Original Paper

Research on Financing Availability of Small Enterprises in Ningbo Based on Amartya Sen's Method

Miao Huiyong[1*]

[1] Teaching Center, Ningbo Open University, Ningbo, China

[*] Miao Huiyong(1978-),Teaching Center, Ningbo Open University, Ningbo, China. female, master degree, certified public accountant in China. Research interest is accounting education and distance education.

Abstract

Space Small enterprises play an important role in China's economic development. Their emergence has played a significant role in increasing employment, stabilizing society, and innovating science and technology. Taking small enterprises in Ningbo as an example, this study used Amartya Sen's method to study the availability of financing. Firstly, the financing availability of small enterprises was analyzed from two aspects of resource endowment and monetary resources. Then, an empirical test was made on the financing availability of small enterprises. Finally, we put forward relevant suggestions for the development of small enterprises according to the current situation and empirical conclusions.

Keywords

small enterprises, financing availability, Amartya Sen's method

1. Introduction

Ningbo is among the first cities to open coastal in China. In China, its comprehensive strength ranks in the top 15. At the same time, as the economic center of Zhejiang Province, Ningbo is a modern international port city. Small enterprises are the characteristics of the Ningbo economy. In 2020, there were 310,000 small enterprises in Ningbo, accounting for 97% of the total number of enterprises in the city. These enterprises contribute 60% of the city's GDP and their income accounts for 52% of the city's enterprise income. Employees of small enterprises account for 75% of the employed population. Small enterprises play a significant role in promoting economic development, providing employment, improving GDP, and promoting scientific and technological innovation in Ningbo. However, due to the influence of the financial system and other factors, small enterprises cannot obtain the corresponding

position in the credit market. "Financing difficulty" has always been a major development problem faced by small enterprises, and has also become an important factor restricting the economic development of Ningbo. It is particularly necessary to solve the financing problems of small enterprises and promote the healthy development of small enterprises.

1.1 Literature Review

At present, there are many types of research on the financing of small enterprises, but the analyses are often one-sided. Amartya Sen's rights method theory divides the factors affecting the financing of small enterprises into three parts, which include the asset status and reputation of small enterprises (resource endowment, assumed as E), financing mechanism (mapping relationship), and the capital stock of financial institutions or informal lending market (the target quantity of financing function mapping, assumed as variable M). These parts constitute the financing rights of small enterprises.

1.1.1 Resource Endowment and Monetary Resources of the Enterprise

At present, the research about financing in Chinese small enterprises mostly focuses on the first part E and the third part M of the financing rights. Among them, the literature research focusing on the first part E found that small enterprises have many problems, such as lack of mortgage assets, lack of formal financial information, low management level, small enterprise-scale (Zhang, 2016). Most of the research on Part III M discussed the supplier of the credit market, commercial banks. For example, it was believed that the operation mode of commercial banks leads to the financing difficulties of Small enterprises (Lv, 2015). Zhang (2000) proposed the method of developing private financial institutions to solve the financing difficulties of small enterprises. Although the available quantity is an important indicator to measure whether there is a shortage or not, the above views emphasized that the lack of one factor has led to the plight of economic individuals. Other scholars prefer to study the financing of small enterprises from the perspective of asset structure and reputation. Asset structure and profit growths are the determinants of capital structure and financing structure (Andrea, 2017). And the growth years of small enterprises can also become an important factor in their financing (Lukas, 2012).

1.1.2 Financing Mechanism

From the perspective of financing mechanism, the research focus on the right mapping relationship of financing of small enterprises. The mapping relationship of financing rights includes the social and economic systems of a country or a region, which would macroscopically affect the market power in the credit market owned by the banks of that country or region. Some scholars believe that only small and medium-sized banks can provide good credit services for small enterprises (Lin et al., 2001). However, Wells Fargo Bank of the United States, as the fourth largest bank in the United States, can still lend to small enterprises very well and achieve good benefits (Luo et al. 2016). The diversification of financial institutions is an important factor to promote competition. Through the decentralization of banks, promoting competition, and weakening the market power of banks, large banking institutions can lend to small enterprises like small financial institutions. The key to the problem is not the distinction between large financial institutions and small financial institutions. It depends on whether

104

banks can weaken the market power of financial institutions through full market competition, and make the loan volume of the credit market to small enterprises reach the desired equilibrium result. Conversely, if a small financial institution in a geographical area has large market power, it can also ask for higher loan prices from small enterprises. Therefore, instead of aimlessly establishing small financial institutions, it is better to promote competition and weaken the market power of financial institutions (Rodrigo et al., 2012).

2. Financing Status of Small Enterprises in Ningbo

A large number of small enterprises are an important micro basis for Ningbo's economy to maintain vigorous development and vitality. It plays a significant role in promoting Ningbo's economic development, providing employment, improving GDP, and promoting scientific and technological innovation. But there are also many problems. Firstly, the quality of personnel is not high, the mode of financial management is backward, and the level of financing management needs to be improved. Secondly, small enterprises lack financing collateral and guarantee, and their anti-risk ability is poor. And the products operated by small enterprises in Ningbo are monotonous. Once the industry is depressed, it will have a great impact on small enterprises. The problems of slow equipment renewal and low technical level lead to the low production efficiency of small enterprises and affect the development.

In recent years, the total credit of small enterprises in Ningbo has increased, but the proportion in the total loans has decreased steadily. According to the statistics of Ningbo Local Financial Supervision and Administration Bureau, the balance of small enterprise loans at the end of 2021 was 367.39 billion yuan, an increase of 36.5% over 2020. The loan interest rate of small enterprises decreased by 0.09%, effectively alleviating the operating pressure of small enterprises caused by rising raw material prices, repeated epidemics, and other factors. The loans of commercial banks to small enterprises are mainly concentrated in the manufacturing industry. This is mainly because the manufacturing industry in Ningbo is relatively developed, and manufacturing enterprises generally have plants, equipment, and other mortgageable goods. Secondly, Ningbo commercial bank deepened the innovation of small financial products and continuously improved the level of credit services. Finally, the financing channels of small enterprises are relatively narrow, and the financing structure is mainly bank financing. Compared with Hangzhou and Shanghai, the development of the Ningbo capital market lags.

3. Theoretical Analysis of Financing Availability of Small Enterprises

3.1 Amartya Sen's Theory

Amartya Sen's theory is a method aimed at the resource exchange behavior of an economic individual in a free exchange market economy. Amartya Sen's theory has considerable universality and adaptability because the economic individual's ability to obtain resources in the market could be determined by observing its bundle of rights. Amartya Sen's theory can be used not only to study

famine but also to study financing. The difference between famine and financing is that the former aims at food, and the latter aims at money.

3.2 Analysis on Financing Availability of Small Enterprises Based on Amartya Sen's Method

The financing right of small enterprises refers to the amount and possibility of monetary resources that small enterprises can obtain with their resource endowment. Since the resource endowments and monetary resources of small enterprises are the two most important aspects that affect the credit extension of financial institutions to small enterprises, this paper analyzed the financing availability of small enterprises based on resource endowments and monetary resources.

3.2.1 Impact of Resource Endowment of Small Enterprises on Financing Availability

The resource endowment of small enterprises includes fixed assets, current assets, production, operation capacity, etc. The resource endowment characteristics of small enterprises were quite different.

(1) Influence of tangible resource endowment on financing availability of small enterprises

Fixed assets, current assets, capital, and other factors are collectively referred to as tangible resource endowments, which can provide direct information to lenders. Fixed assets generally refer to the land and houses owned by small enterprises, which have strong liquidity, and financial institutions generally pay more attention to them. Current assets include sales revenue, movable property, etc. These resource endowments show the cash flow status of small enterprises and provide lenders with stable repayment expectations. Therefore, when granting loans to small enterprises, the traditional "collateral" loan model is still adopted by formal financial institutions such as commercial banks. However, small enterprises have "congenital" weaknesses and deficiencies intangible assets. This traditional loan model affects the financing rights of small enterprises and reduces the financing availability of small enterprises.

(2) Influence of production and operation capacity on financing availability of small enterprises

The level of production and operation capacity directly affects the situation of enterprises using resource endowment for production, which can bring the borrower's repayment expectation, and has a certain impact on financing. The degree of production optimization could be expressed by production efficiency. Measuring production efficiency can show the production and operation capacity of small enterprises. Measuring production efficiency further calculates the impact of production efficiency on Financing availability, which can get the maximum financing amount of the enterprise. Production and operation capacity contains more information about the steady operation of enterprises, such as the integrity of business owners. It is hard to believe how much credit guarantee a poor and inefficient enterprise can provide. With the innovation of credit technology, this aspect will receive more and more attention.

3.2.2 Influence of Monetary Resources on Financing Availability of Small Enterprises

The monetary resources affect the financing availability of small enterprises. The hierarchy shows that money had primary and secondary suppliers. The direct supplier of monetary resources is the central

106

bank, which directly injects liquidity through issuing money or money market operation to form part of monetary resources. Commercial banks convert deposits into loans to form another part of monetary resources. The most important policies on the financing of small enterprises were monetary policies and credit. Therefore, the adjustment of monetary or credit policies will have a certain impact on the financing of small enterprises.

4. Empirical Analysis on Financing Availability of Small Enterprises

To further analyze the influencing factors of financing availability of small enterprises, this paper made an empirical analysis from two aspects, including the impact of resource endowment of small enterprises on the financing of small enterprises and the impact of monetary resources on the financing of small enterprises.

4.1 Influence of Resource Endowment of Small Enterprises on the Financing of Small Enterprises

4.1.1 Selection of Indicators

Generally, financial institutions or private informal lending mainly consider important enterprise resource endowments, such as collateral, assets, and sales revenue. The asset is the basic element for enterprises to operate. Land and other collateral are relatively stable enterprise production factors. Collateral and assets are important factors for borrowers to investigate enterprises. Financial institutions would also focus on the asset operation of enterprises. Good sales performance can not only persuade financial institutions to issue loans but also help small enterprises obtain financing from the private sector. Sales revenue is also an important observation indicator of lending. Therefore, this paper mainly examined the impact of collateral (X1), asset scale (X2), and sales revenue (X3) on the financing amount of small enterprises. The debt (Y) of small enterprises was used as the small enterprises' index of the financing amount.

The sample data studied in this paper comes from 1758 small enterprises in the small enterprise loan database of a bank in Ningbo at the end of 2020. To obtain the relationship between the change rates of several variables, the natural logarithm of each variable was taken.

4.1.2 Establishment of Model

Firstly, by establishing a multiple linear regression model, this research preliminarily analyzed the impact of each variable on the financing amount of small enterprises, to further explore the impact degree and trend of each variable on consumption. The following multiple linear regression equations were established.

$$LNY_i = C + \alpha_1 LNX_{i,1} + \alpha_2 LNX_{i,2} + \alpha_3 LNX_{i,3} + \mu(t)$$

In the equation, Y_i is the financing amount of the i_{th} small enterprise. $X_{i,1}$, $X_{i,2}$, and $X_{i,3}$ are the collateral value, asset scale, and sales revenue of the i_{th} small enterprise respectively. $\mu(t)$ is the random disturbance vectors. The coefficient in front of each variable represents the elasticity coefficient of the financing amount to each variable.

4.1.3 Empirical Analysis and Test of the Model

(1) Descriptive statistics of data

Table 1. Data Characteristics of Small Enterprises

	Value of collateral (10^4 CNY)	Asset scale (10^4 CNY)	Sales revenue (10^4 CNY)
Maximum	1776595	45683586	80000
Minimum	74.57693	3.208319	14.3
Average	7039.649	32998.65	2154.844
Standard deviation	52055.78	1089976	4575.03

(2) Regression analysis and conclusion

The least-square method was used for regression analysis of the model, and the results are shown in Table 2. The regression equation is as follows.

$$LNY_i = -1.2086 + 0.9171LNX1 + 0.0939LNX2 + 0.0121LNX3$$
$$R^2 = 0.80$$
$$F = 2357.01$$
$$D.W = 1.93$$

Table 2. Results of Multiple Linear Regression

Variable	Coefficient	Standard deviation	T statistic	Probability
LNX1	0.917104	0.021272	43.11235	0
LNX2	0.093857	0.017707	5.300584	0
LNX3	0.012089	0.013385	0.903178	0.3666
C	-1.20857	0.224297	-5.38825	0

At the significance level of 1%, only LNX1 and LNX2 in the model passed the T-test, which shows that the collateral value and asset scale had a significant impact on the financing volume of small enterprises. LNX3 failed to pass the T-test, indicating that the sales revenue has no significant impact on the financing volume of small enterprises. The goodness of fit of the whole equation reached 80.00%, indicating that this model fitted the data in the sample well.

(3) Analysis of empirical results

According to the above empirical results, collateral and asset were important factors affecting the financing of small enterprises. Small enterprises could obtain loans through these two factors. The impact of sales revenue on financing was very insignificant, indicating that sales revenue, i.e., cash flow, cannot be an effective tool for financing small enterprises. From the perspective of the financing

coefficient, the financing coefficients of these production factors are less than 1, which shows that it is difficult for small enterprises to obtain financing from the external environment through these production factors. Resource endowment lacks financing flexibility, and these resources play a limited role in external financing. The ability of small enterprises to use resource endowment to allocate funds is weak, and the financing availability of small enterprises is low. At the same time, it also shows that the ability of small enterprises to deal with the impact of the external economic environment was poor. It can be expected that when the impact occurs, small enterprises are almost difficult to resist, and the financing coefficient may even be further reduced. It could be seen that the financial system attaches importance to collateral, land, and assets, resulting in the financing rights of small enterprises at a low level. Small enterprises generally lack collateral, which reduces the financing availability of small enterprises.

4.2 The Impact of Monetary Resources on the Financing of Small Enterprises

4.2.1 Selection of Indicators

(1) Indicators of financing amount of small enterprises. The bank loan is the main way of financing for small enterprises and an important aspect of studying the financing problems of small enterprises. Given the availability of data, small enterprise loans were selected as the explanatory variable(Y).

(2) Variables representing credit resources. This research mainly analyzed the impact of deposit balance (X1), medium and long-term loans (X2), short-term loans (X3), and cash delivery (X4) on the financing of small enterprises.

The samples are from 2018 to 2020. All indicators adopted by variables are monthly indicators. To obtain the relationship between the change rates of several variables, the natural logarithm of each variable was taken. Generally, China's economic time series have strong seasonality and are mostly unstable. Therefore, this research made the seasonal adjustment for all variables.

4.2.2 Selection of Indicators

Firstly, by establishing a multiple linear regression model, this study preliminarily analyzed the impact of various variables on the financing volume of small enterprises. A vector auto regressive (VAR) model was established for impulse response analysis to further explore the impact and trend of explanatory variables on the financing of small enterprises. The multiple linear regression equation was established as follows.

$$\text{LNY}_t = C + \alpha_1 \text{LNX}_{1,t} + \alpha_2 \text{LNX}_{2,t} + \alpha_3 \text{LNX}_{3,t} + \alpha_4 \text{LNX}_{4,t} + \mu(t)$$

In the equation, LNY represents the logarithm of the financing amount of small enterprises. LNX1 represents the logarithm of the deposit balance. LNX2 represents the logarithm of the medium and long-term loan balance. LNX3 represents the logarithm of short-term loans. LNX4 represents the logarithm of cash delivery. $\mu(t)$ is a disturbance vector. The coefficients in front of each variable represent the elasticity coefficient of financing volume of small enterprises to each variable.

4.2.3 Empirical Analysis and Test of the Model

(1) Stationary test of variable data

The sample was the monthly time series data from 2018 to 2020. Therefore, the unit root test was carried out on the variable data, and the test results are as follows.

Table 3. Augmented Dickey-fuller Test (ADF) Stability Test

Variable	Inspection form （C,T,L）	ADF test	Mackinnon critical value （1%，5%，10%）			Unit root test results
LNY	（C,T,2）	-1.41197	-4.24364	-3.54428	-3.2047	Nonstationary
LNX1	（C,T,0）	-2.54126	-4.24364	-3.54428	-3.2047	Nonstationary
LNX2	（C,T,0）	-1.05425	-4.24364	-3.54428	-3.2047	Nonstationary
LNX3	（C,T,0）	2.93316	-4.33933	-3.58753	-3.22923	Nonstationary
LNX4	（C,T,0）	-2.21358	-3.63290	-2.94840	-2.61287	Nonstationary
DLNY	（C,0,0）	***-5.49365	-4.25288	-3.54849	-3.20709	Stationary
DLNX1	（C,0,0）	***-6.89602	-4.25288	-3.54849	-3.20709	Stationary
DLNX2	（C,0,0）	***-5.08661	-4.25288	-3.54849	-3.20709	Stationary
DLNX3	（C,0,0）	***-6.15110	-4.25288	-3.54849	-3.20709	Stationary
DLNX4	（C,0,0）	***-6.48782	-3.63941	-2.95113	-2.6143	Stationary

Note. D was the first-order difference. C, T, and L represented the constant term, time trend term, and lag order in the ADF test respectively. The ADF test adopted Mackinnon critical value (MacKinnon, 1996). * meant rejecting the original hypothesis at a significant level of 10%.** meant rejecting the original hypothesis at a significant level of 5%.*** meant rejecting the original hypothesis at a significant level of 1%.

The results of the ADF test show that the above variables were first-order difference stationary, so the first-order difference form of these variables was used for analysis.

(2) Regression analysis and conclusion

Then, the least square method was used for regression analysis of the model, and the results are shown in Table 4.

Table 4. Results of Multiple Linear Regression

Variable	Coefficient	Standard deviation	T statistic	Probability
LNX1	0.070378	0.133276	0.528061	0.6012
LNX2	0.229398	0.054328	4.222446	0.0002
LNX3	0.522292	0.122176	4.274919	0.0002
LNX4	-0.00377	0.014442	-0.26135	0.7955

C	0.983933	0.257545	3.820438	0.0006

The regression equation is as follows.

$LNY_i = 0.9839 + 0.0704LNX1 + 0.2294LNX2 + 0.5223LNX3 - 0.0038LNX4$

$R^2 = 0.99$

$F = 586.55$

$D.W = 2.39$

At the significance level of 1%, only LNX2 and LNX3 in the model passed the T-test, indicating that medium and long-term loans and short-term loans had a significant impact on the financing of small enterprises. LNX1 and LNX4 failed the t-test, indicating that the deposit balance and cash injection had no significant impact on the financing of small enterprises. As for the whole equation, the goodness of fit reached 99.00%, indicating that this model fitted the data in the sample well.

From the estimation results, the elasticity coefficient of medium and long-term loans was 0.0543, indicating that the increase of medium and long-term loans had a positive impact on the financing of small enterprises, but the impact was small. The elasticity coefficient of short-term loans was 0.1222, indicating that short-term loans had a positive impact on the financing of small enterprises to a certain extent.

(3) Analysis of empirical results

From the above empirical results, we can see that the deposit balance was not a variable that had a significant impact on the financing of small enterprises. The increase in deposits did not mean the increase in the financing of small enterprises. Medium and long-term loans had a relatively weak positive impact on the financing of small enterprises. Short-term loans had a significant positive impact on the financing of small enterprises, indicating that short-term loans were not only the main financing demand of small enterprises but also an important source of financing for small enterprises. Cash injection did not have a significant impact on the financing of small enterprises, which may be related to the small proportion of cash injection in the whole money market. It also shows that the direct delivery of cash and the sudden injection of liquidity did not have a significant impact on the financing of small enterprises. The increase of liquidity could not impact and change the basic structure of the financing market of small enterprises.

5. Suggestions on Increasing the Financing Availability of Small Enterprises in Ningbo

5.1 Improve the Financing Capacity of Small Enterprises

First of all, small enterprises should strengthen their operation and management and improve their financing ability. From the above analysis, it can be seen that a considerable part of the financing difficulties of small enterprises was caused by their problems. This requires small enterprises to update their business philosophy and change the current "family" management mode, to improve their management level and lay a good foundation for enterprises to increase credit. Second, attract talents

111

who can bring substantial benefits and changes to the enterprise through various ways. Third, strengthen the construction of internal control and constantly improve the internal control system. Ensure the authenticity and reliability of financial information. Fourth, through the continuous innovation of technology and business model, improve the market competitiveness and brand value, to improve the economic benefits and financing ability of enterprises. Fifth, establish a sense of integrity and improve the enterprise credit system. Improve their credit rating to lay a good foundation for obtaining financing support.

Secondly, government support is also a booster for the smooth development of small enterprises. The government could further improve the preferential and supportive policies on taxation and financing. With the help of the National Inclusive Finance Demonstration Zone established in Ningbo, build an inclusive credit system and diversified product innovation to better promote the development of small enterprises. In addition, the government should play a guiding role, integrate and use fiscal, tax, and other policy tools, to further improve the industrial structure adjustment and enterprise transformation and upgrading.

5.2 Strengthen the Construction of Social Credit System and Financing Guarantee System for Small Enterprises

Through various ways to improve the trustworthiness awareness of small enterprises, the government and relevant departments should increase the punishment and crackdown on debt evasion to maintain a good social credit environment. Improve the credit evaluation system of small enterprises, which at least includes continuous and complete information such as financial status, asset status, and credit status. Learn from the experience of other countries and establish a financing guarantee system for small enterprises dominated by government guarantees and supplemented by private financing guarantee institutions. In addition, we should strengthen the support and guarantee of insurance for small enterprises.

5.3 Establish a Multi-level Capital Market and Expand Financing Channels for Small Enterprises

Banks should play a leading role. The People's bank of China could strengthen its guiding role by the guidance of national policies, and guide commercial banks to increase credit to small enterprises. Commercial banks should fully implement the national support policies for small enterprises and improve the efficiency of examination and approval. At the same time, commercial banks should innovate service methods and develop credit products suitable for small enterprises. We can also learn from foreign experience and establish financial institutions that provide services for small enterprises.

Secondly, speed up the promotion of securities financing. On the one hand, it is a good way to expand the equity financing channels of small enterprises and speed up the cultivation of many small enterprises with high scientific and technological content and good business conditions to be listed on the gem. In combination with the actual situation of Ningbo, relevant policies shall be issued to support equity financing, share transfer, asset restructuring, and other activities of small enterprises under its jurisdiction. On the other hand, stepping up the development of the city's small enterprise bond market

112

and promoting the standardized development of Internet debt financing enterprises could also improve the financing ability.

Finally, encourage and guide the innovative development of emerging financial formats. Government should make full use of the characteristics and advantages of abundant private capital in Ningbo to encourage private capital to participate in the development of emerging financial formats such as Internet finance. At the same time, the government could actively explore investment channels, absorb private capital to establish private equity funds, and develop various equity investment industries such as angel investment and venture capital.

References

Canales, R., & Nanda, R. (2012). A darker side to decentralized banks: Market power and credit rationing in SME lending. *Journal of Financial Economics*, *105*, 353-366. https://doi.org/10.1016/j.jfineco.2012.03.006

Hehua, L., & Mingxian, L. (2016). Analysis on the influencing factors of financing demand and financing availability of small and micro enterprises. *Research on Economic and Management*, *37*, 52-60.

Jie, Z. (2014). Alleviate the credit financing difficulties of small and micro enterprises by strengthening the supply of credit information. *Economic Review*, *4*.

Jinsong, L. (2015). Reflections on the financing difficulties and high cost of small and medium-sized enterprises. *Journal of Financial Research*, 115-123.

Mc, Namara, A., Murro, P., & O'Donohoe, S. (2017). Countries lending infrastructure and capital structure determination: The case of European SMEs. *Journal of Corporate Finance*, *43*, 122-138. https://doi.org/10.1016/j.jcorpfin.2016.12.008

Menkhoff, L., Neuberger, D., & Rungruxsirivorn, O. (2012). Collateral and its substitutes in emerging markets' lending. *Journal of Banking & Finance*, *36*, 817-834. https://doi.org/10.1016/j.jbankfin.2011.09.010

Xing, Z., Zilin, W. & Wenjing, Z. (2016). Countermeasures and suggestions to solve the financing difficulties of small and micro enterprises -- Based on the investigation and analysis of Ningbo. *Review of Economic Research*, 59-64.

Yifu, L. & Yongjun, L. (2001). Development of small and medium-sized financial institutions and financing of small and medium-sized enterprises. *Economic Research Journal*, 10-18.