

Factor Integration Behavior of Returning Entrepreneurial Migrant Workers and County-Level Common Prosperity: Empirical Evidence from 178 Grain-Producing Counties in Six Major Grain-Producing Provinces in Central China

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Abstract [Objectives] To investigate the impact of the returning entrepreneurial vitality of migrant workers in the major grain-producing areas of the six central provinces on the common prosperity of counties, examine the mediating role of factor integration in this relationship, and identify the heterogeneous effects across different types of counties. [Methods] This study focused on 178 national-level major grain-producing counties across six central Chinese provinces: Shanxi, Henan, Hubei, Anhui, Hunan, and Jiangxi. Utilizing balanced panel data from 2011 to 2022 (a total of 2 136 observations), it developed an evaluation system (prosperity, commonality, and sharing) and a factor integration index (capital, labor, land, technology) to assess the level of common prosperity in these counties. Empirical analyses were performed using fixed-effect and mediating effect models. [Results] The returning entrepreneurial vitality of migrant workers has a significantly positive impact on the comprehensive index of common prosperity in counties (coefficient 0.065, $p < 0.01$). It also positively influences the three sub-dimensions of prosperity, sharing, and commonality. Factor integration serves as a partial intermediary, with migrant workers' entrepreneurial vitality indirectly promoting common prosperity by enhancing the efficiency of the aggregation and allocation of production factors. This enabling effect is particularly pronounced in core grain-producing areas and counties with lower levels of economic development. [Conclusions] The returning entrepreneurial vitality of migrant workers can significantly boost the level of common prosperity in major grain-producing counties, with factor integration serving as the key transmission pathway. It is recommended to dismantle institutional barriers between urban and rural factor markets, particularly focusing on major grain-producing counties. Additionally, the support system for factor integration should be enhanced, and differentiated policies encouraging entrepreneurship among migrant workers should be prioritized in core grain-producing areas and economically underdeveloped counties. This study provides empirical evidence to inform the development of differentiated policies for returning entrepreneurship of migrant workers in major grain-producing counties during the 15th Five-Year Plan period, thereby facilitating the promotion of common prosperity within these counties.

Key words Returning entrepreneurship, Factor integration, Common prosperity, Major grain-producing counties

0 Introduction

Common prosperity is a fundamental requirement of Chinese-style modernization, with counties serving as the primary units for advancing integrated urban-rural development. The No. 1 Central Document for 2026 highlights the importance of enhancing support for returning entrepreneurship and backing the entities involved in these ventures to revitalize rural resources. The preliminary research for the 15th Five-Year Plan by the National Development and Reform Commission highlights "improving the two-way flow mechanism of urban and rural resources and strengthening the grassroots foundation for common prosperity with counties serving as the carrier". It particularly emphasizes the importance of leveraging the leading role of major grain-producing areas and addressing the development challenges faced by these counties, where increased production has not translated into higher incomes or prosperity^[1]. The six central provinces are the heart of China's food security. In 2025, their combined grain output accounted for

28.8% of the national total. However, the per capita disposable income of rural residents in the 178 major grain-producing counties studied was only 38.7% of that of urban residents, 2.2% lower than the national county-level average. The decentralized factors, inefficient allocation, and one-way outflow have become key obstacles hindering common prosperity.

The academic community has reached a strong consensus on the income-enhancing and empowering effects of returning entrepreneurship. Some studies, focusing on migrant workers from a micro perspective, have analyzed the underlying pathway through which returning entrepreneurial migrant workers promote common prosperity for rural residents and areas. These studies confirm that entrepreneurial behaviors can directly expand income opportunities for rural residents by creating jobs and extending industries^[2]. Another study has shifted its focus to the county level and found that the return of entrepreneurial labor forces can promote the upgrading of the county's industrial structure through factor reconstruction, thereby injecting endogenous momentum into the county economy^[3]. Additionally, some studies have explored the synergistic effects of returning entrepreneurship in promoting common prosperity within the contemporary context of digital inclusive finance^[4]. Most of these studies have concentrated on the "outcome effect" of returning entrepreneurship, viewing entrepreneurial be-

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havior as a key lever of rural development, and have established a solid empirical foundation for future research.

Focusing on the central goal of common prosperity, academic research has transitioned from theoretical interpretation to quantitative measurement and practical validation. Chen Lijun *et al.*^[5] were the first to develop a common prosperity index model, creating a quantifiable evaluation system based on dimensions such as development, sharing, and inclusiveness. This model serves as a fundamental analytical tool for studying common prosperity at the county level. Building on this, Xi Huajuan *et al.*^[6] enhanced the statistical monitoring framework for common prosperity, clarified areal disparities and dynamic evolution patterns, and established a standardized benchmark for horizontal comparisons among counties.

Factor allocation has long been a key concern in academic discussions regarding the intermediate transmission link between returning entrepreneurship and rural development. Drawing on the theory of factor endowment, Luo Haoxuan^[7] elucidated the internal logic connecting the structure of agricultural factor endowment, institutional arrangements, and agricultural industrialization, emphasizing that the core of rural development lies in transforming local factor endowments into competitive advantages. Zhang Hu *et al.*^[8] conducted a systematic analysis of the dynamic evolution of market-based factor allocation in China, offering a mature methodological reference for measuring factor allocation at the county level. Fang Shile *et al.*^[9] explored the relationship between returning entrepreneurship and the flow of urban and rural factors, demonstrating that migrant workers returning to their hometowns for entrepreneurship can directly activate idle rural factors and foster the integrated development of rural industries.

The above literature review reveals that existing studies primarily focus on the impact of returning entrepreneurship on individual income or on county-level practices at the national scale, while paying less attention to the unique group of major grain-producing counties. These counties bear a significant responsibility for food security and face pronounced urban-rural dual structure challenges. Their development pathways are highly distinctive. However, most research treats them as ordinary county samples in regression analyses, without thoroughly exploring the entrepreneurial logic shaped by the dual pressures of "ensuring food security and promoting income growth and prosperity". This oversight leads to policies that lack sufficient adaptability. More importantly, most existing research is still limited to testing direct effects. It has yet to systematically develop a comprehensive theoretical chain linking the "vitality of returning entrepreneurship, factor integration and optimization, and common prosperity in counties". Additionally, it has not empirically analyzed the integration logic of the four major factors—capital, labor, land, and technology—making it difficult to understand "why these factors are effective" and "how they can be improved". As a result, there is insufficient foundational logic to support informed policy-making.

Based on the issues mentioned above, this paper selected 178 national-level major grain-producing counties across six central

provinces as research samples. It constructed a county-level common prosperity index and a factor integration index, identified the causal relationship between the vitality of returning entrepreneurship and county-level common prosperity, and systematically analyzed its internal transmission mechanisms and heterogeneous characteristics. This article makes three key marginal contributions. First, it pioneers the alignment of core policy directions for coordinating food security and common prosperity within the 15th Five-Year Plan, focusing specifically on major grain-producing counties. This addresses a gap in existing research, which has largely overlooked common prosperity in these critical agricultural areas. Second, from the perspective of factor integration, it elucidates the fundamental logic by which the vitality of returning entrepreneurship drives common prosperity in counties, thereby enriching theoretical understanding of returning entrepreneurship and inclusive growth. Third, by utilizing long-panel county-level data, the study achieves precise causal identification. Multiple tests confirm the reliability of the findings, offering practical empirical support for developing differentiated policies that promote returning entrepreneurship and advance common prosperity in major grain-producing counties during the 15th Five-Year Plan period.

1 Research hypotheses

In the major grain-producing counties of the six central provinces, the persistent challenges of one-way outflow of rural factors, inefficient allocation, and a single industrial structure fundamentally hinder common prosperity. Enhancing the vitality of returning entrepreneurship can directly foster common prosperity in these counties through three key dimensions. First, by developing distinctive rural industries and extending the agricultural industrial chain, the overall economic scale of the counties can be expanded, raising the general level of prosperity. Second, creating local non-agricultural employment opportunities increase rural residents' wage income, reduce the urban-rural income gap, and promote greater commonality. Third, by boosting county fiscal revenues and improving public services such as education and healthcare, the benefits of development can be shared more broadly. Based on this analysis, this paper proposes Hypothesis 1 (**H1**): the vitality of returning entrepreneurship has a significant positive effect on the level of common prosperity in the major grain-producing counties of the six central provinces.

The key to fostering common prosperity at the county level through returning entrepreneurship lies mainly in optimizing the allocation of production factors. From the perspective of capital, returning entrepreneurship encourages the return of urban capital, leverages the reallocation of county-level financial resources toward rural industries, and helps overcome financing constraints. Regarding labor, it absorbs surplus rural labor force by facilitating their transition to secondary and tertiary industries, thereby increasing labor productivity. In terms of land, efforts should focus on promoting the orderly transfer of land management rights to enable moderate-scale operations. From a technological standpoint,

introducing new varieties and technologies can improve agricultural production efficiency. The integration and optimal allocation of these four key factors can fundamentally address the inefficiencies in rural resource allocation, expand the overall scale of county economies, and create more opportunities for farmers to increase their income. Based on this, this paper proposes **H2**: factor integration plays a significant mediating role between the vitality of returning entrepreneurship and the common prosperity of counties.

The enabling effect of returning entrepreneurship vitality on the common prosperity of counties varies due to differences in the functional roles and economic development levels of these counties. Regarding the functional role in grain production, core grain-producing areas face stricter responsibilities to protect cultivated land and have long struggled with "increased production without corresponding income growth". Enhancing the vitality of returning entrepreneurship can revitalize agricultural resources while strictly safeguarding food security, with a marginal effect significantly greater than that in non-core grain-producing counties. From the perspective of economic development, major grain-producing counties with less developed economies often experience a vicious cycle of "factor outflow and lagging growth". Injecting vitality through returning entrepreneurship can break this cycle, producing a stronger marginal pulling effect than in economically developed counties. Based on these observations, this paper proposes **H3**: the promoting effect of returning entrepreneurship vitality on common prosperity is more pronounced in core grain-producing areas and counties with lower economic development levels.

2 Research design and data interpretation

2.1 Sample selection and data sources This study selected national-level major grain-producing counties from six central provinces—Shanxi, Henan, Hubei, Anhui, Hunan, and Jiangxi—as research samples, covering the period from 2011 to 2022. To ensure the validity and reliability of the empirical analysis, observations with missing values in key variables were excluded to maintain data integrity for regression analysis. After this screening process, a total of 2 136 valid observations from 178 major grain-producing counties were obtained, providing a solid data foundation for the subsequent empirical research. The core data primarily came from the *China County Statistical Yearbook*, provincial statistical yearbooks, and statistical bulletins on the national economic and social development of each county. Missing data were supplemented using linear interpolation.

2.2 Variable setting and explanation This article's variable system encompasses four main categories: the explained variable, the core explanatory variable, the mediating variable, and the control variable. The specific indicators, calculation methods, and attributes are detailed in Table 1.

2.2.1 Explained variable. The explained variable is the county-level common prosperity index, which reflects a condition wherein, alongside overall economic growth, the county narrows the income disparity between urban and rural areas, equalizes access to

public services, and ensures that development opportunities are accessible to all. Drawing on the research of Chen Lijun *et al.* [5] and Xi Huajuan *et al.* [6], an evaluation system was developed based on three dimensions: prosperity, commonality, and sharing. The entropy method was employed to calculate weights, resulting in a comprehensive common prosperity index for counties.

2.2.2 Mediating variable. The mediating variable is the factor integration index, which represents the market-oriented behavior of returning entrepreneurial migrant workers in aggregating, reorganizing, and optimizing the allocation of the four key production factors in rural areas: land, labor, capital, and technology. This index aims to address the challenges posed by the scattered and inefficient allocation of rural factors. Drawing on the research of Zhang Hu *et al.* [8], an index system was developed based on these four core production factors, and a comprehensive index was calculated using the entropy method.

2.2.3 Core explanatory variable. The key explanatory variable is the vitality of returning entrepreneurship, which represents the level of activity among returning individuals who establish new enterprises within the county. This reflects both the entrepreneurial environment and the capacity to cultivate market entities. Following the research of Xie Xuanli *et al.* [10], the number of new enterprises per 10 000 people is used to measure migrant workers' entrepreneurial vitality at the county level. In most cases, new enterprises in major grain-producing counties are primarily founded by migrant workers returning to their hometowns for entrepreneurship. This indicator effectively and consistently captures the level of entrepreneurial activity among migrant workers in the county.

2.2.4 Control variable. To accurately assess the net impact of returning entrepreneurial vitality on the county's common prosperity and to avoid endogeneity issues caused by omitted variables, the following control variables were selected based on the studies of Fang Shile *et al.* [9] and Jiang Sanliang *et al.* [4]: (i) fiscal expenditure level; (ii) financial development level; (iii) fixed investment level; (iv) basic communication infrastructure; (v) agricultural development level; (vi) agricultural technology level; and (vii) industrial structure.

2.3 Descriptive statistics Table 2 presents the descriptive statistics for all variables, clearly illustrating the sample distribution characteristics of each.

The descriptive statistical analysis revealed that the mean of the county-level common prosperity index was 0.225, with a standard deviation of 0.086. The considerable difference between the minimum and maximum values highlights significant regional disparities in the level of common prosperity among the major grain-producing counties in the six central provinces. This finding provides a solid foundation for conducting heterogeneity analysis. Additionally, the mean vitality of returning entrepreneurship was 84.522, accompanied by a high standard deviation of 71.951, indicating substantial variation in entrepreneurial activity among these counties. In some counties, a clustering effect of returning entrepreneurship has emerged, whereas in others, entrepreneurial vitality remains relatively low.

Table 1 Core variable system and measurement methods

Dimension/Category	Primary indicator	Secondary indicator	Calculation method of indicators	Indicator attribute
Explained variable; common prosperity index	Prosperity	Per capita GDP	Per capita GDP of the county	Positive
		Per capita disposable income of urban residents	Total disposable income of urban residents /Permanent urban resident population	Positive
		Per capita disposable income of rural residents	Total disposable income of rural residents/Rural permanent resident population	Positive
	Commonality	Relative income gap between urban and rural areas	(Per capita disposable income of urban residents-Per capita disposable income of rural residents)/Average per capita income of urban and rural areas	Negative
	Sharing	Number of students enrolled in middle schools per 10 000 people	Number of students enrolled in county-level ordinary middle schools/10 000	Positive
		Number of beds in medical and health institutions per 10 000 people	Number of beds in county-level medical and health institutions/10 000	Positive
Mediating variable; factor integration index	Capital	Per capita GDP	Per capita GDP of the county	Positive
		Total retail sales of consumer goods per capita	Total retail sales of consumer goods in the county/Total population at the end of the year	Positive
	Labor	Total population at the end of the year	Total population at the end of the year (10 000 individuals)	Positive
		Proportion of non-agricultural employment in rural areas	(Number of rural practitioners-Number of practitioners in agriculture, forestry, animal husbandry and fishery)/ Number of rural practitioners	Positive
	Land	Proportion of the secondary and tertiary industries in GDP	Added value of the secondary and tertiary industries/Total county-level GDP	Positive
	Technology	Total power of agricultural machinery	Total power of agricultural machinery in the county (10 000 kw)	Positive
Core explanatory variable	Returning entrepreneurship vitality	Number of new enterprises per 10 000 people	Number of newly added enterprises in the county/Total population at the end of the year (10 000 individuals)	Positive
Control variable	Government intervention	Fiscal expenditure level	Local general budget expenditure/County-level GDP	Positive
	Financial development	Financial development level	Financial institution loan balance/ County-level GDP	Positive
	Investment level	Fixed investment level	Added value of the secondary industry/ County-level GDP	Positive
	Infrastructure	Basic communication infrastructure	Number of mobile phone users/Total population at the end of the year	Positive
	Industrial structure	Industrial structure	Total population at the end of the year/Administrative area of the county	Positive
	Agricultural development	Agricultural development level	Total fixed asset investment of the whole society/ County-level GDP	Positive
	Agricultural technology	Agricultural technology level	Total power of agricultural machinery/Permanent cultivated area	Positive

Table 2 Descriptive statistical results of variables

Variable	Sample size	Mean	Standard deviation	Minimum value	Maximum value
County-level common prosperity index	2 136	0.225	0.086	0.056	0.775
Prosperity	2 136	0.120	0.060	0.011	0.477
Commonality	2 136	0.027	0.018	0.010	0.200
Sharing	2 136	0.078	0.028	0.020	0.202
Returning entrepreneurship vitality	2 136	84.522	71.951	5.987	428.723
Factor integration index	2 136	0.239	0.085	0.056	0.581
Fiscal expenditure level	2 136	0.199	0.084	0.028	0.925
Financial development level	2 136	0.591	0.289	0.086	2.077
Fixed investment level	2 136	1.068	0.765	0.180	9.380
Basic communication infrastructure	2 136	1.028	1.887	0.037	13.890
Industrial structure	2 136	0.372	0.092	0.083	0.676
Agricultural development level	2 136	0.196	0.076	0.034	0.676
Agricultural technology level	2 136	1.287	0.542	0.201	4.699

2.4 Model setting To assess the impact of returning entrepreneurial vitality on common prosperity at the county level, the following benchmark regression model was developed. In this model, α_1 represents the effect of returning entrepreneurial vitality on common prosperity. A significantly positive α_1 would indicate that returning entrepreneurial vitality substantially enhances the level of common prosperity in counties. Here, $Wealth_{i,t}$ is the explained variable, representing the county-level common prosperity index; $Ind_Ent_{i,t}$ is the key explanatory variable, denoting returning entrepreneurial vitality within the county; $control_{i,t}$ donates a set of control variables; μ_p accounts for provincial fixed effects, and $\varepsilon_{i,t}$ is the random disturbance term.

$$Wealth_{i,t} = \alpha_0 + \alpha_1 Ind_Ent_{i,t} + \sum \alpha_k control_{i,t} + \mu_p + \varepsilon_{i,t} \quad (1)$$

To investigate the mediating role of factor integration, a step-wise approach to testing mediating effects was employed. The mediating variable, $Factor_{i,t}$, was incorporated into the main effect model to assess its explanatory power and to determine whether the coefficient α_1 was reduced. The following mediating model was then constructed:

$$Factor_{i,t} = \beta_0 + \beta_1 Ind_Ent_{i,t} + \sum \beta_2 control_{i,t} + \mu_p + \varepsilon_{i,t} \quad (2)$$

$$Wealth_{i,t} = \theta_0 + \theta_1 Ind_Ent_{i,t} + \theta_2 Factor_{i,t} + \sum \theta_3 control_{i,t} + \mu_p + \varepsilon_{i,t} \quad (3)$$

Here, $Factor_{i,t}$ serves as the mediating variable, representing the county-level factor integration index. The settings for the remaining variables remain consistent with the benchmark model. The procedure for testing the mediating effect is as follows: first, test the baseline effect using model (1). If α_1 is significantly positive, proceed to test model (2). If β_1 is also significantly positive, then test model (3). If θ_2 is significantly positive and the absolute value of θ_1 's coefficient is smaller than that of α_1 , this indicates a partial mediating effect of factor integration. However, if θ_1 is not significant, it suggests a complete mediating effect of factor integration.

3 Empirical results and analysis

3.1 Benchmark regression results The results of the benchmark regression are presented in Table 3. All four columns of regression include controls for provincial fixed effects. The explained variable in column (1) is the comprehensive index of common prosperity at the county level, while the explained variables in columns (2), (3) and (4) are the prosperity index, sharing index, and commonality index, respectively.

The regression results clearly showed that the coefficient of returning entrepreneurial vitality on the comprehensive index of common prosperity in counties was 0.065, which was significantly positive at the 1% statistical level. It was also significantly positive for the three sub-dimensions: prosperity, sharing, and commonality. This indicates that returning entrepreneurial vitality can not only increase the total economic volume but also narrow the urban-rural gap and promote the sharing of public services, thereby confirming **H1**.

Table 3 Benchmark regression results

Variable	(1)	(2)	(3)	(4)
	Wealth	Rich	Share	Equal
<i>Ind_Ent</i>	0.065 *** (27.52)	0.043 *** (25.29)	0.020 *** (18.32)	0.001 *** (4.93)
<i>Fiscal</i>	-0.430 *** (-20.26)	-0.355 *** (-23.12)	-0.018 * (-1.76)	-0.056 *** (-24.00)
<i>Finance</i>	0.092 *** (14.74)	0.059 *** (13.07)	0.026 *** (8.84)	0.005 *** (7.87)
<i>Invest</i>	0.011 *** (4.99)	0.014 *** (8.93)	-0.006 *** (-5.54)	0.003 *** (10.62)
<i>Comm</i>	0.005 *** (3.00)	0.006 *** (5.10)	-0.002 ** (-2.29)	0.001 *** (4.20)
<i>Industry</i>	0.261 *** (16.31)	0.179 *** (15.45)	0.078 *** (10.40)	0.004 ** (2.22)
<i>Agri</i>	-0.084 *** (-4.24)	-0.084 *** (-5.83)	0.005 (0.57)	-0.006 *** (-2.78)
<i>Tech</i>	0.011 *** (4.62)	0.006 *** (3.68)	0.004 *** (3.65)	0.001 *** (3.53)
Constant	-0.130 *** (-11.91)	-0.105 *** (-13.22)	-0.050 *** (-9.75)	0.025 *** (20.92)
Observations	2 136	2 136	2 136	2 136
R ² squared	0.736	0.743	0.493	0.463
Province FE	Yes	Yes	Yes	Yes

NOTE The *t*-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The same below.

3.2 Test results of mediating effects The three-step method for mediating effects was employed to investigate the transmission effect of factor integration between returning entrepreneurial vitality and the county's common prosperity. The results are presented in Table 4.

Table 4 Test results of mediating effects

Variable	(1)	(2)	(3)
	Wealth	Factor	Wealth
<i>Ind_Ent</i>	0.065 *** (27.52)	0.026 *** (7.99)	0.059 *** (25.98)
<i>Factor</i>			0.248 *** (16.91)
<i>Fiscal</i>	-0.430 *** (-20.26)	-0.264 *** (-8.98)	-0.364 *** (-17.95)
<i>Finance</i>	0.092 *** (14.74)	0.039 *** (4.56)	0.082 *** (13.96)
<i>Invest</i>	0.011 *** (4.99)	-0.004 (-1.40)	0.012 *** (5.83)
<i>Comm</i>	0.005 *** (3.00)	-0.050 *** (-21.80)	0.017 *** (10.13)
<i>Industry</i>	0.261 *** (16.31)	0.135 *** (6.07)	0.227 *** (15.01)
<i>Agri</i>	-0.084 *** (-4.24)	0.151 *** (5.49)	-0.122 *** (-6.48)
<i>Tech</i>	0.011 *** (4.62)	0.038 *** (11.29)	0.002 (0.75)
Constant	-0.130 *** (-11.91)	0.083 *** (5.47)	-0.151 *** (-14.59)
Observations	2 136	2 136	2 136
R ² squared	0.736	0.362	0.768
Province FE	Yes	Yes	Yes

The test results of the three-step method were very clear. In the first step, the benchmark regression (column 1) was significant. In the second step (column 2), the coefficient of returning entrepreneurial vitality on factor integration was 0.026, which was significantly positive at the 1% level. After including factor integration in the third step (column 3), its coefficient was 0.248, also significantly positive at the 1% level. Meanwhile, the coefficient of returning entrepreneurial vitality decreased from 0.065 to 0.059, indicating that factor integration partially mediates the relationship and confirming **H2**.

3.3 Robustness test To verify the reliability of the benchmark regression results, robustness tests were performed using a one-period lag of independent variables. This approach helps eliminate endogeneity issues caused by the bidirectional causal relationship within the current period. The test results are presented in Table 5.

The results of the one-period lag test revealed that the coefficient of the core explanatory variable remained significantly positive at the 1% level, consistent with the findings of the benchmark regression. This confirms the robustness of the benchmark regression's conclusion.

3.4 Heterogeneity analysis Heterogeneity analysis was performed based on the functional role of grain production. Using the median proportion of the primary industry's added value in the county's GDP as the dividing line, the samples were split into two groups: one with a relatively high proportion of the primary indus-

try and another with a relatively low proportion. This classification aimed to differentiate between core and non-core grain production areas. The results of the grouping regression are presented in Table 6.

Table 5 Robustness test: one-period lag of independent variables

Variable	(1)	(2)	(3)	(4)
	Wealth	Rich	Share	Equal
<i>L1_Ind_Ent</i>	0.061 *** (23.86)	0.040 *** (22.04)	0.019 *** (15.85)	0.001 *** (3.95)
<i>Fiscal</i>	-0.466 *** (-21.04)	-0.379 *** (-23.89)	-0.028 *** (-2.62)	-0.058 *** (-24.14)
<i>Finance</i>	0.093 *** (14.45)	0.058 *** (12.55)	0.028 *** (9.01)	0.005 *** (7.63)
<i>Invest</i>	0.010 *** (4.71)	0.014 *** (8.76)	-0.006 *** (-5.56)	0.003 *** (10.73)
<i>Comm</i>	0.005 *** (3.30)	0.007 *** (5.52)	-0.002 ** (-2.14)	0.001 *** (4.19)
<i>Industry</i>	0.245 *** (14.74)	0.168 *** (14.10)	0.075 *** (9.31)	0.002 (1.38)
<i>Agri</i>	-0.059 *** (-2.77)	-0.070 *** (-4.61)	0.015 (1.47)	-0.003 (-1.38)
<i>Tech</i>	0.010 *** (4.10)	0.006 *** (3.48)	0.003 *** (2.83)	0.001 *** (3.16)
Constant	-0.093 *** (-8.02)	-0.077 *** (-9.26)	-0.043 *** (-7.63)	0.027 *** (21.64)
Observations	1 958	1 958	1 958	1 958
<i>R</i> ² squared	0.717	0.731	0.468	0.467
Province FE	Yes	Yes	Yes	Yes

Table 6 Heterogeneity analysis based on the primary industry's added value in the county's GDP

Variable	Provinces with the proportion of the primary industry's added value in GDP greater than the median				Provinces with the proportion of the primary industry's added value in GDP less than the median			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Wealth	Rich	Share	Equal	Wealth	Rich	Share	Equal
<i>Ind_Ent</i>	0.072 *** (19.59)	0.045 *** (18.13)	0.025 *** (13.28)	0.002 *** (3.89)	0.059 *** (15.56)	0.037 *** (13.75)	0.021 *** (12.16)	0.002 *** (3.49)
<i>Fiscal</i>	-0.454 *** (-13.92)	-0.378 *** (-17.12)	-0.013 (-0.79)	-0.064 *** (-17.71)	-0.374 *** (-11.84)	-0.300 *** (-13.39)	-0.023 (-1.62)	-0.054 *** (-14.78)
<i>Finance</i>	0.069 *** (6.75)	0.048 *** (6.93)	0.014 ** (2.58)	0.006 *** (5.58)	0.070 *** (7.00)	0.036 *** (5.06)	0.032 *** (7.12)	0.003 *** (2.68)
<i>Invest</i>	0.007 * (1.88)	0.018 *** (6.90)	-0.013 *** (-6.72)	0.003 *** (7.12)	0.014 *** (4.47)	0.015 *** (6.80)	-0.004 *** (-3.10)	0.003 *** (8.94)
<i>Comm</i>	0.001 (0.50)	0.005 *** (3.08)	-0.004 *** (-3.25)	0.001 ** (2.04)	0.009 *** (3.24)	0.009 *** (4.88)	-0.002 (-1.41)	0.001 *** (3.77)
<i>Industry</i>	0.242 *** (10.42)	0.181 *** (11.57)	0.060 *** (4.94)	0.001 (0.37)	0.291 *** (11.54)	0.185 *** (10.37)	0.101 *** (9.00)	0.003 (0.92)
<i>Agri</i>	-0.071 ** (-2.32)	-0.064 *** (-3.10)	-0.007 (-0.42)	-0.000 (-0.10)	-0.112 *** (-3.75)	-0.113 *** (-5.37)	0.022 (1.65)	-0.017 *** (-4.90)
<i>Tech</i>	0.004 (1.01)	0.005 ** (2.09)	-0.002 (-0.93)	0.001 (1.40)	0.019 *** (4.97)	0.012 *** (4.37)	0.005 *** (2.85)	0.002 *** (5.38)
Constant	-0.117 *** (-6.89)	-0.108 *** (-9.43)	-0.035 *** (-3.93)	0.025 *** (13.34)	-0.120 *** (-7.06)	-0.076 *** (-6.33)	-0.069 *** (-9.10)	0.025 *** (12.82)
Observations	890	890	890	890	889	889	889	889
<i>R</i> ² squared	0.731	0.765	0.441	0.446	0.731	0.721	0.587	0.502
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

The regression results clearly demonstrated that in core grain production areas, where the primary industry constitutes a relatively high proportion, the coefficient for returning entrepreneurial vitality was significantly higher than in non-core areas and was positive at the 1% statistical significance level, confirming **H3**. This suggests that the issue of idle factors is more pronounced in core grain-producing counties, and the marginal effect of returning entrepreneurship is stronger.

4 Conclusions and policy implications

4.1 Conclusions This paper analyzed balanced panel data from 178 national-level major grain-producing counties across six central provinces between 2011 and 2022. It developed an evaluation system and a factor integration index to assess the level of common prosperity in these counties. The study draws three key conclusions: first, returning entrepreneurial vitality significantly and positively influences the common prosperity of major grain-producing counties in the six central provinces. This vitality not only boosts the overall economic output but also helps narrow the income gap between urban and rural areas and enhances the sharing of public services. Second, factor integration serves as the core transmission pathway. Returning entrepreneurship partially mediates this effect by improving the efficiency of aggregation and allocation of capital, labor, land, and technology. Third, this impact exhibits regional heterogeneity, being more pronounced in core grain-producing areas and counties with a relatively high proportion of primary industry.

4.2 Policy implications The research conclusions of this article offer clear policy guidance for dismantling the urban-rural dual structure, enhancing support policies for returning entrepreneurship, and promoting common prosperity in the major grain-producing counties of six central provinces during the 15th Five-Year Plan period.

4.2.1 Dismantling the institutional barriers between urban and rural factors. During the 15th Five-Year Plan period, efforts will focus on major grain-producing counties to improve the land transfer system, establish specialized credit products to support returning entrepreneurship, and enhance the technology promotion system, thereby providing institutional guarantees for factor integration.

4.2.2 Improving the support system for factor integration. It is essential to closely integrate policies supporting returning entrepreneurship with food security strategies, enhance fiscal subsidies,

tax incentives, and credit interest subsidies, establish business incubation centers and industrial parks, and promote the coordinated development of the primary, secondary, and tertiary industries.

4.2.3 Implementing differentiated support policies. Priority should be given to launching pilot programs that encourage returning entrepreneurship in key grain-producing areas and economically underdeveloped counties. Support for large-scale households and family farms should emphasize the integration of land and technology, while support for businesses in the processing and tourism sectors should focus on combining capital and labor. This targeted approach will help prevent resource waste caused by a "one-size-fits-all" policy.

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