relationship-based lending" relationship with ASMEs and whether they can have more advantages in market competition than large commercial banks have not been determined.

DISCUSSION

This study focuses on the operational credit behavior of ASMEs. Through empirical analysis, it reveals multiple constraint mechanisms and forms dialogues and expansions with existing literature at multiple levels.

Firstly, in terms of the specific manifestations of credit constraints, the study finds that the credit constraints imposed by financial institutions on ASMEs are mainly reflected in the reliance on collateral guarantees, insufficient standardization of financial statements, and a preference for short-term loan terms. These characteristics are highly consistent with the financing difficulties faced by ASMEs globally. The regression coefficients further confirm the relevant conclusions. The positive effects of collateral guarantees and financial statements verify the universality of the risk-aversion logic of financial institutions, while the negative coefficient of loan term highlights the structural disadvantages of ASMEs in long-term

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financing. This study supports the classic framework of "collateral – information asymmetry - credit rationing" while also revealing the behavioral alienation of financial institutions under the lifelong responsibility system through quantitative analysis. Credit officers tend to overly rely on collateral and standardized financial indicators to avoid personal risks rather than dynamically assessing the actual operating capabilities of enterprises. This finding supplements the existing literature's discussion on the "institutional risk transfer" mechanism, indicating that the distortion of credit markets in developing countries is not only due to information asymmetry but is also closely related to the deficiencies in the internal incentive mechanisms of financial institutions.

Secondly, recent research further validates the complexity of the dual constraints on supply and demand sides. Some studies have pointed out that in Ethiopia and Tanzania, 43% and 77% of credit-constrained farmers face demand-side restrictions, including risk perception, high transaction costs, and insufficient information acquisition, which echoes the conclusion of this study that financial institutions overly rely on collateral guarantees. It is notable that risk-aversion behavior has become the dominant factor in demand-side constraints in Tanzania, while Ethiopian farmers tend to avoid credit risks through non-agricultural income or asset sales (Balana et. al., 2022). This finding indicates that the causes of credit constraints have significant regional heterogeneity. Therefore, in policy design, it is necessary to take into account both supply-side reform (such as collateral substitution) and demand-side intervention (such as risk education or insurance linkage). Moreover, the nonlinear effect of commercial bank digitalization is in important correspondence with the conclusion of this study (Fangliang et. al., 2025). Therefore, policy design should focus on the heterogeneity of financial institutions. For high-capital banks, encouragement for digital transformation can be provided to release the potential for risk control; for low-capital banks, priority should be given to strengthening the risk buffering capacity.

Thirdly, at the level of bank-enterprise relationships, it has been confirmed that a good bank-enterprise relationship can alleviate credit constraints, which is consistent with the research conclusions of "relationship-based loans" in Vietnam and India. However, this study further reveals the phenomenon of "conformity behavior" of financial institutions, that is, when one institution grants loans to ASMEs, other institutions will reduce risk perception based on the signal of the same industry and follow up with credit granting. This mechanism echoes the "social capital transmission" theory (Maraffi, 1994), but emphasizes the irrational imitation tendency among financial institutions, providing a new perspective for understanding the herd effect in credit markets of developing countries. Empirical research shows that the financing behavior of ASMEs is significantly affected by external shocks. Micro enterprises, due to insufficient collateral and weak credit records, rely more on informal financing channels (such as borrowing from acquaintances), while medium-sized enterprises benefit from government-targeted credit support and increased export opportunities. This finding challenges the assumption of "homogenization of small and micro-sized enterprises" in traditional literature, suggesting that policy formulation should dynamically adjust policy tools based on the enterprise size and life cycle.

However, this study still has certain limitations:

1. Firstly, the sample data is concentrated in a specific region, and the universality of the conclusions needs to be further verified through cross-regional comparisons, especially the applicability of the intellectual property pledge in the agricultural sector, which may be significantly influenced by regional innovation levels and policy implementation strength.
2. Secondly, the analysis of the competitive behaviors of small and medium-sized financial institutions has not quantified the dynamic changes in their service efficiency and risk preferences. In the future, it is possible to combine panel data to track long-term effects.
3. Finally, the study has not deeply explored the potential moderating role of cultural traditions and informal institutions (such as folk credit networks) on the bank-enterprise relationship, which may have significant explanatory power in rural finance in developing countries.

CONCLUSIONS

Overcome the Various Credit Constraints

In order to achieve sustainable development, ASMEs should overcome the credit constraints of mortgage collateral and financial statements.

In order to solve the mortgage problem, ASMEs can try the following methods: First, promote the pledging of intellectual property Rights. ASMEs with innovative capabilities can use their patents, trademarks, and copyrights as collateral for financing. The government can establish a sound intellectual property evaluation and trading system to provide a basis for

the value assessment of intellectual property rights and promote the smooth progress of intellectual property pledge financing. Second, develop accounts receivable financing. Encourage ASMEs to use their accounts receivable as collateral to obtain loans. Banks and financial institutions can establish an accounts receivable financing platform to verify the authenticity of accounts receivable and monitor the flow of funds to reduce credit risks. Third, explore inventory mortgage financing. For ASMEs in the manufacturing and trading industries, inventory can be used as collateral. Agricultural product processing and logistics enterprises can cooperate with banks to provide inventory custody and monitoring services to ensure the safety and value preservation of inventory, enabling small and micro enterprises to use inventory to obtain financing.

In order to solve the problem of financial statements, ASMEs can try the following methods: First, strengthen the accounting basic work. ASMEs should establish and improve accounting systems, standardize accounting processes, and ensure the accuracy and timeliness of accounting records. Employ professional accounting personnel or entrust professional accounting firms to handle accounting business to improve the quality of financial statements. Second, improve financial analysis and forecasting capabilities. In addition to preparing basic financial statements, ASMEs should also strengthen financial analysis, such as analyzing financial ratios, cash flow situations, etc., to deeply understand the financial status of the enterprise. At the same time, establish a financial forecasting model to make reasonable forecasts of the enterprise's future financial situation and operating performance, providing a reference for enterprise decision-making and financing. Third, disclose information honestly and transparently. When preparing financial statements, ASMEs should disclose financial information truthfully and avoid false accounting and concealment of important information. Transparent financial information can help banks and investors better understand the enterprise and enhance their confidence in it.

Maintain a Good Relationship Between Banks and Enterprises

ASMEs can maintain a good relationship with banks through the following ways:

1. Communication and interaction: First, maintain regular contact. Designate a dedicated person in the enterprise to be responsible for communicating with the bank. Regularly visit the bank's account manager or hold video conferences to discuss the enterprise's operations, market trends, and financial needs. This regular interaction helps the bank stay informed about the enterprise's situation and demonstrates the enterprise's attention to the relationship. Second, be proactive in information disclosure. In addition to providing mandatory information, take the initiative to disclose other important information that may affect the enterprise's operations and financial situation to the bank, such as major contracts signed, new project launches, and changes in the management team. This proactive approach allows the bank to have a more comprehensive understanding of the enterprise and enhances mutual trust.
2. Business operations: First, develop a clear business strategy. Formulate a clear and feasible business development strategy and short-term and long-term business plans. The strategy should be based on market demand and the enterprise’s own advantages, with a clear target market, product positioning, and development path. Presenting a well-thought-out business plan to the bank shows the enterprise’s development potential and ability to repay loans; Second, it enhances operational capability and competitiveness. Continuously improve the enterprise's operational management level, optimize production processes, reduce costs, and improve product quality and service levels. Actively carry out technological innovation and market expansion, and continuously enhance the enterprise's competitiveness in the market. A strong and growing enterprise is more likely to gain the bank's support and trust.
3. Cooperation and support: First, use bank services actively. In addition to loans, make full use of other financial services provided by banks, such as settlement, cash management, trade finance, and wealth management. This not only meets the enterprise's diverse financial needs but also deepens the cooperation relationship with the bank and increases the bank's recognition of the enterprise. Second, participate in bank activities. Actively participate in various activities organized by banks, such as financial seminars, business matchmaking meetings, and training courses. This not only helps enterprises improve their financial management and business operation capabilities but also provides opportunities for in-depth communication and cooperation with banks and other enterprises.

Encourage the Development of Small and Medium-Sized Financial Institutions

The government can take the following specific measures to encourage the development of small and medium-sized financial institutions:

1. Policy incentives: First, tax preferences. The government can provide tax incentives for small and medium-sized financial institutions, such as reducing corporate income tax, value-added tax, and other tax rates, or providing tax exemptions and deductions for a certain period (Zhang et. al., 2025). This can reduce the operating costs of these

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institutions, increase their profitability and competitiveness, and encourage them to expand their business and support for ASMEs. Second, financial subsidies. Set up special financial subsidy funds to subsidize small and medium-sized financial institutions that perform well in serving ASMEs. For example, subsidies can be given according to the amount of loans issued to ASMEs or the number of supported ASMEs to encourage them to increase their credit supply to ASMEs.

2. Regulatory support: First, relaxed access conditions. Appropriately relaxing the access conditions for small and medium-sized financial institutions, simplifying the establishment and approval procedures, and encouraging the entry of more social capital to set up small and medium-sized banks, financial leasing companies, small loan companies, and other financial institutions to enrich the supply of financial institutions serving ASMEs; Second, differentiated regulatory policies. Implement differentiated regulatory policies for small and medium-sized financial institutions. For example, appropriately reduce the capital adequacy ratio requirements, loan loss reserve ratio requirements, etc., according to their characteristics and risk levels, to enhance their ability to expand business and support ASMEs.

3. Financing support: First, re-lending and rediscount. The central bank can increase the amount of re-lending and rediscount for small and medium-sized financial institutions, provide them with low-cost funds, and increase their sources of funds and lending capacity. This enables them to have more funds to issue loans to ASMEs and reduce financing costs; Second, bond issuance support. Support small and medium-sized financial institutions to issue financial bonds, asset-backed securities, and other financing tools in the capital market, and expand their financing channels. At the same time, provide certain policy preferences and conveniences in the issuance process to help them raise funds more smoothly.

Directions for Further Research

While this study provides valuable insights into the credit behavior of ASMEs in western China, several avenues for future research remain unexplored. First, the geographic scope of this study is limited to Xinjiang and the surrounding areas. Future research could expand the sample to include ASMEs from other western provinces or even different economic regions in China, enabling cross-regional comparisons and enhancing the generalizability of the findings. Second, this study primarily focuses on quantitative financial and relational variables. Qualitative investigations—such as in-depth interviews with loan officers and enterprise owners—could uncover deeper mechanisms behind credit decision-making and relational banking dynamics. Third, the role of digital finance and fintech platforms in alleviating credit constraints for ASMEs warrants attention. As digital lending grows in China, its impact on traditional credit channels and its potential to reduce information asymmetry could be a promising research direction. Lastly, future studies could explore the impact of recent policy innovations, such as green credit and intellectual property financing, on ASMEs' credit access, particularly in the context of national strategies like rural revitalization and carbon neutrality.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All authors have contributed equally.

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CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

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ФАКТОРИ ВПЛИВУ НА КРЕДИТНУ ПОВЕДІНКУ СІЛЬСЬКОГОСПОДАРСЬКИХ МАЛИХ І МІКРОПІДПРИЄМСТВ ЗАХІДНОГО КИТАЮ

Малі та мікропідприємства є життєво важливим компонентом економіки Китаю, відіграючи все більш значну роль у стимулюванні економічного зростання, сприянні інноваціям і підтримці регіонального балансу. Однак фінансові обмеження довгий час були серйозною перешкодою для їхнього розвитку. Ця проблема особливо гостро стоїть для сільськогосподарських малих і мікропідприємств (ASME) у віддалених західних регіонах Китаю, які намагаються знайти ефективні рішення для своїх труднощів із фінансуванням. Це дослідження спрямоване на системне виявлення ключових факторів, що впливають на кредитну поведінку сільськогосподарських малих і мікропідприємств (ASME) у західному Китаї, з метою усунення постійних обмежень у їх фінансуванні. Щоб системно дослідити основні причини цих постійних проблем із фінансуванням, автори розглянули 253 ASME в Західному Китаї, використовуючи всеосяжну методологію, яка поєднує описовий статистичний аналіз із логістичним регресійним моделюванням. Результати демонструють, що інституційні кредитні обмеження з боку фінансових установ проявляються насамперед у трьох аспектах: наявність кваліфікованого іпотечного забезпечення, рівень стандартизації фінансової звітності та конкретні вимоги щодо строків погашення кредитів. Аналіз підтверджує, що й надання належного забезпечення, і ведення стандартизованої фінансової документації значно підвищують імовірність забезпечення фінансування. І навпаки, фінансові установи демонструють явну прихильність до короткострокового кредитування ASME, що створює додаткові проблеми для підприємств, які потребують довгострокового капіталу. Крім цих інституційних обмежень, дослідження виявляє, що підтримка міцних відносин між банком і підприємством – особливо шляхом диверсифікації банківської діяльності, тобто встановлення зв'язків із кількома фінансовими установами – може ефективно пом'якшити інформаційну асиметрію та підвищити ймовірність успішного фінансування. Крім того, дослідження вказує на те, що регіони з більш високою концентрацією малих і середніх фінансових установ, як правило, сприяють більш конкурентному фінансовому середовищу, що зрештою сприяє доступові ASME до кредитів. Ці результати не лише висвітлюють багатовимірні фінансові бар'єри, з якими стикаються малі та мікропідприємства сільського господарства, а й надають цінні емпіричні дані для підтримки фінансових установ в оптимізації їхніх структур послуг і допомоги державним установам у формуванні цільової політики підтримки.

Ключові слова: сільськогосподарські мікро- та малі підприємства, доступність кредитів, фактори впливу, Західний Китай, відносини між банком і підприємством, фінансова поведінка, інформаційна асиметрія, теорія порядків

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