

Digital Inclusive Finance, Innovation and Entrepreneurship

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Abstract

Based on the data of 31 provinces in China, this paper empirically analyzes the impact of the development of digital Inclusive Finance on entrepreneurial behavior by means of instrumental variable method and spatial SDM model. The results show that: there is a positive "U" curve relationship between digital Inclusive Finance and entrepreneurship. After 2012, the development level of digital Inclusive Finance in each province has exceeded the threshold; The development of digital Inclusive Finance in this province has a suction effect on entrepreneurship in other provinces; Innovation is one of the intermediary paths between digital Inclusive Finance and entrepreneurship. Digital inclusive finance can promote entrepreneurship and drive innovation, and can also promote innovation and then drive entrepreneurship, but the former is more effective. At present, there are still financing constraints in China. The special support funds should be mainly entrepreneurship, and differential credit should be implemented.

Keywords

Digital inclusive finance; Entrepreneurship; Innovation.

1. Introduction

2019 In February, the No.1 document of the China government required to support the establishment of various forms of entrepreneurial service platforms, speed up the solution to the credit difficulties of rural residents, improve the rural innovation and entrepreneurship support service system, and vigorously support the development of small and micro enterprises. In June 2019, Li Keqiang stressed on the national "mass entrepreneurship, mass innovation" activity week that we should actively optimize the business environment, use the "Internet +" platform to improve the level of "entrepreneurship and innovation", and encourage all kinds of micro credit, venture capital to provide growth impetus for innovation and entrepreneurship. With the rise of entrepreneurial economy, the theory and practice circles generally believe that digital Inclusive Finance is an important starting point to eliminate financing constraints and promote entrepreneurship and innovation with low cost and high efficiency. However, this may not be the case: the data shows that the average after tax interest rate of small and micro enterprises in China is only 3.3% in 2019, and the lowest interest rate of Internet financial platform in the same period is 9.3%. Twenty percent of start-ups will close down within two years, and fifty percent of start-ups will live for less than five years. This "first set up, then close down" situation obviously cannot explain the entrepreneurial nature of digital Inclusive Finance. Based on this, this paper analyzes the impact of digital Inclusive Finance on Entrepreneurship from a regional perspective on the premise of considering the existence of entrepreneurship, in order to provide practical suggestions for policy makers and lay a theoretical foundation for further promoting the inclusive development of Finance and guiding the "double innovation" economy in the new normal.

2. Literature Review

In recent years, digital Inclusive Finance, which relies on innovative technologies such as information technology, big data technology and cloud computing, has provided a huge development space for reducing financial transaction costs, expanding the scope of financial services and reaching capacity. As a new financial model, digital Inclusive Finance has become a powerful supplement to traditional finance, and providing affordable financial services for SMEs has gradually become an important measure to support entrepreneurship. At present, the academic research on the relationship between digital Inclusive Finance and entrepreneurship has started, including mechanism analysis (Ke, 2018, fan, 2018, sun, 2019), macro data empirical analysis based on different platforms (Xie, 2018, Zhang, 2019), questionnaire survey on different subjects in a Province, city and county and empirical test through binary selection model (hurst, 2004, Zeng, 2018, Zhou, 2019), etc.

As for the relationship between digital Inclusive Finance and entrepreneurship, most scholars hold a positive attitude: Ma Guangrong and Yang Enyan (2011) pointed out that the less developed the formal finance is, the greater the role of private lending to farmers in establishing their own businesses, and digital Inclusive Finance is more likely to provide more lending channels to entrepreneurs to vulnerable groups, thus more likely to start their own businesses. Zheng Changde (2006) thinks that in the past, for the purpose of reducing service costs and expanding benefits, financial intermediaries in China often only provided financial resources to high-income people and people with higher social status (Chakraborty, 2007, Zheng, 2018, Xie, 2018), while digital universal finance through credit constraint mitigation mechanism, information constraint mitigation mechanism, and social trust enhancement mechanism (He, 2019), improve the quality and accessibility of financial services (Huang, 2016), promote the rational allocation of financial resources, and thus bring more entrepreneurial options to vulnerable groups, although the current level of inclusive financial development in most regions is still insufficient to fully meet the growing financing needs of SMEs (Chen, 2007, Wang, 2017).

But there are also scholars who disagree: according to the data released by China Enterprise Data Survey Center (2017), the pretax interest rate of small and micro enterprises in China is only 10% - 15%, while the average after tax interest rate is only 3.3%, and the lowest interest rate of Internet credit platform in the same period is 9.3%. The high cost of credit makes 20% of small and micro enterprises close down within two years, and 50% of small and micro enterprises have less than five years of existence. Chen (2017) found that the average life span of enterprises subject to financing constraints is 4.7 years, and the number of enterprises withdrawing from the market is increasing year by year. King and Levine (1993) believe that only when the enterprise finally survives in the market, can it be regarded as a successful start-up. It can be seen that if small and micro enterprises are established due to the credit extension of digital Inclusive Finance, and fail due to the high interest rate of digital Inclusive Finance, this kind of entrepreneurship without sustainability cannot be a strong proof of the entrepreneurial nature of digital Inclusive Finance. In foreign countries, Chakraborty (2007) pointed out that the vulnerable groups have weak ability to accept new things, so they cannot get benefits from financial development in the short term; in the long term, although the new financial model brings the vulnerable groups into the service system, their productive investment in financial services still depends on the cost of financial services (Demirgüç-Kunt, 2009). If we borrow If the cost of funds is not affordable, the vulnerable groups are still excluded from the financial system. Cetorelli, Strahan (2006), Kerr and NANDA (2009) use the micro enterprise data of the United States from 1977 to 1994 and find that there is no significant linear relationship between credit availability and entrepreneurial behavior, and structural changes in the financial system are the key factors affecting entrepreneurial activities.

The existing research still has the following improvements: first, the existing literature in the study of the relationship between digital Inclusive Finance and entrepreneurship, mostly based on these characteristics to describe the impact mechanism and path, but the lack of integration with traditional financial development and entrepreneurship theory. As a product of financial development, digital Inclusive Finance has many new characteristics that traditional financial intermediaries do not have. To truly prove the operational boundary and entrepreneurial attribute of digital Inclusive Finance, it needs to be included in the theoretical framework of traditional financial development for further analysis. Secondly, venture capital tends to flow to financial centers or developed economies through spatial structure operation Regions (Martin, Richard, 2010, Zhang, 2016), and the development of digital Inclusive Finance in our province provides more financial support for entrepreneurs by eliminating financial exclusion, which is bound to attract venture capital inflows from other provinces. The existing literature does not take this dynamic process and the spatial correlation of digital Inclusive Finance into account, so the traditional measurement model inevitably has errors (Landstrom, 2010). In contrast, the regional scale analysis is more appropriate than the national scale (Tian, 2016). Finally, the financing constraints faced by small and micro enterprises are still serious at this stage, and the "mass entrepreneurship and innovation" economy is still facing the bottleneck of insufficient funds. In this case, it is worth considering whether innovation and entrepreneurship should be focused on, and whether financial institutions should carry out differentiated credit for entrepreneurial financing needs and innovative financing needs, but most of the existing literature does not involve it.

Based on this, this paper analyzes the relationship between digital Inclusive Finance and Entrepreneurship from the micro perspective, and then uses the spatial econometric model to make empirical analysis and comparison. Finally, through the intermediary effect test procedure of bootstrap method, we study and compare the direct and indirect effects of digital Inclusive Finance on entrepreneurship and innovation, in order to lay a theoretical foundation for further stimulating the vitality of digital Inclusive Finance, improving the level of "mass entrepreneurship and innovation" and promoting regional coordinated development in the stage of economic transformation.

3. Data and Model

3.1. Variable Selection

Explained variable: Previous studies have basically used the number of newly registered enterprises every year to measure entrepreneurial behavior, but as mentioned above, the number of newly registered enterprises in that year cannot reflect the sustainability of entrepreneurial development. Only by promoting the sustainable development of start-ups, can digital inclusive finance really show its role in promoting entrepreneurship. Referring to the practice of Gujiajun and Xie Fenghua (2012), this paper uses the entrepreneurial participation rate derived from "number of individual employees + number of private enterprises) / total number of employees" to measure entrepreneurial behavior, and uses the change rate of private and individual households to measure the entry and exit of entrepreneurial enterprises. The data comes from the National Bureau of statistics.

Main explanatory variables: Digital inclusive financial index (difi) and its square term. At the same time, in order to explore the spatial effect of the development of digital Inclusive Finance on entrepreneurial behavior, this paper constructs the spatial weight matrix based on the standard of economic distance W_1 , matrix based on adjacency standard W_2 . The data comes from the research center of digital Inclusive Finance of Peking University and the website of national geographic information system. In order to prevent collinearity, the data is centralized.

Control variables: referring to the experience and practice of existing literature (Xie Huahua, 2018, Deng Xiaona, 2019), introduce enterprise innovation (INV), economic development level (GDP), unemployment rate (UEM), human capital (EDU), income level (Inc), government size (gov) into control variables. Enterprise innovation is represented by the number of patent applications. No matter whether the patent application is approved or not, it reflects the input and process of R & D (Tian bifei, 2016); the level of economic development is represented by the per capita GDP of each province; human capital is represented by the number of full-time undergraduate and college students in each province; the level of income is represented by the per capita disposable income; and the scale of government expenditure accounts for the GDP Specific gravity. The above data are from China Statistical Yearbook and National Bureau of statistics. It should be noted that in order to facilitate the establishment of spatial measurement model for analysis, this paper selects the balance panel data of 31 provinces in 2011-2017, 217 valid samples, and some abnormal or missing values are supplemented manually. Descriptive statistics are shown in Table 1.

Table 1. Descriptive statistics

Variable name	Observation number	Mean value	Standard error	Maximum value	Minimum value
ENTER	217	4.9	0.16	10.1	2.4
DIFI	217	4.973	0.678	5.819	2.786
DIFI2	217	25.191	6.115	33.861	7.763
INV	217	10.339	1.625	13.350	5.163
GDP	217	5.005	2.339	12.904	1.644
UEM	217	32.963	6.505	45.000	12.000
EDU	217	81.983	50.481	201.530	3.240
INC	217	21.976	8.494	58.988	9.740
GOV	217	21.919	21.180	137.916	11.027

3.2. Model Building

Before regression, in order to understand the characteristics of the samples used in this paper, we draw a scatter diagram with digital Inclusive Finance and entrepreneurship as the horizontal and vertical coordinates. It can be seen from Figure 1 that there is an approximate quadratic function relationship between digital Inclusive Finance and entrepreneurship, and most of the samples are on the right side of the threshold. It can be seen that in the early stage of the development of digital Inclusive Finance, it not only failed to promote entrepreneurship, but also brought a negative impact on entrepreneurship. However, after a period of time, digital Inclusive Finance has a stable role in promoting entrepreneurship. Generally, the relationship between the two is approximately quadratic function, which is in line with the previous conjecture.

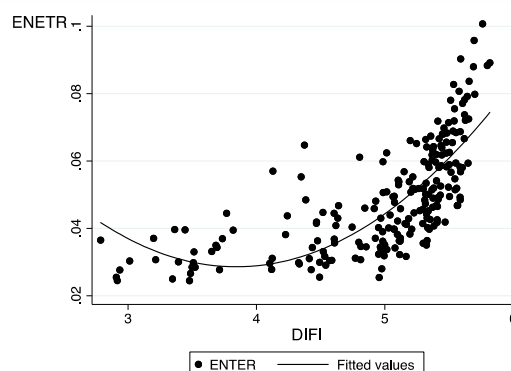


Figure 1. Relationship between digital inclusive financial index and Entrepreneurship

According to the above scatter chart, we can preliminarily verify the possible open-ended upward quadratic function relationship between digital Inclusive Finance and entrepreneurship, as mentioned above, entrepreneurial behavior may have spatial agglomeration effect in China, and the development of digital Inclusive Finance is the optimization of business environment, which is more likely to intensify the spatial agglomeration effect. In order to investigate the spatial spillover effect of digital Inclusive Finance on entrepreneurial behavior, a general spatial Doberman model (SDM) is established as a general form of spatial lag model and spatial error model, which can simultaneously obtain the direct, indirect and total effects of digital Inclusive Finance on entrepreneurial behavior. As shown in formula (1):

$$ENTER_{it} = \rho w_{ij} ENTER_{it} + \beta_1 DIFI_{it} + \beta_2 DIFI2_{it} + \beta_3 DIFI_{it} * INV + \beta_4 DIFI2_{it} * INV$$

$$+ \beta_3 Control_{it} + \beta_4 w_{ij} DIFI_{it} + \beta_4 w_{ij} DIFI_{it} + \beta_5 w_{ij} DIFI2_{it} + \beta_5 w_{ij} Control_{it} + \mu_i + \omega_t + \varepsilon_{it} \quad (1)$$

In style w_{ij} represents the spatial weight matrix constructed based on different rules, $Control_{it}$ represents all control variables, μ_i , ω_t , ε_{it} are space fixed effect, time fixed effect and random error term.

4. Empirical Analysis

This section is mainly divided into two parts. In the first part, the panel data model is used to regress formula (1) to preliminarily judge whether there is a stable quadratic function relationship between digital Inclusive Finance and entrepreneurship; in the second part, the spatial Doberman model is used to regress formula (2) to analyze the spatial effect between digital Inclusive Finance and entrepreneurship.

4.1. Panel Data Model

In this paper, the panel data model is regressed by OLS and panel fixed effect model (through Hausman test). In addition, in order to further eliminate the endogeneity of equation (1) and improve the accuracy of regression results, the corresponding instrumental variables were selected for 2SLS and GMM regression at the same time. According to the experience and practice of the existing literature (Liang Shuanglu, 2019), the Internet penetration rate (int) and its square term (INT2) are regarded as the instrumental variables of digital Inclusive Finance, which are expressed by the ratio of the Internet access ports of each province to the total population of each province. In the effectiveness test of instrumental variables, the digital inclusive financial index is combined with other explanatory variables and instrumental variables for significance test, and the result shows that the F statistic is 33.81, which can be considered as a strong instrumental variable (Woodridge, 2009, Zhou Jingkui, 2010), at the same time nR^2 Equal to 0.04, less than $\chi^2(q)$. The value at 5% level (3.8) passed the over identification test. Finally, the endogenous test shows that the residual item is significantly positive at the level of 1%. The endogenous test shows that the digital Inclusive Finance and entrepreneurship do interact, and the Internet penetration rate is an ideal tool variable. The estimated results are subject to IV-GMM, as shown in the table below.

Table 2. Regression results of panel data model

variable	OLS	Fixation effect	IV-2SLS	IV-GMM
DIFI	-0.070326 ^{***} (-5.2356)	-0.043504 ^{***} (-5.08607)	-0.196025 ^{***} (-3.64038)	-0.162403 ^{***} (-3.52275)
DIFI2	0.009144 ^{***} (6.01074)	0.005418 ^{***} (5.23577)	0.022284 ^{***} (3.86899)	0.018906 ^{***} (3.874274)
INV	-0.004487 (-0.40426)	0.043065 ^{***} (2.66937)	0.007052 ^{***} (2.714129)	0.032843 ^{***} (2.98177)
DIFI*INV	-0.000645 ^{**} (-2.4813)	-0.000472 ^{***} (-3.6005)	-0.001784 ^{***} (-4.78793)	-0.00168 ^{***} (-3.56919)
DIFI2*INV	0.000236 ^{**} (2.5602)	0.000165 ^{***} (3.45578)	0.000495 ^{***} (5.459978)	0.000531 ^{***} (4.193628)
GDP	0.00108 (1.11103)	0.004098 ^{***} (3.35771)	0.00022 (0.151519)	-0.00179 [*] (-1.71764)
UEM	-0.000235 ^{***} (-2.6803)	-3.10E-05 (-0.20378)	-0.001213 ^{***} (-4.10422)	-0.000568 ^{***} (-3.46044)
EDU	3.24E-05 (1.28148)	0.000261 ^{***} (3.2233)	0.000535 ^{***} (6.97029)	0.000191 (1.6152)
INC	0.000482 ^{**} (2.13729)	0.000215 (1.49404)	0.000565 (1.22658)	0.000381 (0.94253)
GOV	-9.86E-07 (-0.02048)	0.000203 (0.902707)	-0.000848 ^{***} (-3.38567)	-0.000297 (-0.92679)
C	0.193143 ^{**} (2.28521)	-0.215975 [*] (-1.92263)	0.427139 ^{**} (2.34941)	0.170422 (1.31157)

It can be seen from table 2 that difi is significantly negative and difi2 is significantly positive, which proves the previous conjecture: there is an open-ended quadratic function relationship between digital Inclusive Finance and entrepreneurship. Based on the regression results of IV-GMM in the fourth column of the table, the inflection point of the quadratic function is calculated to be 80.64, only 16% of which falls to the left of the inflection point. Therefore, it can be considered that digital Inclusive Finance is in the [0, 80.64] range. It does not promote entrepreneurship. Since the digital inclusive financial index of each province has exceeded 80.64 since 2012, the range is about 2 years. After the index of digital Inclusive Finance exceeds 80.64, digital Inclusive Finance has brought significant promotion effect to entrepreneurship.

If we consider the interaction between innovation and digital Inclusive Finance and its secondary term, we find that the coefficient of innovation is always positive after the first derivative of entrepreneurship to digital Inclusive Finance. Therefore, enterprise innovation can enlarge the role of digital Inclusive Finance in promoting entrepreneurship.

Among other control variables, economic growth, human capital, income level all play an important role in promoting entrepreneurship, while the expansion of government scale has a negative impact on entrepreneurship. In addition, the coefficient of unemployment rate is significantly negative, which is consistent with the conclusion of Tian bifei (2016). This may be

because the increase in unemployment means that the economy is in recession and the average quality of workers is low, at this time, the public's entrepreneurial motivation is weakened.

4.2. Spatial Correlation Test

This paper uses moran index to explain the spatial correlation of entrepreneurial behavior in 31 provinces of China from 2011 to 2017. If the moran index is greater than zero, it means that the entrepreneurial behavior of each region is positively correlated in space, that is, the entrepreneurial behavior of each province has agglomeration phenomenon; if it is less than zero, it means that it is negatively correlated in space, that is, the observed value begins to disperse in space. The greater the absolute value of moran index, the greater the spatial relevance of Entrepreneurship (fan, 2016). In order to calculate moran index, this paper constructs a spatial weight matrix based on economic distance standard W_1 . Table 3 is the statistical table of moran index.

Table 3. 2011—2017 moran index of entrepreneurial behavior of 31 provinces

particular year	Moran index	Z statistic
2011	0.407	5.426
2012	0.395	5.190
2013	0.353	4.623
2014	0.349	4.548
2015	0.343	4.473
2016	0.412	5.319
2017	0.415	5.356

It can be seen from table 3 that the moran index of entrepreneurial behavior of all provinces in China from 2011 to 2017 is significantly positive at the level of 1%, and its range is 0.343-0.315, which indicates that there is a significant spatial clustering phenomenon in the entrepreneurial behavior of 31 provinces in China: the provinces with high entrepreneurial participation rate are generally concentrated in the economically developed regions. Therefore, it is necessary to further study the relationship between digital Inclusive Finance, entrepreneurial behavior and enterprise innovation under the spatial econometric model.

4.3. Regression Results of SDM Model

According to the research of Wang Fayuan (2018), firstly, a general spatial Doberman model was established. The regression results passed the Wald test and LR test, and the goodness of fit was significantly positively correlated at the level of 1%. Therefore, the spatial Doberman model was selected for regression. This paper analyzes the relationship between digital Inclusive Finance and entrepreneurial behavior by MLE estimation. In addition, due to the different spatial weight matrix may affect the regression results of the model, in order to facilitate the comparison, the adjacency matrix widely used in the existing literature is also selected in this paper (W_2) The regression results are reported, which are subject to the first column, as shown in the following table:

Table 4. Regression results of spatial econometric model

Variables	Model 1_W ₁	Model 2_W ₁	Model 1_W ₂	Model 2_W ₂
Spatial(rho)	0.1556402 *** (3.25)	0.265482 *** (9.65)	0.5856849 *** (2.65)	0.2337718 ** (1.96)
Direct				
DIFI	-0.0184932 *** (-2.89)	-0.0511636 *** (- 7.32)	-0.0184932 *** (-2.89)	-0.0486231 *** (- 4.71)
DIFI2	0.0022893 *** (2.73)	0.0067141 *** (8.28)	0.0022893 *** (2.73)	0.0060762 *** (4.65)
INV	0.0014524 (0.78)	0.0217371 (1.51)	0.0082633 (0.63)	0.0134995 (0.78)
DIFI*INV		-0.0003647 *** (- 2.74)		-0.0003365 *** (- 2.47)
DIFI2*INV		0.0001246 *** (3.06)		0.0001018 ** (2.18)
Indirect				
DIFI	0.0225289 *** (3.22)	0.0206585 *** (2.89)	-0.022528 *** (-3.22)	-0.0130268 * (-1.89)
DIFI2	-0.0027779 *** (-3.05)	-0.002263 *** (-2.75)	0.0027779 *** (3.05)	0.00162 * (1.92)
INV	0.0012901 (0.82)	0.0077875 (1.56)	0.0108345 (1.57)	0.0043634 (0.66)
DIFI*INV		-0.000419 *** (-2.81)		-0.0000926 (-1.30)
DIFI2*INV		0.0001898 *** (4.20)		0.0000273 (1.27)
Total				
DIFI	-0.0410221 *** (-3.26)	-0.0718222 *** (- 8.93)	-0.0410221 *** (-3.26)	-0.0616499 *** (- 7.30)
DIFI2	0.0050673 *** (3.06)	0.0089772 *** (8.73)	0.0050673 *** (3.06)	0.0076962 *** (7.44)
INV	0.019334 (1.52)	0.0295246 * (1.97)	0.016326 (1.22)	0.0178629 (0.78)
DIFI*INV		-0.0007837 *** (- 4.42)		-0.0004292 ** (-2.49)
DIFI2*INV		0.0003144 *** (6.03)		0.0001291 ** (2.23)
Controls	Yes	Yes	Yes	Yes
sigma ²	0.0000132 ***	0.0000133 ***	0.0000132 ***	0.0000154 ***
log-likelihood	871.741	876.852	865.623	883.693

It can be seen from table 4 that the spatial lag coefficient (ρ) is significantly positively correlated at the level of 5%, indicating that there is indeed a spatial correlation in the entrepreneurial behavior of all provinces in China. $difi$ and its quadratic are significant at the level of 1%, indicating that there is indeed a significant quadratic function relationship between digital Inclusive Finance and entrepreneurial behavior in each province, with a threshold of about 70.105 (all provinces crossed the threshold in 2012), and about 13.8% of the points fall on the left side of the threshold; the impact on entrepreneurship in other provinces is in an inverted "U" relationship, with a threshold of about 149.605 (all provinces crossed the threshold in 2014), and about 36.4% of the points fall on the left side of the threshold. In order to simplify the analysis, it is assumed that the digital Inclusive Finance has a one-way positive impact on the entrepreneurial behavior of the province, that is, in the $[70.105, 149.605]$ range, the digital inclusive finance promotes the entrepreneurship of the province, and at the same time promotes the entrepreneurship of other provinces; in the $[149.605, +\infty]$ range, the provinces with higher digital inclusive finance index begin to absorb the entrepreneurial capital of other provinces, thus promoting the entrepreneurship of the province, and the business between provinces. The environmental gap has widened further. Among the indirect effects, innovation and its interaction with digital inclusive finance are not significant, which means that innovation does not have obvious spatial spillover effect.

Further analysis shows that the interaction term of inv and $difi^2$ is significant at the level of 5%, while the interaction term of inv and $difi$ is not significant, which is mathematically represented by further narrowing the interval where the quadratic function lies to the left of the threshold.

Under W_1 matrix σ^2 Smaller and higher log likelihood, indicating that the economic distance matrix is more robust than the adjacent matrix (Wang Fayuan, 2019). In the second column of regression results in Table 5, whether direct effect or indirect effect, $difi$ and its secondary term are significant at the level of 1%, indicating that there is a significant quadratic function relationship between digital Inclusive Finance and entrepreneurial behavior within and between provinces, confirming the spillover effect of entrepreneurship. The interaction between inv , $difi$ and $difi^2$ is significantly positive and significantly negative at 1% level. It shows that the combination of innovation and digital inclusive finance can promote the entrepreneurship level of the province and other provinces.

4.4. Bootstrap Method to Test the Relationship between Innovation and Entrepreneurship

The existing research on the relationship between entrepreneurship and innovation has been agreed. Can digital inclusive finance promote innovation by promoting entrepreneurship? Can we promote innovation and entrepreneurship? Which way is more effective? In order to answer the above questions, it is necessary to test the intermediary effect of the relationship among the three. At present, the intermediary effect test model proposed by Baron and Kenny (1986) and Wen Zhonglin (2004) has been widely used in China. However, more and more scholars question the rationality and effectiveness of this method. Therefore, bootstrap method is used to investigate the intermediary effect of entrepreneurship and innovation. This method is summarized by Zhao et al (2010) as the intermediary effect test procedure and is applied in the field of empirical research. It has been widely recognized in the world. The estimated results include direct effect, indirect effect and total effect.

It should be noted that the direct effect, indirect effect and total effect obtained by bootstrap method are totally different from the direct effect, indirect effect and total effect obtained by spatial econometric model in the previous article. Here, the direct effect refers to the influence of independent variable on the dependent variable directly without intermediary path; the indirect effect refers to the effect of independent variable on the dependent variable by

influencing the intermediary variable; the total effect refers to the sum of direct effect and indirect effect.

Because the threshold value of the quadratic function relationship between digital Inclusive Finance and entrepreneurship is low, in order to simplify the analysis, this paper considers that there is a one-way positive correlation between them, and does not include the quadratic term of digital inclusive finance index into the intermediary effect test procedure. Table 5 shows the estimated results of direct, indirect and total effects of digital Inclusive Finance on entrepreneurship and innovation by repeated sampling 1000 times under 95% confidence interval.

Table 5. Relationship among digital Inclusive Finance, entrepreneurship and innovation

		Effect value	(Boot)SE	(Boot)LLCI	(Boot)ULCI	Percent
The impact of digital Inclusive Finance on Entrepreneurship	BS_1	0.0013	0.00046	0.0004	0.002	0.085
	BS_2	0.014	0.00112	0.012	0.016	0.915
	Total	0.0153	-	-	-	1
The impact of digital Inclusive Finance on Innovation	BS_1	0.039	0.013	0.014	0.064	0.41
	BS_2	0.056	0.023	0.0114	0.1	0.59
	Total	0.095	-	-	-	1

5. Conclusions and Suggestions

This paper studies how digital inclusive finance affects entrepreneurship and the relationship between them through the intermediary effect test of spatial SDM model and bootstrap method. The results show that there is spatial agglomeration in entrepreneurial behavior in China, and there is a significant positive "U" curve relationship between digital Inclusive Finance and entrepreneurship in our province. The development of digital Inclusive Finance in our province has an inverted "U" spatial spillover effect on entrepreneurial behavior in other provinces. At present, the development level of digital Inclusive Finance in all provinces in China has exceeded the threshold value of positive "U" curve and inverted "U" curve. The province's digital inclusive finance promotes the growth of entrepreneurship in the province by absorbing entrepreneurship resources from other provinces, which is not conducive to the growth of entrepreneurship in other provinces; innovation and entrepreneurship interact, but the positive impact of digital Inclusive Finance on innovation through entrepreneurship is far greater than that through entrepreneurship. According to the analysis results, this paper puts forward the following policy recommendations:

1. Increase investment and Internet construction in remote and poverty-stricken areas, and further improve the differentiated services provided by the development speed of digital Inclusive Finance in such areas to enterprises. In the era of traditional industrial economy, if we want to be rich, we should build roads first. But in the era of digital information, if you want to be rich, first connect to the Internet. The development of digital Inclusive Finance is the optimization of business environment. If there is too much difference in the level of digital economic infrastructure construction between different provinces and cities, it will inevitably lead to the further flow of economic resources to the places where the development of digital Inclusive Finance is faster. These places tend to be more affluent, which will further increase the gap between the rich and the poor.
2. The central government should provide more entrepreneurial incentives to the relatively weak provinces to promote the coordinated development of the region. With the continuous

weakening of market entry barriers in each province, the rapid development of digital Inclusive Finance in this province may have a suction effect on the capital of other provinces. In order to curb this unbalanced circulation of venture capital, the central government can give more policy dividends to vulnerable provinces to encourage entrepreneurship, such as reducing taxes and fees, reducing loan costs, providing subsidies for entrepreneurial enterprises, etc. Enhance the motivation and sense of gain of entrepreneurs and start-ups, and help enterprises survive better.

3. We will give priority to encouraging entrepreneurship and innovation, and deepen the integration of the "mass entrepreneurship and innovation" policy and the "Internet +" development strategy. From the above analysis, we can see that the role of digital Inclusive Finance in promoting entrepreneurship and indirectly driving innovation is far greater than that of digital Inclusive Finance in promoting innovation and driving entrepreneurship. At this stage, financing constraints are still widespread. Financial support system and special funds for "mass entrepreneurship and innovation" should try their best to favor entrepreneurship, drive innovation with entrepreneurship, and drive enterprises to achieve high-quality development with innovation. For start-ups, we should focus on reducing taxes and fees, and appropriately reduce social security rates to ensure that the overall burden of enterprises is not increased. We will continue to increase the proportion of R & D expenses plus deduction, and financial institutions will provide differentiated credit for innovation and entrepreneurship.

4. We will increase the popularization of basic knowledge about financial management and entrepreneurship education, and constantly optimize the business environment. The biggest obstacle of "mass entrepreneurship and innovation" lies in the lack of funds. However, most of the population in China lacks the basic financial and entrepreneurial literacy, and does not have the ability to use financial services and the willingness to start businesses. Therefore, it also makes digital Inclusive Finance "useless". Local governments can organize communities to explain basic financial knowledge and entrepreneurship education courses to the masses, guide them to use various financial tools to carry out innovation and entrepreneurship activities, and play a good role as the guide and waiter of entrepreneurs.

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