Article

Empirical Study on the Key Influencing Factors and Development Mechanisms for the Sustainability of Microfinance Institutions based on the Survey of Chinese Microcredit Companies

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Abstract: Microfinance institutions (MFIs) play an significant role in financial inclusion and poverty alleviation activities. A critical challenge facing MFIs is how on all to build its own capacity for sustainable and healthy development. By using the data from the pilot survey of 65 microcredit companies in Zhejiang of China, this paper explores the factors affecting MFIs activities by principal component analysis and analyzes the key Influencing factors and sustainable development performance with the analysis of variance and multi-regression model.The results indicate that four key factors of operational technology, external environment, financial condition and institution size have a significant positive effect on the economic sustainability performance of MFIs, while the adjusted institution size is insignificant positive effect on operational sustainability performance,which means that key factors of MFIs sustainability have a greater impact on economic sustainability performance than operational sustainability performance.

Keywords: microfinance institutions; sustainable development; key influencing factors

1. Introduction

Since the 1990s, there has been a surge in the use of microfinance as a poverty alleviation tool among international development agencies and their networks, and microfinance has begun to grow in many countries through the establishment of multilateral aid agencies serving poor households and microentrepreneurs.On the other hand, in order to expand their coverage, many microfinance institutions (MFIs) and their networks have started to appeal to commercialization strategies and try to transform in order to attract more capital investment and eventually become part of the financial system. In addition, the development of information and communication technologies (ICT) has driven down many transaction costs in latest years. During this period, an increasing number of MFIs were found to be able to operate independently and self-sufficiently without relying on subsidies. At the same time, microfinance began to replace microcredit as the term for a diverse range of financial services provided to the poor, including lending, savings, and money transfers.

Microfinance has enjoyed impressive success over the past 30 years and developed sustainable institutional systems which could provide systematic financial services to the poor in some countries. Microfinance industries which cover microloans, microsavings and microinsurance have been built in many developing countries, which amply demonstrated that financial services are available to low and middle income people, despite the costly microtransactions. As a matter of fact, the essence of microfinance, as a financial innovation that organically combines the policy objective of promoting rural economic development and the principle of commercialized operation of financial institutions, has remained unchanged. Whether in early or modern times, advocates and practitioners of microfinance have been exploring and trying best to solve three problems whenever. The first is how to increase quality financing services for the general public, mainly low and middle income people, i.e., the breadth problem. The second is how to gradually deepen the reach coverage of financial service residents in poorer and more remote areas, i.e., the depth problem. And the third ids how to reduce costs for customers as well as financial service institutions, i.e., the cost problem. How microfinance can successfully deal with the above three issues and find out the key influencing factors and development mechanisms of sustainable development is an critical issue for MFIs sustainability in the world, which means to explore and create a new path of sustainable development between traditional goals and modern methods.

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2. Literature Review

2.1. Sustainability and economic impact of MFIs

There have been two distinct international perspectives on the sustainability of microfinance, institutionalism and social welfarism, which was called the discrete nature of microfinance [1]. The main reason is the different understanding of the depth of services that are self-sufficient for MFIs. The former believes that the sustainability of MFIs is the successful delivery of financial services to the poor, while the financial self-sufficiency is necessary to reach the sustainability [2]. Financing difficulties are increasingly becoming an important obstacle to the development of some small and medium enterprises (SMEs) [3]. Incomplete financial markets lead to distorted resource allocation, making SMEs can only carry out technological innovation and development through endogenous financing and private finance. In essence, MFIs are a manifestation of financial system innovation and operational mechanism innovation [4].

On the contrary, social welfarism believed that sustainability of MFIs doesn't need financial self-sufficiency [1]. They believe that donors can be seen as social investors and the general consensus is that there are clear balances between self-sufficiency and depth of service [5]. The study found that the function of MFIs to serve the disadvantaged has been achieved to a certain extent, but there is also a more obvious mission drift phenomenon[6]. Unfortunately, little evidence supported the reliability of sustainability of microfinance. Even so, some historical events proved that microfinance is sustainable,such as the Irish loan fund which has survived for more than 100 years and the modern BRI of Indonesia.

As a useful supplement to financial market, MFIs can provide good financial support for three rural areas, SMEs and individual private economy. It also play a positive role in market stability and alleviate the lack of inadequate rural financial services and financing difficulties. The study found that the impact of expected returns on credit demand is partially offset by differences in capital accumulation and dependence on external finance among farmers with different entrepreneurial motives, with relatively greater credit demand among entrepreneurial farmers.[7]In fact, parties are guiding the investors to finance MFIs. Theoretically, if capital markets could provide funds for MFIs and investors could get the benefit while taking risk, it is more possible to eliminate poverty. However, the reality is not as rosy as one might think, as was the case of microfinance crisis in India in October 2010.

2.2. Service positioning and risk control of MFIs

International studies of the financial products and services that MFIs can offer show that there are many differences between the products and services that MFIs can offer are similar to formal financial institutions. For the lending business of microfinance, it is essential to divide the loans into business loans and household consumer or emergency loans.

A very important characteristic of poor households or SMEs is their financial vulnerability, and they are very susceptible to external risks and turbulence. Therefore, the risk control mechanisms of MFIs have their own characteristics, such as relying on social guarantees of the target clients, and group lending. The risk level matching criteria of higher credit rating and lower default loss rate can be used to classify the credit rating of clients[8].In recent years, the microfinance industry have generally suffered from an inadequate risk management system and difficulties in loan recovery. Yao Mingrui explores and suggests that cross-border ecological regulation of fintech should be strengthened [9].

2.3. MFIs operation and performance evaluation

Researches about the effectiveness of practices show that evaluation of the best performance has to be based on specific circumstances and conditions due to the difference between MFIs and formal financial institutions. In the existing literature, the top topics mentioned include the best loan interest rate, MFIs' commercialization, size of the loan and division of credit rating.The scientific nature of the methodology and procedures is very important in assessing microfinance performance. The empirical study showed that MFIs extend the service coverage to middle-income group and utilize the cash flow centered credit technology to make up for lack of traditional financial institutions [10].

The study of the effectiveness of MFIs for external performance is also of considerable interest in the existing international literature, where the main question addressed is whether microfinance is effective in eradicating poverty. It has been proved that the impact of microfinance and the external environment are highly related.

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2.4. Business innovation practice of MFIs

In recent years, most researches have focused on business innovation of MFIs sustainability, which focuses on three aspects of MFIs model innovation, securitization and P2P network lending in the context of Internet finance. Compared with indirect financing and indirect financing, Internet finance is privileged in terms of information, cost, efficiency and inclusiveness. Based on the views of community banks, the innovation and policy of rural finance service channels are studied. Asset securitization is one of the most important financial innovations in the past four decades [11]. Asset securitization is a feasible way for MFIs to broaden their financing channel [12]. Further research conclude that investors and financiers can get win-win by extending to offline small loans, Internet consumer loans, etc. [13].

With the development of the Internet and the innovation of financial instrument, P2P lending becomes an important innovation mode of Internet finance. Based on the relevant content of the new regulation of Internet finance, the basic concept of Internet finance is defined, and seven models of Internet finance are proposed [14].

The study of microfinance, as a new scheme, has to union actual elaborated. Early studies in the field of microfinance lacked the data needed for detailed empirical analysis, and some subsequent studies began to conduct more in-depth empirical analysis on specific topics and dimensions [15]. Studies of sustainability of MFIs are more focused on the the development of the whole industry without unified indicators. To meet the need of development of microfinance, it is important to explore empirically the key factors of microfinance and appropriate development path, which will be focused on in this study to offer operational suggestion for sustainable development of MFIs.

3. Theoretical Analysis and Research Hypothesis

The sustainability of MFIs had been influenced by many factors. So key factors are precondition and condition whether to promote sustainable development and to make relevant policies. According previous literature, this study hypotheses the factors that influence the sustainability of MFIs include financial factor, operational factor, political and legal factors.

Financial factor. Most of the MFIs developed well in recent years, however, there are also some microfinance companies that have entered into difficulties in their development. Financial position is not only a direct manifestation of operation, but also a prominent indicator of sustainability. As such, the study hypotheses that financial position is one of the most important factors that affect the sustainability of MFIs. It is embodied in five aspects of asset ratio, asset-liability ratio, capital turnover, equity ratio and loan losses.

Operational factor. Compared with traditional financial institutions, MFIs face even greater risk. Therefore, the study hypotheses the operation condition is also one of the most important factors that affect the sustainability of MFIs. It mainly reflected in the following aspects, which include the degree of flexibility in establishing the loan period, the limitation of loan amount, the flexibility of loan interest rate, the speed of approval, the strength of the guarantee, the advantage of hardware, the advantage of technology and, the professionalism of the employees.

Political and legal factor. The introduction of supportive government policies and related systems is of great importance to MFIs. There has been a financial document about regulation of MFIs. In a sense, these specific laws and regulations boost economic growth of MFIs. As a result, the study hypotheses political and legal factor plays an important factor in the sustainability of MFIs. It can influence MFIs by relaxation of interest rate policy ceiling, tax incentives, relaxation of deposit restrictions, government public welfare guarantee policy and state subsidy policy.

4. Survey Design and Data Collection

The questionnaire design of this study is mainly set for this paper around the factors influencing the sustainability of microfinance companies and the research content related to the judgment of microfinance company performance The questionnaire includes five basic contents:

(1) Basic information of microfinance companies;
(2) Loans of microfinance companies;
(3) Judgment on influencing factors of sustainable development of microfinance companies
(4) Judgment on performance factors of microfinance companies
(5) Prospects for the future development of microfinance companies

The questionnaire used in this study was developed gradually on the basis of the results of a large amount of previous literature research, the results of interviews in microfinance projects, and some more successful forms of questionnaire design at home and abroad. The preliminary questionnaire was revised and improved after consulting with

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the regulators of relevant functional departments, banks and professional practitioners, on which the final questionnaire was formed.

In this paper, questionnaires were distributed on the spot to collect the required data. A total of 150 questionnaires were distributed, and 73 valid questionnaires were recovered, with a recovery rate of 48.7%. After the questionnaire is returned, the criteria for removing invalid questionnaires are: when filling in the questionnaire, those with no options or more than 5 missing items will be removed. After eliminating invalid questionnaires, 65 valid questionnaires were obtained, with a recovery rate of 43.3%. The key part of the questionnaire in this paper adopted the five point system method of Likert table. In this paper, the author used a self-developed questionnaire to conduct a questionnaire survey on the financial related personnel of micro loans in Zhejiang Province. The questionnaire survey first selected two major directions: the actual situation of the company and the expectation of the future situation, and then measured the indicators that may affect the operation mode of microfinance companies in these two directions, and obtained relevant data on the operation mode.

In addition, this paper has analyzed the company's managerial condition, risk profile and future expectations by their annual report information,comparing to the items above, and we also obtain the relevant data from the Statistical Table of Regional Conditions of microfinance companies by the People's Bank of China. Finally, under the help of the statistics soft , we analyze the sustainable development degree of each factor above.

5. Study Results and Analysis

5.1. Descriptive Statistics

The basic information of microfinance companies predominantly consists of the company's organizational form and the company's asset scale. The loan situation predominantly consists of loan interest rate, loan term, fund channel and guarantee method.

1. Asset size of microfinance companies surveyed.

This study investigated the asset size and distribution of 65 microfinance companies. In accordance with the statistics of relevant data, the proportion of companies with assets of more than 200 million accounts for 46%. The proportion of companies with assets from 5 to 20 million, from 20 to 50 million and from 50 to 80 million accounts each for 12%. The proportion of companies with assets from 80 million to 0.1 billion accounts for 3% and that of 100~200 million accounts for 15%. This suggests that the asset scale of most microfinance companies in Zhejiang is comparatively large.

2. Loan interest rate and loan term.

In accordance with the results of the questionnaire, we can roughly know the range of changes in the minimum and maximum monthly loan interest rates of 65 companies in this study. The lowest monthly interest rate of these companies is chiefly in the range from 1.3% to 1.6%, while the highest monthly loan interest rate is in the range from 1.85% to 2.1%. Microfinance companies shall operate in accordance with the principle of marketization, and the upper limit of loan interest rate shall be liberalized, but shall not exceed the upper limit prescribed by the judicial department.

Because the capital cost of microfinance companies is higher than that of banks, their loan term is generally shorter than that of banks. As displayed in the survey results, the loan term of microfinance companies is primarily half a year and 1-3 months, which generally does not exceed one year.

3. Guarantee mode.

Microfinance companies pay more attention to risk control, and the guarantee mode of the lender is a vital factor for them to consider whether to lend. As displayed in the questionnaire survey, most microfinance companies chiefly choose mortgage and guarantee. When the debtor fails to perform the debt, the microfinance companies can get priority in repayment by converting the property mortgaged by the debtor or by auctioning or selling the property, so as to lessen the risk more favorably. Similarly, when the borrower is unable to repay the loan, the guarantor will perform the debt or assume the responsibility in line with the agreement, which can ameliorate the recovery rate of the loan..

5.2. Dimensional analysis of the sustainable development of microfinance companies

The factor analysis method is explored to extract public factors from a group of related indicators and determine the number of factors, in order to determine the key factors affecting the sustainable development of microfinance companies. When carrying out factor analysis, the correlation between variables should be first determined , and KMO measure and Bartlett sphere test are done to determine whether the data is suitable for factor analysis.

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5.2.1. Dimensional analysis of the factors of the sustainable development of microfinance companies.

According to the theoretical analysis, the Definition and measurement of variables of influencing factors of sustainable development of Zhejiang microfinance companies are shown in Table 1, in which Category a indicators are for financial indicators, Category b indicators are for internal factors and Category C indicators are for external factors. From Table 2, the KMO value is 0.718, greater than 0.7, which indicates that there are common factors among variables. Meanwhile, the significance probability of Bartlett's statistical value is 0.000, less than 0.005, indicating that the scale items are suitable for factor analysis.

Table 1. Defifinition and measurement of variables.

Variable	Measurement of variables
a2	Asset-liability ratio
a3	Turnover rate of funds
a4	Shareholder equity ratio
a5	Loan loss rate
b3	Loan interest rate flexibility
b4	Approval speed
b6	Advantages of the hardware equipment
b7	Advantages of the technical level
b8	Professional quality of the employees
c2	Preferential tax policy
c3	State has relaxed the deposit restrictions
c4	Government public welfare guarantee policy
c5	State subsidy policy

Table 2. KMO sample measures and the Bartlett spheroid test the sustainable development.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.718
Bartlett's spherical degree test	Chi-square approximation	333.607
	df	78
	Sig.	.000

After multiple common factor analysis of variance (ANOVA), for the initial commonality of each variable and the commonality after principal component analysis was used to extract the principal components, this study finally retains 13 indicators.

As the factor analysis results show, owing to the strong correlation of the data, the above 13 indicators are divided into three categories, that is, three factors are extracted, which is consistent with the results of the gravel map. Since the third factor, the gravel slope line is tremendously flat, indicating that there is no special factor worth extracting. As a result, it is appropriate to retain three factors. These three factors explained 60.177% of the total variance of the original 13 variables. The factor analysis method is used to convert the corresponding indicators of the sustainable development of microfinance companies. From the Rotated component matrix of principal component analysis of Table 3, b7, b6, b8 and b4 can be are constructed as common component 1, which is defined as operation technology. C2, c4, c3, c5 and b3 are constructed as common component 2, which is defined as external environment, a2, a4, a5 and a3 are constructed as component 3, which is defined as financial situation. Among the 13 indicators, only indicator b3 is inconsistent with the original construct of this study, which do not belong to an operational technology factor, but an external environment factor.

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Table 3. Results of rotated component matrix of principal component analysis after Kaiser standardization for the factors of the sustainable development *.

Variable	Component		
	1	2	3
b7	.861	.113	.057
b6	.839	.137	-.104
b8	.696	.381	-.179
b4	.677	.509	-.061
c2	.133	.844	.150
c4	.074	.690	.302
c3	.155	.681	.075
c5	.378	.603	.209
b3	.464	.494	-.264
a2	.165	-.051	-.707
a4	.097	.139	.654
a5	.270	-.288	-.604
a3	.520	.001	.525

* Rotation was converged after 8 iterations.

5.2.2. Dimensional analysis of sustainable development performance of microfinance companies.

From the results of the KMO sample measure and Bartlett sphere test in Table 4, the KMO value is 0.752, greater than 0.7, which indicates that there are common factors among variables. Meanwhile, the significance probability of Bartlett statistical value is 0.000, less than 0.005, which means that the scale items are suitable for factor analysis. This study selects 6 performance indicators. Just as the ANOVA of result of common factor that the indicators are all above 0.5 illustrates, the commonality of each variable with other variables shows significant. Among the six indicators to measure the sustainable development performance of microfinance companies, this study extracted two common factors from them, in which the two factors explained 62.401% of the total variance of the original six variables.

Table 4. KMO sample measures and Bartlett spheroid test for sustainable development performance.

Kaiser-Meyer-Olkin measure of sample adequacy		.752
Bartlett's spherical degree test	Approximate chi square	78.223
	df	15
	Sig.	.000

Table 5 is the rotated component matrix of principal component analysis after Kaiser standardization for the corresponding indicators of the sustainable development performance variables of microfinance companies . d1, d2, d4 and d5 are component 1, which is the construct of common factor 1 defined as economic sustainability performance. On the basis of the actual survey content, there are only two variables in component 2 including d3 and d6. The construct of common factor 2 is defined as operation sustainable development performance which is illustrated in Table 6.

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Table 5. Results of rotated component matrix of principal component analysis after Kaiser standardization for the factors of the sustainable development performance *.

Variable	Component	
	1	2
Size of the company	.799	-.250
Brand improvement	.746	.280
Risk control ability	.664	.410
Profitable level	.643	.328
Internal incentive policy	.039	.808
Type of production	.245	.752

* Rotation was converged after 3 iterations.

In the dimensional analysis of influencing factors of sustainable development of microfinance companies, this paper selects six indicators, and then measures the performance of microfinance companies. As illustrated in Table 5, six performance items can be divided into two factors factor analysis, of which four indicators are one factor and the other two indicators are another factor. In general, it is reasonable to have three or more indicators for each factor. However, the data analysis of the questionnaire results indicates that it is most reasonable to select six indicators. If more indicators are added, the cumulative explanation of the factors will not heighten much, but they will be classified into three factors and divided into three dimensions, which will give rise to poor fitting effect of the regression model. As a consequence, it is most appropriate to divide the six indicators into two dimensions and define as two factors.

Table 6. Definition and measurement of variables of performance dimensions.

Performance dimension	variable	Indicators
Economic sustainability performance	d1	Rate of increase of loan volume
	d2	Brand improvement
	d4	Risk control ability
	d5	Profitable level
Operational sustainability performance	d3	Internal incentive policy
	d6	Type of production

5.2.3. Reliability analysis of key factors for sustainable development of microfinance companies.

This study explores the method of Cronbach's consistency coefficient to analyze the reliability. The internal consistency coefficient is most suitable method for homogeneity test to check whether each item in each factor measures the same or similar characteristics. For the items that describe the same indicators in the questionnaire, the measurement is reliable only when their answers are the same or similar reliability. When the coefficient α is greater than 0.7, it means the reliability is comparatively strong. When the coefficient is between 0.5 and 0.7, it is considered that the reliability is average and should be further explored.

In the construct component 1 of operation technology, the value of internal consistency coefficient α is equal to 0.868, which indicates that the reliability index is immensely ideal. The standardized internal consistency coefficient α is 0.870, and the subscale contains 4 indicators. For the reason that the internal consistency coefficient α at the operation technology level is higher than 0.800, and the split half reliability statistic Guttman Split Half coefficient is equal to 0.860, which fully indicates that the internal consistency at the operation technology level is highly reliable.

In the construct component 2 of external environment, the value of internal consistency coefficient α is equal to 0.767, which indicates that the reliability index is considerably satisfactory. The standardized internal consistency coefficient value α is 0.764. The coefficient values α of the five selected indicators range from 0.692 to 0.781, and nothing but one is slightly higher than the coefficient α of 0.767. Guttman's split reliability value of the external environment level

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construct is 0.733, and the internal consistency coefficient α is higher than 0.700, which indicates that the internal consistency credibility of the external environment" level is extremely high.

In the construct component 3 of financial condition, the internal consistency coefficient is equal to 0.670, which indicates that the reliability index is satisfactory. The standardized internal consistency coefficient is 0.661, and the subscale contains 4 indicators. The corrected total correlation coefficient value of the four indicators is between 0.617 and 0.650, which fully indicates that each indicator has a high consistency with the sum of the other items, and and each item has no higher coefficient α than 0.670. Since the internal consistency coefficient at the level of financial condition is higher than 0.600, and Guttman's half reliability value is 0.626, it means that the internal consistency reliability at the level of financial condition is slightly satisfactory.

Table 7. Reliability statistics results for the sustainability influencing factors of microfinance companies.

Component	Cronbach's Alpha	Standardized Cronbachs Alpha	N of Items
Operation technology	.868	.870	4
External environment	.767	.764	5
Financial condition	.670	.661	4

5.2.4. Reliability analysis of sustainable development performance of microfinance companies.

The internal consistency coefficient α of the economic sustainability performance is equal to 0.672, which indicates that the reliability is favorable. The standardized internal consistency coefficient value α is 0.726. The subscale contains 4 indicators. The corrected total correlation coefficient of these four indicators is from 0.413 to 0.574, which indicates that each indicator has a high consistency with the sum of the other items. The coefficient values α of the four selected indicators range from 0.541 to 0.721, and only one is higher than the coefficient α 0.672 at the level of economic sustainability performance. The internal consistency coefficient α of the economic sustainability performance is higher than 0.600, which indicates that the internal consistency reliability of the financial situation is still satisfactory. At the level of operational sustainability performance, the internal consistency coefficient α is equal to 0.547, which indicates that the reliability is slightly acceptable. The standardized internal consistency coefficient α is 0.551, and the subscale contains 4 indicators, as shown in Table 8.

Table 8. Reliability statistics results for the sustainability performance of microfinance companies.

Component	Cronbach's Alpha	Standardized Cronbachs Alpha	N of Items
Economic sustainability performance	.672	.726	4
Operational sustainability performance	.547	.551	2

6. Further Discussion

6.1. Multiple linear regression model construction

Through the factor analysis, three dimensions of influencing factors are obtained for sustainable development of companies, which are defined as operating technology, external environment and financial situation. These three factor scores fully reflect the impact of 13 indicators on the sustainable development of microfinance companies. Through the model fitting, this study finally considers the use of these three factors and the vital factor of enterprise scale for regression analysis, and design the following model (1) and model (2).

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$$Y_1 = \beta_1 * X_1 + \beta_2 * X_2 + \beta_3 * X_3 + \beta_4 * X_4 + \gamma \quad (1)$$

$$Y_2 = \beta_1 * X_1 + \beta_2 * X_2 + \beta_3 * X_3 + \beta_4 * X_4 + \gamma \quad (2)$$

Where Y1 represents the economic sustainability performance in the model (1), and Y2 represents the performance of operational sustainability in model (2). X1, X2, X3, and X4 represent the operation technology, external environment, financial situation, and enterprise scale respectively.

6.2. Regression analysis

The regression results of the model (1) is shown in Table 9, in which the adjusted R2 is 0.645. The fitted linear regression model reflects 64.5% of the original data. As revealed by this model, the fitting effect is good. The regression results of the model (2) can be seen in Table 9, in which the adjusted R2 value is tremendously small, and the fitting effect of the linear regression model is relatively insignificant.

Table 9. Results of the regression for the sustainability development.

Model	R	R2	Adjusted R2	Standard estimation error
1	.817	.668	.645	.59387432
2	.226	.051	.004	1.00381785

6.3. Analysis of Variance (ANOVA)

ANOVA is adopted in this study to explore the variance of a single factor or several independent dependent variables to test whether the difference between the mean values of each factor is statistically significant. First, ANOVA of economic sustainability performance is tested. As the model (1) showed in Table 10, the F statistic in the ANOVA results is 29.649, and the probability P value is less than the significance level of 0.05, so the model has a favorable fitting degree, that is, the four factors of operating technology, external environment, financial situation and enterprise size have a remarkable impact on the economic sustainability of the sustainable development of microfinance companies.

Second, Performance ANOVA of the operational sustainability is tested. As the results of model (2) is showed in Table 10, the F statistic in the ANOVA results is 1.076, and the probability P value is greater than the significance level of 0.05. The four factors have no noticeable impact on the operational sustainability of the sustainable development of microfinance companies.

Table 10. Anova results of the models for the sustainability development performance.

Model		Sum of squares	df	Mean square	F	Sig.
Model 1	Regression	41.827	4	10.457	29.649	.000
	Residual	20.809	59	.353		
	Total	62.636	63			
Model 2	Regression	3.252	3	1.084	1.076	.366
	Residual	60.459	60	1.008		
	Total	63.711	63			

6.4. Further determination and analysis of regression

The parameter estimation results of the regression for the economic sustainability performance is shown in the model (1) of Table 11, hence the regression equation (3) can be established as follows.

$$Y1 = 0.033X1 + 0.156X2 + 0.112X3 + 0.660X4 - 1.849 \quad (3)$$

As the comparison of the fitted predicted value with the actual value reveals, the goodness of fit in the model is favorable. Apart from that, the economic significance of each variable coefficient symbol in the model is reasonable, and the growth of each influencing factor is positively correlated with the characteristics of sustainable economic development of microfinance companies. Meanwhile, the probability P value of the factor operation technology is equal to 0.062,

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greater than the significance level of 0.05, indicating that the operation technology factor in the model is comparatively unremarkable. The factor of enterprise size is positively correlated with the characteristics of sustainable economic development of microfinance companies, and is also the most remarkable among the four factors. The external environment is also extremely noticeable, and is the second most influential factor.

The economic significance of each variable coefficient in the model does not conform to the actual situation, indicating that the influence of the three factors in the model is not striking, and the impact on the operational sustainable development of microfinance companies is not noticeable.

Table 11. Regression results of the sustainable development performance.

Model		Non-standardized coefficients		Standard coefficient		
		B	SE	Bête	t	Sig.
Model 1	(constant)	-1.849	.189		-9.795	.000
	Financial condition	.112	.075	.112	1.485	.043
	Operation technology	.033	.075	.033	.439	.062
	External environment	.156	.075	.156	2.082	.022
	enterprise size	.660	.061	.813	10.759	.000
Model 2	(constant)	-.008	.125		-.066	.947
	Operation technology	.026	.126	.026	.203	.839
	Financial condition	-.213	.126	-.212	-1.683	.098
	External environment	-.075	.126	-.075	-.595	.554

7. Conclusions

All This article study takes 65 microfinance companies in Zhejiang Province as research samples, conducting an empirical analysis on the reliability and validity of relevant data and variables. As the research results show, the measurement of each variable in the model analysis meets the requirements of reliability and validity. Apart from that, confirmatory factor analysis confirmed the validity of the model constructed in this paper. As research shows, microfinance companies have large assets, and their corporate forms include joint stock limited company and limited liability company. The ratios of these two forms are similar. Compared with small and medium-sized enterprises, the number of shareholders of Zhejiang microfinance companies is comparatively small, and the personnel structure is comparatively complete and compact.

By the factor analysis results and questionnaire survey results, the establishment of the regression models in this paper confirms that the four factors of operation technology, external environment, financial situation and enterprise size are noticeably positively associated with the economic sustainability of the MFIs development of . The three factors of external environment, financial situation and enterprise scale also have obvious and striking positive effects on the economic sustainability of the MFIs development.

The key factors influencing the sustainable development of MFIs are composed of three dimensions: the external environment dimension which includes preferential tax policies, government public welfare guarantee policies, national easing of deposit restrictions and national subsidy policies, etc. , the operation technology dimension which includes the advantages of technical level, hardware configuration, employee professionalism and approval speed, etc. and the financial status dimension which includes asset liability ratio, shareholders' equity ratio, loan loss rate and capital turnover rate, etc.. The sustainable development performance dimension of microfinance companies can be divided into economic sustainability performance which includes the increase rate of loan volume, brand improvement, risk control ability and profitability and operational sustainability performance which includes internal incentive policies and product categories. All factors of influencing factors and performance dimensions have passed the reliability test.

Then, this paper tries to establish a regression equation between influencing factors and performance. Through variance analysis, this paper found that the four factors of operation technology, external environment, financial situation and enterprise size have noticeable impact on the economic sustainability of the MFIs development. However, these four factors cannot pass the significance test of their impact on operational sustainability. Aside from that, as the variable coefficients in the model show, there is a positive correlation between the four influencing factors and the

economic sustainability of the MFIs development , which is consistent with the actual economic significance, but the significance of the operating technology factor is not satisfactory.

This study also has some limitations.This paper tried to empirically study by selecting complete samples and accurate research methods, however,there are still some deficiencies, which need to ameliorate in future research. First is on the Questionnaire survey. The items setting of the questionnaire may not be perfect enough and there may be concerns about human factors in the process of questionnaire design, so it may not be possible to answer on the basis of the real situation. Aside from that, owing to the limited human and material resources and the relative less companies when the questionnaire survey is done. On the other hand, the number of valid sample data recovered is extremely small. If these aspects can be improved, the research results will be more satisfied. Finally, the selection of research methods and models needs to be further studied and discussed, which needs more innovative methods in the further research.

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References

1. 1.Morduch, J., The microfinance schism. World Development 2000, 28, 617-629. https://doi.org/10.1016/S0305-750X(99)00151-5.
2. 2.González-Vega, L., et al. Spécialisation de la suite de Sturm. RAIRO - Theoretical Informatics and Applications - Informatique Théorique et Applications 1994, 28,. 1-24.
3. 3.Pischke, J. Measuring the trade-off between outreach and sustainability of microenterprise lenders. Journal of International Development 1996, 8, 225-239.
4. 4.Geng, X.; Feng, B. Study on the operation of microfinance companies and their sustainable development - a case study of shandong microfinance companies. Shandongg Social Scinece 2015, 1, 131-135. https://doi.org/10.14112/j.cnki.37-1053/c.2015.01.019.
5. 5.He, GW; Liu, T. A study on farmers' credit needs for entrepreneurship in poor areas: based on the perspective of entrepreneurial type heterogeneity. Finance and Insurance 2019, 40, 11-18. https://doi.org/10.3969/j.issn.1003-7217.2019.05.002.
6. 6.Shi, BF; Wang, J.; Chi, GT. The inclusive finance, bank loans and financing of small private business microfinance loan - based on matching credit risk and credit rating. Chinese Journal of management Science 2017, 25, 28-36. https://doi.org/10.16381/j.cnki.issn1003-207x.2017.09.004.
7. 7.Yao, MR. Fintech cross-border ecological regulatory ideas to explore. Tsinghua Financial Review 2021, 2, 91-94. https://doi.org/10.19409/j.cnki.thf-review.2021.02.024.
8. 8.Zhang, LY.; Yu Y.; Yang, J. The inclusive effect of microfinance in china:evidence from 4220 farmers in 6 provinces. Agricultural Technology and Economy 2021, 2, 88-99. https://doi.org/10.13246/j.cnki.jae.2021.02.008.
9. 9.Yang Z., Huang M. Innovation of rural financial service channel and policy support suggestions based on the perspective of community banks. Southern Finance 2019, 12, 76-83.
10. 10.Peng, XF; Zou, ZT. Analysis of asset securitization business of small loan company in china. Economic System Reform 2017, 2, 144-149.
11. 11.Jiang, XL. Reflections and insights on asset securitization under internet finance. China Economic & Trade Herald 2019, 12, 82-84.

12. 12.Zhang, ZX. Analysis of the connotation and model of Internet finance. Finance and Accounting Monthly 2017, 91, 84- 91. https://doi.org/10.19641/j.cnki.42-1290/f.2017.02.014.
13. 13.Meehan; Jennifer. Tapping financial markets for microfinance. Grameen Foundation USA 2004, 9-10.
14. 14.Arvind A. News and trends in fintech and digital microfinance: why are European MFIs invisible? FIIB Business Review 2018, 7. https://doi.org/10.1177/2319714518805183.
15. 15.DeYoung R, Glennon D, Nigro P. Borrower–lender distance, credit scoring, and loan performance: evidence from informational-opaque small business borrowers. Journal of Financial Intermediation 2008, 17, 113-143. https://doi.org/10.1016/j.jfi.2007.07.002
16. 16.Frédéric H, Johan B, Gert V H. Exploring the potential contribution of green microfinance in transformations to sustainability. Current Opinion in Environmental Sustainability 2019, 41. https://doi.org/10.1016/j.cosust.2019.11.001.
17. 17.Kazeem B L O, Olayiwola S O. Digital banking, managerial opportunism and the performance of microfinance banks in Nigeria. Journal of Policy and Development Studies 2020, 12, 27-35. https://doi.org/10.12816/0056334.
18. Shuang, S.; Baiyang, Z.; Wen, Z. The impact of digital inclusive finance on residents' consumption upgrade under the new development pattern -- based on the provincial panel quantile model. Frontiers in Economics and Management 2022, 3, 682-689. https://doi.org/10.6981/FEM.202202_3(2).0081.