frontiers in Sustainable Food Systems

TYPE Original Research
PUBLISHED 25 February 2026
DOI 10.3389/fsufs.2026.1764885

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OPEN ACCESS

EDITED BY
Woraphon Yamaka,
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REVIEWED BY
Chunyuan Ke,
City University of Macau, Macao SAR, China
Chen Yiru,
Hunan First Normal University, China

*CORRESPONDENCE
Zhaoyang Lu
luzhaoyang@swupl.edu.cn

RECEIVED 11 December 2025
REVISED 02 February 2026
ACCEPTED 09 February 2026
PUBLISHED 25 February 2026

CITATION
Lu Z, Feng H, Gou D, Dong J and Li N (2026) Rural industrial revitalization and common prosperity: pathways to sustainable development in China's agricultural regions.
Front. Sustain. Food Syst. 10:1764885.
doi: 10.3389/fsufs.2026.1764885

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Rural industrial revitalization and common prosperity: pathways to sustainable development in China's agricultural regions

Zhaoyang Lu[1]*, Hailong Feng[1], Diao Gou[2], Jianglai Dong[1] and Nan Li[1]

[1]School of Economics, Southwest University of Political Science and Law, Chongqing, China, [2]School of Business, Southwest University of Political Science and Law, Chongqing, China

Introduction: The essence of rural revitalization lies in achieving "affluent living" with common prosperity in rural areas being the focal point and challenge. As a key element of rural revitalization, industrial revitalization of rural areas plays a pivotal role in advancing common prosperity in rural communities.
Methods: This study is based on the panel data of 30 provinces in China from 2013 to 2023 (excluding Hong Kong, Macau, Taiwan, and Tibet), and has constructed an indicator system for rural industrial revitalization and common prosperity. Based on this, the fixed effect model and the mediation effect model were adopted to systematically evaluate the impact of rural industrial revitalization on rural common prosperity. Through various robustness tests such as endogeneity handling, machine learning verification, and placebo test, the reliability of the research results has been ensured.
Results: The research results indicate that rural industrial revitalization can significantly enhance the level of rural common prosperity, and this has been fully verified through various robustness tests. Furthermore, this effect shows significant heterogeneity. The effects are stronger in the central and western regions, as well as in the areas with low urbanization rates, compared to those in the eastern regions and areas with high urbanization rates. Finally, promoting income growth and improving human capital are crucial micro mechanisms for rural industrial revitalization and the promotion of common prosperity in rural areas of our country.
Discussion: Science-driven rural industrial revitalization and further clarification of the realization path for enabling rural common prosperity are of great significance for achieving the goal of common prosperity. This evidence highlights the necessity of formulating region-specific strategies, especially in underdeveloped and low-urbanization areas. Rural industrial revitalization can bring the greatest marginal benefits. The research conclusions of this article provide new ideas and inspiration for effectively promoting rural industrial development and achieving common prosperity in rural areas.

KEYWORDS
common prosperity, global south, inclusive development, rural industrial revitalization, rural livelihoods, sustainable rural development

1 Introduction

Poverty has been a persistent social phenomenon throughout human history, and combating poverty remains a perpetual endeavor in the development of human society (Wang, 2025). Governments around the world attach great importance to poverty alleviation (Duan and Liu, 2025). As the largest developing country, the disparity in income between urban and rural areas has always been one of the most persistent challenges in China's development (Li M. et al., 2025). The slowdown in farmers' income growth is also one of the major challenges faced by the agricultural sector in China (Liu et al., 2024b). Therefore, the Chinese government has paid close attention to the issue of poverty (Huang and You, 2025; Li R. et al., 2025; Li and Zhou, 2025). The Chinese government formally declared a comprehensive victory in the fight against poverty on February 25, 2021 (Wang and Jie, 2025). In the aftermath of this achievement, the issue of common prosperity has increasingly become a focal point, attracting widespread attention both domestically and internationally (Zhang Q. et al., 2025; Zhang et al., 2025a; Jiang et al., 2025). The practice has demonstrated that rural industrial revitalization serves as an important platform for promoting innovation and entrepreneurship among farmers, boosting production, and increasing income (Peng et al., 2024; Chen and Wu, 2025). It is a crucial means for China to achieve its goal of common prosperity (Li, 2022; Wan and Chen, 2023). As China steadily advances towards this objective, in-depth research on whether and how rural industrial revitalization can promote common prosperity is of great significance not only for the modernization of China's agricultural and rural sectors but also for providing valuable insights to other developing countries facing similar challenges (Sha et al., 2024; Gai et al., 2025; Lu et al., 2026a).

Few scholars have directly studied how rural industrial revitalization affects common prosperity in rural areas; however, related research is plentiful. The true essence of common prosperity is for all citizens to enjoy the fruits of economic growth equally. The "common" aspect primarily implies narrowing income and wealth disparities, whereas "prosperity" emphasizes accumulating wealth through high-quality development (Nga and Kesumo, 2025; Qiao and Chen, 2025). Its specific content can be understood in terms of political, economic, and social dimensions (Ross, 2022; Zhang and Chen, 2025). Many scholars divide common prosperity into two dimensions: "prosperity," which includes both material and spiritual aspects, and "sharing," which involves society members sharing income and property, and equally accessing public services (Liu et al., 2023; Zhang T. et al., 2023; Shi et al., 2025).

"Overall prosperity" and "shared prosperity" are not completely substitutable. Some scholars conceptualize common prosperity in four aspects: overall prosperity, shared prosperity, universal prosperity, and spiritual prosperity. Despite China's achievements in coordinating urban and rural development and constructing new urbanization models, the fundamental resolution of the "three rural issues" (agriculture, rural areas, and rural people) remains elusive, and a dual urban–rural structure still exists (Liu et al., 2020; Lu et al., 2026b; Zheng et al., 2022). An analysis of the urban–rural income gap suggests that promoting common prosperity among farmers and rural areas is the focus and challenge in achieving common prosperity for all (Zhang and Wang, 2023; Ma and Yang, 2025; Xin et al., 2025). The current push for common rural prosperity faces numerous challenges such as low agricultural production efficiency, inefficient resource and elements utilization, an unstable agricultural foundation that limits income growth for farmers (Zhang C. et al., 2023), inadequate development of rural collective economies, prominent shortcomings in rural livability and business environments, and significant disparities in rural affluence (Yao et al., 2024). The challenges faced by different rural areas in China vary owing to diverse resource endowments and developmental stages (Li and Ma, 2024).

The core task in achieving common prosperity for farmers and rural areas is to promote faster income growth for low-income households (Li, 2023); this involves not only promoting equitable income distribution but also focusing on health equity, the construction of spiritual civilization, and the widespread availability of cultural resources (Michael, 2022). To achieve common rural prosperity, high-quality rural revitalization is a requirement and an inevitable course of action. This involves the effective implementation of fiscal support for agriculture in projects that are conducive to rural and agricultural development (Tu et al., 2024); adherence to the development and regulation of the digital economy; promotion of rural revitalization and urban–rural integration; enhancement of the wealth-creating capabilities of agriculture, rural areas, and farmers (Li Z. et al., 2022; Lu et al., 2025a); and continued leveraging of the role of rural collective economic organizations to enable new types of collective economies to empower common rural prosperity (Jiang et al., 2023).

Industrial prosperity signifies a profound revolution in the rural economic structure (Zhang et al., 2020) and is an important means of achieving common prosperity in rural areas (Xu and Lu, 2025). How can rural industrial revitalization be realized? The prerequisites for rural industrial revitalization are adherence to green development; an earnest practice of President Xi Jinping's concept that "lucid waters and lush mountains are invaluable assets" (Sun et al., 2023); and the advancement of rural industrial modernization through diversification, specialization, greening, sharing, digitization, and quality enhancement of rural industries. The key goals are to achieve high-quality, comprehensive development of rural areas through a high-level industrial system (Jin et al., 2024), promote the integrated development of rural industries through the digital economy (Hou et al., 2023), fully harness the positive spillover effects of finance on rural industrial revitalization (Jin and Zhong, 2024), and empower rural industrial revitalization through efficiency improvements, industrial transformation, and structural optimization (Pang, 2023; Lu et al., 2025b).

In summary, the existing literature on rural industrial revitalization focuses on theoretical analysis, its realization path, role mechanisms, and so on (Luo et al., 2023). Meanwhile, many scholars have reached a consensus on the promotion of common prosperity in terms of economic growth (Xie et al., 2024), improvement of the income distribution system (Sun and Cao, 2022; Duan and Wang, 2023), development of the digital economy (Chen et al., 2023; Chen and Zhang, 2023) and digitally inclusive financial development (Su, 2023; Zhang et al., 2024; Xu, 2025; Xu M. et al., 2025), which lays the foundation for this study. Although there are many related studies, few have examined how rural industrial revitalization affects rural common prosperity. An in-depth exploration of the mechanism can help in achieving common prosperity through a comprehensive promotion of rural revitalization. Hence, this study examines the impact of rural industrial revitalization on rural common prosperity and its mechanism, based on 2013–2023 panel data of 30 provinces in China. The contributions of this study are summarized below:

(1) This article defines rural industrial revitalization from the perspective of a comprehensive transformation led by agriculture,

distinguishes it from mere industrial expansion and economic growth, and then constructs a corresponding index system. Meanwhile, from the dual dimensions of overall prosperity and development sharing, a rural common prosperity indicator system was established. This paper integrates the two aspects into a unified research framework and examines the impact of rural industrial revitalization on rural common prosperity, thereby filling the research gap in this field.

(2) Based on theoretical analysis, this paper, using panel data of 30 provinces in China from 2013 to 2023, empirically examined the impact of rural industrial revitalization on rural common prosperity, and further verified the robustness of this conclusion. Furthermore, by introducing micro variables such as residents' income levels and human capital levels, the micro mechanism by which rural industrial revitalization affects rural common prosperity was further explored. It has provided a new theoretical basis and empirical evidence for promoting farmers' income growth and efficiency improvement, and achieving common prosperity in rural areas.

(3) Based on the above research, this paper starts from the perspective of the heterogeneity of geographical location and urbanization development level, and conducts an in-depth investigation into the differentiated impact mechanisms of rural industrial revitalization on common prosperity in eastern, central, and western regions of China, as well as in high and low urbanization areas. This research outcome can provide important theoretical references and decision-making basis for local governments to formulate more targeted and effective policies for promoting common prosperity.

2 Theoretical framework and hypotheses development

The concept of "rural industrial revitalization" currently lacks a clear definition in academic circles; however, the concept of "rural industry" is more precisely delineated (Liu N. et al., 2024; Sarfo et al., 2024; Pan et al., 2025). It refers to agriculture-based, agriculture-oriented, and agriculture-enhancing industries. This study posits that rural industrial revitalization can be described as the process through which farmer incomes rise, more jobs are created, the industrial structure is optimized, and rural economic growth is fueled by the growth of rural industries (Deng et al., 2024a; Qu et al., 2024; Xu D. et al., 2025; Xin and Deng, 2025; Ye and Jiang, 2025). This includes the modernization of agriculture and diversification of rural industries, as well as improvements in rural public services and infrastructure (Deng et al., 2024b; Tao et al., 2024; Wu et al., 2024; Fan and Gan, 2025; Zhou and Gu, 2025).

The development of traditional industries and economic growth are typically reflected in changes in the industrial structure, scale, and per capita GDP (Xu F. et al., 2025; Noah et al., 2026). The revitalization of rural industries focuses on enhancing agricultural production efficiency and increasing farmers' income as its core development objective. It promotes the integrated development of industries in rural areas, builds a modern agricultural industrial system, and promotes all-around development in rural areas (Zhao and Yang, 2025). Rural industrial revitalization is the foundation of comprehensive rural development (Liu et al., 2020). Therefore, rural industrial revitalization is not merely about expanding industries and achieving economic growth; instead, it is led by agriculture and aims to promote the all-round development of the economy, ecology, and society in rural areas.

"Common prosperity in rural areas" refers to the gradual narrowing of income disparities, urban–rural disparities, and regional disparities in the context of continuous high-quality development and modernization of rural areas and farmers. This implies not only an increase in farmers' income and welfare but also a more equitable distribution of public services such as education, healthcare, and culture, which indicates the achievement of material wellbeing for farmers and their spiritual self-reliance and strength (Liu and Dong, 2025; Mao, 2025; Qi et al., 2025; Ramadhan et al., 2025).

The development of rural industries can foster progress in the rural economy, facilitate urban–rural integration, and provide an essential foundation for rural revitalization (Shi and Yang, 2022; Fang et al., 2023). However, insufficient rural productivity development, unbalanced industrial development, and an inefficient flow of factors between urban and rural areas have intensified the challenges of achieving an integrated urban–rural development, impeding further advancement of common prosperity in rural areas (Li H. et al., 2022). This may be attributed to several factors.

First, the income of rural residents is primarily derived from agriculture, with a focus on farming (Niu and Zhou, 2025; Weng and Wang, 2025). Traditional agriculture generally yields a lower income for most farmers compared with the income sources of urban residents. In the process of rural industrial development, which targets the modernization of agriculture and rural areas, advanced agricultural technologies are employed, and secondary and tertiary industries are integrated to bring new economic growth points to rural areas (Fei et al., 2025; He et al., 2025; Jin et al., 2025).

Second, rural industrial development relies on local resources, which vary significantly across different regions in China. Consequently, disparities exist in the development of rural industries. In less developed areas, the level of production technology and the quality of the workforce are lower; the industrial structure is more homogeneous, and infrastructure and public services are insufficient to support industrial development, thus widening the urban–rural gap (Li et al., 2024; Sun et al., 2024).

Third, to achieve common prosperity in rural areas, high-quality development is essential, which requires not only robust economic growth but also equitable income distribution. Rural industrial revitalization encompasses the dual goals of high-quality development and common prosperity (Wu, 2025; Wang J. et al., 2025; Xu and Yang, 2025). As a vital means of realizing common prosperity in rural areas in the new stage of China's development, rural industrial revitalization offers a potential solution.

The "State Council's Guidelines on Promoting Rural Industrial Revitalization" states that the basic principles of rural industrial revitalization are "adapting measures to local conditions, highlighting characteristics, market orientation, government support, integrated development, leading with agriculture, green leadership, and innovation-driven approaches". Through rural industrial revitalization, distinctive and advantageous rural industries tailored to local conditions can be developed to help achieve a balanced development across regions and thereby promote the flow of market-oriented urban–rural elements, and under government support, encourage equal and fair construction of regional infrastructure and public services and drive the shift of the rural industrial structure from homogeneity to

integration to enable diversified employment for farmers and full development of rural productivity. Strict adherence to the protection of arable land and ecological red lines, along with innovation-driven approaches, can enhance the quality and efficiency of rural industries. Based on this, we propose:

> *H1*: Rural industrial revitalization has a positive impact on common prosperity in rural areas.

Income is a key determinant of farmers' prosperity, and promoting sustained income growth is the primary objective of achieving common prosperity in rural areas. China currently experiences considerable income disparities among its residents. Historically, lower than that of many other countries, China's income gap now lies between that of Europe and the United States (Piketty et al., 2019). Owing to the incomplete establishment of an integrated urban–rural public security system and the relative backwardness of rural development, the achievement of common prosperity faces significant challenges. The key is to facilitate the transition of a broad segment of low-income groups to middle-income status.

The eradication of absolute poverty through targeted poverty-alleviation campaigns has shifted the focus to poverty governance in China to address relative poverty. The majority of China's low-income population lives in rural areas. The main issue holding back income growth is the slow pace of development of rural industries that benefit farmers. China's agricultural total factor productivity is less than one-third that of non-agricultural industries, and 25% of the labor force in the primary sector contributes only 7.04% to China's GDP. This has to do with rural regions' inadequate integration of basic, secondary, and tertiary businesses, particularly the lagging development of the agro-processing industry. Moreover, common prosperity in rural areas is closely linked to rural productivity. Only when rural productivity and industries develop to a certain level can farmers achieve full employment and higher income, which would lead to common prosperity in rural areas (He et al., 2024).

Rural industrial revitalization promotes deep integration of primary, secondary, and tertiary industries. It facilitates the investment of rural capital, accumulation of human capital, improvement of agricultural technological efficiency, and innovation of production organization models. All of them improve worker productivity and the effectiveness of allocating agricultural resources, help build a reasonable profit-sharing mechanism, and enable farmers to increase their income (Wang et al., 2021). Furthermore, in order for farmers to become the driving force behind rural industrial revitalization and partake in the benefits of industrial growth, it is imperative that their primary position be maintained during the implementation process. Accordingly, we propose:

> *H2a*: Rural industrial revitalization promotes common prosperity in rural areas through its income-increasing effect.

The upgrading of the industrial structure has changed the requirements for labor skills and qualities, and the demand for talent has diversified, thereby promoting improvements in educational attainment and skills (Shao and Wang, 2025). Therefore, rural industrial revitalization, by promoting the upgrading and optimization of the industrial structure, has increased demand for high-quality talent. This, in turn, encourages rural laborers to enhance their skills through education and training, thereby increasing their human capital. Furthermore, human capital shapes the structure of the talent market (Ran et al., 2023), and strong human capital can enhance entrepreneurs' ability to access the resources they need, thereby promoting entrepreneurial activity (Pham et al., 2025). In the agricultural sector, workers with higher levels of education and skills are more likely to adopt new technologies, optimize operations, and adapt to market changes, thereby enhancing human capital and, in turn, boosting efficiency and innovation (Ye, 2025). In the context of industrial revitalization and digital integration, enhancing human capital can improve the application of technologies in rural industries and the efficiency of factor allocation, thereby promoting the upgrading of rural industries to higher-value-added segments. Furthermore, high-quality human capital enhances rural entities' ability to obtain policy, financial, and market information, thereby promoting the development of new rural industrial forms and ensuring the sustainability of the benefits of industrial revitalization.

Furthermore, human capital development helps narrow the income gap between urban and rural areas and achieve economic balance (Zhang et al., 2025). Human capital development has improved rural laborers' employment prospects, enabling them to secure higher-paying jobs and expand their income-generating opportunities. At the same time, the concentration of human capital has made the economic landscape more balanced, ensuring that the benefits of industrial revitalization accrue not only to a few entities, thereby improving the income distribution pattern and narrowing the urban–rural gap. Furthermore, a concentration of human capital effectively fosters prosperity (Wei R. et al., 2025; Liang and Qiao, 2025). The knowledge spillover and demonstration effects resulting from the concentration of human capital can motivate more rural entities to learn and replicate successful experiences, thereby promoting a common level of prosperity within the region. Based on these observations, we propose the following hypotheses:

> *H2b*: Rural industrial revitalization can achieve common prosperity in rural areas by enhancing the level of human capital.

Drawing on the theoretical analysis presented above, this study establishes a model (Figure 1) that delineates how rural industrial revitalization helps promote common prosperity. This model discerns two

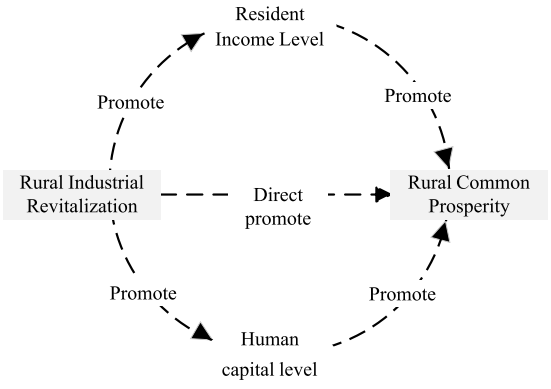

FIGURE 1
Mechanism and path for rural industry revitalization and common prosperity.

primary facets: first, the direct impact of rural industrial revitalization on common prosperity, and second, it can indirectly promote the common prosperity by increasing income and improving the human capital level.

3 Methodology

3.1 Data source description

This study used 2013–2023 panel data from 30 provinces in China. The data sources were the "China Statistical Yearbook", "China Rural Statistical Yearbook", "China Urban and Rural Construction Statistical Yearbook", various provincial statistical yearbooks, and the Peking University Digital Finance Research Center. To ensure consistency in the measurement units across different data types, the following procedures were applied: (1) Standardization: The data used in the models analyzing the impact of rural industrial revitalization on rural common prosperity were standardized to eliminate the influence of different units of measurement; (2) Adjustment for Inflation: Economic data such as GDP were deflated using 2013 as the base year to account for the effects of inflation; (3) Handling of Ratio Variables: Ratio variables were used in their original forms; (4)Log Transformation: For variables with large original values, a logarithmic transformation was applied to normalize the data and reduce skewness; (5) Interpolation for Missing Data: Where appropriate, interpolation methods were employed to fill in the missing data points to maintain the integrity of the dataset. The findings of the descriptive statistical analysis are shown for each variable in Table 1. Furthermore, to ensure that each explanatory variable could be independently related to the explained variable, we conducted a multicollinearity test on the model variables. The results show that all variables have variance inflation factor (VIF) values below 10, with an average VIF of 4.35, which is significantly lower than the threshold of 10. This result indicates that there are no serious multicollinearity problems in the model.

3.2 Variable selection

The variables used in this study are described below.

3.2.1 Dependent variable

The dependent variable is Rural Common Prosperity (*RCP*). Although existing literature extensively measures common prosperity, studies that specifically target rural common prosperity are few (Liu K. et al., 2025; Tan et al., 2025; Xing and Wang, 2025). No unified measurement index system similar to the broader concept of common prosperity is currently available; however, existing measurements often revolve around the two dimensions of "prosperity" and "sharing." In line with the practical needs of this research, we selected indicators based on two aspects: the overall level of prosperity and the degree of shared development. Rural common prosperity was measured in this study using the entropy method; Table 2 provides the specific index system.

3.2.2 Explanatory variable

The core explanatory variable: Rural Industrial Revitalization (*RIR*). The current literature on evaluation indicators for rural industrial revitalization is relatively scarce and lacks consensus, with the majority of academics concentrating on the rural revitalization strategy's overall measurement. Drawing on the construction methods of the evaluation index system for rural industrial revitalization from previous studies (Liu et al., 2022a; Wang S. et al., 2025; Zhou et al., 2025; Xu and Yang, 2025) and based on the theoretical analysis and data availability in the previous section, this study uses the entropy weight method to measure the level of rural industrial revitalization in each province. Specifically, the evaluation was conducted from three dimensions: the agricultural product industry system, the multifunctional agricultural system, and the agricultural supporting industry system. The specific evaluation indicators are listed in Table 3.

In Table 3, the Producer Price Index reflects the returns on agricultural products and the market transmission mechanism. A reasonable and stable price index can enhance the investment and expansion intentions of business entities, thereby promoting rural industry development. The total output value of agriculture, forestry, animal husbandry, and fishery, as well as the per capita grain output, can directly reflect the output scale and supply capacity of the primary industry in rural areas and can be used to measure whether agriculture and related industries can continuously and stably expand effective supply and enhance economic contribution. The total power of agricultural machinery and rural electricity consumption reflects the input of

TABLE 1 Descriptive statistical analysis results.

Variables	Symbol	Obs	Mean	SD	Min	Max
Rural common prosperity	*RCP*	330	0.4850	0.1124	0.1771	0.7614
Rural industrial revitalization	*RIR*	330	0.1993	0.0818	0.0385	0.4889
Urbanization level	*URB*	330	0.6223	0.1161	0.3789	0.9309
Rural financial development level	*DIG*	330	5.6190	0.3126	4.7792	6.2103
Inclusive finance development level	*FIN*	330	6.8310	6.2883	1.1435	42.1002
Regional income inequality level	*IMP*	330	0.5264	0.1683	0.2910	1.0000
Government intervention	*GOV*	330	0.2492	0.1012	0.1066	0.6430
Opening up to the outside world	*OPEN*	330	0.2583	0.2539	0.0076	1.2571
Resident income level	*INC*	330	9.4880	0.3393	8.6286	10.4049
Human capital level	*HCL*	330	0.0221	0.0059	0.0089	0.0437

TABLE 2 Rural common prosperity indicator system.

Primary indicator	Secondary indicator	Tertiary indicator	Method of measurement
Overall wealth level	Economic aspect	Income level	Per capita disposable income of rural residents
		Consumption level	Per capita consumer spending of rural residents
	Cultural aspect	Mental outlook	Average educational attainment in rural areas
			Rural residents' expenditure on cultural, educational, and entertainment services
	Social aspect	Infrastructure	Postal services rural delivery routes
			Mileage of third and fourth-class roads
		Public services	Number of rural residents with minimum living standard security
			Number of healthcare professionals per thousand rural residents
Degree of shared development	Urban–rural disparity	Disparity in residents' living standards	Urban–rural per capita disposable income ratio
			Urban–rural per capita consumer spending ratio
		Infrastructure disparity	Urban–rural per capita road area ratio
			Urban–rural per capita green space ratio
		Public service disparity	The urban–rural ratio of hospital beds per thousand people
			Urban–rural per capita transfer income ratio
		Industrial development disparity	Labor productivity of the secondary and tertiary industries/Labor productivity of the primary industry

TABLE 3 Rural industrial revitalization indicator system.

Primary indicator	Secondary indicator	Tertiary indicator
Agricultural product industry system	Product supply	Producer price index
	Product production	Total output value of agriculture, forestry, animal husbandry, and fishery
		Per capita grain production
	Product competition	Total power of agricultural machinery
		Rural electricity consumption
Multifunctional agricultural industry system	Economic function	Number of enterprises
		Fixed asset investment in agriculture by households
	Social function	Rural population proportion
	Ecological function	Fertilizer usage
		Green space area
	Cultural function	Cultural centers
Agricultural support industry system	Technological support	Proportion of agricultural R&D expenditure
		Proportion of agricultural R&D personnel
		Number of Internet users

agricultural production factors and the upgrading of production methods. An increase in input and efficiency usually indicates that the industry is undergoing transformation and upgrading to a higher level. The number of enterprises and farmers' agricultural fixed asset investment reflects changes in the agricultural industry's main body and capital input. An increase in these figures usually indicates an improvement in the industry's activity level, an extension of the industrial chain, and a capacity for job creation. The proportion of the rural population can be used to depict changes in the population and employment structure during industrial development. Such changes can reflect the impact of rural industries' absorption capacity and the improvement of public services on population retention and employment stability. The amount of chemical fertilizer used and the area of green space were used to reflect green and sustainable transformation in the process of industrial revitalization. Together, they depict the extent to which agricultural industries have shifted from simplistic approaches to green, efficient models. The cultural activity center not only reflects improvements in rural public services and quality of life but also provides a platform for industries such as rural tourism and leisure agriculture. In this sense, it may help promote the diversified development of local cultural industries. The proportions of agricultural research and development funds and of research personnel reflect the level of investment in agricultural science and technology and the support provided by talent. Technological progress and

talent building provide key impetuses for the innovative development of rural industries. The number of internet users reflects the level of rural digital infrastructure and the extent of digitalization. This improvement can help reduce information and transaction costs, promote e-commerce sales and industrial chain collaboration, and drive the expansion of rural industrial chains and the development of new business models.

3.2.3 Mediating variables

To explore the mechanisms through which rural industrial revitalization affects common prosperity in rural areas, this study considered income growth and employment as mediating variables, measured by the Resident Income Level (*INC*) and Human Capital Level (*HCL*), respectively. The INC was measured through per capita disposable income in rural areas. The HCL is measured using the methodology proposed by Wang et al. (2026) and calculated as the ratio of the number of students enrolled in regular higher education institutions to the region's year-end resident population.

3.2.4 Control variables

Under the condition of available data, this paper refers to existing studies (Zhang T. et al., 2023; Jiao et al., 2025; Wang et al., 2026; Lu et al., 2026c; Lu et al., in press) and sets the following control variables: (a) Urbanization Level (*URB*), which is the ratio of the population living in cities to the overall population; (b) Rural Financial Development Level (*FIN*), assessed using the ratio of agriculture-related loans to the total value of agricultural output; (c) Inclusive Finance Development Level (*DIG*), measured using the digital inclusive finance index; (d) Income Inequality Level (*IMP*), measured by comparing the per capita disposable income of rural areas in other regions with that of Shanghai; (e) Degree of government intervention (*GOV*), the proportion of local fiscal expenditure to regional GDP; and (f) Degree of openness (*OPEN*) is indicated by the ratio of total value of goods imports and exports to the regional GDP.

3.3 Model specification

The following baseline regression model was constructed to examine the impact of the rural industrial revitalization (RIR) on the regression model:

$$RCP_{it} = \alpha_0 + \alpha_1 RIR_{it} + \alpha_2 \sum control_{it} + y_t + \mu_i + \xi_{it} \quad (1)$$

In Model 1, *RCP* represents rural common prosperity; i is the region; t is the period; α denotes the parameters to be estimated; *RIR* denotes rural industrial revitalization, and *Control* represents the control variables. μ represents the region-specific effects in the model. y denotes time-specific effects, capturing any influence specific to the study period (years). ξ is the random error term used in this model.

To verify whether hypotheses H2a and H2b are valid, we constructed the following mediation effect model:

$$Med_{it} = \theta_0 + \theta_1 RIR_{it} + \theta_2 \sum control_{it} + y_t + \mu_i + \xi_{it} \quad (2)$$

$$RCP_{it} = \beta_0 + \beta_1 RIR_{it} + \beta_2 Med_{it} + \beta_3 \sum control_{it} + y_t + \mu_i + \xi_{it} \quad (3)$$

In these models, *Med* represents the mediating variable, and the other symbols have the same meaning as those in the baseline regression Model 1. In the empirical test, Model 2 was first employed to examine whether *RIR* significantly influenced the mediating variable (*Med*), thereby determining whether *RIR* operates through this channel. Based on this, rural common prosperity (*RCP*), rural industrial revitalization (*RIR*), and the mediating variable (*Med*) were incorporated into Model 3 to examine whether the mediating variable (*Med*) had a mediating effect.

4 Empirical results

4.1 Baseline regression results

Table 4 presents the results of baseline regression analyses. Column (1) of Table 4 shows panel regression results that only include individual fixed effects, while Column (2) includes individual fixed effects and time fixed effects, and Column (3) lists regression results that include individual time double fixed effects and control variables. In all three scenarios, the regression coefficients for RIR are significantly positive at the 1, 5, and 1% levels. This result indicates that RIR plays a crucial role in promoting RCP, thereby verifying H1. Furthermore, each control variable had a significant impact on the RCP to varying degrees; thus, the selection of control variables was effective.

Rural industrial revitalization, a fundamental aspect of rural rejuvenation, requires precise and impactful measures and plays a vital role in promoting common prosperity in rural areas. It leverages local resources and advantages, extends and expands industries to enhance the value of rural industrial development, and stimulates local economic growth. Additionally, China's shift from traditional to modern agriculture is facilitated by rural industrial revitalization, which permits complicated elements and technical innovation to infiltrate primary, secondary, and tertiary sectors. This transition broadens employment and income generation opportunities for farmers, benefiting them substantially. Additionally, improvements in rural

TABLE 4 The results of the benchmark regression analysis.

Variables	(1) RCP	(2) RCP	(3) RCP
RIR	1.0333***	0.1213**	0.2362***
	(0.0979)	(0.0607)	(0.0621)
Constant	0.2791***	0.3704***	−0.3020
	(0.0197)	(0.0113)	(0.2763)
Controls	*No*	*No*	*Yes*
Province FE	*Yes*	*Yes*	*Yes*
Year FE	*No*	*Yes*	*Yes*
Observations	330	330	330
R-squared	0.2716	0.8489	0.8691

Robust standard errors are indicated in parentheses. *** denotes $p < 0.01$; **, $p < 0.05$; and *, $p < 0.1$.

infrastructure and public services such as water and electricity supplies, roads, healthcare, and sanitation provide essential support for rural development. These advancements not only improve living conditions for farmers but also lay the groundwork for achieving common prosperity.

4.2 Endogeneity treatment and robustness tests

4.2.1 Endogeneity treatment

In the baseline regression analysis, the model may be subject to endogeneity due to omitted control variables or reverse causality, thereby affecting the reliability of the estimation results. In view of this, a commonly adopted approach in existing literature is to handle it using the instrumental variable method. Therefore, in the subsequent analysis, the instrumental variable method was used to test for and correct for potential endogeneity.

(1) Historical level of industrial development

This study follows the method of Xu M. et al. (2025) and uses the historical level of rural industrial development as the instrumental variable, lagged by one period. The two-stage least squares (2SLS) method is used to address endogeneity. Theoretically, RIR in the previous period does not directly affect RCP in the current period. It only influences the RIR for the current period and thereby indirectly affects the RCP for the same period. From the statistical results, Table 5's columns (1)–(2) present the regression analysis results for the instrumental variable method. As shown in the table, the *Kleibergen–Paap rk LM* statistical value is significant at the 1% level, rejecting the null hypothesis that the instrumental variables are unidentifiable and indicating that they are effective and pass the pseudo-identification test. The statistical value of *Cragg–Donald Wald F* was 24.637, which was higher than the 10% critical value of 16.38 set by *Stock–Yogo*. This result indicates that the null hypothesis of weak instrumental variables is rejected, thereby eliminating the problem. Furthermore, although in the case of heteroscedasticity robustness, the *Kleibergen–Paap rk Wald F* statistic did not fully exceed the corresponding critical value, this statistic is generally more conservative and prone to underestimating the strength of the instrumental variables in a limited sample. Based on the significance of the regression results in the first stage and the failure of the *Hansen J* test to reject the overidentification null hypothesis, it can be concluded that the selected instrumental variables were generally reasonable and acceptable. According to the results in column (2) of Table 5, after applying instrumental variables for endogeneity handling, RIR still had a significant positive impact on the RCP, indicating the robustness of the baseline regression results.

(2) Level of agricultural industrial agglomeration

The calculation method was based on Yuan et al. (2020). It measures the level of industrial agglomeration using the regional entropy value, which is calculated as the ratio of the total output value of agriculture, forestry, animal husbandry, and fishery in a certain region to the total output value of agriculture, forestry, animal husbandry, and fishery in the whole country, divided by the ratio of the gross domestic product of that province to the gross domestic product of the whole country. This indicator can effectively mitigate the influence of regional- and industrial-scale differences, thereby more accurately reflecting the degree of agricultural industrial agglomeration in the region. From a theoretical perspective, the direct target of agricultural industrial agglomeration is the agricultural industrial system itself rather than the level of rural common prosperity. Its impact on common rural prosperity is indirectly achieved by promoting the development of the agricultural industry. From the statistical results, Table 5's columns (3)–(4) present the regression analysis results of the instrumental variable method. As shown in the table, the *Kleibergen–Paap rk LM* statistical value is significant at the 1% level, rejecting the null hypothesis that the instrumental variables are unidentifiable and indicating that they are effective and pass the pseudo-identification test. The statistical values of *Cragg–Donald Wald F* and *Kleibergen–Paap rk Wald F* are 18.160 and 20.441, respectively, which are higher than the 10% critical value of *Stock–Yogo* (16.38). This result indicates that the null hypothesis of weak instrumental variables was rejected, thereby eliminating the problem. Furthermore, the *Hansen J* statistic is 0.000, indicating that there is no overidentification problem with the instrumental variable. Therefore, the selection of instrumental variables was effective. According to the results in column (4) of Table 5, after applying the instrumental variable for endogeneity treatment, the RIR still had a significant positive impact on the RCP, indicating the robustness of the baseline regression results.

TABLE 5 Regression results using the instrumental variable method.

Variables	(1) RIR	(2) RCP	(3) RIR	(4) RCP
IV	0.3102**		0.0524***	
	(0.1358)		(0.0189)	
RIR		0.5273**		0.5882***
		(0.2376)		(0.2234)
Constant	1.0256***	−0.3152	0.9350**	−0.6798**
	(0.4759)	(0.4625)	(0.3642)	(0.3447)
Controls	*Yes*	*Yes*	*Yes*	*Yes*
City FE	*Yes*	*Yes*	*Yes*	*Yes*
Year FE	*Yes*	*Yes*	*Yes*	*Yes*
Observations	300	300	330	330
R-squared	0.5341	0.9669	0.5562	0.9650
Kleibergen–Paap rk LM statistic	9.581***		20.664***	
Cragg–Donald Wald F statistic	24.637 {16.38}		18.160 {16.38}	
Kleibergen–Paap rk Wald F statistic	5.251 {16.38}		20.441 {16.38}	
Hansen J statistic	0.000		0.000	

Robust standard errors are indicated in parentheses. *** denotes $p < 0.01$; **, $p < 0.05$; and *, $p < 0.1$. The value in curly braces {} is the Stock–Yogo critical value at the 10% level.

4.2.2 Other robustness tests

(1) Placebo test

To further verify the reliability of the promoting effect of the RIR on the RCP in the benchmark regression and eliminate the possibility that the results may be caused by model specification errors, omitted variables, measurement errors, or random factors leading to spurious causal relationships, this study conducted a placebo test using a random sampling method. The specific approach was to maintain the original sample size, randomly shuffle the values of the core explanatory variable, RIR, across regions and years, and reassign them to each observation. After each random sample, the baseline regression model is re-estimated, and the resulting regression coefficients and significance levels are recorded. This process was repeated 1,000 times, generating estimates from a random distribution and comparing them with the actual regression results to determine whether the base conclusion deviated significantly from the random distribution. The RIR coefficients and significance distribution graphs of the random sampling regression results are shown in Figure 2.

As shown in Figure 2, after random sampling and regression analysis, the 1,000 RIR coefficients mostly fell above the 10% significance level, indicating a non-significant normal distribution and suggesting that the random RIR effects are mostly non-significant. However, the benchmark regression results were located at the tail of this distribution and represented a low-probability event. Therefore, the original estimation results exhibited a certain degree of robustness.

(2) Double machine learning test

The simple multiple linear regression model has inherent drawbacks, such as overly strong functional form assumptions, poor handling of high-dimensional covariates, endogeneity bias, overfitting, and limited predictive performance. The core of dual machine learning lies in "orthogonalization" and "cross-fitting." By dividing the samples into multiple folds and exchanging the training and validation data within each fold, even if the estimation of the disturbance term is not sufficiently precise, it is still possible to achieve an unbiased and efficient estimation of the target parameters, effectively suppressing overfitting and bias accumulation. Therefore, in the following section, we adopt the approach of Yu and Zou (2025) and Liu and Wei (2025) and use a partially linear dual-machine-learning model to conduct a robustness test. In the specific calculation process, to reduce bias in the model setting for dual machine learning on the benchmark, four algorithms were employed: Lasso Regression, Elastic Net Regression, Ridge Regression, and Support Vector Machine (SVM). At the same time, for each algorithm, two cross-validation methods were used: 5-fold (*Kfolds* = *5*) and 8-fold (*Kfolds* = *8*) to assess the impact of changes in the sample segmentation ratio on the research conclusions.

The rows (1)–(4) in Table 6 represent the test results for 5-fold (with *Kfolds* = *5*), and rows (5)–(8) represent the test results for 8-fold (with *Kfolds* = *8*). The results showed that the RIR significantly improved the RCP across four machine learning models and two sample segmentation ratios. This finding is consistent with previous baseline regression results. Thus, the benchmark regression results are highly credible.

(3) Tail shortening treatment

To reduce the interference of extreme values and outliers on the regression results and to prevent a few abnormal observations from having an excessive influence on the parameter estimation, we performed tail trimming at the 1 and 99% levels for the core variables to test the stability and reliability of the benchmark regression conclusion after eliminating extreme samples. According to the results in column (1) of Table 7, the regression coefficient of RIR remains significantly positive at the 1% significance level, further strengthening the robustness of the base conclusion.

(4) Exclude samples from the municipalities directly under the central government

Given that special administrative regions are significantly different from other provinces in terms of resource concentration,

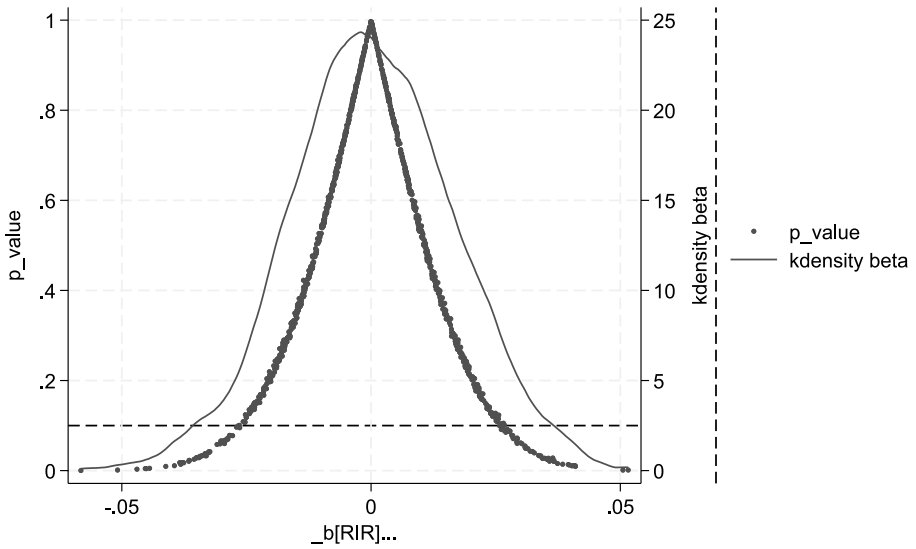

FIGURE 2
Placebo test.

TABLE 6 Results of the double machine learning (DML) test.

Variables	(1) Lassocv	(2) Elasticcv	(3) Ridgecv	(4) SVM	(5) Lassocv	(6) Elasticcv	(7) Ridgecv	(8) SVM
RIR	0.2646***	0.2451***	0.2472***	0.1606***	0.2149***	0.2413***	0.2411***	0.1538***
	(0.0766)	(0.0800)	(0.0765)	(0.0420)	(0.0790)	(0.0772)	(0.0782)	(0.0415)
Constant	−0.0002	0.0000	0.0002	0.0169***	−0.0003	−0.0001	−0.0002	0.0176***
	(0.0013)	(0.0013)	(0.0013)	(0.0029)	(0.0013)	(0.0013)	(0.0013)	(0.0028)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Province FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	330	330	330	330	330	330	330	330

Robust standard errors are indicated in parentheses. *** denotes $p < 0.01$; **, $p < 0.05$; and *, $p < 0.1$.

TABLE 7 Other robustness tests.

Variables	(1) Winsorization	(2) Exclude municipalities	(3) One-period lagged
RIR	0.2887***	0.3274***	
	(0.0689)	(0.0653)	
L. RIR			0.1636**
			(0.0653)
Constant	−0.2766	−0.2705	0.2683
	(0.2964)	(0.2666)	(0.3511)
Controls	*Yes*	*Yes*	*Yes*
Province FE	*Yes*	*Yes*	*Yes*
Year FE	*Yes*	*Yes*	*Yes*
Observations	330	286	300
R-squared	0.8710	0.8979	0.8406

Robust standard errors are indicated in parentheses. *** denotes $p < 0.01$; **, $p < 0.05$; and *, $p < 0.1$.

economic vitality, and policy systems, including them in the full sample may amplify the enabling effects of the RIR. Therefore, after excluding samples from the municipalities, a new regression estimation was conducted. The results in column (2) of Table 7 indicate that the regression coefficient of RIR remains significantly positive at the 1% significance level, further verifying the robustness of the baseline conclusion.

(5) Lagged one-period core explanatory variable

To further alleviate the potential reverse-causal relationship and the time-lag issue caused by the RIR, this study introduces the RIR one period in advance. It examines whether its previous changes still have a significant impact on the current RCP. This approach enhances the causal interpretability and robustness of the benchmark regression results. The results in the (3) column of Table 7 show that the RIR regression coefficient for the lagged period remains significantly positive, further verifying the robustness of the basic conclusion.

4.3 Heterogeneity tests

4.3.1 Regional heterogeneity

China's vast territory, influenced by diverse natural conditions, historical cultures, and local policies, exhibits imbalanced and insufficient regional development. The impact of rural industrial revitalization may vary owing to regional disparities. Therefore, this study divides the entire sample into eastern, central, and western regions. According to the regression results in columns (1)–(3) of Table 8, the RIR has a significantly positive impact on the RCP in the central and western regions at the 1% significance level, but its effect is not significant in the eastern region.

From a practical perspective, the main reasons for this disparity stem from differences in development stage, resource endowment, and constraints across regions. For underdeveloped regions in the central and western parts of the country, rural economic development is relatively slow, with scarce financial resources and weak economic resilience (Cao et al., 2025). Farmers' income is highly dependent on the primary industry and related industries.

TABLE 8 Heterogeneity test results.

Variables	(1) Eastern region	(2) Central region	(3) Western region	(4) Areas with high urbanization rate	(5) Areas low urbanization rate
RIR	0.0208	1.2568***	0.5019***	−0.0346	0.3854***
	(0.0811)	(0.1868)	(0.1852)	(0.0807)	(0.0882)
Constant	−0.4946	−0.8774	−0.4766	−1.0079**	0.3537
	(0.5176)	(0.7325)	(0.5585)	(0.4950)	(0.3901)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Province FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	121	88	121	121	209
R-squared	0.8832	0.9052	0.9124	0.8830	0.8963

Robust standard errors are indicated in parentheses. *** denotes $p < 0.01$; **, $p < 0.05$; and *, $p < 0.1$.

Meanwhile, the western region lags in terms of economic development and modernization, with a higher poverty rate and greater demand for rural revitalization (Qian et al., 2025). In this context, the RIR can directly promote employment growth and increase farmers' income by improving agricultural production conditions, cultivating specialized industries, and extending the agricultural value chain. The marginal effect is particularly significant. Meanwhile, with the revitalization of rural industries, digital infrastructure and digital finance have a significant "filling of gaps" effect in remote areas (Chen et al., 2025). The development of the digital economy can significantly promote rural revitalization (Deng X. et al., 2024), thereby effectively amplifying the RIR's impact on the RCP. In contrast, the eastern region has a developed economy and a diversified industrial structure, which gives it advantages in technological innovation and resource allocation (Liu et al., 2024a). In this context, farmers' income sources have become more diversified, and rural residents' reliance on agriculture and related industries has been relatively low. The marginal improvement in income and welfare brought about by the RIR is limited, and its effect is easily "diluted" by other growth factors, such as technological innovation, capital allocation efficiency, and the development of high-end services. Therefore, it was unlikely to have a statistically significant short-term effect.

4.3.2 Urbanization heterogeneity

Based on each province's average urbanization rate, this study divided the entire sample into high- and low-urbanization-rate areas for regression analysis. According to the results in columns (4) and (5) of Table 8, it can be seen that in regions with a higher urbanization rate, the impact of RIR on RCP is not significant. In regions with lower urbanization rates, the effect is significantly positive at the 1% level. From a practical perspective, urbanization can effectively reduce poverty in rural areas (Ha et al., 2021). Meanwhile, new urbanization is mainly driven by higher productivity in the industrial and service sectors (Tripathi and Rani, 2018). Therefore, regions with high urbanization rates have a better foundation for poverty reduction than regions with low urbanization rates. The increase in rural resident income is mainly achieved through nonagricultural employment and improvements in public services. The marginal promoting effect of the RIR is relatively low. There were more rural low-income groups in areas with low urbanization. Coupled with the scarcity of nonagricultural jobs in cities and their weak absorption capacity, the revitalization of rural industries can directly boost local employment and business income. Therefore, it has a more significant impact on improving common prosperity. In addition, new productive forces, green bonds, and the digital economy have a significant effect on common prosperity (Liu et al., 2024b; Liu S. et al., 2025; Lu et al., 2025c; Wei L. et al., 2025). Digital technology and rural digital connectivity have a more significant impact on narrowing the income gap between urban and rural areas in highly urbanized provinces (Zhang and Lu, 2025). In areas with high urbanization rates, factors with higher returns, such as the digital economy, are more prominent, and rural income growth relies more on channels such as e-commerce and digital finance. This scenario can easily lead to a "crowding-out" effect on RIR, thereby reducing its impact on RCP. In areas with low urbanization levels, the concentrations of these elements were relatively low. The digital economy and the benefits of platforms have not yet been fully realized (Lu et al., 2026d). Farmer income growth depends more on the improvement and development of local industrial systems. Therefore, the influence of the RIR on the RCP is more significant.

4.4 Mechanism analysis

Based on the theoretical analysis in the previous section, this study argues that RIR promotes RCP by facilitating INC and enhancing HCL. To verify this hypothesis, this study follows common practice in the existing literature (Lu H. et al., 2025; Zheng et al., 2025). It conducts the following mediation effect test using the two-step method and Models 2 and 3.

The rows (1) and (2) of Table 9 present the regression results for the mediating effect of INC. The results in Column (1) show that RIR can significantly promote INC at the 10% level. Therefore, the first test is conducted. According to the results in Column (2), when both variables are included in Model 3, RIR and INC have a significant positive effect on RCP at the 1% level, and the regression coefficient of RIR is lower than that of the baseline regression. This finding indicates that the RIR can positively impact the RCP by enhancing the INC, thereby verifying the existence of a mediating effect. Therefore, H2a is verified.

TABLE 9 Test Results of the Mediating Effects.

Variables	(1) INC	(2) RCP	(3) HCL	(4) RCP
RIR	0.0333*	0.2186***	0.0059*	0.2142***
	(0.0185)	(0.0617)	(0.0033)	(0.0613)
INC		0.5308***		
		(0.1971)		
HCL				3.7648***
				(1.1127)
Constant	7.9798***	−4.5377***	−0.0449***	−0.1331
	(0.0824)	(1.5961)	(0.0145)	(0.2759)
Controls	*Yes*	*Yes*	*Yes*	*Yes*
Province FE	*Yes*	*Yes*	*Yes*	*Yes*
Year FE	*Yes*	*Yes*	*Yes*	*Yes*
N	330	330	330	330
R-squared	0.9990	0.8724	0.8963	0.8742

Robust standard errors are indicated in parentheses. *** denotes $p < 0.01$; **, $p < 0.05$; and *, $p < 0.1$.

At the same time, this research finding is consistent with existing studies suggesting that rural industrial development can effectively promote the growth of rural residents' income (Wang et al., 2024) and that increased income helps realize common prosperity (Kakwani et al., 2022).

The rows (3) and (4) in Table 9 present the regression results for the mediating effects of HCL. The results in column (3) show that RIR significantly promotes HCL at the 10% level. Therefore, the first step was successfully verified. According to the results in Column (4), when both variables are included in Model 3, both RIR and HCL have a significant promoting effect on RCP at the 1% level. Moreover, the regression coefficient for the RIR was lower than that in the baseline regression, thereby verifying the mediating effect. Thus, H2b was verified. At the same time, this research finding is consistent with existing studies, which suggest that rural industrial development can effectively enhance human capital levels (Chen et al., 2024) and that human capital is of great significance in narrowing the income gap between urban and rural areas and achieving common prosperity (Luo and Hu, 2024).

With the revitalization of rural industries, the infrastructure in agricultural areas will be further improved. Infrastructure such as broadband networks has expanded the accessibility of basic technical education and vocational training, and enhanced the fairness and cohesion of development opportunities between urban and rural areas (Niu et al., 2022). Higher education is more likely to produce graduates with the potential to invent new technologies. It can not only provide technology and innovation but also supply the labor force with highly skilled talents (Maneejuk and Yamaka, 2021). Therefore, the level of higher education, as a proxy variable for human capital, can enhance rural labor productivity and employment capabilities, providing high-quality and sustainable human capital reserves for urban–rural integration (Wang and Song, 2026). The enhancement of human capital, exemplified by higher education, helps promote the dissemination and innovation of knowledge, thereby improving the quality and skills of farmers, enabling their intellectual capital to better contribute to agricultural production (Ren et al., 2025; Chen and Hu, 2025).

Therefore, from the perspective of statistical results or from the viewpoint of existing research, both H2a and H2b were supported as reasonable.

5 Discussion

First, this study reveals that rural industrial revitalization has a significant promoting effect on rural common prosperity, thereby supporting Hypothesis 1. The validity of Hypothesis 1 was also verified through robustness tests, including endogeneity handling and double machine learning. Meanwhile, the levels of residents' income and human capital play a mediating role in the process of rural industrial revitalization in promoting rural common prosperity, supporting Hypothesis 2a and Hypothesis 2b. These results contribute to the expanding literature on rural transformation and spatial equity and align with prior studies that emphasized the strategic importance of industrial integration in achieving balanced rural development (Wang S. et al., 2025). Rural industrial integration has the potential to enhance rural resilience, reduce inequality, and narrow the gap between urban and rural areas (Fan et al., 2023). The integration of primary, secondary, and tertiary industries in rural areas creates diversified development pathways that contribute to both economic growth and the equitable distribution of development outcomes. Rural revitalization requires breaking away from the "sole reliance on agriculture" development strategy and shifting towards a more comprehensive industrial transformation (Liu et al., 2022b). Moreover, the incorporation of mediation analysis provides a deeper understanding of the mechanisms through which industrial revitalization affects common prosperity, allowing the disentanglement of income and human capital effects—two critical channels identified in the literature (Wang et al., 2024).

Second, empirical analysis shows that the impact of rural industrial revitalization on rural common prosperity is more significant in the central and western regions and in areas with a lower level of urbanization. This is an important contribution to the literature, as much of the existing research has focused on eastern or urban-adjacent regions, where industrial capacity and infrastructure are more developed. Our findings suggest that in less developed or less urbanized areas, rural industrial revitalization plays a more critical role in generating local employment, improving household income, and compensating for development deficits. This echoes the regional differentiation highlighted by Feng et al. (2019), who found that land-centered urbanization has differential impacts on rural transformation depending on local conditions. The stronger effects observed in central and western provinces also reflect the context-dependent nature of industrial development. In these regions, rural industrial revitalization often represents one of the few viable pathways for inclusive growth, given limitations in infrastructure, capital access, and market connectivity. Nevertheless, the development of rural industries in these regions can unlock latent potential by

utilizing local resources, promoting endogenous innovation, and supporting rural human capital formation (Zhang Y. et al., 2023). These regional findings also reinforce the relevance of spatially differentiated development strategies, as recognized in the broader discourse on China's rural evolution.

Third, the results resonate with the spatial restructuring framework of Jiang et al. (2022) and Long et al. (2022), who propose that rural revitalization depends not only on industrial input but also on spatial reallocation mechanisms, such as land consolidation and infrastructure integration. Our findings indirectly support this view by showing that the effects of industrial revitalization are most visible in areas where structural transformation of land use is feasible. In this sense, the study highlights the interplay between industrial policy and spatial governance in driving inclusive rural development. Taken together, the empirical results lend support to a multidimensional understanding of rural common prosperity. Rather than being driven solely by fiscal transfers or social welfare, common prosperity in the Chinese rural context appears to depend on structural economic changes—particularly those induced by rural industrial revitalization. As Hu et al. (2025) suggest, the integration of agriculture, industry, and services catalyzes institutional, spatial, and economic reconfigurations, making prosperity both broader in reach and deeper in structure. In summary, this study advances the literature by providing provincial-level empirical evidence on how rural industrial revitalization shapes rural common prosperity in China. It complements prior conceptual and policy-focused works by grounding the analysis in measurable economic and social outcomes.

Fourth, for the majority of developing countries, the issue of rural poverty remains extremely serious (Onyeyirichi and Deepika, 2025; Anthopoulou et al., 2025). The growth of the agricultural sector plays a crucial role in reducing global poverty, especially in the poorest countries (Hossain et al., 2024). Therefore, the findings of this article regarding the promotion of rural common prosperity through rural industrial revitalization have significant reference value for the policy practices of other developing economies. However, it is necessary to emphasize that the impact of rural industrial revitalization on rural common prosperity may exhibit certain heterogeneity due to factors such as the economic system, policy regulation, and natural resources. Therefore, this kind of "borrowing" is not merely about simply copying a specific set of policy tools; rather, it involves providing a transferable development logic: By reconfiguring the agricultural-based industrial system, we aim to boost the income of farmers and, in the process, enhance the accumulation of human capital and the capacity for providing public services, thereby promoting the common prosperity of rural areas. The rural poverty in developing countries is intertwined with issues such as a short industrial chain and a weak market. The revitalization of rural industries should be based on local conditions, and policies should be tailored to local circumstances. Overall, the main message of this article is not to provide a set of directly applicable policy templates, but to reveal the differences in effectiveness and applicable limitations of rural industrial revitalization as a development path under different institutional and market conditions, thereby providing a reference for developing countries to explore rural industrial revitalization and poverty reduction strategies that are in line with their own national conditions.

6 Conclusions and policy recommendations

6.1 Conclusion

Based on panel data from 30 provinces in China, this study empirically investigates the impact of rural industrial revitalization on rural common prosperity using FGLS and mediation effect models. The main conclusions are summarized below: (1) Rural industrial revitalization significantly promotes rural common prosperity, a conclusion reaffirmed by the robustness tests. (2) The effect of rural industrial revitalization on common prosperity shows heterogeneity, with more significant impacts in the central, western, and lowly urbanized areas. (3) The mechanism tests reveal that rural industrial revitalization enhances rural common prosperity by increasing the disposable income and human capital.

6.2 Policy implications

Based on the above research conclusions, to promote common rural prosperity through industrial revitalization, we suggest focusing on the following aspects:

First, RIR has a significant and direct promotional effect on prosperity. Therefore, local governments should further enhance their efforts, strengthen support mechanisms for rural industries, and raise the region's common prosperity level. Local governments should promote the large-scale, standardized, and brand-oriented development of local rural industries. Therefore, we should improve the production, storage, logistics, and sales systems of rural industries and establish an integrated production and sales mechanism, thereby reducing transaction costs for agricultural products and enhancing their added value. Furthermore, local governments should avoid relying excessively on urban areas to drive rural development. Instead, they should foster the internal growth momentum of rural areas by promoting integrated urban–rural development and improving the rural financial system (Lu et al., 2025d).

Second, as the impact of RIR on common prosperity shows significant heterogeneity, local governments should follow market rules, fully recognize regional differences, and formulate rural industrial development plans that align with local resource endowments, market demands, and technical conditions. In the central and western regions and areas with low urbanization rates, we should not only fully leverage their ecological advantages to promote characteristic agriculture but also strengthen infrastructure and public service development. The government should prioritize supporting labor-intensive industries with strong employment absorption capacity and county-level industries that benefit the people, and continuously promote RIR. In the eastern regions or those with a higher level of urbanization, the marginal effect of simply relying on scale expansion may diminish. Therefore, the policy focus should shift from quantitative expansion to quality improvement and value chain enhancement. First of all, it is necessary to promote standardized production and brand building of agricultural products, and concurrently develop high-value-added links such as intensive processing, pre-packaging, and functional agricultural products, in order to enhance the market bargaining power of the agricultural industry. Secondly, strengthen the collaborative interaction with supporting industries such as supply chain services, digital marketing, and agricultural tourism. Furthermore, we should shift from homogeneous competition to differentiated industrial positioning, and encourage county-level regions to engage in division of labor

cooperation and cross-regional collaboration. For instance, jointly build an industrial chain collaboration platform, share warehousing, cold chain, and testing centers, and connect with leading enterprises to secure orders. This will enable more resources to be invested in technological transformation, green and low-carbon development, and improvement of service capabilities, rather than blindly constructing similar agricultural industries. Thus, it can enhance the efficiency of transforming industrial revitalization into operational income and improvement of public services.

Third, local governments should rationalize the micro-mechanism through which RIR promotes and advances common prosperity by raising rural residents' disposable income and human capital levels. Local governments should provide targeted support for low-income rural populations. Through financial subsidies, knowledge dissemination, and skills training, they can enhance their economic participation and momentum of development, thereby increasing their income levels. It is also necessary to improve the rural income distribution mechanism, increase the proportion of farmers' operating and wage incomes, and prevent excessive income concentration among a few individuals. It is equally crucial to introduce policies that encourage high-quality enterprises and talent to return to their hometowns for employment and entrepreneurship (Lu et al., 2025e). The government should enhance rural education, vocational skills training, and digital skills training, and encourage returnee entrepreneurship as well as the cultivation of new types of professional farmers. By establishing an efficient employment information platform and improving talent subsidy incentive mechanisms, governments can attract external talent and stimulate human capital vitality.

6.3 Research limitations

The study has four main limitations. First, it used provincial macro data, making it difficult to obtain information from some rural areas and accurately measure sharing within rural populations. Future research could develop a more systematic index or use richer data to improve evaluations of rural common prosperity. Second, given the lack of unified calculations of core indicators by official or authoritative institutions, this study constructs and measures them based on the existing literature, which inevitably leads to deviations and may affect the accuracy of results, particularly in heterogeneity analysis. In the future, as research in this field deepens, more objective calculation methods will be established. Third, the historical industry development levels and other instrumental variables selected in this study may still exert indirect effects on rural common prosperity through other channels, such as path dependence, thereby potentially leading to endogenous issues. Future research can further explore and identify more reasonable instrumental variables. Forth, the study did not account for recent policy documents promoting rural industrial revitalization and common prosperity, relying on limited data. Follow-up studies should examine the impact of these policies to provide more targeted recommendations for underdeveloped regions.

Data availability statement

Publicly available datasets were analyzed in this study. The data that support the findings of this study are openly available in Figshare at https://doi.org/10.6084/m9.figshare.29858696.

Author contributions

ZL: Formal analysis, Writing – review & editing, Supervision, Writing – original draft, Methodology, Project administration, Funding acquisition, Conceptualization. HF: Methodology, Data curation, Conceptualization, Investigation, Writing – review & editing, Formal analysis, Software, Writing – original draft. DG: Resources, Visualization, Writing – original draft, Validation, Investigation, Software, Conceptualization, Writing – review & editing. JD: Writing – original draft, Methodology, Writing – review & editing, Formal analysis, Resources, Visualization, Data curation, Validation. NL: Resources, Writing – review & editing, Validation, Writing – original draft, Visualization, Methodology, Conceptualization, Investigation, Software.

Funding

The author(s) declared that financial support was received for this work and/or its publication. This research was supported by the General Project of the National Social Science Foundation of China (Grant No. 23BGL203). The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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