The entrepreneurial effect of "two rights" mortgage policy: a quasi-natural experiment-based study

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**Abstract**

Entrepreneurship is an important way to increase farmers' income and enhance the endogenous power of villages, however, farmers usually face the problem of insufficient initial capital to start their businesses. Can the "two rights" mortgage policy revitalize farmers' dormant assets, such as land and house bases, and provide suitable collateral for farmers' entrepreneurship financing? This paper investigates the policy effects of the "two rights" mortgage on farmers' entrepreneurial activities through a quasi-naturalistic experimental design based on the data of the 2017 mobile population survey, and finds that: (1) the "two rights" mortgage policy effectively promotes farmers' tendency to choose The study found that (1) the "two rights" mortgage policy effectively promoted farmers' tendency to choose entrepreneurship, but there were significant differences between survival entrepreneurship and opportunity entrepreneurship, and the "two rights" mortgage policy significantly promoted farmers' choice of survival entrepreneurship but did not significantly promote farmers' choice of opportunity entrepreneurship; (2) the "two rights" mortgage policy had a significant impact on farmers' entrepreneurship. (2) there is a significant income effect of the "two rights" mortgage policy on farmers' entrepreneurial performance, but there is no significant income effect after classifying subsistence entrepreneurship and opportunity entrepreneurship; (3) the effect of the "two rights" mortgage policy on farmers' entrepreneurial choices varies across regions, and there is a significant income effect after classifying subsistence entrepreneurship and opportunity entrepreneurship; (4) there is a significant income effect of the "two rights" mortgage policy on farmers' entrepreneurial choices. (3) The effect of the "two rights" mortgage policy on farmers' entrepreneurial choices varies across regions and is equally divided between survival and opportunity entrepreneurship, with the policy effect showing a trend of weakening from east to west. Based on the research results, this paper proposes the following policy optimization suggestions: (1) the value assessment system and the transfer market should be improved to clarify the value of the "two rights" mortgage, to further play the role of the "two rights" mortgage policy in promoting farmers' entrepreneurial choices; (2) the "two rights" mortgage policy should be improved to promote farmers' entrepreneurial choices. (2) The supporting mechanism of the "two rights" mortgage policy should be improved to realize the income effect of the "two rights" mortgage policy on different types of farmers' entrepreneurship.

**JEL classification numbers:** Q14

**Keywords:** Homestead mortgage; farmland mortgage; farmers' entrepreneurship; quasi-natural experiment

1. Introduction

After China has achieved a comprehensive victory in the battle against poverty in 2020, how consolidating the results of poverty eradication and establishing a long-term poverty eradication mechanism is a major challenge for China's economy and society. The No. 1 Document of the Central Government in 2021 points out that the key to solving the problem of unbalanced and insufficient development lies in the "three rural areas", and raising the income of rural residents has become the key to promoting common prosperity. The key point of departure is to increase the income of rural residents. Entrepreneurship not only helps to promote national innovation and long-term economic growth (Samila and Sorenson, 2011; Prieger et al., 2016), but also helps to solve the employment problem and increase residents' income in society (Banerjee and Newman, 1993; De Mel st al., 2008; Zhou Guangsu et al. 2017). Therefore, increasing the income level of farmers through entrepreneurship is important for narrowing the income gap between urban and rural residents and achieving common prosperity (Ziyan Yang and Wenfeng, 2020).

However, any entrepreneurial activity faces a certain threshold of initial wealth (Balmaceda, 2017; Li-Fang et al., 2019), and farmers usually need credit financing in the form of a credit to meet the initial capital requirements of entrepreneurship due to their lack of wealth. However, due to severe financial exclusion in the financial sector, it is difficult for poor and disadvantaged groups to obtain adequate loans from formal financial institutions (Yexin Zhou et al., 2014), and credit constraints become a major factor inhibiting farmers' entrepreneurial decisions and entrepreneurial performance (Fang Li and Lei Fang, 2016;Hongfei Yin, 2020; Hongfei Yin et al., 2021). In this context, revitalizing dormant assets such as land and house bases so that farmers have suitable collateral and can thus obtain credit from formal channels becomes an important path to break the dilemma of financing farmers' entrepreneurship.

In order to clearly define and effectively protect the property rights of rural land and residential bases and revitalize the dormant capital of farmers, the State has promulgated a series of policies: at the end of December 2015, the Standing Committee of the Chinese People's Congress authorized the State Council to allow mortgage loans with the operation rights of rural contracted land in 232 pilot counties (cities and districts) administrative regions, including Daxing District in Beijing, and on March 15, 2016, the People's Bank of China and five other departments then jointly promulgated the Interim Measures on the Pilot Mortgage of the Operation Right of Rural Contracted Land (hereinafter referred to as Agricultural Land Mortgage) to regulate the mortgage of the operation right of agricultural land; the People's Bank of China and six other departments issued the Interim Measures on the Pilot Mortgage of Farmers' Housing Property Rights (hereinafter referred to as Home Base Mortgage) in March 2016, in 59 pilot counties (cities and districts), including Jixian County in Tianjin Administrative regions to temporarily adjust the implementation of the provisions of the Property Rights Law and the Security Law on the right to use collectively owned residential bases shall not be mortgaged, allowing mortgage loans on farmers' housing property rights (including the right to use residential bases), the so-called mortgage loans on farmers' housing property rights refers to the ownership of farmers' housing and the right to use the occupied residential bases as collateral, without changing the nature of the ownership of residential bases, and the lending institutions to eligible farmers In December 2017, the State Council issued the Guiding Opinions on Launching the Pilot Program of Mortgage Loans for Rural Contracted Land Management Rights and Farmers' Housing Property Rights, which provides guidance on mortgage loans for "rural contracted land management rights" and "farmers' housing property rights". The pilot work (hereinafter referred to as the "two rights" mortgage policy) has made further regulation and guidance. So, have these policies revitalized farmers' dormant assets, provided farmers with agreeable collateral, and thus alleviated the credit constraints faced by farmers' entrepreneurship and promoted farmers' entrepreneurial activities? Because the existing studies have not conducted an overall assessment of the policy effects of the "two rights" mortgage policy on farmers' entrepreneurial activities, this paper will analyze and demonstrate this issue. This paper will help to evaluate the overall effect of the "two rights" mortgage policy, which will help to promote further optimization of the policy.

1. Literature Review and Research Hypothesis

At present, studies related to farmland mortgage policy and homestead mortgage policy have achieved certain results, and some scholars have studied the impact of farmland mortgage policy in several aspects, including influencing factors (Su Lanlan et al., 2017), credit availability (Meishan Jiang and Yunsheng Mi, 2020), mortgage mode (Heng Zhang et al., 2018) and mortgage effect, while studies on homestead mortgage have mainly focused on three areas, including willingness to mortgage the homestead (Wei Zou et al., 2017; Xianbo Hui, 2017), mortgage financing effect(Xiaojie Zhu, 2019) and social risk(Chao Lin and Hongbing Chen, 2014).

However, there is a relative lack of research on the impact of the "two rights" mortgage policy on farmers' entrepreneurship, and only a few scholars have conducted scattered studies on this issue: in terms of the impact of the home base mortgage policy on farmers' entrepreneurial activities, Zhu (2019), based on research data from 2015-2017, found that home base mortgage can significantly increase the income of agricultural production factors, thus increasing the income of agricultural production factors. Based on research data from the pilot counties of rural homestead use rights mortgage in Henan Province from 2015 to 2017, using the double difference propensity score matching method (PSM-DID), he found that homestead use rights mortgage can significantly enhance the income of agricultural production factors, thus improving agricultural output; Li.(2020), on the other hand, based on data from the 2017 Mobility Survey, demonstrated through propensity score matching that homestead mortgage policy on farmers' entrepreneurial choices and entrepreneurial performance; in terms of the impact of farmland mortgage policy on farmers' entrepreneurial activities, Su and Kong(2018) find that farmland mortgage loans promote farmers' entrepreneurship, especially farm-related entrepreneurship, by influencing entrepreneurial farmers' land transfer decisions and operational aspects; Shanshan Hu and Chao (2020) demonstrate that farmland mortgage policy releases the asset Hu and Chao (2020) demonstrated that farmland mortgage policy released the liquidity of assets and thus promoted farmers' farm-related entrepreneurship; Ren and Hu (2021) found that farmland mortgage policy had a significant impact on both farmers' farm-related and non-farm entrepreneurship, and the expectation of policy effect was positively related to farmers' farm-related entrepreneurship "without leaving the land", but the stronger the expectation of policy effect was, the more likely it was to generate "farm-related entrepreneurship". However, the stronger the expectation of the policy effect, the more likely it is to generate off-farm entrepreneurship.

It can be seen that the current research on the impact of the "two rights" mortgage policy on farmers' entrepreneurial activities is not sufficient, and there are still some problems: for example, the existing studies focus more on the impact of the "two rights" mortgage policy on entrepreneurial intentions, however However, entrepreneurial activities can be divided into three stages: before (Ko and Kelvie, 2018; Glaeser et al., 2015), during (Burns et al., 2016; Chen et al., 2018) and after (Hoogendoorn et al., 2013; Dongmei et al., 2020). The impact of the "two rights" mortgage policy on farmers' entrepreneurial performance has not been evaluated; in addition, entrepreneurship can be usually divided into survival entrepreneurship and opportunity entrepreneurship, where survival entrepreneurship is passive entrepreneurship, where entrepreneurs passively start their businesses due to the lack of other employment options, and opportunity entrepreneurship is active entrepreneurship, where entrepreneurs find entrepreneurial The division between survival entrepreneurship and non-survival entrepreneurship better reflects the structural characteristics of farmers' entrepreneurship, however, existing studies have not conducted in-depth research on farmers' entrepreneurial activities from this perspective. So, what is the impact of the "two rights" mortgage policy on farmers' entrepreneurial activities in terms of total effect and structure?

First, in terms of the impact of the "two rights" mortgage policy on farmers' entrepreneurial decisions, farmland mortgages can influence entrepreneurial farmers' land transfer decisions (Lanlan Su and Rong Kong, 2018), releasing the liquidity of land assets (Hu Shanshan and Chao Na, 2020), and by investing farmland mortgages in existing production and business processes (Hu Liang et al., 2017; Xin Zhang et al., 2017). (Liang and Hu et al., 2017; Zhang and Xin et al., 2017), and in terms of the impact of the homestead mortgage policy on farmers' entrepreneurial activities, the homestead mortgage realized the realization of farmers' property rights and interests (Chen and Dan, 2020) and promoted farmers' income growth through the realization of the fictitious rights of ownership, the manifestation of the potential value of eligibility rights, and the diversified flow mechanism of use rights (Zhang and Zhang, 2021). Therefore, this paper proposes Hypothesis 1 as well as Hypothesis 1.1 and Hypothesis 1.2:

**H1:** By alleviating the credit constraints faced by farmers in starting their own businesses, the "two rights" mortgage policy improves farmers' entrepreneurial choices.

**H1.1:** The "two-rights" mortgage policy improves survival entrepreneurship options.

**H1.2:**: The "two-rights" mortgage policy enhances opportunistic entrepreneurial choices.

Second, according to the resource replenishment theory, poverty is caused by a lack of resources, and resource endowment conditions have an important influence on farmers' choice to start a business (Jianghua Chen et al., 2022), if poor people with entrepreneurial needs are provided with financial capital or other material assets, then it will help them to start a business and thus increase their income and escape from poverty (Sutter et al., 2013). Adequate farmland mortgages not only help farmers start their businesses, but also give them sufficient capital to hire employees to add to their labor force and also to purchase large fixed assets to increase productivity (Jung, et al., 2020; Li, 2020). In other words, having a higher entrepreneurial performance means having a higher level of income. Therefore, this paper proposes hypothesis 2 as well as hypothesis 2.1 and hypothesis 2.2:

**H2:** By improving resource allocation, the "two rights" mortgage policy improves farmers' entrepreneurial performance.

**H2.1:**: The "two rights" mortgage policy improves the entrepreneurial performance of farmers' subsistence entrepreneurship.

**H2.2:**: The "two rights" mortgage policy improves the entrepreneurial performance of farmers' opportunity-based entrepreneurship.

1. Research design and research methodology
	1. Research design based on quasi-natural experimental method

Quasi-natural experiment is a research method compared with real experimental research. Compared with randomized natural experiments, quasi-natural experiments do not have a completely random assignment of treatment objects, but still have a certain degree of non-randomness.

First, to test Hypothesis 1, Hypothesis 1.1, and Hypothesis 1.2, and to examine the marginal impact of the "two rights" mortgage policy on farmers' entrepreneurial decisions, farmers in the pilot area who participated in the "two rights" mortgage were used as the experimental group, while farmers in the pilot area who did not participate in the "two rights" mortgage were used as the control group. In this paper, the farmers who participated in the "two rights" mortgage in the pilot area as the experimental group and the farmers who did not participate in the "two rights" mortgage in the pilot area as the control group can be expressed as:

$Y=β\_{0}+β\_{1}treat+\sum\_{i=2}^{n}β\_{i}X\_{i}+ε$ (1)

Y is a dummy variable representing farmers' choice of entrepreneurship, Y is 1 if farmers choose to start their own business and 0 if they choose not to start their own business; β0 is a constant term; treat, is a dummy variable, treat is 1 if farmers take out "two rights" mortgage and 0 if they do not; β1 is a dummy variable representing the marginal effect of "two rights" mortgage policy on farmers' choice of entrepreneurship. Xi is the control variables, βi are the corresponding coefficients, and ε is the random disturbance terms.

Then, to test Hypothesis 2, Hypothesis 2.1, and Hypothesis 2.2, and to examine the income effect of the "two rights" mortgage policy on entrepreneurial performance, based on the idea of quasi-natural experiments, this paper selects the entrepreneurial farmers who take out "two rights" mortgage in the pilot area as the experimental group, and the entrepreneurial farmers who do not take out "two rights" mortgage in the pilot area as the control group. Based on the idea of quasi-natural experiments, we choose the entrepreneurial farmers in the pilot area who have taken out "two rights" mortgage as the experimental group and the entrepreneurial farmers in the pilot area who have not taken out "two rights" mortgage as the control group:

$Income=β\_{0}+β\_{1}treat+\sum\_{i=2}^{n}β\_{i}X\_{i}+ε$ (2)

The Income is the farmers' entrepreneurial performance, β1 is a constant term, treat is a dummy variable, treat takes the value of 1 if the "two rights" mortgage is carried out, and 0 if the "two rights" mortgage policy is not carried out; β1 is the policy effect of the "two rights" mortgage, reflecting the marginal impact of the "two rights" mortgage policy on farmers' entrepreneurial performance. is the policy effect of the "two rights" mortgage, reflecting the marginal effect of the "two rights" mortgage policy on farmers' entrepreneurial performance, Xi is the control variable group, βi is the corresponding coefficient, and ε is the random disturbance term.

* 1. Selection of research methods
		1. logit model

Logit model is a mainstream dichotomous choice model, which focuses on estimating the probability of the explained variable by analyzing the main relationship between the explained variable and the explanation. Since the 1960s, many scholars have extended the model from several fields. Based on the principles of the classical Logit model, meanwhile, referring to the research basis of Gomariz and Ballesta (2014), the following Logit model is proposed in this paper:

 $P(Y=1)=\frac{exp(β\_{0}+\sum\_{i=1}^{N}β\_{i}x\_{i}+ε)}{1+exp(β\_{0}+\sum\_{i=1}^{N}β\_{i}x\_{i}+ε)}$ (3)

In Eq. (3), P(Y=1) denotes the probability that y takes the value of 1;β\_0 is the constant term; Xi is the individual control variables, theβ\_i then is the regression coefficient of each independent variable, and ε is the random disturbance term.

* + 1. Deviation correction matching

Propensity Score Matching (PSM) was first proposed by Rosenbaum and Rubin (1983), and it balances the data by resampling or matching the non-intervention sample with the intervention sample based on the probability of receiving the intervention (i.e., propensity value). score matching method, the sample selectivity bias based on both observable and unobservable factors can be excluded, resulting in a "clean" average effect of the policy disposition. The Average Treatment Effect on the Treated (ATT) can be estimated without bias if the conditional independence assumption and the common support condition are satisfied. The average treatment effect (ATT) of the "two rights" mortgage policy on the entrepreneurial performance of farmers i can be expressed as follows:

$ATT=E\left[exp\_{i}=1,P\left(X\_{i}\right)\right]-E\left[exp\_{i}=1,P\left(X\_{i}\right)\right]$ (4)

However, due to the uncertainty in estimating propensity scores in the first stage of propensity score matching, Abadie and Imbens (2004,2006) reverted to the simpler Marxian distance for k-nearest neighbor matching with put-backs and allowing for ties (ties). In this way, the researcher has to make only a small number of subjective decisions when computing the matching estimates. More importantly, since inexact matching is generally biased, Abadie and Imbens (2008), proposed a bias-corrected approach to estimate the bias by regression, and then obtained the "bias-corrected matching estimator" (bias-corrected matching estimator). In addition, Abadie and Imbens (2011) also obtained robust standard errors that hold under heteroskedasticity by performing quadratic matching within the treatment or control group. Based on the bias-corrected matching, the income effect (SATT) of the "two rights" mortgage policy on the entrepreneurial performance of farmers i can be expressed as:

$SATT=E\left[exp\_{i}=1,P\left(X\_{i}\right)\right]-E\left[exp\_{i}=1,P\left(X\_{i}\right)\right]$ (5)

1. Variable selection and descriptive statistics

According to the content to be studied in this paper, this paper chooses to use the data from the 2017 National Mobility Dynamic Monitoring Survey (CMDS) organized by the National Health and Family Planning Commission. Based on the pilot areas specified in the Interim Measures for the Pilot Scheme of Mortgage Loans for the Management Rights of Rural Contracted Land and the Interim Measures for the Pilot Scheme of Mortgage Loans for the Property Rights of Farmers' Housing, 9118 samples were selected from the pilot areas of household registration, including both farmers who started their businesses and those who did not, and those who took out mortgages for the "two rights" and those who did not. The sample includes both farmers who started their businesses and those who did not, as well as those who took out "two rights" mortgages and those who did not, so that the impact of the "two rights" mortgage policy on farmers' entrepreneurial activities can be identified comprehensively.

* 1. Variable selection

Explanatory variables: the explanatory variables selected in this paper are (1) an entrepreneurial choice: i.e., whether farmers engage in entrepreneurship, defining farmers with the employment status of an employee as not engaging in entrepreneurship and assigning a value of 0, and farmers with the employment status of self-employed or employer as entrepreneurship and assigning a value of 1. In addition, according to the classification method of the Global Entrepreneurship Monitor 2019 (GEM2019) and referring to existing studies (Chao Xu et al. 2017), farmers whose employment status is employer are defined as opportunity-based entrepreneurship, and farmers whose employment status is self-employed laborer are defined as survival-based entrepreneurship. (2) Entrepreneurial performance: Generally, income statement, balance sheet, and cash flow statement are important reference indicators to reflect entrepreneurial performance, but since farmers' entrepreneurship is generally small in scale and most of them do not have a perfect accounting system, based on data availability, this paper chooses to use "personal monthly income" to measure farmers' entrepreneurial performance ( Li et al. 2020).

The core explanatory variable: whether to mortgage the "two rights" or not. The mortgage of "rural contracted land management rights" and "farmers' housing property rights" is a key factor to alleviate the credit constraint faced by farmers' entrepreneurship, therefore, in this study, whether or not to mortgage "two rights" is chosen as the core explanatory variable. Therefore, in this paper, the core explanatory variable is whether to mortgage "two rights" or not, and the value of 1 is assigned if "rural contracted land management rights" or "farmers' housing property rights" are mortgaged, otherwise the value of 0 is assigned.

Control variables: human capital is an important factor affecting entrepreneurial activities, and individuals' education level and employment experience can have an important impact on the development and outcome of entrepreneurial activities (Guangrong Ma and Enyan Yang, 2011), therefore, in this paper, we choose to control for human capital characteristics variables: including gender, age, education level, health status, and employment experience; in addition, public services equally affect entrepreneurial activities and production. In addition, public services also affect the effectiveness of entrepreneurial and production activities (Xia Yiran and Lu Ming, 2015), therefore, this paper chooses to control for public service variables: the availability of public services.

* 1. Descriptive statistics

Descriptive statistics for each variable are shown in Table 1, specifically:

(1) 40.3% of the farmers in the sample chose to start their own business, about 34.19% of the entrepreneurs chose to start a survival-oriented business, and about 6.12% chose an opportunity-oriented business. The average monthly income of farmers was 4006.59 RMB with a standard deviation of 3078.53 RMB, indicating that most farmers had a monthly income between 1000 and 7000 RMB. In the sample, 57.8% of the farmers chose a "two rights" mortgage.

(2) There was no significant difference in the gender of the sample, while the mean value of age was 36 years old, most of the sample had education levels between primary and high school or specialist, the vast majority of the sample group was in good health, and only 20% of the sample group had the experience of working. Among the farmers interviewed, only 1.6% had a village share and only 20% had experience working outside the village, and only 30% of the respondents believed that public services were provided.

Table 1 Descriptive statistics of variables

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable Name | Sample size | Variable Description | Average value | Standard deviation | Minimum value | Maximum value |
| Employment Options | 9118 | 1 = start-up; 0 = not start-up | 0.403 | .491 | 0 | 1 |
| Survival Entrepreneurship | 8560 | 1=yes; 0=no | 0.364 | 0.481 | 0 | 1 |
| Opportunistic Entrepreneurship | 6001 | 1=yes; 0=no | 0.093 | 0.290 | 0 | 1 |
| Personal monthly income | 9118 | Continuous Variables | 4006.59 | 3078.53 | 0 | 50,000 |
| "Two rights" mortgage | 9118 | 1=mortgaged; 0=unmortgaged | 0.578 | .494 | 0 | 1 |
| Gender | 9118 | 1=Male; 0=Female | 0.554 | .497 | 0 | 1 |
| Age | 9118 | Continuous Variables | 35.647 | 9.489 | 16 | 65 |
| Education level | 9118 | 0=never attended school; 1=elementary school; 2=junior high school; 3=high school or college; 4=bachelor's degree; 5=graduate and above | 2.373 | .845 | 0 | 5 |
| Health Status | 9118 | 1=healthy; 0=unhealthy | 0.983 | .128 | 0 | 1 |
| Work experience | 9118 | 1=yes; 0=no | 0.199 | .4 | 0 | 1 |
| Public Services | 9118 | 1=yes; 0=no | 0.300 | .458 | 0 | 1 |

1. Empirical test results
	1. Empirical results on entrepreneurial choices

From Table 2, we can see that the "two rights" mortgage policy significantly promotes the probability that farmers tend to choose entrepreneurship, with a marginal effect of 0.065, indicating that the "two rights" mortgage policy increases the probability that farmers choose entrepreneurship by 6.5%. Therefore, hypothesis 1 is considered to be valid. The regression results by region show that the "two rights" mortgage policy has a significant positive impact on farmers' entrepreneurial choice in the eastern, central, and western regions, and shows a decreasing trend from the eastern to the western region. Specifically, the "two rights" mortgage policy increased the probability of farmers choosing to start a business by 11.6% in the eastern region; it increased the probability of farmers choosing to start a business by 9.1% in the central region, while it did not significantly increase the probability of farmers choosing to start a business in the western region.

Table 2 Logit regression results for entrepreneurial choice

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Business Choice | Eastern Region | Central Region | Western Region |
| "Two rights" mortgage | 0.065\*\*\* | 0.116\*\*\* | 0.091\*\*\* | 0.000 |
| (0.011) | (0.018) | (0.021) | (0.018) |
| Gender | 0.009 | 0.015 | 0.002 | 0.010 |
| (0.011) | (0.018) | (0.021) | (0.018) |
| Age | 0.007\*\*\* | 0.010\*\*\* | 0.009\*\*\* | 0.004\*\*\* |
| (0.001) | (0.001) | (0.001) | (0.001) |
| Education level | -0.090\*\*\* | -0.089\*\*\* | -0.064\*\*\* | -0.111\*\*\* |
| (0.007) | (0.012) | (0.014) | (0.011) |
| Health Status | 0.006 | 0.022 | 0.006 | 0.009 |
| (0.014) | (0.026) | (0.026) | (0.024) |
| Work experience | 0.003 | 0.017 | 0.021 | -0.024 |
| (0.014) | (0.023) | (0.027) | (0.024) |
| Public Services | 0.029\*\* | 0.001 | 0.054\*\* | 0.033\* |
| (0.012) | (0.020) | (0.022) | (0.019) |
| Sample size | 9118 | 3156 | 2618 | 3344 |
| LR chi2(9) | 599.41 | 288.45 | 166.24 | 207.95 |
| Prob>chi2 | 0.000 | 0.000 | 0.000 | 0.000 |
| Pseudo R2 | 0.0488 | 0.0693 | 0.0460 | 0.0465 |

As can be seen from Tables 3 and 4, after subdividing the entrepreneurial choices into survival and opportunity entrepreneurship, the "two rights" mortgage policy showed significant differences between the two different types of entrepreneurial choices: first, the "two rights" mortgage policy had a significant effect on farmers' choice of Firstly, there is a significant effect of "two rights" mortgage policy on farmers' choice of survival entrepreneurship, with a marginal effect of 0.07 in the total sample, i.e., it increases the probability of farmers' choice of survival entrepreneurship by 7%, while there is no significant effect on farmers' choice of opportunity entrepreneurship, therefore, hypothesis 1.1 is valid while hypothesis 1.2 is not valid. The marginal impact of the "two rights" mortgage policy on farmers' choice of survival entrepreneurship also has a decreasing trend from east to west, with the "two rights" mortgage policy increasing the probability of farmers' choice of entrepreneurship in the eastern region by 11.8% and in the central region by 10.7%, but not significantly increasing the probability of farmers' choice of entrepreneurship in the western region. The "two rights" mortgage policy only increases the probability of farmers choosing to start a business in the eastern region by 2.2%, while the "two rights" mortgage policy has a significant effect in the eastern region only. In the case of opportunity entrepreneurship, the "two-rights" mortgage policy has a significant effect only in the eastern region.

Table 3 Logit Regression Results for Survival Entrepreneurship

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Survival Entrepreneurship | Eastern Region | Central Region | Western Region |
| "Two rights" mortgage | 0.070\*\*\* | 0.118\*\*\* | 0.107\*\*\* | 0.003 |
| (0.011) | (0.018) | (0.021) | (0.018) |
| Gender | -0.001 | -0.005 | -0.007 | -0.001 |
| (0.011) | (0.018) | (0.021) | (0.018) |
| Age | 0.007\*\*\* | 0.009\*\*\* | 0.010\*\*\* | 0.004\*\*\* |
| (0.001) | (0.001) | (0.001) | (0.001) |
| Education level | -0.097\*\*\* | -0.104\*\*\* | -0.076\*\*\* | -0.118\*\*\* |
| (0.007) | (0.012) | (0.015) | (0.011) |
| Health Status | 0.102 | 0.030\*\*\* | 0.015\*\*\* | 0.007\*\*\* |
| (0.007) | (0.025) | (0.027) | (0.024) |
| Work experience | 0.005 | 0.015 | 0.023 | -0.019 |
| (0.014) | (0.023) | (0.028) | (0.024) |
| Public Services | 0.033\*\*\* | 0.000 | 0.052\*\* | 0.044 |
| (0.012) | (0.020) | (0.023) | (0.019) |
| Sample size | 8560 | 2946 | 2436 | 3178 |
| LR chi2(9) | 663.95 | 377.84 | 190.71 | 227.82 |
| Prob>chi2 | 0.000 | 0.000 | 0.000 | 0.000 |
| Pseudo R2 | 0.0591 | 0.1015 | 0.0576 | 0.0550 |

Table 4 Logit regression results for opportunity-based entrepreneurship

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Opportunistic Entrepreneurship | Eastern Region | Central Region | Western Region |
| "Two rights" mortgage | 0.008 | 0.022\* | -0.001 | -0.004 |
| (0.008) | (0.012) | (0.016) | (0.011) |
| Gender | 0.021 | 0.019 | 0.020 | 0.021\* |
| (0.008) | (0.012) | (0.016) | (0.011) |
| Age | 0.002\*\*\* | 0.004\*\*\* | 0.002\* | 0.001 |
| (0.000) | (0.001) | (0.001) | (0.001) |
| Education level | 0.002 | 0.006 | 0.007 | -0.007 |
| (0.005) | (0.008) | (0.011) | (0.007) |
| Health Status | -0.005 | -0.009 | -0.008 | 0.005 |
| (0.010) | (0.018) | (0.021) | (0.015) |
| Work experience | -0.001 | 0.007 | 0.003 | -0.013 |
| (0.010) | (0.016) | (0.021) | (0.014) |
| Public Services | 0.002 | 0.001 | 0.025 | -0.011 |
| (0.010) | (0.013) | (0.018) | (0.012) |
| Sample size | 6001 | 2194 | 1597 | 2210 |
| LR chi2(9) | 33.87 | 33.45 | 8.16 | 10.31 |
| Prob>chi2 | 0.000 | 0.000 | 0.3190 | 0.1719 |
| Pseudo R2 | 0.0091 | 0.0242 | 0.0072 | 0.0087 |

* 1. Empirical results on entrepreneurial performance

To ensure the matching quality of the sample data, we further plotted the density function after obtaining the propensity scores to check the common support domain after matching, and the results are shown in Figure 1. It can be seen that after matching, the propensity scores of the samples with "two rights" mortgage and the samples without "two rights" mortgage have a large overlap, and most of the observed values are within the common range, indicating that the matching effect is good and satisfies the common support test.



Figure 1 Kernel density function before and after propensity score matching

Table 5 reports the results of the parallel hypothesis tests. As can be seen in Table 5, the standardized deviations (%bias) of all variables after matching are less than 5% and all t-test results accept the original hypothesis, thus allowing the parallel hypothesis to be satisfied.

Table 5 Balanced hypothesis testing

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Mean | %bias | t | P>|t| |
|  | Treat group | Control group |
| Gender | 0.589 | 0.595 | -1.8 | -0.69 | 0.491 |
| Age | 36.027 | 36.047 | -0.2 | -0.11 | 0.913 |
| Education level | 2.2637 | 2.2706 | -0.8 | -0.42 | 0.671 |
| Health Status | 0.834 | 0.833 | 0.3 | 0.17 | 0.867 |
| Work experience | 0,.215 | 0.214 | 0.3 | 0.17 | 0.863 |
| Public Services | 0.298 | 0.291 | 1.4 | 0.72 | 0.473 |

From Table 6, we can see that there is a significant treatment effect of the "two rights" mortgage policy on farmers' entrepreneurial performance in both the total sample and the sub-region, specifically, in the total sample, the income effect of the "two rights" mortgage policy on farmers' entrepreneurial performance is $176.62. In the total sample, the income effect of the "two rights" mortgage policy on farmers' entrepreneurial performance is 176.62 RMB, which means that the "two rights" mortgage policy increases the monthly income of farmers' entrepreneurship by 176.62 RMB per month. The income effect for farmers in the eastern region is $492.54, the income effect for the central region is -257.26, and the income effect for the western region is not significant. As can be seen from Tables 7 and 8, after subdividing the types of entrepreneurship into survival entrepreneurship and opportunity entrepreneurship, the "two rights" mortgage policy does not show a significant income effect, only in survival entrepreneurship, the "two rights" mortgage policy in the eastern region shows a Therefore, hypothesis 2.1 and hypothesis 2.2 are not valid.

Table 6 Bias-corrected matching results for entrepreneurial performance

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Entrepreneurial Performance | SATT value | Standard deviation | Z-value | P-value |
| Total Sample | 176.62 | 68.771 | 2.57 | 0.010 |
| Eastern Region | 492.54 | 127.448 | 3.86 | 0.000 |
| Central Region | -257.26 | 144.001 | -1.79 | 0.074 |
| Western Region | 52.29 | 113.030 | 0.46 | 0.644 |

Table 7 Bias-corrected matching results for survival-oriented entrepreneurial performance

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Entrepreneurial Performance | SATT value | Standard deviation | Z-value | P-value |
| Survival Entrepreneurship | 47.20 | 135.01 | 0.35 | 0.727 |
| Eastern Region | 520.47 | 259.72 | 2.00 | 0.045 |
| Central Region | -144.93 | 246.831 | -0.59 | 0.557 |
| Western Region | -120.98 | 197.169 | -0.61 | 0.542 |

Table 8 Bias-corrected matching results for opportunity-based entrepreneurial performance

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Entrepreneurial Performance | SATT value | Standard deviation | Z-value | P-value |
| Opportunistic Entrepreneurship | 441.550 | 580.565 | 0.76 | 0.447 |
| Eastern Region | 1495.665 | 980.839 | 0.49 | 0.137 |
| Central Region | -1026.144 | 905.220 | -1.13 | 0.257 |
| Western Region | 817.780 | 863.610 | 0.95 | 0.344 |

* 1. Robustness test
		1. Robustness test for entrepreneurial choice

Robustness tests on entrepreneurial choices. In this paper, OLS regressions are conducted on paired samples with matched propensity scores to test the main findings related to entrepreneurial decisions. Table 9 shows the results of the OLS regression. From Table 9, we can see that there is indeed a significant effect of the "two rights" mortgage policy on farmers' entrepreneurial choices, and consistent with the main test in the sub-region test.

Table 9 Results of Robustness Tests for Entrepreneurial Choice

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Business Choice | Eastern Region | Central Region | Western Region |
|  | (1) | (2) | (3) | (4) |
| "Two rights" mortgage | 0.059\*\*\* | 0.118\*\*\* | 0.083\*\*\* | -0.007 |
| (0.011) | (0.018) | (0.020) | (0.017) |
| Gender | 0.007 | 0.015 | -0.002 | 0.003 |
| (0.0107) | (0.018) | (0.020) | (0.018) |
| Age | 0.007\*\*\* | 0.010\*\*\* | 0.008\*\*\* | 0.004\*\*\* |
| (0.001) | (0.001) | (0.001) | (0.001) |
| Education level | -0.083\*\*\* | -0.079\*\*\* | -0.053\*\*\* | -0.103\*\*\* |
| (0.007) | (0.012) | (0.014) | (0.011) |
| Health Status | 0.002 | 0.027 | 0.006 | -0.005 |
| (0.015) | (0.026) | (0.027) | (0.025) |
| Work experience | 0.008 | 0.018 | 0.030 | -0.012 |
| (0.014) | (0.022) | (0.026) | (0.023) |
| Labor force situation | 0.031\*\*\* | 0.003 | 0.058\*\*\* | 0.030 |
| (0.012) | (0.019) | (0.022) | (0.019) |
| Constants | 0.312\*\*\* | 0.106 | 0.223\*\*\* | 0.493\*\*\* |
| (0.038) | (0.0645) | (0.073) | (0.061) |

Tables 10 and 11 reports the results of robustness tests of the "two rights" mortgage policy on subsistence and opportunity entrepreneurship. From Table 10, it can be seen that the "two rights" mortgage policy has a significant contribution to farmers' choice of survival entrepreneurship, and it is consistent with the main test results by region, but it does not have a significant contribution to farmers' choice of opportunity entrepreneurship, and it is not significant by region, therefore, hypothesis 1.2 passes the robustness test and hypothesis 1.3 does not pass the robustness test.

Table 10 Results of Robustness Tests for Survival-Based Entrepreneurship

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Business Choice | Eastern Region | Central Region | Western Region |
| "Two rights" mortgage | 0.063\*\*\* | 0.121\*\*\* | 0.097\*\*\* | -0.006 |
| (0.011) | (0.018) | (0.021) | (0.0189) |
| Gender | -0.003 | 0.006 | -0.008 | -0.009 |
| (0.011) | (0.018) | (0.021) | (0.018) |
| Age | 0.007\*\*\* | 0.009\*\*\* | 0.009\*\*\* | 0.004\*\*\* |
| (0.0007) | (0.001) | (0.001) | (0.001) |
| Education level | -0.095\*\*\* | -0.094\*\*\* | -0.064\*\*\* | -0.111\*\*\* |
| (0.007) | (0.012) | (0.015) | (0.011) |
| Health Status | 0.004 | 0.037 | 0.010 | -0.008 |
| (0.015) | (0.025) | (0.027) | (0.026) |
| Work experience | 0.012 | 0.018 | 0.033 | -0.004 |
| (0.014) | (0.021) | (0.027) | (0.023) |
| Public Services | 0.035\*\*\* | 0.004 | 0.057\*\* | 0.040\*\* |
| (0.012) | (0.019) | (0.023) | (0.020) |
| Constants | 0.306\*\*\* | 0.129\*\* | 0.188\*\* | 0.481\*\*\* |
| (0.039) | (0.064) | (0.075) | (0.061) |

Table 11 Results of robustness tests for opportunistic entrepreneurial choices

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Business Choice | Eastern Region | Central Region | Western Region |
| "Two rights" mortgage | 0.008 | 0.022\* | -0.001 | -0.003 |
| (0.008) | (0.013) | (0.017) | (0.012) |
| Gender | 0.021\*\*\* | 0.019 | 0.014 | 0.025\*\* |
| (0.008) | (0.013) | (0.017) | (0.012) |
| Age | 0.002\*\*\* | 0.004\*\*\* | 0.001 | 0.000 |
| (0.000) | (0.001) | (0.001) | (0.001) |
| Education level | 0.005 | 0.009 | 0.009 | -0.003 |
| (0.005) | (0.009) | (0.012) | (0.007) |
| Health Status | -0.003 | -0.015 | 0.002 | 0.006 |
| (0.012) | (0.021) | (0.023) | (0.017) |
| Work experience | -0.005 | 0.005 | 0.002 | -0.016 |
| (0.010) | (0.015) | (0.021) | (0.015) |
| Labor force situation | 0.000 | -0.003 | 0.024 | -0.011 |
| (0.009) | (0.014) | (0.019) | (0.013) |
| Constants | 0.007 | -0.078\* | 0.027 | 0.054 |
| (0.027) | (0.047) | (0.059) | (0.037) |

* + 1. Robustness tests on entrepreneurial performance

This paper chooses to test the robustness of entrepreneurial performance by matching the kernel density propensity score. Table 12 shows that there is a significant income effect of the "two rights" mortgage policy on farmers' entrepreneurial performance with an income effect of $347.642, and the income effect remains significant in the eastern region with an income effect of $649.107 after sub-region, so hypothesis 2 passes the robustness test. As can be seen from Table 13, there is no significant income effect of the "two rights" mortgage policy on farmers' survival-oriented entrepreneurial performance, nor is it significant after the sub-region, therefore, this paper considers that hypothesis 2.1 fails the robustness test; as can be seen from Table 14, the "two rights" mortgage policy has a significant effect on farmers' survival-oriented entrepreneurial performance. " mortgage policy does not have a significant income effect on farmers' opportunity-based entrepreneurship, and it is only significant in the western region after sub-region (t-value > 1.56), therefore, this paper considers that hypothesis 2.2 fails the robustness test.

Table 12 Matching results of the Marks scores for entrepreneurial performance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Entrepreneurial Performance | Treat group | Control group | Difference | S.E. | T-stat |
| Total Sample | 4054.586 | 3706.944 | 347.642 | 150.652 | 2.31 |
| Eastern Region | 4487.334 | 3838.226 | 649.107 | 181.081 | 3.58 |
| Central Region | 3962.042 | 4032.110 | -70.068 | 227.451 | -0.31 |
| Western Region | 3625.474 | 3389.185 | 236.289 | 152.911 | 1.55 |

Table 13 Matching results of the Marks scores for survival-oriented entrepreneurial performance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Entrepreneurial Performance | Treat group | Control group | Difference | S.E. | T-stat |
| Total Sample | 4125.41 | 3803.85 | 321.56 | 202.58 | 1.59 |
| Eastern Region | 4547.78 | 4149.38 | 398.41 | 360.33 | 1.11 |
| Central Region | 4091.36 | 4623.99 | -532.63 | 365.76 | -1.46 |
| Western Region | 3663.18 | 3584.48 | 78.70 | 242.94 | 0.32 |

Table 14 Matching results of Marks scores for opportunity-based entrepreneurial performance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Entrepreneurial Performance | Treat group | Control group | Difference | S.E. | T-stat |
| Total Sample | 7157.37 | 6554.55 | 602.82 | 821.71 | 0.73 |
| Eastern Region | 8330.43 | 7511.59 | 818.84 | 1137.83 | 0.72 |
| Central Region | 5853.61 | 8551.55 | -2697.94 | 1708.62 | -1.58 |
| Western Region | 6735.71 | 5157.14 | 1578.57 | 897.81 | 1.76 |

1. Conclusions and Policy Recommendations
	1. Conclusion

The "two rights" mortgage is an important way to alleviate the financing constraints faced by farmers' entrepreneurship and plays a crucial role in promoting farmers' income and achieving common prosperity. Given this, this paper investigates the impact of the "two rights" mortgage policy on farmers' entrepreneurial activities based on a quasi-natural experiment design and theoretical and empirical analyses based on data from the 2017 mobile population survey. This paper finds that:

（1）"The regression results by region show that the "two rights" mortgage policy has effectively promoted farmers' entrepreneurial decisions, and has increased the overall probability of farmers' entrepreneurial choices by 6.5%. The regression results by region show that the "two rights" mortgage policy has a significant positive impact on farmers' entrepreneurial choices in both eastern and central regions, but shows a decreasing trend from eastern to central regions.

（2）After distinguishing between subsistence and opportunity entrepreneurship, the "two rights" mortgage policy showed a significant effect on farmers' choice of subsistence entrepreneurship, which increased the probability of farmers' choice of subsistence entrepreneurship by 7% but did not have a significant effect on farmers' choice of opportunity entrepreneurship. The regression results by region show that the "two rights" mortgage policy has a significant effect on farmers' choice of survival entrepreneurship in the eastern and central regions, but not on farmers' choice of opportunity entrepreneurship.

（3）There is a significant income effect of the "two rights" mortgage policy on farmers' entrepreneurial performance, with an income effect of $176.62, which means that the "two rights" mortgage policy has increased the monthly income of farmers' entrepreneurship by $176.62 per month, but the income effect of the "two rights" mortgage policy on farmers' entrepreneurial performance is significant by region. The income effect of the "two rights" mortgage policy on the entrepreneurial performance of farmers in the eastern and central regions is 492.54 yuan and -257.26 yuan for farmers in the central region.

（4）However, after distinguishing between subsistence and opportunity entrepreneurship, there is no significant income effect of the "two rights" mortgage policy on farmers' subsistence and opportunity entrepreneurship performance, and only in the eastern region, there is a significant effect on farmers' choice of subsistence entrepreneurship, with an income effect of $520.47.

* 1. Policy recommendations

Based on the findings of this paper, this paper proposes the following policy recommendations:

（1）Improve the value assessment system and transfer market to clarify the value of mortgage. Although the "two rights" mortgage policy improves farmers' entrepreneurial choices overall, its effect is highest in the more economically developed eastern region, lower in the central region, and not significant at all in the western region. So, what is the root cause of this phenomenon? According to my team's experience and interviews in Ningxia, Shandong, Hunan, Jilin, Gansu, Hebei, and other pilot areas of the "two rights" pilot mortgage, the root cause of this situation is that the more economically developed regions, the clearer the mortgage value of farmland and residential land, while the less economically developed regions, the more ambiguous the mortgage value of farmland and residential land. The more developed the economy is, the clearer the mortgage value of farmland and house bases is, while the less developed the economy is, the more ambiguous the value of farmland and house bases is. Therefore, the existing benchmark prices for evaluating the value of agricultural land and residential bases should be further established, and the establishment of a perfect system for evaluating the value of agricultural land and residential bases should be accelerated, especially for small-scale agricultural land and residential bases of medium size and above. The market of rural land and mansion base transfer should be further improved, so that the property rights of agricultural land and mansion bases can be traded in the market, thus promoting the transfer and thus further releasing the economic value of agricultural land and mansion bases.

（2）Improve the supporting mechanism of the "two rights" mortgage policy. The "two rights" mortgage policy has improved the overall entrepreneurial performance of farmers, however, after subdividing into subsistence and opportunity entrepreneurship, it has not shown significant results for both types of entrepreneurship, which indicates that the "two rights" mortgage policy still lacks supporting policies and mechanisms in the process of accessing and using credit. This indicates that the "two rights" mortgage policy still lacks adaptive supporting policies and mechanisms in the process of accessing and using credit, which leads to the failure of the "two rights" mortgage policy to achieve a wide and significant income effect among different entrepreneurial farmers. Therefore, we should establish a mechanism to follow up and help farmers with "two rights" mortgage loans, and provide certain guidance to farmers who use "two rights" mortgage loans to start their businesses, to improve the effect of "two rights" mortgage loans on farmers' entrepreneurship. The effect of "two rights" mortgage on farmers' entrepreneurship to increase income.

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