Can Centralized Intervention Solve Rural Credit Exclusion? Evidence from China

Bingwu Liao[1(✉)] and Murong Shen[1,2]

[1] Beijing Normal University, No. 19, Xinjiekouwai Street, Haidian District, Beijing 100875, People's Republic of China
lbkroax@live.com

[2] Beijing Normal University at Zhuhai, No. 18, Jinfeng Road, Tangjiawan, Zhuhai 519087, People's Republic of China

Abstract. The purpose of this study is to analyze whether the centralized intervention represented by government intervention can effectively solve the problem of rural credit exclusion, and provide evidence for the development of global rural inclusive credit. In the process of research, this study uses the random effect model (REM) as the analysis method to analyze the data of China's Household Financial Survey (CHFS) from 2013 to 2019. The results show that centralized intervention can significantly improve the rural credit exclusion under moderate conditions, but with the strengthening of the intervention, this effect continues to decline and become a constraint, showing an inverted "U" type. Therefore, this study suggests that to solve the problem of rural credit exclusion, in addition to moderate centralized intervention, we also need to rely more on the role of decentralized subjects.

Keywords: Credit Exclusion · Centralized Intervention · Financial Capability · Blockchain

1 Introduction

With the introduction of the concept of "Inclusive Financial System" by the United Nations in 2005, the research on the topics of financial inclusion and exclusion has been the focus of global academia. "Inclusive finance" is a concept proposed to solve the financial exclusion faced by the poor, farmers, women and other vulnerable groups. In China, depends on the development of Internet finance and the implementation of the government's anti-poverty strategy, the financial exclusion of rural residents has been effectively alleviated. But there is still obvious and widespread exclusion in the availability of credit. "Fairness" and "Sharing" of rural inclusive credit, determines that it is a kind of "quasi-public goods" [1]. This shows that we develop it rely on the market alone, we will encounter the problem of "market failure", such as the microfinance crisis in Andhra Pradesh, India. To maintain the external economy of rural inclusive credit, the government needs to participate in centralized intervention. However, if the government intervenes, it may cause "government failure" with low efficiency [2], such as Thailand's Village Fund Program. So, can centralized intervention solve the problem of credit exclusion?

J. Yen et al. (Eds.): ICBIS 2023, AHCS 14, pp. 1362–1369, 2023.
https://doi.org/10.2991/978-94-6463-198-2_142

In order to answer the above questions, this study uses the evidence from China, to empirically analyze the impact of the centralized intervention on the financial wellbeing of rural households. The main content of this study includes three parts below: The first part is selection and measure of variables, the second part is empirical analysis, the third part is discussion and development implications.

2 Selection and Measure of Variables

2.1 Data Collection

Based on data reliability, integrity and availability, we use the China Household Finance Survey (CHFS) data from 2013 to 2019 released by the Southwest University of Finance and Economics as the target database. The CHFS data had conducted five national surveys, which were adopting modern survey technology and survey management tools to scientifically sample and collect representative data for household financial at the national and provincial levels, forming a cross-year tracking panel database. Through data collation, we obtained 3604 samples to participate in four surveys, totaling 14416 observation data.

2.2 Dependent Variables

On the choice of the dependent variables, we focus on the financial wellbeing. In Sen's theory, the wellbeing is not a simple total problem, nor just a utility problem, but also involves distributive and non-utility problems; not a supply of "Primary Goods", nor just the fairness of results, but also the fairness of the process of wellbeing distribution [3]. Sen believed that the purpose of development is freedom, that is, the possibility of people realizing various functional activities. Sen defined the freedom to realize this possibility as "Capability", which is the embodiment of individual wellbeing evaluation [4]. Based on Sen's theory of capability, Sherraden defined the capability in the financial field as "Financial Capability", and believed that financial capability is the ability to have the opportunity to pursue their own financial interests [5]. Moreover, financial capability is the combination of financial literacy and financial inclusion, that is, the organic combination of personal financial behavior ability and financial action opportunities [6]. It can give individuals the opportunity to obtain useful financial services, thus contributing to the improvement of personal financial wellbeing and the development of financial markets [7]. So, we tend to believe that financial capability is the specific manifestation of financial wellbeing, and make it the dependent variable of this study.

The International Network on Financial Education (INFE) project of the Organization for Economic Co-operation and Development (OECD) divides financial capability indicators into five aspects, including financial knowledge, financial awareness, financial skills, financial attitude and financial behavior. They believe that this can be used as an international standard for the evaluation of financial literacy of countries, providing a standardized measurement tool for the transnational comparison of financial literacy [8]. In this paper, we combine the questionnaire design of OECD/INFE and CHFS, to build a measurement system for rural household financial capability (FC) and value range as shown in the Table 1.

Table 1. Measurement System and Value Range of FC Variables

1st Level Indicator	2nd Level Indicator	Value Range
Financial Knowledge	Interest Rate Knowledge	(0, 1)
	Inflation Knowledge	(0, 1)
	Risk Knowledge	0–1
Financial Awareness	Investment Risk Awareness	0–1
	Knowledge Learning Awareness	(0,1)
	Risk Appetite Awareness	0–1
Financial Skills	Numbers of Financial Assets	0–1
Financial Attitude	Credit Demand	(0, 1)
Financial Behavior	Use of Credit Loan	(0, 1)
	Use of Credit Card	(0, 1)

2.3 Independent Variables

In addition, the key independent variable of this study is centralized intervention wave (CI). China's centralized intervention in rural inclusive credit from 2013 to 2019 mainly occurred twice, in 2015 and 2017. In 2015, China issued the "Plan for Promoting Inclusive Financial Development" and launched a personal policy-based credit tool called poverty alleviation micro-credit in rural areas. In 2017, China launched the rural revitalization strategy, invested a large amount of financial resources in rural areas, and required large and medium-sized state-owned commercial banks to increase the credit business in rural areas. The two interventions were progressive and nationwide. Therefore, this study adopts the discrete assignment method of (0, 1) for the centralized intervention variables, and takes 2013–2017 as one stage and 2015–2019 as another stage. The specific assignment method is shown in the Table 2.

Since credit exclusion is the result of evolution under decentralization operation of the market, in theory, centralized intervention can solve this problem. Therefore, we put forward a hypothesis for analysis:

H1: Centralization intervention can improve the financial capability of rural households.

Table 2. Value of CI Variables

Stage	2013	2015	2017	2019
1st Stage	0	0	1	
Dif.	–	0	1	
2nd Stage		0	0	1
Dif.		–	0	1

Table 3. Selection and Measure of Control Variables

1st Level Variables	2nd Level Variables	Measure Method
Household Characteristic	Gender	Male = 1, Female = 0
	Age	Actual age
	Age_2	Age^2/100
	Edu	The most educated house-hold members: high school = 1, above = 2, below = 0
	Region	East = 1, non = 0
Economic Ability	Size	Number of household member
	Biz	One biz activity = 1, non = 0, above one = 2
	HPI	Log of total income/number of members
	NFA	Logarithmic value of non-financial assets

2.4 Control Variables

Based on the research of previous literature, we separated the control variables into two groups. The first, household characteristic variables, consisted of gender of the head of household, age of the head of household, age square/100, education level, household size and household region. The second set of control variables is economic ability variables, included household business type, household per capita income, household non-financial asset value [8–11]. The specific selection method of variables is shown in Table 3.

3 Empirical Analysis

3.1 Model Design

In order to examine the effect of centralized intervention on the financial capability of rural households, based on the panel data constructed by the CHFS tracking database, we set the analysis model as follows:

$$FC_{it} = \beta_0 + \beta_1 CI_t + \beta_2 X_{it} + \varepsilon_{it}$$

where FC_{it} represents the financial capability of i family in year t, CI_t is the centralized intervention shock in year t, and X_{it} is a group of control variables, ε_{it} is the random perturbation term.

Because the wave of financial capability is decentralized, the impact of centralized intervention is completely exogenous, just like an Instrumental Variable. In addition, the value of the centralized intervention in this study is completely exogenous, so the model is theoretically free of endogenous problems. In order to pursue a more accurate valuation, we use the random effect model (REM) to carry out regression analysis on the data.

Table 4. Regression of CI on Rural Households' FC in 1st Stage

Dependent Variable: FC	(1)	(2)	(3)	(4)
CI	0.0382***	0.0369***	0.00894**	0.0286**
Gender		0.0392***		0.0226***
Age		0.0392***		0.00289*
Age_2		−0.00634***		−0.00346***
Edu		0.0282***		0.0250***
Size		0.0136***		0.00974***
Biz			0.0568***	0.0522***
HPI			0.00260***	0.00124
NFA			0.0235***	0.0184***
Samples	3604	3604	3604	3604
Wald-Chi-Square	76.14***	453.43***	1159.90***	1140.86***

* $p < .05$. ** $p < .01$. *** $p < .001$.

3.2 Regression Results

3.2.1 1st Stage Regression

The 1st stage analysis uses data from 2013, 2015 and 2017, with 10812 observation data of 3604 samples in total. The regression results are shown in Table 4. The column (1) is the effect of CI on the FC of rural households without control variables, column (2) and column (3) are the regression results after adding household characteristic variables and economic ability variables respectively, and column (4) is the regression results after adding all control variables. The Wald Chi Square test results show that the four regressions are below the level of 1% and significantly reject the endogenous hypothesis of the independent variable.

From the regression results, the coefficient of CI is significantly positive at the level above 95%. It shows that CI can significantly improve the FC of rural households, and the original hypothesis H1 is supported.

3.2.2 2nd Stage Regression

The 2nd stage analysis uses data from 2015, 2017 and 2019, with 10812 observation data of 3604 samples in total too. The regression results are shown in Table 5, whose design of each column is consistent with Table 4. The Wald Chi Square test results show that the four regressions are also below the level of 1% and significantly reject the endogenous hypothesis of the independent variable.

As with the 1st stage regression, the coefficient of CI is significant above 95%. The difference is that after adding the control variables of economic ability, the coefficient of CI changes from positive to negative in 2nd stage. This indicates that CI will restrict the improvement of rural households' FC under the consideration of the impact of household economic ability. So, the original hypothesis H1 cannot be supported.

Table 5. Regression of CI on Rural Households' FC in 2nd Stage

Dependent Variable: FC	(1)	(2)	(3)	(4)
CI	0.0259***	0.0147***	−0.0412**	−0.0174**
Gender		0.0271**		0.0168*
Age		0.00674*		0.00433*
Age_2		−0.00327***		−0.00302**
Edu		0.0233***		0.0221***
Size		0.0283***		0.0142***
Biz			0.0675***	0.0535***
HPI			0.00564***	0.00461***
NFA			0.0373***	0.0262***
Samples	3604	3604	3604	3604
Wald-Chi-Square	513.68***	941.08***	2441.37***	2754.95***

* p < .05. ** p < .01. *** p < .001.

3.2.3 Robust Test

Although the effect of CI on FC of rural households is significant, its direction is different: at 1st stage, it shows a positive effect, supporting the original hypothesis H1; In the 2nd stage, it is reflected as a negative effect, and the original assumption H1 is not tenable. That is to say, if the model estimate in this study is effective, the impact of CI on FC of rural households should show an inverted "U" type. In order to prove the reliability of the regression results of the above model, we need to test the robustness of the model. The test design is as follows:

- Expand data observations. We combine the panel data of the two stages data into a new panel data, covering four surveys, including a total of 3604 samples and 14416 observations.
- Replace the independent variable. We re-assign the CI variables of the four surveys, instead of using progressive assignment, that is, $CI_{2013} = 0, CI_{2015} = 1, CI_{2017} = 2, CI_{2019} = 3$. And we add $CI\_2 = CI \times CI$, the square variable of centralized intervention, to test whether the centralized intervention has the inverted "U" type of effect.
- Replace the model. We use Random Effect Model (REM) and Fixed Effect Model (FEM) to regress new panel data and new independent variables respectively.
- Sample tail reduction. We delete the 1% sample with the highest and lowest average FC, to reduce the impact of tail sample data from the upper and lower directions on the model.

After the treatment above, the new regression results are shown in Table 6, and the coefficients of CI are significant at the level of 99%. The (1) and (2) columns in the table are the regression results of the new panel data using REM and FEM, respectively. It can be seen that CI has a significant positive effect on rural households' FC, and

Table 6. Robust Test Result

Dependent Variable: FC	(1)	(2)	(3)	(4)
CI	0.0235***	0.0213***	0.0273***	0.0257***
CI_2	−0.0038***	−0.0040***	−0.0043***	−0.0047***
Model	REM	FEM	REM	FEM
Samples	3604	3604	3532	3532

* p < .05. ** p < .01. *** p < .001.

the effect of CI_2 on rural family FC is negative, which means that the effect of CI on rural households' FC really presents an inverted "U" type. The (3) and (4) columns in the table are the regression results of REM and FEM after sample tailing, which are basically consistent with the first two columns. Therefore, the results of robust test support the reliability of the above model results.

4 Discussion and Implication

Based on the analysis above, this study found that:

- Centralized intervention can promote the financial capability of rural households.
- The marginal utility of the positive effect from centralized intervention is decreasing.
- The role of centralized intervention belongs to the inverted "U" shape.

Findings from the study support to the role of centralized intervention in promoting the financial capability of rural households, and provide evidence that centralized intervention can effectively solve the problem of rural credit exclusion. However, centralized intervention is not omnipotent. With the continuous enhancement of centralized intervention, its marginal utility on the financial capability has been declining, and its effect is negative after exceeding a certain degree. This is the result of the centralization effect in the process of strengthening the centralized intervention, because the centralization effect will have a crowding-out influence on the decentralized subjects like market and society, reducing the promotion role of the market and social on rural inclusive credit, such as financial technology innovation, financial model innovation, etc. When these decentralized subjects lose the space to play a role in rural inclusive credit, the role of centralized intervention also loses the ability to promote positively.

Therefore, this paper suggests that solving the problem of rural credit exclusion requires not only centralized intervention, but also the role of decentralized subjects. If the result of centralized intervention can establish a decentralized platform relationship, such as the blockchain platform, then the role of market and society, these decentralized subjects, will be sustainable development. And that may be the best way to solve the rural credit exclusion and the development of rural inclusive credit.

References

1. A. Demirguç-Kunt, L. Klapper and D. Singer, Financial Inclusion and Inclusive Growth: A Review of Recent Empirical Evidence, World Bank Policy Research Working Paper 2017, Washington, DC, Vol. 8040, pp. 1–25.
2. P. Mader, Contesting Financial Inclusion, Development and Change, 3 (2018): 1-24.
3. A. Sen, The Standard of Living: Lecture II, Lives and Capabilities, in: G. Hawthorn (Ed.), The Standard of Living, Cambridge University Press, Cambridge, 1987.
4. A. Sen, Development as Freedom, Anchor, New York, 1999.
5. M. Sherraden, Financial Capability: What Is It, and How Can It Be Created?. CSD Working Papers, 2010: pp. 10–17.
6. M. Sherraden, Building Blocks of Financial Capability, In: J. Birkenmaier, M. Sherraden, J. Curley, Financial Capability and Asset Development: Research, Education, Policy and Practice, Oxford University Press, Oxford, 2013.
7. M. Sherraden, D. Ansong. Financial Literacy to Financial Capability: Building Financial Stability and Security, In: et al. International Handbook of Financial Literacy, Springer, Singapore, 2016.
8. G. Chowa, D Ansong, and M. R. Despard, Impact of Internal and External Capabilities of Rural Households, Social Work Research, 38 (2014): 19-35.
9. A. Lusardi, O. Mitchell, Financial Literacy Around the World: An Overview, Journal of Pension Economics and Finance, 10 (2011), pp. 497-508.
10. A. Lusardi, O. Mitchell, Financial Literacy and Planning: Implications for Retirement Well-being, In: A. Lusardi, O. Mitchell, Financial Literacy: Implications for Retirement Security and the Financial Marketplace, Oxford University Press, Oxford, 2011.
11. M. Taylor, S. Jenkins, and A. Sacker, Financial Capability and Wellbeing: Evidence From the BHPS, FSA Occasional Papers in Financial Regulation, (2009), No. 34.