

Original Paper

Rural Return Migration for Entrepreneurship and County Economic Development: A Study Based on the Pilot Policy for Return Migration Entrepreneurship

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Received: September 10, 2025 Accepted: September 24, 2025 Online Published: October 11, 2025
doi:10.22158/rem.v10n2p183 URL: <http://dx.doi.org/10.22158/rem.v10n2p183>

Abstract

The return of migrant workers to start businesses is an important means for optimizing resource allocation and effectively enhancing the return of urban resources to the county. This is also an important path for the economic development of the county. This study uses the county-level panel data of 2060 counties in 31 provinces of China from 2007 to 2023, and employs the multi-time-point difference-in-differences method to examine the impact and mechanism of the pilot policies for migrant workers' return to start businesses on the economic development of the county. The study finds that the benchmark regression indicates that the pilot policies for migrant workers' return to start businesses can significantly improve the economic development level of the county. This result remains valid after a series of robustness tests. The heterogeneity analysis shows that the promoting effect of the pilot policies for migrant workers' return to start businesses on economic development has a gradient feature of "the strongest in the east, followed by the west, and not significant in the central region". The mechanism analysis indicates that the pilot policies for migrant workers' return to start businesses can promote economic development by promoting local real industries. Innovation level, industrial scale, and industrial structure level can all effectively promote the economic development of the county. The research conclusion of this article provides important empirical evidence for optimizing the policies for migrant workers' return to start businesses and promoting the economic development of the county.

Keywords

Migrant workers' return to start businesses, County-level economy, Multi-time-point Difference-in-Differences method

1. Introduction

County-level economy, as the basic unit of the national economy, serves as a crucial link connecting cities and rural areas. It plays an irreplaceable role in addressing "agriculture, rural areas, and farmers" issues, promoting regional coordinated development, and achieving rural revitalization. For a long time, due to the one-way flow of production factors and unequal exchange, county-level economy has largely been in an attached position, providing production factors such as funds and talents for urban development. How to break this predicament and cultivate the endogenous growth momentum of county-level economy has become a core issue for China to promote urban-rural integration and achieve the goal

of common prosperity. The Chinese government attaches great importance to promoting rural economic development and rural revitalization through supporting returnee entrepreneurship. For instance, pilot policies targeting migrant workers' returnee entrepreneurship aim to encourage the return of labor force, utilizing their accumulated funds, technologies, management experience, and market information to carry out entrepreneurial activities in county-level and rural areas, thereby driving local economic development and high-quality agricultural development.

Studies have shown that returnee entrepreneurship significantly increases the possibility of rural family entrepreneurship (Zhou et al., 2024). Panel data analysis at the county level shows that the pilot policies promoting returnee entrepreneurship can significantly promote county-level economic growth and industrial structure upgrading (Tian & Juan, 2024). Moreover, entrepreneurial activities are considered as the key to activating the internal driving force of the countryside, promoting urban-rural integration, and achieving comprehensive rural revitalization.

This study aims to deeply investigate the impact of labor returnee entrepreneurship on county-level economic development and its internal mechanism. Using county-level panel data from 2060 counties in 31 provinces of China from 2007 to 2023, this paper regards the national pilot policies promoting returnee entrepreneurship as a quasi-natural experiment. It adopts the multi-period difference-in-differences (Multi-period DID) method to identify the net effect of the pilot policies on county-level economic development and conducts analysis around the following contents: Firstly, through baseline regression, it analyzes the average impact of the policies on county-level economic development; Secondly, it conducts heterogeneity analysis from the perspectives of geographical location and economic development level to explore the differences in policy effects; Finally, starting from three mediating variables of innovation level, industrial scale, and physical industrial structure level, it deeply analyzes the mechanism of their effects.

The marginal contributions of this study are mainly reflected in the following aspects: The expansion of research data and methods, using a large sample panel data of 2060 counties in 31 provinces of China from 2007 to 2023, with a wider sample coverage and longer time span. The multi-period DID model can more accurately identify the causal effect of the pilot policies on county-level economic development, effectively overcoming the endogeneity bias problem of traditional research methods. The advancement of research perspective and depth, not only focusing on the average treatment effect and heterogeneity of the policies, but also focusing on the "supply-demand" end, empirically testing three mechanisms of innovation level, industrial scale, and physical industrial structure level, deepening the theoretical understanding of how returnee entrepreneurship affects county-level economic development, and providing more empirical evidence for related research.

The structural arrangement of this study is as follows: The second part elaborates on the policy background and theoretical framework, and proposes research hypotheses; The third part explains the research design, including sample selection, data sources, and model setting; The fourth part reports the empirical results, including baseline regression and robustness tests; The fifth part conducts heterogeneity analysis, the sixth part analyzes the mechanism, and the seventh part presents research conclusions and policy implications.

2. Policy Background and Theoretical Framework

2.1 Policy Background

The policy background of the pilot programs for returning entrepreneurs is rooted in China's national strategy of promoting coordinated urban-rural development and rural revitalization. To address the challenges of unbalanced urban-rural development, rural depopulation, and labor outflow, the national government has introduced a series of guiding policies. In 2015, the State Council issued the "Opinions on Further Doing a Good Job in Employment and Entrepreneurship under the New Situation", which for the first time included supporting the return of migrant workers and other personnel to start businesses within the national policy framework, marking the transition of returning entrepreneurship from local practice to a national strategy. Subsequently, the policy system has been gradually improved, and local governments have also issued a series of documents, providing systematic support to returning entrepreneurs in multiple aspects such as financing support, tax incentives, land guarantee, and skills training.

Since 2016, the National Development and Reform Commission has successively launched three batches of pilot programs for returning entrepreneurs. The first batch of pilot programs began in February 2016, including 90 counties. The second batch of pilot counties started in December 2016, including 116 counties. The third batch of pilot counties began in October 2017, including 135 counties. In total, there were 341 pilot counties in the three batches.

The pilot programs for returning entrepreneurs are closely related to county-level innovation-driven development. The pilot policies guide the concentration of talents, technologies, and capital in county areas, effectively stimulating the innovation vitality of county-level areas. Returning entrepreneurs often introduce new technologies, new business models, and new approaches, such as rural e-commerce and specialty agricultural product processing, promoting the optimization and upgrading of the county-level industrial structure. For county-level economic development, the pilot programs for returning entrepreneurs have played a significant role as a driver. Entrepreneurial activities have led to employment growth, technological innovation, and increased investment, becoming new growth points for county-level economies.

Overall, the pilot programs for returning entrepreneurs are not only an important means to promote balanced urban-rural development but also a concrete practice to integrate the "mass entrepreneurship and innovation" strategy with the rural revitalization strategy. Through promoting county-level innovation, industrial upgrading, and economic development, this policy provides an effective path for building a new type of urban-rural relationship and achieving common prosperity.

2.2 Hypotheses

A large number of studies have shown that labor returning to their hometowns to start businesses has a significant promoting effect on the economic development of the county. The returning entrepreneurs directly inject vitality into the county economy by establishing new enterprises, creating job opportunities, and increasing local tax revenue. Shen and Wang (2024) found based on a quasi-natural experiment that after the implementation of the returning entrepreneur policy, the agricultural labor productivity (ALP) in the pilot counties was significantly improved, indicating that the returning entrepreneur activities can effectively drive the improvement of agricultural production efficiency in the county. Bao et al. (2022)'s empirical research further confirmed that the entrepreneurial behavior of returning migrants has a positive impact on rural economic and social development, including promoting agricultural transformation and increasing farmers' income. From a more macro perspective, returning

entrepreneurship is regarded as the “new engine” of rural revitalization, playing a crucial role in integrating regional resources, upgrading the industrial structure, promoting labor employment, and increasing the income level of rural residents and even promoting common prosperity. Therefore, the following hypotheses are proposed:

H1: The pilot policy of labor force returning to their hometowns can promote the economic development of the county.

Returning entrepreneurship is an important way to enhance the innovation level of the county. Returning personnel often bring the technical knowledge, management experience, and market concepts accumulated outside the county back to their hometowns and apply them to entrepreneurial practices, thereby driving local industrial innovation. For example, returning entrepreneurs introduce innovative business models such as online and offline integration, customization, and personalized production, which enhance the added value and market competitiveness of agricultural products and meet the diversified needs of modern consumers. For young talents in agriculture and forestry, their returning entrepreneurship can effectively innovate traditional agricultural development methods with their professional knowledge, guiding farmers to achieve efficient cultivation of multiple crops, thereby creating a broader entrepreneurial space and driving local economic development. Moreover, the popularity and use of the Internet provide strong support for the entrepreneurship of returning migrant workers, with the development of e-commerce bringing online payment, financial services, and training services, helping entrepreneurs break through the limitations of traditional business incubation and demonstrating the enabling role of technological innovation in the entrepreneurial process. Therefore, the following hypothesis is proposed:

H2: The pilot policy of labor force returning to their hometowns promotes the economic development of the county by driving the improvement of innovation levels.

Returning entrepreneurship directly promotes the economic development of the county by expanding the industrial scale. Although many returning entrepreneurs have a small initial scale with limited staff numbers and annual turnover, their development process is itself a process of gradually expanding the industrial scale. Entrepreneurs integrate resources and expand production, effectively enhancing the production and operation capabilities of the enterprise, thereby driving the overall expansion of the county's industrial scale. Yao et al. (2022)'s research pointed out that one of the goals of exploring the development path of returning entrepreneurship opportunities is to increase the turnover and scale of start-up enterprises, which directly helps to promote the development of entrepreneurial activities and economic scale growth in the region. Government policies such as industrial policies, financial support, and infrastructure construction create favorable conditions for the expansion of the scale of returning entrepreneur enterprises and further attract investment, thereby promoting the expansion of the county's industrial scale. Therefore, the following hypothesis is proposed:

H3: The pilot policy of labor force returning to their hometowns promotes the economic development of the county by boosting the industrial scale.

Returning entrepreneurship plays a key role in optimizing and improving the physical industrial structure level of the county. Entrepreneurs tend to enter and deeply cultivate the real economy sector, especially those related to agriculture and rural resources, which directly promotes the adjustment and upgrading of the county's industrial structure. Shen and Wang (2024)'s research revealed that the returning entrepreneur policy has a more significant effect on improving the agricultural labor productivity of non-agricultural strong counties (with the proportion of the primary industry below 15%), which indirectly

reflects that returning entrepreneur activities can help promote the integration and structural optimization of industries. Returnee entrepreneurs have effectively enhanced the overall structure level and added value of the real economy by promoting the integrated development of the primary, secondary, and tertiary industries. They have fully utilized rural resources, returned capital, modern concepts, and technologies. Optimizing the industrial structure has also been regarded as an important strategy to stimulate the willingness of migrant workers to return and start businesses. By optimizing the structure, it can expand income sources and create new growth points for the county economy. Therefore, the following hypothesis is proposed:

H4: The pilot policy of labor force returning to their hometowns promotes the economic development of the county by enhancing the level of the real economy's industrial structure.

3. Research Methodology

3.1 Sample Selection and Data Sources

In order to examine the impact of the pilot policy for returning entrepreneurs on the economic growth of county-level regions, this paper collected and organized county-level panel data of 2060 counties in 31 provinces of China from 2007 to 2023. Among them, 341 counties were designated as pilot areas for returning entrepreneurs. The data sources used in this paper are as follows: The list of pilot areas for returning entrepreneurs was obtained from the website of the National Development and Reform Commission; Enterprise registration data was obtained from the China Business and Enterprise Registration Database; Patent authorization data of each county from 2007 to 2023 was obtained from the China National Intellectual Property Administration's China Patent Publication Announcements; The remaining indicators' data were all obtained from the "China County (City) Social Economic Statistical Yearbook" and the "China County Statistical Yearbook" for each year from 2007 to 2023.

3.2 Model Specification

Since the pilot program of returning to one's hometown for entrepreneurship can be regarded as a quasi-natural experiment, this paper uses the difference-in-differences method to estimate the impact of the policy of returning to one's hometown for entrepreneurship on the economic growth of counties. The counties that are selected as the treatment group are those in the pilot areas for returning to one's hometown for entrepreneurship, while the other counties are set as the control group. Considering that the policy was implemented in three batches, a progressive difference-in-differences model is used for evaluation. The following form of the baseline regression model is set:

$$Y_{ijt} = C + \alpha did_{ijt} + \beta X_{it} + \lambda_i + \gamma_t + T \times p_j + \varepsilon_{ijt}$$

Y_{ijt} represents the dependent variable, indicating the economic development level of the i -th county in the j -th province during the t -th year. $did_{ijt} = treat_{ij} \times post_t$, $treat_{ij}$ is a dummy variable representing whether the i -th county in the j -th province is a pilot county for returning to start a business. If the i -th county is a pilot county, its value is 1; otherwise, it is 0. $post_t$ is a time dummy variable. In the year when it is confirmed that the county is a pilot county and subsequent years, its value is 1; otherwise, it is 0. did_{ijt} is a dummy variable reflecting whether the j -th province and the i -th county implemented the pilot policy for returning to start a business in the t -th year and subsequent years. If region i implemented this policy in the t -th year, its value is 1; otherwise, it is 0. α is the coefficient of concern in this study, measuring the effect of the pilot policy for returning to start a business on the income gap between urban and rural areas in the county. X_{it} are a series of control variables that affect the income gap between urban and rural areas in the county in the t -th year. λ_i is the county fixed effect, and γ_t is

the year fixed effect. To control for the characteristic changes of regions over time, an additional $T \times p_j$ is used to control the interaction term between the time trend and the province fixed effect. ε_{ijt} is the random disturbance term.

3.3 Variable Selection and Explanation

3.3.1 Dependent Variable

The dependent variable in this paper is the level of county economic development. Following the common practice in existing literature, the natural logarithm of the actual GDP of each county is selected to measure the level of county economic growth. Meanwhile, to ensure the reliability of the regression results, the natural logarithm of the per capita actual GDP of each county is also used as a reference.

3.3.2 Independent Variable

The independent variable in this paper is the policy of encouraging migrant workers to return to their hometowns for entrepreneurship. Based on the list of pilot areas for returning entrepreneurship published by the National Development and Reform Commission, and considering the order of establishment, a pilot policy variable is generated. Specifically, the pilot policy variable is assigned a value of 1 for the year when each county was selected as a pilot county and all subsequent years, and 0 otherwise.

3.3.3 Control Variables

This paper selects a series of variables that may affect the county-level economy as control variables to control for the interference of other factors and ensure the accuracy of model estimation. The specific variables and their settings are as follows:

First, the level of economic development, represented by the natural logarithm of the regional gross domestic product (GDP). This indicator reflects the overall scale of the county-level economy and is a core indicator for measuring the economic foundation and output capacity. To more accurately capture the degree of development, the per capita economic development level is also introduced, represented by the natural logarithm of the per capita regional GDP. This indicator is often regarded as an important proxy variable for measuring residents' income and quality of life. Second, the level of county-level entrepreneurial activity, represented by the natural logarithm of the number of newly registered enterprises in the current year plus 1. The number of new enterprises is a key indicator for measuring economic vitality, innovation spirit, and job creation capacity, and has a significant impact on the development of the county-level economy. The logarithmic transformation and addition of 1 not only alleviate the right-skewed distribution of the data but also make the coefficient easier to interpret as a percentage change. Third, the level of fiscal support, represented by the natural logarithm of local fiscal general budget expenditure. The scale of government expenditure reflects the intensity and direction of fiscal policy, directly affecting the supply of public services and the efficiency of resource allocation, and is an important means of regulating the economy. Fourth, the size of the regional population, represented by the natural logarithm of the total population at the end of the year. Population size is the basis for local market demand and labor supply, and has an important impact on the economic agglomeration effect and scale effect. Fifth, the level of communication facilities, represented by the ratio of the number of fixed-line telephone users to the total population at the end of the year. This ratio indicator reflects the popularization degree of information infrastructure in the county, and is an important factor affecting the efficiency of information circulation, transaction costs, and the modernity of economic development. Sixth, the level of residents' savings, represented by the ratio of the balance of urban and rural residents' savings deposits to the regional GDP. This ratio measures the scale of social savings relative to the total economic output, reflecting both residents' wealth accumulation and consumption potential and the

supply status of social funds. Seventh, the level of financial development, represented by the ratio of the balance of various loans of financial institutions at the end of the year to the regional GDP. This ratio is a core indicator for measuring the degree of financial deepening and the efficiency of financial intermediation, directly affecting the allocation efficiency of capital and the investment capacity of enterprises. Eighth, the potential of market consumption, represented by the natural logarithm of the per capita total retail sales of consumer goods. This indicator directly measures the final consumption demand of residents and the market capacity, and is a key component for driving economic growth. Taking the logarithm of this variable helps to capture the impact of its percentage change on the dependent variable.

By controlling the above variables, the aim is to more clearly identify the net effect of the core explanatory variables on the dependent variable and enhance the robustness of the model estimation.

3.3.4 Mechanism Variables

Theoretical analysis suggests that the pilot policy for rural migrant workers' return to start businesses may increase the economic level of counties through the following three paths.

Firstly, this paper uses the natural logarithm of the total number of authorized patents in the county (innovation level) to measure the innovation capacity and knowledge output level of the county. Returnees are usually important carriers of new technologies and new knowledge, and their entrepreneurial activities can directly promote the application of technology, model innovation and knowledge diffusion, thereby enhancing total factor productivity and providing core impetus for industries to move up the value chain. Secondly, this paper uses the natural logarithm of the number of industrial enterprises above designated size (industrial scale) as a proxy variable for the scale of the county's industrial foundation entities. This indicator reflects the degree of agglomeration and development volume of the secondary industry. The returnee entrepreneurship policy can consolidate the local industrial foundation and create more non-agricultural jobs by fostering and attracting industrial enterprises, directly promoting regional economic development. Thirdly, this paper uses the ratio of the added value of the secondary industry to the regional GDP (industrial structure level) to describe the physical composition and heightening degree of the county's industrial structure. An increase in this ratio indicates that economic resources are concentrating in the higher value-added industrial sectors. This heightening transformation of the industrial structure is a key path to improving the overall economic level.

Through the above mechanisms, the pilot policy for rural migrant workers' return to start businesses is expected to jointly act on the economic development of counties from multiple dimensions, including enhancing innovation-driven forces, strengthening the industrial foundation, promoting industrial structure transformation, and optimizing spatial allocation.

Table 1. Descriptive Statistics

VARIABLES	Description	mean	sd
dev_level	ln(regional GDP)	10.13	0.772
dev_level 1	ln(per capita regional GDP)	10.13	0.772
did	Was it a pilot county for returning to start a business in the current year? Yes = 1, No = 0		
entrepreneurship_index	ln(1 + number of new registered	7.713	1.157

	enterprises in the current year)		
fiscal_support	ln(local fiscal general budget expenditure)	12.24	0.849
population_size	ln(year-end total population)	3.531	0.870
internet_penetration	Fixed telephone users / year-end total population	1,264	962.9
household_savings	Balance of savings deposits of urban and rural residents / regional GDP	0.778	0.412
financial_depth	Balance of all loans of financial institutions at the year-end / regional GDP	0.674	0.413
market_consumption	ln(social commodity retail sales total / year-end total population)	8.892	0.866
innovation_level	ln(total authorized patent quantity)	4.491	1.652
industrial_scale	ln(The number of industrial enterprises above designated size)	3.918	1.411
industrial_structure	(second industry added value / regional GDP)	0.406	0.157

4. Empirical Results and Analysis

4.1 Benchmark Regression

Based on the benchmark regression equation (1), the regression was conducted and the entrepreneurship-related variables (county-level entrepreneurship activity), regional-level variables (fiscal support, regional population size, communication facility level), and entrepreneurial potential (household savings level, financial development level, market consumption potential) were added successively. The specific results are shown in Table 2. According to the results of columns (1) to (4), regardless of whether control variables and fixed effects are included, the core explanatory variable DID is significantly positive at the 1% significance level, indicating that the returnee entrepreneurship pilot policy can promote regional economic development. From the results of column (4) in Table 2, it can be seen that, under the condition of controlling other factors constant, the returnee entrepreneurship pilot program on average increases the county-level economic development level by 2.2%. Therefore, H1 is verified.

Table 2. Baseline Regression

VARIABLES	(1)	(2)	(3)	(4)
	dev_level	dev_level	dev_level	dev_level
did	0.029*** (4.60)	0.029*** (4.56)	0.024*** (3.88)	0.022*** (4.21)
entrepreneurship_index		0.018*** (4.48)	0.012*** (3.01)	0.021*** (6.06)
fiscal_support			0.165*** (17.15)	0.144*** (18.21)
population_size			-0.433*** (-20.83)	-0.361*** (-14.53)
internet_penetration			0.000*** (5.90)	0.000*** (5.19)

household_savings				-0.473*** (-31.25)
financial_depth				-0.058*** (-6.82)
market_consumption				0.172*** (19.86)
County-level fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Province × Time fixed effects	Yes	Yes	Yes	Yes
Observations	24719	24719	22747	21510
R-squared	0.968	0.968	0.973	0.980
Adj. R-squared	0.965	0.965	0.970	0.978

Note. The robust standard errors clustered at the county level are presented in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

4.2 Event Analysis of Policy Effects (Parallel Trends Test)

To assess the impact of the pilot policy for rural migrant workers' return to their hometowns for entrepreneurship on the urban-rural income gap using the difference-in-differences model, the parallel trend assumption must be satisfied. To verify the parallel trend assumption and clarify the policy effect of the pilot program, this paper employs an event analysis method for testing.

To verify the parallel trend assumption of the difference-in-differences model, following the approach of Beck (2010), the event analysis method was adopted to incorporate multiple year dummy variables before and after the implementation of the returnee entrepreneurship pilot policy as explanatory variables into the benchmark model, in order to test whether the pre-treatment parallel trends were parallel and to examine the dynamic effects of the returnee entrepreneurship pilot policy on the economic development level of counties. The analysis window was set to six years before and after the policy announcement, and the year farthest from the event occurrence was used as the base year.

As shown in Figure 1, before the policy implementation, the returnee entrepreneurship pilot policy did not have a significant impact on the economic growth of counties, and the estimated coefficient values fluctuated around zero. This indicates that there was no significant difference between the treatment group and the control group before the policy impact, validating the parallel trend assumption for the application of the difference-in-differences method in this study. Moreover, after the second year of policy implementation, the returnee entrepreneurship pilot policy had a significant positive impact on the economic growth of counties, and the estimated coefficient became significant from the second year after the policy implementation. That is, in the period before the policy implementation, the estimated coefficient for each time window was not significant. Additionally, after the policy implementation, the coefficient estimate was positive and passed the significance test. The estimation results suggest that, on the one hand, the treatment group and the control group shared a common trend before the policy implementation; on the other hand, the implementation of the returnee entrepreneurship pilot policy

promoted the economic growth of counties, and the policy effect was time-lagged. As time went on, the effect of the policy gradually strengthened.

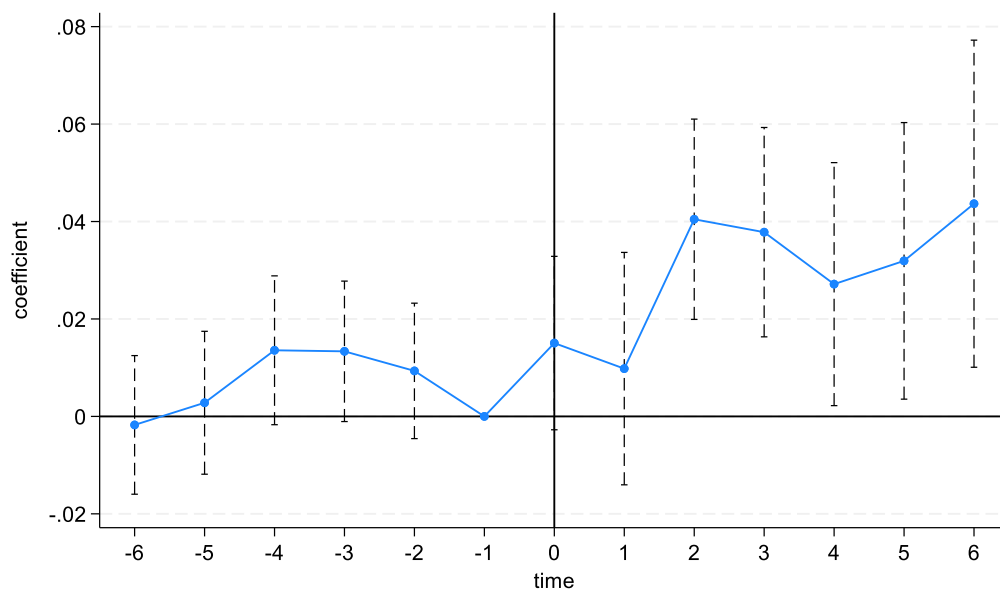


Figure 1. Results of Parallel Trend Test

4.3 Placebo Test

This paper employs permutation tests to further verify the parallel trend test results in Figure 1, to determine whether the impact of the pilot policy for rural migrant workers' return and entrepreneurship on the urban-rural income gap is due to other unobservable factors. As a placebo test method, permutation tests can help distinguish whether the estimated results are statistically significant or randomly generated. This method involves randomly selecting a "pseudo-treatment group" of the same size as the original treatment group from the sample, assuming these samples are the counties where the pilot policy for rural migrant workers' return and entrepreneurship occurred, with the remaining counties serving as the control group. After repeating the sampling 1,000 times and conducting repeated estimations on the samples, 1,000 regression results of the "pseudo-policy dummy variable" are ultimately obtained. Figure 2 shows that the regression coefficients are concentrated around 0, significantly different from the coefficient of the benchmark regression model 4 (0.022), indicating that the conclusions of the benchmark study have strong reliability and robustness.

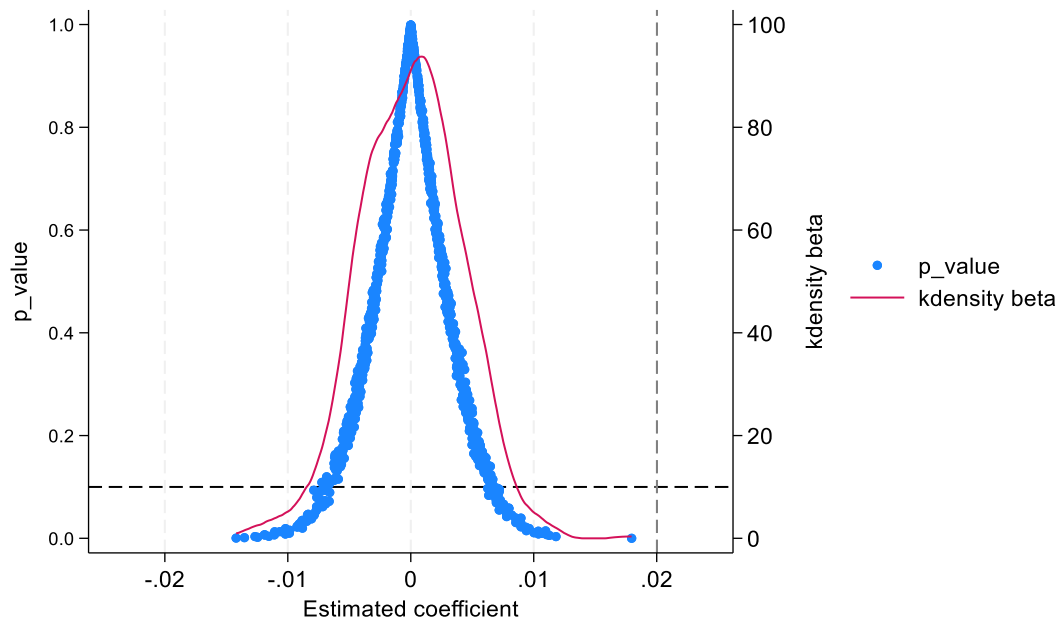


Figure 2. Results of the Placebo Test

4.4 Other Robustness Tests

To verify the robustness of the benchmark regression results and ensure that the previous conclusions are not caused by model specification errors or random factors, this paper conducts robustness tests using three methods: “excluding the interference of the policy implementation year”, “replacing the explained variable”, and “changing the sample observation period”. The results are shown in Table 3.

Firstly, to eliminate the possible interference of transitional factors in the year of policy implementation, this paper re-estimates the model by excluding the samples of the policy implementation year. The results in column (1) show that the coefficient of the core variable DID is 0.026 and is highly significant at the 1% statistical level (t-value is 4.17), which is highly consistent with the benchmark regression results, indicating that the policy effect is not driven by special factors in the implementation year.

Secondly, to overcome the possible bias caused by a single indicator measurement, this paper replaces the explained variable for testing. The results in column (2) show that the coefficient of DID is 0.027 and is highly significant at the 1% level (t-value is 5.72), and the coefficient size is very close to the benchmark result, further confirming the robustness of the policy effect.

Finally, the sample time span of this paper is from 2007 to 2021, while the pilot policy for migrant workers’ return to start businesses occurred in 2016 and 2017. The period before the policy shock might be too long, causing estimation bias. Therefore, we set the sample period to 2013 to 2021 for re-estimation. The results in column (3) show that in different time windows, the coefficient of DID remains significant at the 1% statistical level (coefficient is 0.018, t-value is 4.62). Although the coefficient value has slightly changed, its positive or negative direction and statistical significance have not changed, indicating that the estimation results are not sensitive to the choice of different sample periods.

Table 3. Results of Robustness Analysis

VARIABLES	(1)	(2)	(3)
	Remove the year of policy implementation	Replace the dependent variable	Change the sample range
did	0.026*** (4.17)	0.027*** (5.72)	0.018*** (4.62)
entrepreneurship_index	0.021*** (6.06)	0.030*** (10.13)	0.026*** (7.18)
fiscal_support	0.144*** (18.09)	0.208*** (24.11)	0.126*** (11.98)
population_size	-0.361*** (-14.42)	0.033** (1.99)	0.075*** (3.46)
internet_penetration	0.000*** (5.19)	0.000*** (6.70)	0.000*** (3.39)
household_savings	-0.472*** (-31.06)	-0.556*** (-38.25)	-0.546*** (-24.79)
financial_depth	-0.059*** (-6.89)	-0.043*** (-5.80)	-0.058*** (-4.94)
market_consumption	0.173*** (20.23)	0.138*** (19.61)	0.095*** (10.87)
County-level fixed effects	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Year fixed effects	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Province × Time fixed effects	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Observations</i>	21315	24880	12944
<i>R-squared</i>	0.980	0.992	0.994
<i>Adj. R-squared</i>	0.978	0.991	0.993

Note. The robust standard errors clustered at the county level are presented in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

4.5 PSM-DID Analysis

This paper also employed the propensity score matching difference-in-differences (PSM-DID) method to test the implementation effect of the pilot policy for returning home to start a business. The testing method involves estimating the probability of each individual (county) becoming a treatment group through a Logit model (i.e., propensity score), and then matching the treatment group with similar propensity scores in the control group. The purpose of this is to construct a control group that is as similar as possible to the treatment group in observable characteristics, thereby alleviating selection bias caused by observable variables. It is ensured that there are no significant differences between the two groups of samples before the implementation of the pilot policy for returning home to start a business.

From the results before and after matching, there are no significant differences in the covariates after matching, which basically passes the balance test. The balance test graph shows that most of the observations are within the common support range, and some samples will be lost after matching. From the kernel probability density, after matching, the two curves of the experimental group and the control group overlap more, satisfying the common support assumption.

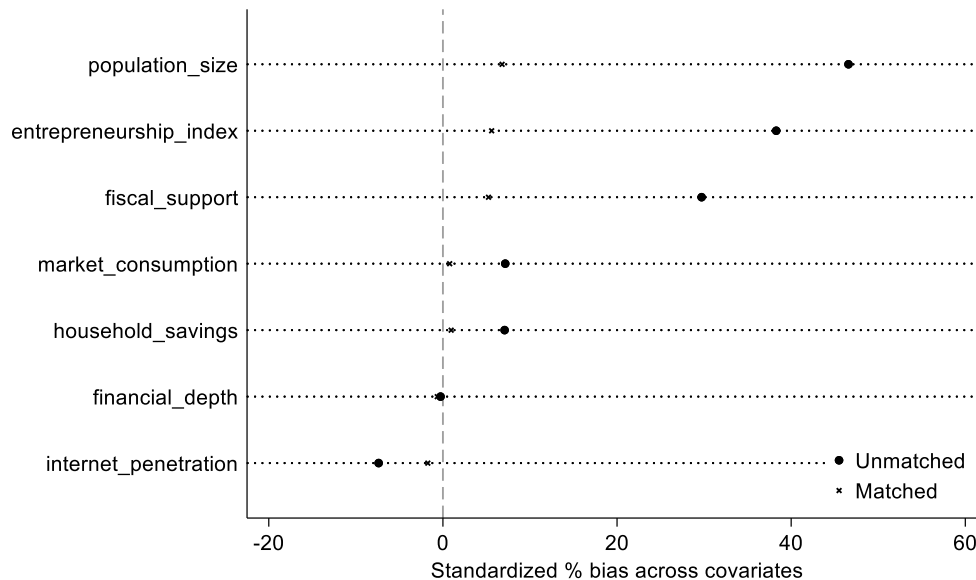


Figure 3. Balance Test

The results of the robustness checks are presented in Table 4. We employed three propensity score matching (PSM) methods without replacement: 1:1 nearest-neighbor matching, kernel matching, and caliper matching with a 0.05 radius. The dependent variable is the urban-rural income gap, and the key independent variable is the interaction term representing the pilot policy. As indicated in the table, the positive effect of the DID estimator on county-level economic development remains significant across all three matching methods. These findings confirm the robustness of our primary results.

Table 4. PSM Balance Hypothesis Test

VARIABLES	(1)	(2)	(3)
	nearest-neighbor matching	kernel matching	caliper matching
did	0.0218** (2.5715)	0.0223*** (4.17)	0.0225*** (4.21)
County-level fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Province $\times$ Time fixed effects	Yes	Yes	Yes
Observations	5,402	21621	21633
R-squared	0.987	0.9804	0.9804

t statistics in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5. Heterogeneity Test

Table 5. Results of Heterogeneity Analysis

VARIABLES	(1)	(2)	(3)
	east	middle	west
did	0.046*** (4.21)	0.012 (1.48)	0.021** (2.36)
County-level fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Province $\times$ Time fixed effects	Yes	Yes	Yes
Observations	4616	7185	9709
R-squared	0.983	0.979	0.979
Adj. R-squared	0.981	0.976	0.977

t statistics in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

To deeply investigate the differences in the impact of the pilot policies promoting returnee entrepreneurship on the economic development of counties, this paper further conducts grouped regressions based on the three major regions of the east, the middle, and the west to explore the regional heterogeneity characteristics of the policy effects. Table 5 reports the corresponding estimation results. As shown in the table, the impact of the returnee entrepreneurship policy on the economic development of counties shows significant regional heterogeneity. Specifically:

The policy effect is the strongest in the eastern region (the DID coefficient is 0.046, significant at the 1% statistical level). This may be due to the developed market economy and well-established entrepreneurial ecosystem in the eastern region, which can provide better infrastructure, financial support, and industrial chain support for returnee entrepreneurship, allowing the policy effect to be fully released.

The policy effect is more obvious in the western region (the DID coefficient is 0.021, significant at the 5% statistical level). As a traditional labor export area, the scale of returnees in the western region is larger, and the marginal effect of the capital, technology, and human capital flowing back brought by the policy is more prominent, effectively activating the local economy.

The policy effect is statistically insignificant in the central region (the DID coefficient is 0.012, t-value is 1.48). This may reflect the “middle trap” faced by the central region - lacking the market advantage of the eastern region and not having the marginal benefits of the western region, resulting in the policy effect not yet fully manifested.

In summary, the effect of the returnee entrepreneurship policy shows a gradient feature of “the strongest in the east, followed by the west, and not significant in the central region”, indicating that the policy effect is deeply influenced by the initial conditions and development stage of the region. This finding has important policy implications: When promoting the returnee entrepreneurship policy, it is necessary to fully consider regional differences and implement precise and differentiated policy plans. In the eastern region, the business environment can be further optimized, and policy support can be strengthened; in

the western region, support should be increased, and the policy coverage expanded; in the central region, the key bottlenecks restricting the policy effect need to be identified and targeted breakthroughs made.

6. Mechanism Analysis

The above regression results have verified that the pilot policy for returning entrepreneurs to start businesses significantly promotes the economic growth of counties. However, what is the intermediate mechanism through which the pilot policy for returning entrepreneurs to start businesses promotes the economic growth of counties? To this end, this paper conducts a mechanism analysis based on the two-step method. Combining the theoretical analysis in the previous section, it is believed that economic growth and the real industries in the region will have a synergistic effect. Therefore, three variables, namely the level of innovation, the scale of industry, and the level of the real industrial structure, are introduced to construct an effect model to explore the mechanism by which the pilot policy for returning entrepreneurs to start businesses affects the economic growth of counties.

Table 6. Results of Mechanism Analysis

VARIABLES	(1)	(2)	(3)
	innovation_level	industrial_scale	industrial_structure
did	0.047** (2.31)	0.058*** (5.48)	0.009*** (4.40)
County-level fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Province $\times$ Time fixed effects	Yes	Yes	Yes
Observations	20682	24909	25112
R-squared	0.923	0.964	0.911
Adj. R-squared	0.914	0.961	0.902

t statistics in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Endogenous growth theory holds that the upgrading of industrial structure is a significant manifestation of the endogenous nature of technology, with its core lying in the reallocation of production factors from low-efficiency sectors to high-efficiency ones. Returning entrepreneurs, through knowledge spillover, technology application, and organizational innovation, directly drive the county-level industries towards technology-intensive and high-end value chain positions. This paper examines this path through three sub-mechanisms:

Enhancing innovation levels. Returning entrepreneurs introduce the technological knowledge and management experience they have accumulated in cities to the county areas, generating a significant knowledge spillover effect. They enhance the total factor productivity of local enterprises through technology imitation, R&D investment, and business model innovation, and stimulate the “learning by doing” effect, promoting the formation of an innovation ecosystem in the county. Empirical results show

that the pilot policy for returning entrepreneurship has a significant positive impact on the innovation level of the county (measured by the logarithm of the number of patent authorizations) at the 5% statistical level, with a coefficient of 0.047. This indicates that after the implementation of the policy, the average innovation output in the pilot counties has increased by 0.047 units, and the knowledge spillover effect has become the original driving force for industrial structure upgrading. Therefore, H2 is verified. Strengthening industrial foundation. Returning entrepreneurship activities give rise to new enterprises and attract the clustering of supporting enterprises along the industrial chain, directly expanding the scale of industrial entities in the county. The economies of scale effect reduces production costs, improves resource utilization efficiency, and provides non-agricultural employment opportunities for rural labor, accelerating the transfer of production factors from the agricultural sector to the industrial sector. The regression results show that the policy's impact coefficient on industrial scale is 0.058, which is significant at the 1% level. This means that the number of industrial entities in the pilot counties has significantly expanded, and the industrial foundation has been strengthened, providing a carrier support for industrial structure upgrading. Therefore, H3 is verified.

Optimizing industrial structure. Returning entrepreneurship promotes the concentration of resources in the high-value-added secondary industry, as reflected in the increase in the proportion of secondary industry added value. This structural transformation not only enhances the economic efficiency of the county but also drives the development of related service industries through industrial linkage effects, forming a modern industrial system of "integration of secondary and tertiary industries". Data shows that the coefficient of the policy on the industrial structure level of the entity (the ratio of secondary industry added value to regional GDP) is 0.009, which is significant at the 1% level. Although the absolute value is small, it reflects the continuous and stable marginal contribution of the policy to the heightening of the industrial structure. Compared with non-pilot counties, the coefficient of industrial structure upgrading in pilot counties has significantly increased. Therefore, H4 is verified.

The above three paths form a closed loop. Technological innovation enhances the efficiency of the industrial sector, the expansion of industrial scale accelerates structural transformation, and the heightening of the structure in turn nourishes the demand for innovation. This actually also conforms to the idea that "the real economy can support the economy". This process aligns with the logical chain of "endogenous technology 、 optimized factor allocation、 economic structure upgrading" in endogenous growth theory, thus being able to verify hypotheses H2, H3, and H4.

7. Research Findings and Policy Implications

Based on the empirical analysis, this study mainly arrives at the following conclusions and policy implications: The pilot policy of returning to one's hometown for entrepreneurship has significantly enhanced the economic development level of the county by promoting the return of talents, capital, and technology. This effect is more pronounced in the central and western regions. Its mechanism mainly lies in stimulating innovation vitality, expanding industrial scale, and optimizing the industrial structure. To deepen the policy effect, it is suggested that local governments implement differentiated support strategies, precisely formulate entrepreneurship support measures based on the economic foundation and resource endowment of the county; at the same time, strengthen service guarantees by building a one-stop entrepreneurship service platform, innovating financial products and guarantee mechanisms, and focusing on resolving key bottlenecks such as financing, land use, and talent introduction, thereby promoting the transformation of returning entrepreneurship from being driven solely by policies to

coordinated development of an industrial ecosystem, effectively enhancing the endogenous growth momentum of the county economy.

Acknowledgement

This paper was supported by Foundation for Distinguished Young Talents in Higher Education of (2023WQNCX041), Guangdong Office of Philosophy and Social Science (GD24XYJ37), Zhanjiang City philosophy and social science project (ZJ25YB25).

References

- Bao, A., Pang, G., & Zeng, G. (2022). Entrepreneurial effect of rural return migrants: Evidence from China. *Frontiers in Psychology*, 13, 1078199. <https://doi.org/10.3389/fpsyg.2022.1078199>
- Beck, T., Levine, R., & Levkov, A. (2010). Big Bad Banks? The Winners and Losers from Bank Deregulation in the United States. *The Journal of Finance*, 65(5), 1637-1667. <https://doi.org/10.1111/j.1540-6261.2010.01589.x>
- Bi, H. H. (2024). The growth of the county economy in China. *China Economic Journal*, 18(1), 78-105. <https://doi.org/10.1080/17538963.2024.2404757>
- Biggiero, L. (2006). Industrial And Knowledge Relocation Strategies Under the Challenges of Globalization and Digitalization: The Move of Small and Medium Enterprises Among Territorial Systems. *Entrepreneurship & Regional Development*, 18(6), 443-471. <https://doi.org/10.1080/08985620600884701>
- Chen, L. (2023). Discussion on Statistical Monitoring and Evaluation of High-Quality Development of County Economy. *Proceedings of Business and Economic Studies*, 6(6), 92-97. <https://doi.org/10.26689/pbes.v6i6.5836>
- Hu, D., Hu, M., Chen, Y., & Yuan, F. (2021). Research on the Main Body of Rural Economic Innovation Based on the Perspective of Public Policy. *E3S Web of Conferences*, 275, 03066. <https://doi.org/10.1051/e3sconf/202127503066>
- Huang, L., Huang, Y., Huang, R., Xie, G., & Cai, W. (2022). Factors Influencing Returning Migrants' Entrepreneurship Intentions for Rural E-Commerce: An Empirical Investigation in China. *Sustainability*, 14(6), 3682. <https://doi.org/10.3390/su14063682>
- Liu, H., Wang, T., & Xu, H. (2024). A Study of Young Agricultural and Forestry Talents Returning to Their Hometowns for Employment and Entrepreneurship under the Strategy of Rural Revitalization. *Advances in Education*, 14(2), 1063-1069.
- Ma, X., & Komatsu, S. (2024). Impact Of E-Commerce on Income Inequality: Evidence from Rural China Based On Cross-County Panel Data. *Information Technology for Development*, 31(3), 635-663. <https://doi.org/10.1080/02681102.2024.2397340>
- Qin, Q., Guo, H., Shi, X., & Chen, K. (2023). Rural E-commerce and County Economic Development in China. *China & World Economy*, 31(5), 26-60. <https://doi.org/10.1111/cwe.12501>
- Qin, Y., & Fang, Y. (2022). The Effects of E-Commerce on Regional Poverty Reduction: Evidence from China's Rural E-Commerce Demonstration County Program. *China & World Economy*, 30(3), 161-186. <https://doi.org/10.1111/cwe.12422>
- Shen, L., & Wang, F. (2024). Can Migrant Workers Returning Home for Entrepreneurship Increase Agricultural Labor Productivity: Evidence from a Quasi-Natural Experiment in China. *Agriculture*, 14(6), 905. <https://doi.org/10.3390/agriculture14060905>

- Sun, Y., & Ren, Y. (2025). Impact of the Pilot Policy for Migrant Workers' Return Entrepreneurship on High-Quality Agricultural Development in the Context of Rural Revitalization. *Sustainability*, 17(7), 3154. <https://doi.org/10.3390/su17073154>
- Tang, L., Hu, J., Stauvermann, P. J., Sun, Q., & Zhao, Y. (2025). Can Rural E-commerce Development Mitigate Labour Outflow?—An Example of the Comprehensive Demonstration Policy for E-commerce in Rural Areas of China. *Applied Economics*, 1-15. <https://doi.org/10.1080/00036846.2025.2557577>
- Tian, X., & Juan, Z. (2024). Policy Evaluation of Place-Based Strategies on Upgrading County Industrial Structures Amid Economic Structural Transformation: Insights from Pilot Counties of China's Returning Entrepreneurs. *PLOS ONE*, 19(12), e0315264. <https://doi.org/10.1371/journal.pone.0315264>
- Wei, X., Yang, Z., Yan, Y., & Sun, J. (2024). Rural E-commerce, Digital finance, and urban-rural common prosperity: A Quasi-natural Experiment Based on China's Comprehensive Demonstration of E-commerce Entering Rural Areas Policy. *Finance Research Letters*, 69, 106237. <https://doi.org/10.1016/j.frl.2024.106237>
- Xue, Y., Kong, M., Chen, R., Wang, Q., Shen, Y., & Zhuang, J. (2023). How Does Internet Use Promote Returned Migrant Workers' Entrepreneurship: Evidence from Rural China. *Sustainability*, 15(13), 10351. <https://doi.org/10.3390/su151310351>
- Yu, Y., Tu, H., & Tian, Q. (2025). The Impacts of Rural E-Commerce on County Economic Development: Evidence from National Rural E-Commerce Comprehensive Demonstration Policy in China. *Journal of Theoretical and Applied Electronic Commerce Research*, 20(3), 235. <https://doi.org/10.3390/jtaer20030235>
- Zhang, Y., Wu, X., & Cai, R. (2025). The Effects of Rural E-Commerce on Income Inequality: Evidence from the National Rural E-Commerce Comprehensive Demonstration Policy in China. *Economic Analysis and Policy*, 87, 221-234. <https://doi.org/10.1016/j.eap.2025.05.052>
- Zhao, D., & Lin, Y. (2024). Research on the Evaluation of Rural E-commerce Development in China—From the perspective of provincial administrative units. *Proceedings of the 2024 International Conference on Economic Data Analytics and Artificial Intelligence*, 258-264. <https://doi.org/10.1145/3717664.3717706>
- Zhao, X., & Qi, X. (2024). Research on Influencing Factors and Incentive Measures of Entrepreneurial Willingness of Returning Migrant Workers in Nanjiang County under the Background of Rural Revitalization. *Advances in Social Sciences*, 13(7), 578-584. <https://doi.org/10.12677/ass.2024.137578>
- Zhou, J., Zhang, X., Korkmaz, A. G., Ding, X., & Yue, P. (2024). Mirroring The Urban Exodus: The Impact of Return Migration on Rural Entrepreneurship. *Finance Research Letters*, 66, 105619. <https://doi.org/10.1016/j.frl.2024.105619>