

Digital Financial Development, Financial Service Participation and Residents' Entrepreneurship

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Abstract

This paper analyses the impact of different forms of financial participation on residents' entrepreneurial choices by defining different forms of lending based on CHFS 2019 data. The study finds that: (1) Both single and compound forms of participation can have a significant positive impact on residents' entrepreneurial choices, with the compound form of participation having a relatively higher boosting effect than the single form of participation; (2) Among the single forms of participation, internet loans have the smallest promotion effect, indicating that the role of digital finance is still to be explored, while private loans have the largest promotion effect; (3) Among the composite forms of participation, the form without bank loans has the lowest facilitation effect, indicating that bank loans are highly important for residents' choice of entrepreneurship; (4) Heterogeneity analysis reveals that financial services participation has a more significant contribution to entrepreneurial activity among low endowment households, both in single and composite forms of participation. This paper argues that the supporting role of formal finance should be strengthened, the development of informal finance should be reasonably guided, and the financial literacy of households should be further enhanced to bring into play the inclusive role of digital finance.

JEL classification numbers: H20, H30, H81.

Keywords: Digitization of financial institutions; Financial services participation; Digital finance; Internet lending; Entrepreneurial activity.

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1. Introduction

The Central Economic Working Conference for 2022 puts forward the policy to pursue "the coordinated development to maintain stable growth, promote reform, make structural adjustments, benefit people's livelihood, and guard against risk, and further ensure stability in employment, financial operations, foreign trade, foreign investment, domestic investment, and expectations". In recent years, through the optimization and upgrading of the industrial structure, the economic growth of China has entered from the stage of high-speed development to the stage of high-quality development, but, in the meantime, it has also experienced in this period the pain of a slowdown in its growth rate, difficulties for the operation of enterprises, and increased pressure on employment. In addition, the interactive effects of multiple factors such as the sluggish global economic growth, the emerging protectionism in global trade, and the impact of the pandemic have brought the grave dilemma of employment and increase in incomes, which presents great challenges to the work of consolidating the results of poverty eradication and the realization of common prosperity.

Employment is the foundation of people's livelihood. The focus of "maintaining stability in employment" should be on both consolidating existing employment opportunities and creating new ones. Therefore, under the interactive scenarios of high-quality economic development and epidemic prevention and control, boosting employment with entrepreneurship has become an important strategic choice to alleviate the difficulties in employment, and a major need at present for China's economic and social development. Academics have long been focusing on entrepreneurship, and relevant studies have indicated that entrepreneurship is the main driving force of the economic process itself (Schumpeter, 1934), and that it does not only facilitate the innovation and long-term economic growth in a country (King et al., 1993; Samila et al., 2011; Liargovas et al., 2015; Priege et al., 2016), but also solves employment issues in society and increases incomes (Banerjee et al., 1993; Mel et al., 2008).

However, there is generally a threshold for the minimum capital for entrepreneurial activities. When the state of a household's asset is certain, the constraints on financing will hinder entrepreneurial activities for those that lack start-up funds, which is the main obstacle that restricts residents from engaging in such activities (Yin Hongfei et al., 2021; Li Guozheng et al., 2020). Traditional financing loans—including formal financing loans and the informal financing loans—have long been the primary means of entrepreneurial funding. In terms of the formal loans, the formal financial institutions with complete organizational structures and standard procedures operate with low risks, but often have strict application standards and require full guarantees and certain barriers for the qualifications of the borrower to avoid non-performing loans; in addition, in developing countries, including China, due to the dual financial structure, incomplete financial markets, and strict government regulation on finance, the degree of constraints in formal credits is relatively high, and the wealth-based credit system with limited liability has further

aggravated the issue of credit constraints for the low-income groups (McKinnon, 1973; Zhang Longyao et al., 2013; Li Yang, 2017). The informal loans, on the other hand, mainly include loans from family and friends and private loan organizations. The advantage of the former is that it lowers the cost of information search and can quickly complete the financing, whereas private organizations do not require complicated procedures or strict application qualification standards, where anyone in need can get a loan; but in this case the interest rate is higher, and often only small amounts of loans for short-term emergency needs can be granted; also, if the amount of loan exceeds a certain range, there will be moral hazard (Su Fang et al., 2019). In short, formal financial loans have lower risks, but also weak inclusiveness, while informal loans have high inclusiveness but low loan amount.

With the rapid popularization of mobile internet and the continuous development of digital technology, financial institutions are demonstrating the trend of technological and digital development. Digital finance enterprises such as "Ant Cash Now", "Weilidai", "JD Baitiao", "WeBank", and "Xinwang Bank" have developed rapidly and expanded a new financing channel for entrepreneurs - internet loans. Relevant studies indicate that through changes in financial infrastructure, financial service platforms, channel combinations, scenarios and other fields, digital finance (especially digital financial inclusion) has solved a series of problems that have been burdening traditional financial institutions, such as service efficiency, mobile channel popularization, customer screening and service, risk assessment and control, differentiated pricing systems and back-end operations (Xie Zhichun et al., 2018), compensating, to a certain extent, for the shortcomings of traditional financial loan methods and taking into both financial inclusion and loan limits. However, the participation and conduction of digital finance will face a "knowledge threshold", that is, residents need to have a certain level of knowledge on digitization (Cheng Mingwang et al., 2019).

In summary, every means of financial loan has its own advantages and disadvantages. As the loan channels become increasingly diversified, residents will also be able to choose more flexible ways and means when financing their businesses. However, past researches investigate only the impact of a single channel on credit availability, ignoring the complex causal relationship between the joint effects of different channels and entrepreneurial activities (Misangyi et al., 2017). Therefore, the fundamental question that this study focuses on is: In the context of the digitization of financial institutions, what are the impacts that diversified financial participation methods have on residents' entrepreneurial activities?

2. Literature Review

2.1 Traditional channels of loan and entrepreneurial activities

The research on the influence of traditional loan channels such as regular finance and informal finance on entrepreneurial activities focuses mainly on the following three domains: (1) The alleviation of regular finance of financing constraints on household entrepreneurial activities. Most studies have shown that the impact of

financing constraints on household entrepreneurship is significant (Evans et al., 1989; Hurst et al., 2004), and that the development of the financial market can effectively alleviate the financing constraints on entrepreneurship, significantly promoting entrepreneurial activities and the market access of new enterprises (Shao Chuanlin, 2014); In areas where it is relatively easier for residents to obtain bank loans, the entry and growth rate of new local enterprises are higher (King et al., 1993; Paulson et al., 2004). However, in rural and underdeveloped areas, due to the lack of collateral and effective credit proof, local households are still facing greater constraints and the phenomenon of "financial exclusion" when starting a business (Guiso et al., 2004; Zhang Longyao et al., 2013). (2) The supplement of informal finance to formal finance. Due to the great "financial exclusion" phenomenon in formal finance, residents who are willing to start a business generally cannot meet the requirements of regular financial institutions such as banks because of the lack of objective information that can be easily observed, passed and verified, such as mortgage assets, financial statements, and the incentive measures from and motives of banks for providing credit and other financial services to such a special group of customers is also missing (Su Fang et al., 2019). Therefore, informal finance has become an effective replacement and supplement to formal finance (Stein et al., 2002; Allen, 2000). In most cases, informal financing requires no guarantee or even formal contracts, but relies on the trust and personal relationship between borrowers and lenders (Turvey et al., 2010); due to the endogenous nature of informal finance, it has significantly promoted household entrepreneurial decision-making and opportunity-oriented entrepreneurial activities, further facilitates household entrepreneurship by alleviating the financing constraints and plays an important role in household entrepreneurship (Li Yiwen et al., 2016). (3) The comparative studies on the influence on entrepreneurial activities of formal informal finance. Some scholars believe that formal finance has greater advantages over the latter in comparison. For example, Han et al. (2013) finds, by investigating the impact of the evacuation of regular financial institutions in rural areas in China, that the austerity of formal credit is, through the wealth effects, obstructing farming households' entrepreneurship, and has a greater impact on the acquisition of informal credit. Liu Yusong et al. (2018) find with CFPS data that there is an effect of alternative between formal and informal finance, but the former plays a more important role in the farming population's decision-making. Meanwhile, some scholars believe that informal finance has a greater advantage. For example, from the perspective of endogenous finance, Li Yiwen et al. (2016) believe that the endogenous and localized informal finance better suits the risks of farming households' entrepreneurship, and alleviates constraints of formal credit to meet their financing needs, and that it does not only promote their entrepreneurial decisions, but can also improve the results. From the perspective of regional differences, Liu Xinzhi et al. (2017) find that in a national view, the marginal effects of informal finance on farming households' entrepreneurial decisions are greater. In terms of different regions, the formal finance in central and western China could not provide effective support for their entrepreneurship.

2.2 Emerging channels of loan and entrepreneurial activities

Digital Finance, an emerging mode of financial service, has opened up a third financing channel that is completely different in addition to the formal and informal finance. Considering the characteristics of traditional finance and digital finance, traditional finance mainly emphasizes the depth of financial services, such as strengthening financial deepening or competition, whereas digital finance mainly focuses on the breadth of financial services (Li Jianjun et al., 2019). Some scholars believe that financial services should fully meet the financial needs of various regions and classes, because such different groups have the same strong demand for financial services, and that unequal financial market access has become a major obstacle to economic development that has greatly reduced entrepreneurial activities (Claessens et al., 2007). And the emergence of digital finance provides an opportunity for the solution of this issue, because its characteristics of "low cost, wide coverage, and sustainability" are in sharp contrast to traditional finance, and its services can be used, through scenarios, data, and innovative financial products, to compensate for the shortcomings of traditional services and help with the availability of vulnerable groups to obtain financial services (Huang Yiping et al., 2018). With the rapid development of e-commerce and communication technology, compared with traditional finance, digital finance has stronger geographical penetrability, the advantage of low cost, and better inclusiveness, and provides more conditions and opportunities for residents to start a business (Li Jizun, 2015).

It is generally acknowledged that digital finance has a positive role in promoting residents' entrepreneurship (Jiao Jinpu et al., 2015; He Jing et al., 2019; Tao Yunqing et al., 2021). Digital finance is participating in entrepreneurial activities in various ways. In terms of residents' financing needs, the application of digital financial services helps alleviate constraints, improves the visibility of financial services, effectively reduces the financing costs of residents' entrepreneurial activities, helps with the problem of residents' entrepreneurial credit constraints, and thus promotes residents' entrepreneurship (Xie Xuanli et al., 2018). From the perspective of service scope and information acquisition, it is believed that, with the help of big data technology, digital finance has expanded the information source from financial suppliers, so that it is easier to obtain information with more dimensions and more comprehensive coverage (Dong Xiaolin et al., 2021). Also, one of the characteristics of digital finance is providing residents with inclusive financial services, widely expanding their coverage, solving the issue of residents' entrepreneurial credit constraints, and making it possible to expand business scale with more abundant funds (Han et al., 2013; He Guangwen et al., 2019; Zhang Jinlin et al., 2022). In addition, Huang Yiping et al. (2019) point out that digital finance has subverted the traditional business trade model, released a large number of new business opportunities, improved the efficiency of resource allocation, broken the industry and information barriers, reduced market transaction costs, and plays an important role in promoting social equality and creating a good environment for entrepreneurship. In addition, some scholars discuss this issue from the perspective

of human capital accumulation. Li Jianjun *et al.* (2020) believe that the core element of financial services in residents' entrepreneurial activities is improving the financial capacity of residents, where residents gain from improvement in many basic skills and knowledge that are closely related to entrepreneurship, such as the usage of trading media, risk awareness, risk management, and, in the main time, be motivated about the development and establishment of their willingness to start businesses. However, some scholars have found that the development of digital finance has not narrowed the "digital gap" as expected. Instead, it has greatly intensified and expanded the original urban and rural gaps and the income gap within rural areas (Qiu Zeqi *et al.*, 2016). And there are three main reasons. First, the internet speed in rural areas is slower and the connection is unstable, which reduces the effectiveness of digital technology as a tool. Second, rural residents are affected by age, educational and occupational factors, and, therefore, may be marginalized or even crowded out in the labor market. Third, farmers' heterogeneity in terms of human capital, social capital, material capital, etc., is transformed into digital finance, which also brings a first-level digital gap characterized by digital infrastructure "access gap" and the second-level digital gap characterized by the "usage gap" of technology, leading to a three-level digital gap featuring digital "income gap" (Li Yi *et al.*, 2021). In addition, digital finance also comes with the "Matthew effect". As far as the households in entrepreneurial activities are concerned, factors like the level of internet access, the skills that match the application of digital technology, and their own education level will cause residents to generate different levels of "internet capital" (Qiu Zeqi *et al.*, 2016; Li Yi *et al.*, 2021), whereby gaps in the participation of digital finance come into existence. The research of Wang Xiuhua *et al.* (2020) also support the existence of the "Matthew effect" in digital credit for different residents.

2.3 Review

Previous studies have analyzed the impact of financial services on the entrepreneurial activities of residents from the two aspects of traditional finance and digital finance, and has achieved many results, laying a solid foundation for this research, but the following questions still need to be addressed with further analysis: (1) Past research has analyzed the promotion from financial services on entrepreneurial activities from the perspectives of traditional and digital finance. However, in the background of the continuous integration of the two, few studies have incorporated them under the same framework or conducted an empirical analysis of the impact of the compound participation of financial services on entrepreneurial activities; (2) Whether it is traditional or digital finance, it is an effective channel for entrepreneurs to alleviate credit constraints. However, existing researches are mainly focused on the alternation between different financial services in participation, but overlook the complementary side of their relations. In view of this, this study innovatively analyzes and discusses the impact of the different methods of participation of the financial services on entrepreneurial activities from

the perspective of single participation and compound participation. In short, this study will reveal the complex causal relationship between the joint effect of different loan channels and residents' entrepreneurial activities, expand the theoretical boundary between credit constraints and entrepreneurship, and provide scientific guidance for the optimization of the policy of "finance services the development of the real economy", contributing to the achievement of national economic and social development goals of epidemic prevention and the stable growth.

3. Theoretical Analysis and Hypothesis

Credit constraints are one of the main obstacles to the entrepreneurial activities of potential participants (Cagetti et al., 2006). Generally, the traditional financing channels of entrepreneurs include their own funds, formal financial loans, informal financial loans and government subsidies, etc. (Hurst et al., 2004; Zhang et al., 2015). There are large differences in the aspects of financing scale, qualification review, risk control, and loan interest rates in formal and informal financial loans, as well as different requirements for the lender. To elaborate, formal finance has cost and scale advantages, but its "threshold effect" is also obvious; informal finance has information advantages and relatively high efficiency, but loans from family and friends are often short-term loans for daily expenses, and private loans and small loans from companies usually have high interest rates (Su Fang et al., 2019; Claessens et al., 2007). In comparison, digital finance has transformed and optimized traditional finance with the help of the Internet, artificial intelligence and other technologies, with its characteristics of "low cost, wide coverage, and sustainability" in sharp contrast to traditional finance. Digital financial services can, through scenarios, data and innovative financial products, make up for the shortcomings of traditional financial services, and improve the accessibility of financial services for vulnerable groups (Huang Yiping et al., 2019).

To start businesses with credit constraints, entrepreneurs can choose to realize financing through one or multiple loan channels. And different methods of these financial services participation function differently in alleviating the constraints for residents, and consequently lead to different entrepreneurial decisions. Therefore, to first compare and analyze the impact of the participation methods of different financial services (namely, single participation, with only one channel of the loan, and compound participation, with more than one channel) on residents' entrepreneurial activities, this study proposes H1 and an alternative H1.1:

H1: Compared with the single form of participation, compound participation can more effectively promote the choice of entrepreneurship of residents.

H1.1: Compared with the compound form of participation, single participation can more effectively promote the choice of entrepreneurship of residents.

Furthermore, in order to analyze in detail the impacts of financial service participation on residents' entrepreneurial choices, this article will compare the different ways of single participation (i.e., the three methods of participation) and the compound participation (i.e., different compound forms). Due to the strong "financial exclusion" phenomenon of traditional finance, residents with financing demands often have to choose informal finance. But the emergence of digital finance has improved the situation with its characteristics of "low cost, wide coverage, and sustainability" in sharp contrast to traditional finance. Therefore, this article proposes H2 and an alternative H2.1:

H2: Compared with bank loans and private loans, internet loans can more effectively promote the choice of entrepreneurship of residents.

H2.1: Compared with bank loans and private loans, internet loans have not replaced them to promote the choice of entrepreneurship of residents; because of the financial exclusion in traditional finance, private loans are still the primary driving force for the choice of entrepreneurship of residents.

Generally, the funds for entrepreneurial activities can be obtained through endogenous financing and exogenous financing (Wang Chaoen et al., 2015). Endogenous financing usually refers to the assets of entrepreneurs themselves and their families, and exogenous financing refers to funds from outside this range, which includes loans from relatives, friends, other farming households, and private financial institutions, regular loans and other funds from formal financial institutions, and various government subsidies at all levels (Su Fang et al., 2019). Some scholars also believe that the regional financing model can significantly affect entrepreneurial activities: bank credit-led financing models will suppress the "number" of entrepreneurial activity growth, and it is active equity financing that will promote entrepreneurship (Cai Qingfeng et al., 2017). Therefore, as the methods of residents' participation in financial services increase, the credit scale and entrepreneurial capital also increase, which lead to H3 and an alternative H3.1:

H3: The increase in the forms of residents' financial participation (compound form of participation) can more effectively promote the choice of entrepreneurship of residents.

H3.1: Residents' choices of entrepreneurship are not promoted with the increase in financial participation forms.

4. Variable Selection and Empirical Analysis

4.1 Data source, variable selection and descriptive statistics

4.1.1 Data source

The data used in this article is supported by the second round of the Chinese Household Finance Survey (CHFS) carried out nationwide in 2019 by the Southwestern University of Finance and Economics, which adopts a three-stage PPS sampling method and aims to collect the micro-information of Chinese households through scientific sampling and modern survey technology and investigation management methods, to provide researchers at home and abroad with high-quality micro-data on Chinese households' financial issues. The samples cover a great amount of micro data in assets and liabilities, income and expenditure, insurance and guarantee, household population characteristics, employment situation and other aspects of more than 28,000 families from 1048 communities (or villages), 262 counties (or autonomous regions and county-level cities), and 29 provinces across the country. For large-scale micro data in various aspects such as employment. And the project uses a series of measures to control sampling and non-sampling errors, which ensures the representativeness and high quality of data. At the same time, the 2019 CHFS includes three forms of financial participation, bank loan, internet loan, and private loan, having provided ideal data support for the impact of different forms of participation of financial services on households' entrepreneurial activities that this study will analyze.

4.1.2 Variable selection and descriptive statistics

Explained Variable: household entrepreneurship^①. In order to study the impact of financial service participation on the entrepreneurial behavior of residents, the explained variable in this article is whether a household engages in entrepreneurial activities. With reference to the research of Yin Zhichao et al. (2015), this study defines household entrepreneurship as a household "with self-employment or business operations", including private businesses, leasing, transportation, online stores, We business, purchasing agents, firms and corporations, etc. And agricultural production and operation^② of farming households is not included. Families "with self-employment or business operations "are marked 1, and others, 0. Also, reasons for entrepreneurship such as "wanting to be their own bosses", "increase income", "flexibility and freedom", and "social responsibility" will be categorized as active entrepreneurship, and others, passive entrepreneurship^③.

Table 1 demonstrates the basic situation of household entrepreneurship. In the sample, a total of 3950 households chose to start a business, of which 2762 were active entrepreneurship, accounting for 69.92%, and 1188, passive entrepreneurship, accounting for 30.08%. This table also shows the industries of household entrepreneurial activities. In terms of active entrepreneurship, the wholesale and retail industry accounts for nearly half of the account (43.45%), and entrepreneurial activities in other industries rank second, accounting for 21.36%, followed by the accommodation and catering industry and the residential service industry (12.27%

and 11.01%), while other industries accounts for only single-digit proportions. In passive entrepreneurial activities, wholesale and retail industry also ranks first, accounting for 51.43%, followed by the accommodation and catering industry, accounting for 14.48%, and the residential service industry only accounts for 9.18%. In general, among the two categories, the wholesale and retail industry is evidently in the lead, followed by the accommodation and catering industry and residential service industry (other industries of active entrepreneurship omitted), indicating that in the current household entrepreneurship market, these three industries have taken in the vast majority of entrepreneurs.

Table 1: Basic information on household entrepreneurship

Category	Entrepreneurship	
	Active (Number/Percentage)	Passive (Number/Percentage)
All	2762 (69.92%)	1188 (30.08%)
Mining	4 (0.14%)	0 (0.00%)
Manufactures	177 (6.41%)	41 (3.45%)
Electricity, gas and water production and supply	10 (0.36%)	2 (0.17%)
Construction	144 (5.21%)	39 (3.28%)
Transportation, storage and post	160 (5.79%)	67 (5.64%)
Information transmission, computer service and software	37 (1.34%)	8 (0.67%)
Wholesale and retail	1200 (43.45%)	611 (51.43%)
Accommodation and catering	339 (12.27%)	172 (14.48%)
Finance	10 (0.36%)	2 (0.17%)
Real estate	24 (0.87%)	4 (0.34%)
Leasing and business service	52 (1.88%)	20 (1.68%)
Scientific research, technology service and geological exploration	8 (0.29%)	1 (0.08%)
Water, environment and public institution management	8 (0.29%)	0 (0.00%)
Residential and other services	304 (11.01%)	109 (9.18%)
Education	27 (0.98%)	6 (0.51%)
Health, social security and benefit	55 (1.99%)	13 (1.09%)
Culture, sports and entertainment	59 (2.14%)	23 (1.94%)
Public management and social organizations	1 (0.04%)	0 (0.00%)
Agriculture, forestry, husbandry and fishery	82 (2.97%)	43 (3.62%)
Others	59 (21.36%)	20 (1.68%)

Explain Variable: form of participation in financial services. According to the source of loans of households in industry and commerce business, this article first defines three forms of loan: bank loans (i.e., formal financial services participation), private loans (i.e., informal financial services participation) and internet loans (i.e., digital financial services participation). For bank loans, households with "bank/credit cooperative loans that have not yet been repaid due to production and operation activities" will be marked 1, and others, 0. For private loans, household with "private loans that have not yet been repaid due to industrial and commercial production and operation" will be marked 1, and others, 0. For internet loans, household with "internet loans that have not yet been repaid due to industrial and commercial production and operation" will be marked 1, and others, 0. And, on the basis of these three methods of participation, this article further defines two forms of participation in financial services: first, the single form of participation (where there is only one channel of loan and, naturally, one of the aforementioned three methods of financial services participation). Households with only one of the "bank loan, private loan, or internet loan" participation are marked, and those not involved in any form above, 0. Second, the compound form of participation (where more than one category of loan are involved, that is, entrepreneurial activities that include two or three forms of participation). Households with more than one form of loans (and, therefore, more than one form of participation) are marked 1, and others, 0.

The details of financial services participation and loan forms is shown in Figure 1, 2, and 3. Figure 1 illustrates that bank loans and private loans are the main forms of household entrepreneurial activities, respectively accounting for 47% and 46%, which are almost the same, and that there are fewer households that choose internet loans, accounting for only 7%. And Figure 2 shows that in compound forms, "bank loan+private loan" is the absolute majority (70.77%), followed by "bank loan+internet loan", accounting for 13.08%. In Figure 3, it is demonstrated that 82% of the households are involved in the single form of participation, and 18%, compound form. In general, traditional loans (bank and private loans) are still the first choice for residents, and a single form of participation (i.e., only one form loan) is still the main form of participation in financial services for residents.

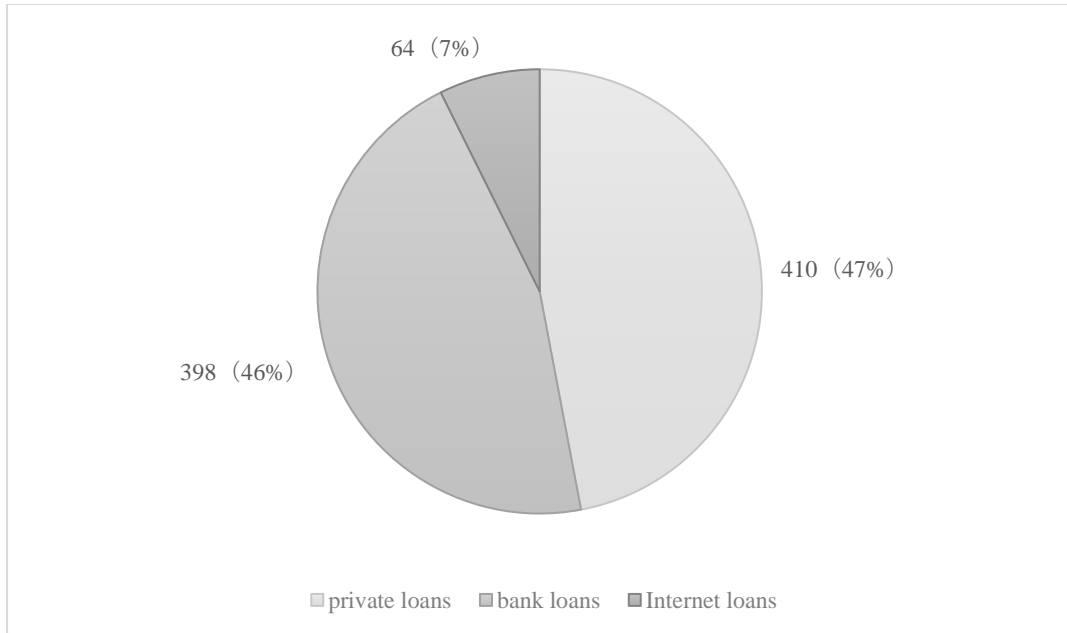


Figure 1: Forms of loan

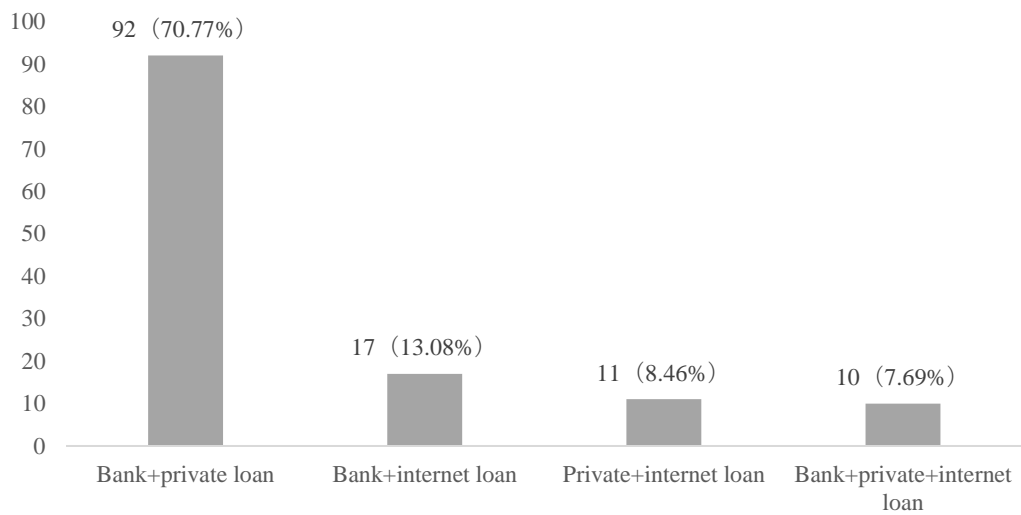


Figure 2: Forms of compound participation

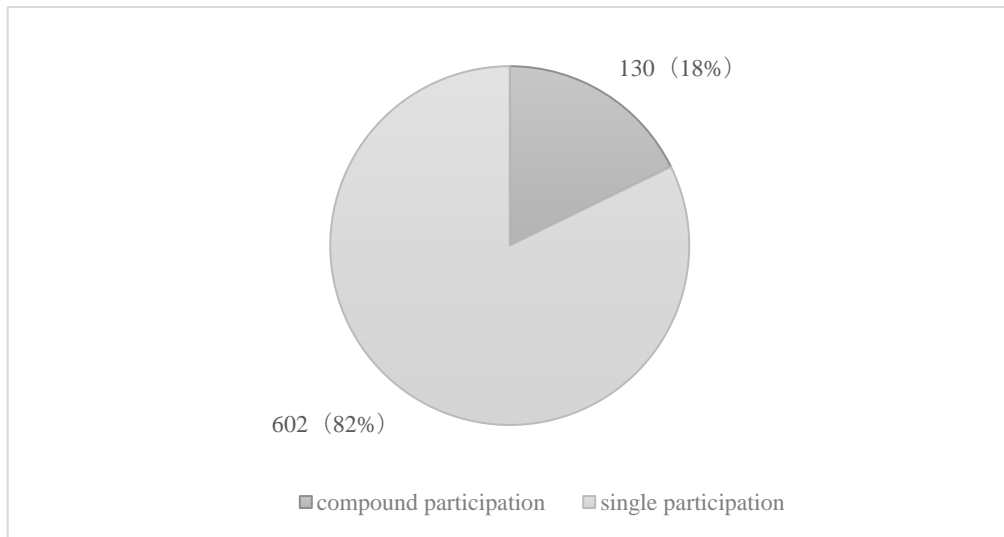


Figure 3: Forms of financial services

Control variables: Since entrepreneurial activities are closely related to the human capital characteristics of entrepreneurs, this study sets as control variables the heads of the households' individual characteristics based on the survey, including gender, age, education level and political status. Also, this article controls certain variables that affect household entrepreneurship, including risk preferences and social capital. To elaborate, risk preferences are evaluated by their tendency on risks and rewards. Residents that are not willing to take any kind of risk or tolerate only risks at low or average level are marked 0, and others, 1. And social capital is measured by the logarithmic value of festival transfer income. The definition and descriptive statistical results of specific variables are shown in Table 2.

As is indicated in Table 2, in terms of the entrepreneurship-related variables, only 11.4% of the sample households engage in entrepreneurial activities, with active entrepreneurship taking up only 8%, and passive entrepreneurship, 3.4%; regarding the variables in participation in financial services, the proportions of for bank, private and internet loans are only 1.1%, 1.2%, and 0.2%. The proportion of single form of participation in financial services is 1.7%, and compound participation, 0.4%; as for the variables of head of the household, 75.3% are male, most are between 43 and 70 years old, with an educational background of elementary or middle school, only 17.5% are CPC members, 84.5% are married, and 79.5% are healthy; in terms for household characteristic variables, the average value of social capital (the logarithmic value of the festival transfer income) is 7.288, and the standard deviation is 1.254, indicating that the social capital of most families falls between 6 and 8.5 units.

Table 2: Descriptive analysis of variables

Variable	Sample	Variable description	AVE	σ	Min.	Max.
Entrepreneurship	34643	1=Y ; 0=N	0.114	0.318	0	1
Active entrepreneurship	34643	1=Y ; 0=N	0.080	0.271	0	1
Passive entrepreneurship	34643	1=Y ; 0=N	0.034	0.182	0	1
Bank loan	34643	1=Y ; 0=N	0.011	0.107	0	1
Private loan	34643	1=Y;0=N	0.012	0.108	0	1
Internet loan	34643	1=Y;0=N	0.002	0.043	0	1
Single form	34643	1=Y;0=N	.017	0.131	0	1
Compound Form	34643	1=Y;0=N	0.004	0.061	0	1
Gender	34643	1=M;0=F	0.753	0.431	0	1
Age	34631	Consecutive variable	56.371	13.708	13	101
Education background	34643	0=N/A;1=Primary school;2=Secondary school;3=College or higher	1.675	0.718	0	3
CPC member	34643	1=Y;0=N	0.175	0.38	0	1
Marriage	34643	1=Y;0=N	0.845	0.362	0	1
Health	34643	1=Y;0=N	0.795	0.403	0	1
Social capital	11788	Consecutive variable	7.288	1.254	0	12.206
Internet wealth management	34643	1=Y;0=N	0.504	0.5	0	1
Financial wealth management	34643	1=Y;0=N	0.066	0.249	0	1
Stock investment	34643	1=Y;0=N	0.058	0.233	0	1
Fund investment	34643	1=Y;0=N	0.019	0.135	0	1
Derivative management	34643	1=Y;0=N	0.009	0.096	0	1

4.2 Empirical analysis on entrepreneurial decisions

4.2.1 Research model

Table 1 indicates a centralized distribution in residents' choices of entrepreneurial activities, therefore, although the entrepreneurial choice is a binary variable, Probit model or Logit model would cause a large deviation. According to data characteristics and research objects, this will conduct an empirical using the Tobit model.

To reveal the impact of different financial services participation on the choice of entrepreneurship of residents, this article establishes a regression model (1) to analyze:

$$EC = \alpha_0 + \alpha_1 FPW + \sum_{i=2}^n \alpha_i X_i + \varepsilon \quad (1)$$

EC (Entrepreneur Choice) represents the entrepreneurial decision of residents, and FPW (Financial Participation Way) represents the form of financial service participation of residents, including the single form and the compound form. FPW includes the single participation and the compound participation. The single form involves three types: bank loans, private loans, and internet loans. The compound form refers to more than one way of loan. In addition, this article examines the differences in the influence of different financial services participation on entrepreneurial decisions by building model (2) and (3):

$$EC = \beta_0 + \beta_1 LF + \sum_{i=2}^n \beta_i X_i + \varepsilon \tag{2}$$

Y represents the choice of entrepreneurs, LF represents the loan form, including formal loan, private loan and internet loan.

$$EC = \beta_0 + \beta_1 PW + \sum_{i=2}^n \beta_i X_i + \varepsilon \tag{3}$$

Y represents the choice of entrepreneurs, PW represents the compound form of participation, including "bank loan+private loan", "bank loan+internet loan", "private loan+internet loan" and "bank loan+private loan+internet loan".

4.2.2 Comparative analysis on single and compound form of participation

Table 3 shows the regression results of the influence of single and compound form of on entrepreneurial choices, and the omitted details of variables are indicated in Table 3. It can be seen that the marginal effects of a single compound forms are 0.324 and 0.3257, and all significant at a level of 1%, the coefficient of compound form is slightly higher than the single form, but the difference is within 1%. It shows that whether it is a single or compound form of participation, it significantly promoted the entrepreneurial activities of residents, and increased the probability of entrepreneurship by approximately 32%, and that the coefficient of compound form of participation is slightly higher than the single form. Therefore, in this study, H1 is verified and holds good, and H1.1 is not, that is, compared with the single participation form, the compound participation form can more effectively promote the entrepreneurial choices of residents.

Table 3: Comparative analysis of single and compound participation

	(1)	(2)
Single	0.324***	
	(0.014)	
Compound		0.325***
		(0.029)
Gender	0.016**	0.026***
	(0.007)	(0.008)
Age	-0.004***	-0.004***
	(0.000)	(0.000)
Education	0.005	0.006
	(0.005)	(0.003)
Political background	-0.038***	-0.040***
	(0.008)	(0.009)
Marriage	0.051***	0.053***
	(0.010)	(0.010)
Health	0.050***	0.052***
	(0.009)	(0.010)
Social capitol	0.004**	0.006***
	(0.002)	(0.003)

P.S.: (Standard Error). *, **, *** represent significance on the level of 10%, 5%, and 1%.

4.2.3 Comparative analysis on different forms of single participation

Table 4 further illustrates the influences of the three ways of financial service participation on entrepreneur' choices (see details in Table 4). It is indicated that way of participation is significant at a level of 1%, among which, the marginal effects of private loans are the highest, that of bank loans are second, and that of internet loans, the lowest. The marginal effects of private loans and bank loans are relatively close with a distinction of less than 1%, while that of internet loans is low in comparison, which demonstrates that even though internet loans presents a natural inclusiveness through computers, mobile phones and other electronic devices, its role in household entrepreneurship still needs to be further developed. Therefore, H2 is disproved, and H2.1 tested true, that is, compared with bank loans and private loans, internet loans have not replaced them and more effectively promoted residents' entrepreneurial choices. Moreover, due to the financial exclusion in traditional financial sectors, private loans remain still the financial form that can most promote the choice of residents' entrepreneurial activities.

Table 4: Comparative analysis on the influence of single form

	(1)	(2)	(3)
Bank loan	0.324***		
	(0.017)		
Private Loan		0.334***	
		(0.017)	
Internet Loan			0.280***
			(0.043)
Gender	0.013***	0.010**	0.013***
	(0.004)	(0.004)	(0.005)
Age	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)
Education	0.002	0.002	0.002
	(0.003)	(0.003)	(0.003)
Political Status	-0.024***	-0.021***	-0.023***
	(0.005)	(0.005)	(0.005)
Marriage	0.019***	0.023***	0.023***
	(0.005)	(0.005)	(0.006)
Health	0.023***	0.025***	0.025***
	(0.004)	(0.005)	(0.005)
Social Capitol	0.004***	0.005***	0.005***
	(0.002)	(0.002)	(0.002)

P.S.: (Standard Error). *, **, *** represent significance on the level of 10%, 5%, and 1%.

4.2.4 Comparative analysis on different forms of compound participation

Table 5 further illustrates the influence of different combinations of compound forms of participation on entrepreneurship choices. The four combinations of the three loan forms, with a significance of 1%, are not very different regarding the marginal effects on household entrepreneurship (see Table 5 for details). The compound form of "bank loan+private loan" has the highest marginal effect, while the marginal effect of "private loan+internet loan" is the lowest. Therefore, this study disproves H3 and verifies H3.1, that is, residents' entrepreneurial choices have not been promoted as the number of forms of financial participation increase.

Table 5: Comparative analysis on the influence of single form

	(1)	(2)	(3)	(4)
Bank+private loan	0.333***			
	(0.033)			
Bank+internet loan		0.313***		
		(0.105)		
Private+internet loan			0.275***	
			(0.105)	
Bank+private+internet loan				0.295***
				(0.121)
Gender	0.014***	0.015***	0.014***	0.014***
	(0.005)	(0.005)	(0.005)	(0.005)
Age	-0.003***	-0.003***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
Education	0.002	0.002	0.002	0.002
	(0.003)	(0.003)	(0.003)	(0.003)
Political Status	-0.023***	-0.023***	-0.023***	-0.024***
	(0.005)	(0.005)	(0.005)	(0.005)
Marriage	0.021***	0.022***	0.022***	0.022***
	(0.006)	(0.006)	(0.006)	(0.006)
Health	0.026***	0.026***	0.026***	0.026***
	(0.005)	(0.005)	(0.005)	(0.006)
Social Capitol	0.006***	0.005***	0.005***	0.005***
	(0.002)	(0.002)	(0.002)	(0.002)
P.S.: (Standard Error). *, **, *** represent significance on the level of 10%, 5%, and 1%.				

5. Robustness Test and Heterogeneity Analysis

5.1 Robustness test

In the empirical analysis, the possible endogenous problems in the participation forms of financial services mainly come from two aspects: first, the reverse causality, that is, if the entrepreneur has started a business before financing, a tight cash flow or an urgent need for fund to expand the business scale may cause the choices of entrepreneurship to, in turn, affect the form of participating in financial services. Second, the missing variables—unobservable personal characteristics of entrepreneurs—such as capability or adventurous spirit may simultaneously affect both the form of financial services participation and entrepreneurial decisions, and the omission of these bidirectional factors can cause errors in estimations.

5.1.1 Selection of instrumental variables

Borrowing is essentially entrepreneurs' participation in financial markets. Therefore, this study establishes instrumental variables through the non-borrowing activities of entrepreneurs in the market, using the five variables of internet wealth management, financial management, stock investment, fund investment and derivative investment (see Table 2 for descriptive statistics) that reflect residents' investment and wealth management behavior in the financial market. Based on this, two instrumental variables are established: (1) Single financial investment. Residents with only one of the five forms of investments are marked 1, and others, 0. (2) Compound financial investment, if the sum of the five variables is greater than 1, the value is 1, and if not, 0.

Based on the instrumental variables, the following two-step regression equations are established: (4) and (5) are the first step of estimate equation. Single and compound financial investments are the explained variables of single participation and compound participation, and the control variables are in accordance with the main regression model. The equations (4) and (5) are substituted accordingly.

Step 1:

$$\overline{\text{SingleForm}}_i = \rho_0 + \rho_1 \text{SingleInvestment}_i + \sum_{i=2}^n \rho_i X_i + \varepsilon_i, \tag{4}$$

$$\overline{\text{CompoundForm}}_i = \rho_0 + \rho_1 \text{CompoundInvestment}_i + \sum_{i=2}^n \rho_i X_i + \varepsilon_i, \tag{5}$$

Step 2:

$$EC = \alpha_0 + \alpha_1 \overline{FPW} + \sum_{i=2}^n \alpha_i X_i + \varepsilon, \tag{6}$$

5.1.2 Results of IV-Tobit test

Table 6 shows the results of the IV-Tobit verification. First, the regression results of the two steps are significant at a level of 1%. The fitting value of the marginal coefficient of compound participation is greater than that of the single participation, which is consistent with the main conclusion. It can be seen from the table that the F values are 34.75 and 57.05, which pass the requirements of 10 and above for valid instrumental variable F in the Cragg-Yogo verification, eliminating the possibility of weak instrumental variables.

Table 6: IV-Tobit test

	(1)	(2)	(3)	(4)
	Step 1	Entrepreneur decision	Step 1	Entrepreneur decision
Single investment	0.008*** (0.003)			
<u>Single form</u>		50.286*** (18.550)		
Compound investment			0.006*** (0.001)	
<u>Compound form</u>				60.105*** (17.955)
Control variable	Y	Y	Y	Y
F		34.75		57.05
P.S.: (Standard Error). *, **, *** represent significance on the level of 10%, 5%, and 1%.				

5.1.3 Results of IV-2SLS test

Table 7 shows the results of the IV-2SLS verification. The regression results of the two steps are significant at a level of 1%. The fitting value of the marginal coefficient of compound participation is greater than the that of the single participation, which is also consistent with the main conclusion. It is demonstrated that the F values are 63.27 and 11.14, which pass the requirements of 10 and above for valid instrumental variable F in the Cragg-Yogo verification, eliminating the possibility of weak instrumental variables.

Table 7: IV-2SLS test

	(1)	(2)	(3)	(4)
	Single	Entrepreneur decision	Compound	Entrepreneur decision
Single investment	0.023*** (0.003)			
<u>Single form</u>		4.338*** (0.515)		
Compound investment			0.006*** (0.001)	
<u>Compound form</u>				9.844*** (2.735)
Control Variable	Y	Y	Y	Y
Wald value		63.27		11.14
P.S.: (Standard Error). *, **, *** represent significance on the level of 10%, 5%, and 1%.				

5.2 Heterogeneity Analysis

The residents' entrepreneurial decisions are not only related to financial services, but also affected by internal and external factors. For example, previous entrepreneurial experience of entrepreneurs will form a "branding" (Dai Weiqi et al., 2016) to promote them to better engage in entrepreneurial activities; and the overall economic situation of a region will affect the accessibility of residents' financial services (Dong Xiaolin et al., 2021). So, this study chooses the following dimensions to analyze the heterogeneity of the influence of financial services on residents' entrepreneurial activities.

5.2.1 Entrepreneurship categories

Global Entrepreneurship Monitor (GEM)⁽⁴⁾ divide entrepreneurship into necessity entrepreneurship and opportunity entrepreneurship. The former are passively selected due to lack of other employment options, and the latter is an active activity where entrepreneurs discover opportunities and act voluntarily. Therefore, this article further analyzes the heterogeneity of two categories. The regression results are shown in Table 8.

It can be found from Table 8 that in the two types of entrepreneurship, the single form and the compound form of financial participation are distinct in marginal effects. The marginal coefficients of the single and compound participants of active entrepreneurship are 0.225 and 0.325, and those of passive entrepreneurs, 0.081 and 0.09. The marginal impact of financial participation on active entrepreneurship is much greater than that on passive entrepreneurship. In addition, the results of the two entrepreneurial types are consistent with the main conclusion, that is, the marginal effect of compound participation is higher than that of single participation.

Table 8: Heterogeneity analysis on entrepreneurship categories

	(1)	(2)	(3)	(4)
	Active entrepreneurship		Passive entrepreneurship	
Single form	0.225***		0.081***	
	(0.001)		(0.008)	
Compound form		0.325***		0.090***
		(0.029)		(0.014)
Control variable	Y	Y	Y	Y
P.S.: (Standard Error). *, **, *** represent significance on the level of 10%, 5%, and 1%.				

5.2.2 Entrepreneurial experience

American scholar Macmillan (1986) proposes that in the research of entrepreneur's types, the research of habitual entrepreneurs with the "entrepreneurial experience curve" should be taken special consideration of, because they are the "engine" of business activities. Therefore, this study further discusses separately experienced entrepreneurs and first-time entrepreneurs. The results are shown in Table 9:

whether it is a single or compound participation, experienced entrepreneurs have higher marginal effects than first-time entrepreneurs. One possible reason is that the former can form deeper understandings on their projects and are more likely to receive entrepreneurial funds.

Table 9: Heterogeneity analysis on entrepreneurial experience

	(1)	(2)	(3)	(4)
	Experienced		Inexperienced	
Single form	0.503***		0.287***	
	(0.050)		(0.016)	
Compound form		0.451***		0.290***
		(0.100)		(0.033)
Control variable	Y	Y	Y	Y

P.S.: (Standard Error). *, **, *** represent significance on the level of 10%, 5%, and 1%.

5.2.3 Industries

The acquisition of entrepreneurial funds is also closely related to the characteristics of the industry. In industries with high added value, the profit rate after starting a business is slow, which is not ideal for reducing the pressure on loan or further obtaining loans. From the perspective of the cost of entrepreneurial opportunities, the negative impact of the repayment pressure of high added value industries is more possible. In order to verify this hypothesis, the study further classifies high and low added value industries^⑤ on the basis of the 20 industries in household survey. The estimated results are shown in Table 10, and it can be seen that whether it is a single participation or a compound participation, in the high added value industry, digital finance participation has a lower impact coefficient on entrepreneurship decisions.

Table 10: Heterogeneity analysis on industries

	(1)	(2)	(3)	(4)
	High added value		Low added value	
Single form	0.437***		0.469***	
	(0.089)		(0.037)	
Compound form		0.350**		0.422***
		(0.179)		(0.077)
Control variable	Y	Y	Y	Y

P.S.: (Standard Error). *, **, *** represent significance on the level of 10%, 5%, and 1%.

5.2.4 Urban and rural differences

By comparing the influence of the financial participation of urban and rural residents on entrepreneurial decisions, it can be found that the marginal coefficients of single and compound form of financial participation in urban areas are 0.316 and 0.312, and those of rural areas, 0.325 and 0.332. There is no major difference in forms of participation urban and rural areas, and, between the two areas, the marginal effects of rural area are slightly higher than that of urban areas, which is further analyzed. Table 12 indicates that in urban and rural areas, the marginal effects of internet loans are all lower than that of bank loans. And in comparison, the marginal effects of all forms of loans are higher than those in rural areas.

Table 11: Heterogeneity analysis on urban and rural difference

	(1)	(2)	(3)	(4)
	Urban		Rural	
Single form	0.316***		0.325***	
	(0.023)		(0.018)	
Compound form		0.312***		0.332***
		(0.045)		(0.039)
Control variable	Y	Y	Y	Y

P.S.: (Standard Error). *, **, *** represent significance on the level of 10%, 5%, and 1%.

Table 12: Heterogeneity analysis on urban and rural difference

	(1)	(2)	(3)	(4)	(5)	(6)
	Urban			Rural		
Bank loan	0.546***			0.537***		
	(0.024)			(0.021)		
Private loan		0.551***			0.546***	
		(0.027)			(0.019)	
Internet loan			0.518***			0.495***
			(0.058)			(0.062)
Control variable	Y	Y	Y	Y	Y	Y

P.S.: (Standard Error). *, **, *** represent significance on the level of 10%, 5%, and 1%.

5.2.5 Regional differences

The level of financial development is closely related to regional economic development. Therefore, this study conducts heterogeneous analysis at the regional level based on the level of economic development. The source of samples is divided into three regions, the east, the central and the west according to the National Bureau of Statistics. And the estimation is shown in Table 13. Surprisingly, in the west, whether it is the single or compound form, the coefficients are all higher than in the two regions. The coefficient of the west is 0.555, which is higher than 0.547 in the

east and 0.539 in the central. The marginal coefficient of compound participation in the west is 0.538, which is higher than 0.536 in the east and 0.523 in the central region. One reasonable explanation is that it is relatively difficult to obtain financial loans in the western region, so entrepreneurs who have obtained loans are more likely to make the decision.

In addition, the coefficients of both single and compound participants in the central region are all higher than those of the other two regions. One reasonable explanation is that residents in the east are in possession of more assets, and entrepreneurial activities can be carried out without large loans. Due to the underdeveloped financial services in the western region, even with the willingness of entrepreneurship, loans are not easy to be granted. Therefore, in the central region, where there are necessary foundations of both aspects, the coefficient is consequently higher.

Table 13: Heterogeneity analysis on regional differences

	(1)	(2)	(3)	(4)	(5)	(6)
	East		Central		West	
Single form	0.305***		0.338***		0.326***	
	(0.023)		(0.025)		(0.025)	
Compound form		0.309***		0.340***		0.325***
		(0.049)		(0.058)		(0.047)
Control variable	Y	Y	Y	Y	Y	Y

P.S.: (Standard Error). *, **, *** represent significance on the level of 10%, 5%, and 1%.

6. Conclusion and Suggestions on Relevant Policies

6.1 Conclusion

Based on the 2019 CHFS by the Southwest University of Finance and Economics, this study analyzes the influence of different forms of financial services participation on households' entrepreneurship decisions, and finds:

(1) Both single and compound forms of participation have a significantly positive influence on residents' entrepreneurial choices. Relatively speaking, the compound form has a higher promotion effect than the single form. After further categorizing the single participation form, it is found that private loans have the greatest impact on residents' choices, followed by bank loans, and finally, internet loans, which indicates that although digital finance has the characteristics of "low cost, wide coverage, sustainability", it has not yet produced the expected effect. After categorizing the compound forms, it is found that the form of "bank loan+private loan" has the greatest marginal effect on residents' entrepreneurship, and "private loan+internet loan", the lowest, and that in spite of certain thresholds, in the compound participation, the forms involving bank loans still have great marginal effects, which means that bank loans are still significant for residents' entrepreneurship.

(2) In order to further explore the influence of heterogeneity of different forms of financial service participation on residents' entrepreneurial decisions, this article analyzes the heterogeneous internal and external situations in entrepreneurial activities. An analysis on the heterogeneity of active entrepreneurship and passive entrepreneurship finds that the participation of financial services is more obvious in passive entrepreneurship. Based on the heterogeneity of entrepreneurial experiences, it is found that the promotion of financial service participation is more obvious for entrepreneurs who lack relevant experience. In terms of the heterogeneity of the industry categories, financial service participation promotes better entrepreneurs in industries with low added value. There is no significant difference in the analysis of heterogeneity of urban and rural areas, but there are differences regarding the specific forms of single participation. And the differences between the participation of formal financial services and digital financial services in urban and rural areas are the main reason for the difference in compound forms. In terms of regional heterogeneity, financial services participation has more obvious impacts on entrepreneurial decisions in central China. In general, the results of heterogeneity analysis indicate that financial services have a more significant promotional effect on the entrepreneurial activities of households with low endowment.

6.2 Suggestions on relevant policies

On the basis of the conclusions above, the following suggestions are put forward for relevant policies:

(1) Formal finance: on micro levels, make full use of the advantages of large bank branches and institutions to increase the construction of specialized institutions for financial services for household entrepreneurship; guide small and medium-sized banks to increase support on credits for household entrepreneurship; further develop the supportive role of commercial banks for local SMEs, and banks at all levels should improve the financing guarantee policy and reasonably determine the guarantee fee to provide targeted financial products and differentiated services for household entrepreneurship. On macro levels, the government should improve the risk management system to reasonably direct the funds of regular financial industries such as large commercial banks to household financial supply to eliminate the negative effects of market failure; improve the risk management system, formulate a credit rating system that can reflect the household entrepreneurial situation; establish a reasonable and scientific rating indicators and build a credit system for household entrepreneurship.

(2) Informal finance: on the one hand, ease the regulation on informal finance, clarify its legal status, and guide them to better serve household entrepreneurship; with the help of the social capital effect by the local social network, information, standards, and trust of the community and the organization of residents, innovate the joint insurance loan mechanism and credit loans, further establish the connection between formal and informal finance, increase the supply of funds for informal finance, and guide its reasonable expand. On the other hand, in response to the risk

of informal finance, it is necessary to accelerate its legalization, establish an effective risk early warning mechanism and crisis processing mechanism for informal finance, strengthen supervision, and direct its standardized development.

(3) Digital finance: first, for areas with underdeveloped economy, the government should strengthen the balanced distribution of financial resources in all regions, and continue to promote the construction of digital financial infrastructure in remote areas, including the mobile internet and modern financial supervision systems, so that the people in rural and remote areas can gain access to basic digital financial services. Second, the government should develop the residents' skills with financial knowledge training to expand the coverage of service of the financial system, and, at the same time, promote the competition and cooperation of traditional finance and digital finance, and gradually improve the product system of the digital financial market to better meet the domesticated financial demand.

Annotate:

- ① In most cases, the entrepreneurial activities in China are conducted in the units of households.
- ② Agricultural entrepreneurship is likely to be confused with basic agricultural production, and is, therefore, omitted in this study.
- ③ See question B2001aa "reasons for working in industry and commerce businesses", Chinese Household Finance Survey, 2019.
- ④ See Gao J. 2006, "Global Entrepreneurship Monitor China Report", Tsinghua UP.
- ⑤ The high added value industry includes the information technology industry, the financial industry, the leasing business industry, the scientific research technology industry, and the entertainment industry. And the low added value industry contains other industries.

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