# Digital Trade and Common Prosperity: Evidence from the Provincial Level

**Authors:** Zhao Sanglin, Li Zhetong, Wang Chao, Zhou Zhiyuan, Deng Hao, wandering star, Yuan Bingkun, Tong Jia'ang, Wang Chao

**Date:** 2024-09-15T00:00:00+00:00

## Abstract

Return-to-hometown entrepreneurship constitutes one of the crucial measures for promoting common prosperity. The emergence of rural digital trade has accumulated rich prior experience, economic resources, and entrepreneurial opportunities for return-to-hometown entrepreneurship activities, which can effectively facilitate the successful development of such entrepreneurship, the spontaneous growth of the rural economy, and inject greater innovative vitality into rural economic development. Digital trade can achieve common prosperity between urban and rural areas in terms of channels, resources, and markets by connecting urban-rural entrepreneurial channels, integrating urban-rural entrepreneurial resources, and opening up urban-rural entrepreneurial markets, thereby narrowing the wealth gap between urban and rural regions. The driving role of digital trade in return-to-hometown entrepreneurship can be enhanced through improving legal regulations related to rural return-to-hometown entrepreneurship, advancing vocational training for rural return-to-hometown entrepreneurs, and encouraging cross-sectoral collaboration among return-to-hometown entrepreneurs, thus better realizing common prosperity.

## Full Text

## Digital Trade and Common Prosperity: Evidence from the Provincial Level

**Zhao Sanglin[1], Li Zhetong[2], Wang Chao*[2], Zhou Zhiyuan[3], Deng Hao[1], You Xing[4], Yuan Bingkun[5], Tong Jiaang[6]**

[1] School of Engineering Management, Hunan University of Finance and Economics, Changsha, 410205, China
[2] School of Mathematics and Statistics, Hunan University of Finance and Economics, Changsha, 410205, China

[3] Moscow State University, Moscow, 101-135, Russia
[4] School of Economics, Hunan University of Finance and Economics, Changsha, 410205, China
[5] School of Energy Science and Engineering, Central South University, Changsha, 410083, China
[6] School of Economics, Fudan University, Shanghai, 200433, China

**Abstract**

Return-to-hometown entrepreneurship represents a crucial initiative for promoting common prosperity. The rise of rural digital trade has accumulated substantial prior experience, economic resources, and entrepreneurial opportunities for such activities, effectively driving the successful development of return-to-hometown ventures and fostering spontaneous rural economic growth while injecting greater innovative vitality into rural economies. Digital trade can achieve common prosperity between urban and rural areas across channels, resources, and markets by connecting urban-rural entrepreneurial pathways, integrating urban-rural entrepreneurial resources, and opening up urban-rural entrepreneurial markets, thereby narrowing the wealth gap between urban and rural regions. The promotional role of digital trade in return-to-hometown entrepreneurship can be strengthened through improving relevant legal frameworks, advancing vocational training for rural returnee entrepreneurs, and encouraging cross-sectoral collaboration among returnee entrepreneurs, thereby better achieving common prosperity.

**Keywords:** Digital trade; Return-to-hometown entrepreneurship; Common prosperity; Rural economy

Promoting common prosperity constitutes an essential path for enhancing national cohesion and safeguarding the interests of the broad populace during China's socialist modernization drive (Cheng & Liu, 2012) [1]. It refers to the gradual reduction of wealth disparities among different social groups during development (Qiu, 2016 [2]; Huang, 2021 [3]). Since the 20th Party Congress, "improving people's wellbeing and raising the quality of life" has become a critical goal for achieving common prosperity for all in stages, making economic development in the new era characterized by greater diversity and inclusiveness. Due to historical legacies in economic development, the urban-rural dualistic development strategy has created increasingly significant economic gaps between urban and rural areas (Wang, 2001 [4]; Wen et al., 2005) [5], resulting in substantial outflows of working-age labor from rural areas, idle rural social resources, and backward rural industrial chains, presenting a progressively declining social landscape (He, 2018) [6]. Consequently, rural revitalization represents a key link in promoting common prosperity (Ye, 2018) [7].

Digital technology has transformed contemporary social production and lifestyles, creating more convenient environments and innovative atmospheres for economic production and transactions. As a novel economic model built upon internet platform technologies, digital trade can effectively break down information asymmetries between urban and rural areas, shorten geographical distance, and bring more possibilities for rural economic development (Song, 2022) [8]. The vigorous development of digital platform economies has spawned numerous entrepreneurial activities, injecting new innovative momentum into modern urban-rural economic development. This represents an important form of future economic activity and a crucial component of rural revitalization.

## 2. Literature Foundation

Since the information revolution, digital technology has brought major breakthroughs to human economic production and life, significantly improving production and transaction efficiency and enabling trade activities to operate across broader regions with greater influence. Since the global popularization of internet and digital technologies, scholars have focused on the booming trade facilitated by digital technology and conducted relevant research.

Existing studies have explored digital technology and trade from perspectives including the concept and definition of digital trade, its advantages, and its disadvantages. Regarding the concept of digital trade, Deardorff (2018), Lan & Dou (2019), and Ma & Pan (2020) have noted through discussions on definitions of trade, digital products, and digital technology that digital trade can involve either product trade completed through digital technology or trade centered on digital products and digital industries. Regarding advantages, some scholars argue that digital technology can reduce trade costs by building network virtual spaces, helping more small, medium, and micro enterprises and entrepreneurs participate in industrial chain construction and enabling different types of economies to realize their value. Current research has fully demonstrated both advantages and challenges of digital trade, generally agreeing that it can improve the overall economic environment by reducing costs, stimulating innovation, and enhancing fairness, while simultaneously facing practical issues such as technological monopolies, rising operational costs, institutional imperfections, and information security, which create uncertainties for digital trade development.

Evidently, digital trade can promote rural development by fostering balanced development of primary, secondary, and tertiary industries in rural areas, accelerating the inflow of social resources into rural markets, and creating more employment opportunities for rural labor. This provides assistance for rural industrial upgrading and increasing farmers' incomes, thereby advancing the rural revitalization process.

## 3. Empirical Analysis of Digital Trade and Common Prosperity

**3.1.1 Data Sources** The empirical data for this study were primarily collected from the National Bureau of Statistics, Wind, and CNRDS (China Research Data Services Platform) databases, using panel data from 30 provinces for the period 2011-2023. To ensure more authentic and objective research results, this study followed existing research (Xu, 2023) [9] in processing the sample by: (1) removing observations with missing data; (2) winsorizing all continuous variables at the 1st and 99th percentiles; and (3) applying logarithmic transformation to absolute value indicators. The final sample comprised 330 observations.

### 3.1.2 Variable Definitions (1) Dependent Variable: Digital Trade (DT)

Digital trade refers to the process of conducting cross-border trade using the internet and digital technologies, involving transactions of goods and services, data flows, and digitalized business activities. Following previous scholars, this study constructed a digital trade indicator measured using the entropy method across four dimensions: infrastructure environment, technological innovation environment, digital trade capacity, and trade potential. Specific indicators are shown in Table 1-1 Components of Digital Trade Indicators.

### (2) Independent Variable: Common Prosperity (Rich)

Common prosperity represents an essential requirement of socialism with Chinese characteristics, a concentrated manifestation of the superiority of the socialist system, and an important component of the Chinese Dream of national rejuvenation. Following Han et al. (2022) [10], this study measured the common prosperity index using principal component analysis across seven dimensions: urban per capita disposable income, rural per capita disposable income, urban permanent population, total permanent population, Gini coefficient, urban-rural income ratio, and urbanization rate. For robustness, the entropy method was also used for verification.

### (3) Mediating Variables: Employment and Innovation

This study examines the pathways between digital trade and common prosperity from two dimensions: employment and innovation. For employment, we used entrepreneurial activity (BAU) and unemployment status (UNE).

For the entrepreneurship dimension, following Bai et al. (2022) [11] and Zhou (2018) [12], this study adopted the population method in stepwise regression, using provincial population as the standardization base and measuring entrepreneurial activity as the number of new enterprises per hundred people at the provincial level. Compared with standardization based on enterprise numbers, the population method avoids measurement bias caused by regional enterprise size heterogeneity. For unemployment status, this study used urban registered unemployment rate.

For innovation, regional innovation level refers to the innovation capacity and performance within a specific geographic area. This study used innovation level and R&D intensity as dimensions. Innovation level was measured as the natural logarithm of invention patent applications accepted, while R&D intensity was measured as internal R&D expenditure divided by regional GDP.

**(4) Control Variables**

Drawing on previous literature on common prosperity, this study selected control variables including: foreign direct investment (FDI), measured as (total FDI × USD-RMB exchange rate)/regional GDP; government intervention (Gov), measured as fiscal expenditure/regional GDP; social consumption level (SCL), measured as total retail sales of consumer goods/GDP; population density (PoP), measured as total regional population/regional administrative area; and labor level (Labor), measured as the natural logarithm of employed persons.

Main variable definitions are shown in Table 1-3.

**3.2.1 Basic Estimation Model** This study collected all aforementioned variables from the National Bureau of Statistics database (http://www.stats.gov.cn/) and Wind database (www.wind.com.cn). To test the main hypothesis (H1), this study employed the following model in empirical estimation. To address potential heteroskedasticity, robust standard errors were introduced. The specific model is as follows:

$$Rich_{i,t} = \alpha + \beta_1 DT_{i,t} + \gamma Controls_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (1-1)$$

where $DT$ represents digital trade, $Rich$ denotes common prosperity, $Controls$ represents the set of control variables, and $\varepsilon$ is the residual term assumed to be normally distributed. $\mu_i$ represents individual fixed effects, and $\lambda_t$ represents year fixed effects. This study controlled for both individual and year fixed effects to enhance reliability.

**3.2.2 Mediating Variable Model** To examine the mediating mechanisms through which digital trade affects common prosperity, this study followed Wen (2014) [13] in using the "stepwise regression method" to estimate mediating variables. Specifically, entrepreneurial activity (BAU), unemployment status (UNE), innovation level (Inv), and R&D intensity (RD) were used as mediating variables to test the baseline regression, with corresponding models constructed as:

$$Media_{i,t} = \alpha + \beta_1 DT_{i,t} + \gamma Controls_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (1-2)$$

$$Rich_{i,t} = \alpha + \beta_2 DT_{i,t} + \theta Media_{i,t} + \gamma Controls_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (1-3)$$

When coefficients $b_1$ and $d_2$ in equations (1-2) and (1-3) are both significant, the mediating variable exerts a mediating effect. When coefficient $d_1$ in equation (1-2) is significant, it indicates partial mediation; otherwise, it indicates complete mediation.

**3.3 Descriptive Statistics** Descriptive statistical analysis was first conducted on all variables. Table 1-4 presents the descriptive statistics for the provincial-level data from 2011-2021.

For the dependent variable, digital trade (DT) has a mean of 0.156 and standard deviation of 0.114. For the core independent variable, common prosperity (Rich) has a mean of -0.010, standard deviation of 0.323, maximum of 0.795, and minimum of -0.752, indicating substantial variation across provinces. For mediating variables, entrepreneurial activity (BAU) has a mean of 0.853 and standard deviation of 0.140, while unemployment status (UNE) has a mean of 0.032 and standard deviation of 0.006, suggesting concerning regional employment conditions. For innovation, innovation level (Inv) has a mean of 9.618 and standard deviation of 1.382, while R&D intensity (RD) has a mean of 0.017 and standard deviation of 0.011, indicating regional disparities in innovation.

**3.4 Correlation Test** This study used Pearson correlation analysis to examine the relationship between digital trade and common prosperity, with all major variables analyzed. The Pearson correlation matrix is shown in Table 1-5. The correlation coefficient between digital trade (DT) and common prosperity (Rich) is positive and significant at the 1% level, indicating a significant correlation that preliminarily validates the first hypothesis and lays the foundation for subsequent regression analysis.

**3.5.1 Baseline Regression Estimates** As described above, this section controls for year and regional fixed effects. Columns (1)-(2) present the baseline regression results. Without control variables, digital trade shows a significant positive correlation with common prosperity. After adding control variables, the significant positive relationship persists at the 1% level, with a coefficient of 0.785. The R-squared increases from 0.13 to 0.353, indicating good model explanatory power and appropriate control variable selection. These results demonstrate that digital trade can promote common prosperity, validating hypothesis H1. Digital trade contributes to common prosperity by: (1) expanding and connecting global markets, providing broader development opportunities that stimulate economic growth, create employment, and raise incomes; (2) offering convenient platforms for innovation and entrepreneurship, enabling faster emergence of new business models, products, and services; and (3) breaking geographical constraints, allowing global market expansion that provides SMEs and developing countries with greater international access, promoting balanced economic development and narrowing wealth gaps.

**3.5.2 Endogeneity Issues** Sample self-selection bias is a common phenomenon, as the regression sample in this study was not "randomly" selected, potentially creating endogeneity issues from self-selection bias and omitted variables that are difficult to avoid. Therefore, this study employs instrumental variables to address these issues.

Following Xiao et al. (2023) [13], this study selects the number of post offices per million people in each city in 1984 as the instrumental variable. This choice is justified because: (1) the 1984 post office density is highly correlated with current digital trade development, and (2) it has no direct relationship with common prosperity. Based on this rationale, this study conducts in-depth analysis using two-stage least squares (2SLS) from the perspective of internet development. Table 1-8 presents the IV regression results: Column (1) shows the first-stage results, where the coefficient for 1984 post offices per million people (IV_{1984}) is significantly positive, satisfying the relevance requirement. Column (2) shows that the coefficient for digital trade (DT) is 2.057, significant at the 1% level, confirming that digital trade promotes common prosperity. The 2SLS results are consistent with previous findings.

**3.5.3 Robustness Checks** To further verify robustness, the core independent variable was replaced with a composite score obtained through principal component analysis, and model (1-1) was re-estimated. Table 1-9 shows that the coefficient for DT_W remains significantly positive at the 1% level, indicating that digital trade development still promotes common prosperity with unchanged control variable signs, validating baseline results. Additionally, considering potential time lags, this study regressed using lagged digital trade. Column (2) shows that lagged digital trade maintains a significant positive correlation with common prosperity, confirming model robustness.

**3.6 Further Analysis** To test the mechanism hypotheses (H2a, H2b, H2c, H2d), this study conducted stepwise regression analysis from employment and innovation dimensions.

**3.6.1 Mechanism Testing** Table 1-10 presents employment dimension results. Columns (1)-(2) show entrepreneurial activity results: Column (1) indicates a significant positive correlation between digital trade and entrepreneurial activity at the 1% level, while Column (2) shows entrepreneurial activity significantly positively correlates with common prosperity. These results demonstrate that digital trade enhances entrepreneurial activity to achieve common prosperity, validating H2a. Digital trade provides broader platforms for innovation and creativity, enabling entrepreneurs to promote and sell innovative products or services through digital platforms and stand out through unique creativity and competitive pricing, thereby creating more opportunities for common prosperity.

For unemployment status, Column (3) shows a significant negative correlation

between digital trade and unemployment, indicating that digital trade reduces urban registered unemployment rates. Column (4) reveals a significant negative correlation between unemployment status and common prosperity. Thus, digital trade alleviates unemployment to achieve common prosperity, validating H2b. The rapid development of the digital economy demands greater technical and digital capabilities. Digital trade development provides learning and training opportunities, enabling people to adapt to digital era requirements. Governments and enterprises can provide relevant skills training and transition support to help unemployed individuals change career directions and enhance employability, thereby achieving common prosperity.

Beyond employment, digital trade also drives regional innovation. Table 1-11 presents innovation dimension results. Columns (1)-(2) show innovation capacity results: Column (1) indicates a significant positive correlation between digital trade and innovation capacity, while Column (2) shows innovation capacity significantly positively correlates with common prosperity, demonstrating that digital trade enhances innovation capacity to achieve common prosperity. Digital trade provides new business models and market opportunities, enabling online sales, digital services, and virtual technological innovation that broaden innovation channels. It also offers innovators more opportunities to observe and understand market demand, facilitating development of market-aligned innovative products and services. Columns (3)-(4) present R&D investment results: Column (3) shows a significant positive correlation between digital trade and R&D investment, while Column (4) shows R&D investment significantly positively correlates with common prosperity, indicating that digital trade boosts R&D investment to achieve common prosperity, validating H2c. In summary, digital trade facilitates the introduction of external technology and innovation, enabling cooperation and exchange with global technology providers and innovative enterprises to import advanced technologies and innovation outcomes, accelerating local enterprises' technological upgrading and innovation capacity enhancement.

**3.6.2 Heterogeneity Analysis** Considering unbalanced economic development levels, this study adopted Chen's (2023) [14] regional classification method, dividing the 30 provinces (excluding Tibet) into eastern, central, and western regions. Eastern region includes 12 provinces: Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan. Central region includes 8 provinces: Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, and Hunan. Western region includes 10 provinces: Inner Mongolia, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang, and Chongqing.

Table 1-12 presents regional regression results. In the eastern region, the coefficient between digital trade and common prosperity is 0.573, significant at the 1% level. In the central region, the coefficient is 1.571, also significant at 1%. In the western region, the relationship is not significant. Thus, digital trade pro-

motes common prosperity in eastern and central regions but not significantly in western regions, with the central region showing stronger effects than the eastern region (1.571 vs. 0.573). This may be because central regions have more central geographic locations with better locational advantages, enabling more convenient connections to eastern, western, and other regional markets and resources, thereby increasing digital trade opportunities and transaction volumes to promote common prosperity. Additionally, central regions may receive more active government support and prioritized promotion for digital trade development, with greater policy support and infrastructure investment that enhance transaction efficiency and scale, thereby advancing common prosperity.

## 4. Conclusions and Recommendations

This study finds that digital trade significantly impacts common prosperity in several ways:

1. Digital trade significantly positively affects common prosperity by expanding and connecting global markets, providing broader development opportunities, stimulating economic growth, creating employment, and raising incomes. It offers convenient platforms for innovation and entrepreneurship, breaks geographical constraints, and enables global market expansion.
2. Digital trade influences common prosperity through entrepreneurial activity and unemployment status. It enhances entrepreneurial activity and reduces unemployment rates, thereby creating more employment opportunities and contributing to common prosperity.
3. Digital trade positively impacts common prosperity by improving innovation capacity and R&D investment. It facilitates the introduction of external technology and innovation, accelerates local enterprises' technological upgrading, and provides more opportunities to understand market demand for developing innovative products and services.
4. Heterogeneity analysis reveals regional differences in digital trade's impact on common prosperity, with significant effects in eastern and central regions but not in western regions, likely due to varying economic development levels and innovation environments.

Based on these findings, this study proposes the following policy implications:

1. **Optimize government functions and business environment to support employment.** Governments should establish special funds to support entrepreneurial projects in digital trade, particularly for startups and SMEs, while simplifying administrative procedures and lowering entrepreneurial barriers to create a more favorable business environment.
2. **Encourage innovation and serve enterprises from multiple angles.** Governments should increase investment in network infrastructure

construction and upgrading, particularly in remote areas, to ensure seamless digital access and provide a solid foundation for digital trade and online innovation. To stimulate enterprise innovation, governments can provide fiscal subsidies and tax incentives to encourage increased R&D investment in key technology areas.

3. **Implement region-specific policies according to local conditions.** For central regions, the focus should be on strengthening comprehensive digital economy development through enhanced government support, including fiscal funding and tax preferences, while accelerating information infrastructure construction such as broadband networks and data centers.

---

## References

[1] Cheng, E., & Liu, W. (2014). Theoretical interpretation and practical analysis of socialist common prosperity. In *Marxist Political Economy Research (Vol. 2, 2012)* (pp. 569-579). Beijing: China Social Sciences Press.

[2] Qiu, H. (2016). The scientific connotation and realization path of common prosperity. *Political Economics Review*, 7(4), 21-26.

[3] Huang, C. (2021). On the internal logic and theoretical issues of rural revitalization and common prosperity. *Journal of Nanjing Agricultural University (Social Sciences Edition)*, 21(6), 1-9.

[4] Wang, C. (2001). The relationship between social identity of new-generation rural migrants and urban-rural integration. *Sociological Studies*, (3), 63-76.

[5] Wen, T., & Wang, Y. (2005). Agricultural credit, fiscal support for agriculture, and rural economic development. In *Proceedings of the 2005 Annual Conference of the Chinese Agricultural Economics Society* (pp. 408-427). Chongqing: China Agriculture Press.

[6] He, X. (2013). Rural land abandonment and the rise of "new middle farmers". *Decision*, (7), 18.

[7] Ye, X. (2018). Reform and innovate the fiscal support mechanism for rural revitalization. *Rural Work Communication*, (22), 50.

[8] Song, X. (2022). Research on the integration of digital economy and real economy in the Qinba Mountain area of southern Shaanxi. *Times Economy & Trade*, 19(10), 138-140.

[9] Xu, H., Yang, W., & Tan, X. (2023). The impact of digital economy on common prosperity: An empirical analysis based on provincial panel data. *Statistics & Decision*, 39(19), 5-10.

[10] Han, L., Peng, Y., & Meng, Q. (2023). Digital inclusive finance, entrepreneurial activity, and common prosperity: An empirical study based on China's provincial panel data. *Soft Science*, 37(3), 18-24.

[11] Bai, J., Zhang, Y., & Bian, Y. (2022). Does innovation-driven policy enhance urban entrepreneurial activity? Evidence from national innovative city pilot policies. *China Industrial Economics*, (6), 61-78.

[12] Zhou, X. (2018). *China Entrepreneurship Competitiveness Development Report (2018)*. Beijing: Economic Management Press.

[13] Xiao, M., & Wei, L. (2023). Does digital transformation inhibit the "herding behavior" of corporate investment? *Modern Economic Research*, (8), 86-95.

[14] Chen, A., & Wang, C. (2023). Corporate environmental responsibility, green technology innovation, and corporate financial performance. *Taxation and Economy*, (4), 82-89.

*Note: Figure translations are in progress. See original paper for figures.*