

# A B S T R A C T S

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1. Tian, X., Li, W., & Li, R. (2021). The environmental effects of agricultural mechanization: Evidence from agricultural machinery purchase subsidy policy. *Chinese Rural Economy*, (9), 95–109 (田晓晖, 李薇, 李戎 (2021). 农业机械化的环境效应——来自农机购置补贴政策的证据. *中国农村经济*, (9), 95–109).

**Abstract** Based on China's agricultural production data at the county level and satellite remote sensing data, from the perspective of the implementation of the agricultural machinery purchase subsidy policy, this article takes the quasi-natural experimental characteristics of the policy as exogenous shocks of agricultural mechanization and uses the difference-in-differences (DID) approach to measure the impacts of agricultural machinery purchase subsidy policy on polluting agricultural production behaviors and its mechanisms. The results show that the agricultural machinery purchase subsidy policy has significantly improved the level of agricultural mechanization, and the impacts of the policy on polluting agricultural production behaviors are different and with a certain lag. Specifically, the policy has significantly reduced the use of plastic film in the current year and the next year, and increased the number of straw-burning points in the next year after the policy started, but had no significant impacts on the use of chemical fertilizer and pesticide. The mechanism analysis shows that the policy has changed the way farmers used in polluting inputs and treated agricultural production waste by expanding the proportion of grain sown area and promoting the outflow of agricultural labor force, which has a corresponding impact on the ecological environment.

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2. Fu, L., Mao, X., Mao, X., & Li, H. (2020). Research on evaluation of the green agriculture development in Zhejiang Province under the background of rural revitalization—From the perspective of comprehensive utilization of agricultural resources. *Chinese Journal of Agricultural Resources and Regional Planning*, (12), 23–34 (傅琳琳, 毛晓红, 毛小报, 李海涛 (2020). 乡村振兴背景下浙江省绿色农业发展评价研究——基于农业资源综合利用的视角. *中国农业资源与区划*, (12), 23–34).

**Abstract** Based on a systematic review of green agriculture development in Zhejiang Province, from the perspective of comprehensive utilization of agricultural resources, this study builds a comprehensive evaluation index system for green agriculture from four aspects, socioeconomic development, resource input reduction, resource recycling, and resource and environment safety, and it evaluates the level of green agriculture development in Zhejiang Province. The BPEIR conceptual model was borrowed to establish the conceptual model and the evaluation index system of green agriculture production system in Zhejiang Province, and combining with macro-level data, the grey relational analysis was used to evaluate the development status of green agriculture development in Zhejiang Province from 2002 to 2016 from a dynamic perspective and compared the basic status of green agriculture development in 11 prefecture-level cities in Zhejiang in 2015. The results were listed as follows. The comprehensive utilization index of green agricultural resources in Zhejiang Province showed a fluctuating upward trend, and at different development stages, it displayed regular changes. The index was significantly higher in the northern part of Zhejiang Province than that in the southern Zhejiang. Hangzhou, Jiaxing and Ningbo were among the top three, and Jinhua had the lowest comprehensive utilization index of green agricultural resources. In summary, the development level of green agriculture in Zhejiang Province is on the rise, but large regional disparities still exist. Implementing differentiated development strategies, improving the policy system, enhancing the quality and brand, and strengthening the science and technology support are the keys to promote the green agriculture development in Zhejiang.

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3. Xu, W., Wang, R., Liu, C., Xu, Y., & Liu, X. (2021). Study on the space-time evolution characteristics and its influence mechanism of Chinese agricultural science and technology innovation. *Forum on Science and Technology in China*, (8), 108–119 (徐维祥, 王睿, 刘程军, 徐严, 刘晓雯 (2021). 中国农业科技创新的时空演进特征及其影响机制研究. *中国科技论坛*, (8), 108–119).

**Abstract** Based on the reconstructed agricultural science and

technology index system, the entropy weight TOPSIS method is used to estimate the Chinese agricultural science and technology innovation level. According to the spatial auto-correlation, trend surface and spatial gravity models, its space-time evolution characteristics are analyzed and the influence mechanism is studied with the further application of the GWR model. The results reveal the followings. (1) China's agricultural science and technology innovation level is relatively low, and the polarization trend and level difference are large. In general, it shows a development trend of hierarchical decrease from northeast China—north China—east China to southwest China—northwest China. (2) Big variation within the region regarding the level of Chinese agricultural science and technology innovation is obvious, showing an inverted  $\zeta$ -shaped trend for the spatial pattern. Meanwhile, the structure of spatial connection network has been featured by “density in the east and sparseness in the west,” revealing a big spatial connection intensity between the northeast China and east China, indicating a spatial variation pattern where there is strong spatial triangular connection between Heilongjiang-Zhejiang-Anhui and intense cross connection between Shaanxi-Shandong, Shandong-Hubei and Shaanxi-Zhejiang. (3) Great positive effect has been made on agricultural science and technology innovation by the level of government support, human capital and internet + strategy. Also rural economy level and agricultural resources in some regions have exerted a positive influence on agricultural science and technology innovation from the negative. But regional openness has negatively affected agricultural science and technology innovation in most regions.

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4. Ma, J., Meng, H., Shao, D., & Zhu, Y. (2021). Green finance, inclusive finance and green agriculture development. *Finance Forum*, (3), 3–20 (马骏, 孟海波, 邵丹青, 朱亚珊 (2021). 绿色金融、普惠金融与绿色农业发展. *金融论坛*, (3), 3–20).

**Abstract** The coordinated development of green finance and inclusive finance can effectively promote the development of green agriculture, improve the environment, reduce carbon emissions, and improve the financial availability in the field of “agriculture, rural areas and

farmers.” At present, the main obstacles faced by China in financial support for green agriculture development include the following four aspects. The standard of green agriculture has not been unified and standardized, the scope of financial support for green agriculture is not clear enough, there is no credit system for green agriculture financing subject or a risk sharing mechanism in green agriculture supply side, and the consumption end of green agriculture needs to be further activated. In order to eliminate the above obstacles, we need the cooperation of agricultural authorities, financial regulatory departments, financial institutions and local governments.

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5. Yan, G., He, Y., & Zhang, X. (2022). Can the development of digital inclusive finance promote agricultural mechanization? Based on the perspective of the development of agricultural machinery outsourcing service market. *Journal of Agrotechnical Economics*, (1), 51–64 (闫桂权, 何玉成, 张晓恒 (2022). 数字普惠金融发展能否促进农业机械化——基于农机作业服务市场发展的视角. *农业技术经济*, (1), 51–64).

**Abstract** In China, more often than not, agricultural stakeholders are notoriously tricky to take out a loan or have to take the loan at a much higher cost. What is noteworthy is that the burgeoning trend of digital inclusive finance in China renders novel logical thinking for the upward trajectory of agricultural mechanization to leap out of the foregoing vicious hoop. From the perspective of the development of the agricultural machinery outsourcing service market, this paper considers how digital inclusive finance affects agricultural mechanization in China. Data are retrieved from the 2014 and 2016 waves of China Labor-Force Dynamics Survey (CLDS) and the Digital Inclusive Finance Index conducted by Sun Yat-sen University and Peking University, respectively. This paper pools cross-section data by matching the macro-data and micro-data. This paper finds that digital inclusive finance may be identified as a countermeasure of inclusiveness to boost the performance of agricultural production, of which its emergence can significantly support farmers in their decision making to grain production via agricultural machinery or

semi-mechanized practices from traditional manual practices. Further, this paper proposes that the development of the agricultural machinery outsourcing service market plays a pivotal role in the inter-linkage between digital inclusive finance and agricultural mechanization, concretely speaking, inclusive finance on agricultural mechanization. Moreover, this paper discusses potential endogeneity a priori and attempts to conduct the falsifiability test, which reveals that our findings are robust.

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6. Xue, C., Shi, X., & Zhou, H. (2020). Influencing path of agricultural mechanization on total factor productivity growth in planting industry. *Journal of Agrotechnical Economics*, (10), 87–102 (薛超, 史雪阳, 周宏 (2020). 农业机械化对种植业全要素生产率提升的影响路径研究. *农业技术经济*, (10), 87–102).

**Abstract** Improving the total factor productivity of agriculture continuously is the key to ensuring China's food security. As the basic connotation and technical support of agricultural modernization, agricultural mechanization is an important way to improve the total factor productivity of agriculture. This article takes the farming industry as an example, Malmquist Productivity Index is used to measure and decompose crop productivity in various regions of China, and the impact characteristics and impact path of agricultural mechanization level on total factor productivity of crop production are carried out by OLS method. The research finding are: The level of agricultural mechanization has significantly promoted the improvement of total factor productivity in the crop industry, the path and characteristics of upgrading were in different stages of agricultural mechanization development. In the primary stage, the improvement of agricultural mechanization level through technological progress path has the greatest effect on total factor productivity of the planting industry, while in the middle and advanced stage, the improvement of agricultural mechanization level through technological efficiency change path has a greater effect on total factor productivity of planting industry. The accurate analysis and judgment of the mechanism and characteristics of the effect of agricultural mechanization level on the improvement

of total factor productivity of the planting industry can provide a theoretical basis for different policies and measures to better play the role of agricultural mechanization in the improvement of total factor productivity.

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7. Li, J., & Chen, Y. (2022). Agricultural corporatization is the only way to agricultural modernization in China. *Chinese Rural Economy*, (8), 52–69 (李静, 陈亚坤 (2022). 农业公司化是农业现代化必由之路. *中国农村经济*, (8), 52–69).

**Abstract** China is poised to realize agricultural modernization by 2035, and it is necessary to clarify who can lead small farmers into agricultural modernization. Based on the theory of agricultural modernization, this article reviews relevant theories including small holder theories, cooperative theories and agricultural company theories. It proposes that only agricultural companies can play a leading role in the modernization of smallholder agriculture. The study also analyzes the evolution of the relationship between companies and farmers and comes to the conclusion that only by transforming the market transaction relationship between the two sides into a vertical integrated labor division relationship within the system, can a reasonable interest linkage mechanism be truly formed. Therefore, China needs to promote the development of agricultural companies, and digital technology will help speed up this process so as to accelerate the realization of China's agricultural modernization.

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8. Zhang, Z., Li, C., & Bai, H. (2022). The impact of agricultural infrastructure on food production efficiency. *East China Economic Management*, (10), 100–109 (张志新, 李成, 白海洋 (2022). 农业基础设施对粮食生产效率的影响. *华东经济管理*, (10), 100–109).

**Abstract** Based on the perspective of agricultural infrastructure type

differences and the provincial panel data from 2000 to 2019, this paper explores the impact of different types of agricultural infrastructure on food production efficiency and its mechanism using dynamic panel two-step differential GMM and dual intermediary effect. The research results show that on the whole, agricultural infrastructure has a positive impact on food production efficiency, but there are obvious differences in the impact of different types of agricultural infrastructure on food production efficiency. The impact degree is followed by agricultural water conservancy infrastructure, transportation infrastructure, digital infrastructure, and electric power infrastructure. Through further mechanism analysis, it is found that on the one hand, by improving the technical level of agricultural infrastructure in the process of food production, the consumption of resources per unit of food production can be reduced and the efficiency of food production can be improved; on the other hand, by expanding the scale of agricultural infrastructure in the process of food production, we can improve the mechanization level and the efficiency of food production.

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9. Liu, Y., & Yan, H. (2021). County financial agglomeration, agricultural mechanization and the growth of farmers' income—County financial agglomeration, agricultural mechanization and the growth of farmers' income. *Journal of Agrotechnical Economics*, (12), 60–75 (刘洋, 颜华 (2021). 县域金融集聚、农业机械化与农民收入增长——基于河南省县域面板数据的经验分析. *农业技术经济*, (12), 60–75).

**Abstract** This article put forward research hypotheses by expounding the theoretical logic among county financial agglomeration, agricultural mechanization, and farmers' income growth. Then, based on the county panel data of 105 counties in Henan Province from 2001 to 2017, the empirical analysis was carried out by employing the intermediary effect test model, panel threshold model, and quantile regression model. The research showed that county financial agglomeration could not only directly affect the growth of farmers' income, but also indirectly and “partially” affect agricultural mechanization. Meanwhile, the positive

effect of agricultural mechanization on the growth of farmers' income is affected by the double threshold effect of county financial agglomeration. As the level of county-level financial agglomeration rises, the positive effect presents an inverted "U" structure. Moreover, the promoting effects on high-income farmers groups are more significant than those with low-income farmers. Finally, some policy enlightenments were proposed to increase farmers' income, such as improving the level of county-level financial agglomeration, establishing and improving the system that county-level financial to support the development of agricultural mechanization, and strengthening the education of financial and agricultural modernization for low-income farmers.

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10. Sun, C., & Chen, Y. (2020). Evaluation and improvement countermeasures of China's agricultural science and technology innovation capability in the new period. *Chinese Journal of Agricultural Resources and Regional Planning*, (8), 91–99  
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**Abstract** This research aims to measure the effect of agricultural science and technology innovation in China. Based on the innovation-driven perspective, this paper constructs the agricultural innovation-driven process model, and then combines with the gray correlation analysis method to make sure China's agricultural science and technology innovation capability evaluation indexes, and then applies the revised CRITIC method to make an empirical analysis on China's agricultural science and technology innovation capability during 2010–2016. The results show that: (1) China's agricultural science and technology innovation capability has grown considerably during this period, with the score increasing from 0.0166 in 2010 to 0.08865 in 2016, a full increase of 53 times, but the growth rate is obvious. (2) Stage characteristics of China's agricultural science and technology innovation still presents obvious national government-oriented (policy-dependent) characteristics, agricultural science and technology innovation investment capacity plays a leading role, and input-output efficiency is relatively low. The results are also very obvious. In 2015–2016, China's agricultural output value increased by

26. 58%, and the per capita net income of farmers increased by 17. 95%. (3) China's agricultural science and technology innovation capacity is subject to the level of rural economic development, rural per capita income, the "bottleneck" of the quality of rural population quality education, and internal expenditures of research and development funds. The empirical analysis results are in good agreement with the reality, which indicates that the agricultural science and technology innovation capability evaluation index system based on the agricultural science and technology innovation driving model and the gray correlation method has strong interpretative and scientific rationality; policy support, industrial cluster, efficiency Guidance, production research-study integration, wide-area cooperation, and cultivation of propaganda are the main directions for the improvement of China's agricultural science and technology innovation capabilities.

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11. Liu, Y., & Xiao, X. (2022). Leading rural revitalization with green development: Formation mechanism and path of evolution in green agriculture industrial chains in ethnic mountainous areas. *Journal of South-Central University for Nationalities( Humanities and Social Sciences)*, (1), 148–187  
(柳一桥, 肖小虹 (2022). 以绿色发展引领乡村振兴——民族山区绿色农业产业链的形成机理与演进路径. *中南民族大学学报(人文社会科学版)*, (1), 148–187).

**Abstract** Persisting in green agricultural development and building green agriculture industrial chains are an important way to realize rural revitalization in ethnic mountainous areas. This paper analyzes the basic characteristics and organizational features of green agriculture industrial chains. It illustrates the formation mechanism of green agriculture industrial chains in ethnic mountainous area in light of institutional change and comparative benefit enhancement. It proposes countermeasures to develop green agriculture industrial chains in ethnic mountainous areas, ranging from measures to reduce transaction cost, to those reducing information asymmetry, and to those enhancing technology supply. It is the hope of the authors that green agricultural development will lead to the revitalization of rural ethnic mountainous areas.

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12. Gong, B. (2022). Technology diffusion and regional productivity gaps in China's agricultural sector. *Economic Research Journal*, (11), 102–120 (龚斌磊 (2022). 中国农业技术扩散与生产率区域差距. *经济研究*, (11), 102–120).

**Abstract** Accelerating diffusion of agricultural technology and narrowing agricultural productivity gap across regions are important for promoting rural revitalization and coordinated regional development. China's urban-rural factor mobility is becoming increasingly free, but the regional agricultural productivity gap is widening over time. To explain this contradiction, this paper adds to existing literature from three perspectives, namely, theoretical framework, empirical method and research data.

On the theoretical part, based on the appropriate innovation theory and induced innovation theory, we systematically analyze the effects of three major constraints, namely, resource endowment, geographical proximity and administrative jurisdiction, on diffusion of agricultural technology and productivity catch-up. In terms of methodology, this paper establishes a multidimensional frontier productivity catch-up model, which provides an econometric tool to test the hypothesis that “technology diffusion and productivity catch-up are more likely to occur in areas with similar resource endowment, areas in closer distance, and areas within the same administrative jurisdiction.” Regarding data source, this paper uses county-level balanced panel data for China from 1985 to 2015 to empirically investigate diffusion of agricultural technology and productivity catch-up at the same time.

The empirical results show that widening of differences in resource endowment, geographical distance and administrative jurisdictional will weaken technology diffusion from frontier regions, decelerate the interregional agricultural productivity catch-up and lead to enlarged regional productivity gap. The speed of technology diffusion and productivity catch-up gradually slows down in the following cases: (1) when the resource endowment across counties is more different from each other (within the same resource endowment sub-group within the same resource endowment group-nationwide); (2) when the geographical proximity across counties are larger (within the radius of 100 kilometers-within the radius of 200 kilometers-within the radius of 400 kilometers-nationwide); and (3) when the research scope of

administrative jurisdiction expands (within the same city-within the same provincial region-nationwide). In terms of mechanism analysis, this paper finds evidence that resource endowment, geographical proximity and administrative jurisdiction all significantly affect the relative price of land and labor. Moreover, these three factors also have significant impacts on substitution rate and substitution elasticity across inputs when the relative price of land and labor is controlled.

This paper makes the following innovations. (1) Taking China as an example, we extend the appropriate innovation theory to agriculture and combine with the induced innovation theory to establish a new analytical framework that investigates the channels through which resource endowment, geographical proximity and administrative jurisdiction affect the speed of technology diffusion and productivity catch-up. (2) This paper uses the productivity catch-up model rather than the traditional convergence model to jointly investigate diffusion of agricultural technology and productivity catch-up, and extends the classic single-dimensional frontier model to a multidimensional one so that multiple constraints can be considered simultaneously. (3) In this paper, we conduct the empirical analysis using long panel data at county level to overcome the shortcomings of using macro data at provincial level and micro data at rural household level in existing literature. (4) Different from existing studies that focus on convergence at national level, this paper proposes and tests the hypothesis that “technology diffusion and productivity catch-up are more likely to occur in areas with similar resources endowment, areas in closer distance, and areas within the same administrative jurisdiction,” which provides a potential explanation of the widening agricultural productivity gap across regions in China.

This paper offers the following policy implications. (1) The findings comprehensively reflect the changes in China’s agricultural productivity. Specifically, China’s agricultural productivity has achieved remarkable growth but the regional gap has enlarged. (2) To narrow the agricultural productivity gap, Chinese government should relax the regional administrative constraints on the diffusion of agricultural technology by increasing agricultural R&D investment in disadvantaged provincial regions through transfer payments and promoting the flow and integrated development of factors in different regions through regional integration policies. (3) Chinese government should eliminate the constraints of geographical distance to technology diffusion. On the one hand, it can strengthen the construction of transportation and

communication facilities, to reduce interregional transportation cost, and promote communication across regions. On the other hand, it needs to consider the sphere of influence of regional agricultural technology centers to optimize their spatial distribution.

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13. Lai, X., Zhang, J., Zhang, Y., Li, Z., & Zhao, D. (2022). Spatial economic effects of agricultural science and technology innovation in China: An empirical study based on crop patents. *R&D Management*, (2), 68–78 (赖晓敏, 张俊飏, 张艳, 李兆亮, 赵丁洁 (2022). 中国农业科技创新的空间经济效应——基于种植业专利的实证研究. *研究与发展管理*, (2), 68–78).

**Abstract** Endogenous growth theory holds that technological innovation represented by patent is the source of economic growth. How to evaluate the actual contribution level of Chinese agricultural patents to economy under the condition of technology spillover remains to be further explored. Based on the planting industry data of 31 provincial administrative regions from 1985 to 2017, it analyzed the contribution of valid invention patents to economic output and their spatial composition from the perspectives of two technology diffusion ways, i.e. geography and supply-demand connection. The results show that under different spatial matrices, the significant contribution of patented technology to agricultural output is second only to chemical fertilizer and labor; under inverse distance matrix, patents generate positive spatial spillover effect due to interregional knowledge flow; under geographical adjacency matrix, technology similarity matrix and industry similarity matrix, the spatial spillover effects of patents are significantly negative, but still smaller than their positive direct effects. The different directions of patent spillover effects indicate that patents have not only a positive effect on agricultural economy decreasing with distance due to technology diffusion, but also a restraining effect caused by the property rights exclusivity in the same agricultural regionalization. Therefore, in the development of regional agricultural science and technology innovation, the economic effects of local and surrounding area patent output should be appropriately coordinated and utilized to achieve sustainable agricultural growth.

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14. Wang, D., Du, X., & Guo, X. (2021). Capability evaluation and analysis of provincial agricultural science, technology and innovation. *Science and Technology Management Research*, (1), 1–8 (王丹, 杜旭, 郭翔宇 (2021). 中国省域农业科技创新能力评价与分析. *科技管理研究*, (1), 1–8).

**Abstract** Based on the connotation and characteristics of provincial agricultural science, technology and innovation (ASTI) and the concept of provincial ASTI capability, a capability evaluation index system of provincial ASTI was constructed from the aspects of ASTI support factors, input factors and output factors. The ASTI capabilities of 31 Chinese provinces in the period of 2008–2017 were evaluated and analyzed. This study finds that the ASTI capabilities of 31 Chinese provinces have steadily improved, but the overall level is relatively low; there is a large gap in provincial ASTI capabilities, and the rankings show regional lock-in phenomenon; the provinces with leading innovation capabilities have strong ASTI support, input and output capabilities, while the backward provinces perform poorly in the three aspects.