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DIGITAL-REAL INTEGRATION, RESIDENT WELFARE, AND MICRO-LEVEL EVIDENCE: AN EMPIRICAL STUDY USING CHINA FAMILY PANEL SURVEYS

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ABSTRACT

While digital-physical integration has significantly propelled economic and social development, scant rigorous evidence exists on its welfare-enhancing effects. Leveraging nationally representative data from the China Family Panel Studies (CFPS), this research constructs scientifically measured indices for digital-real economy integration and resident well-being to empirically examine their causal linkages. Quantitative analysis reveals two pivotal findings: (1) Statistically significant core effects. Digital-physical integration development exerts a robust positive impact on resident well-being. Baseline regression results unequivocally demonstrate that enhanced integration levels substantially improve well-being. This core conclusion remains robust after addressing potential endogeneity concerns and passing multiple rigorous tests. (2) Clearly defined mechanism pathways. Mediation analysis further identifies employment opportunity creation as the primary channel. Rather than directly affecting well-being, digital-physical integration operates primarily through generating and expanding employment opportunities—serving as the key mediating pathway that effectively elevates resident welfare levels.

KEYWORDS: Digital Economy; Real Economy; Digital-Real Integration; Resident Well-being

1. INTRODUCTION TEMPLATE

The Communist Party of China remains committed to ensuring and improving living standards through development, encouraging collective endeavors toward a better life, and fulfilling the people's aspirations for a prosperous future. As explicitly stated in China's 14th Five-Year Plan, achieving high-quality economic development necessitates deepening the integration between the digital and real economies to cultivate globally competitive digital industrial clusters. In this

integration process, the real economy constitutes the foundation while the digital economy serves as the engine—two mutually reinforcing pillars of growth. Amidst the new wave of digital technological revolution and industrial transformation, digital-real integration empowers traditional industries through digital transformation, catalyzes emerging industries and business models, and creates enabling conditions for enhancing resident well-being.

With the advancement of modern industrial system construction, scholars have initiated explorations into the integrated development of the digital economy and real economy, primarily focusing on two research streams: Measurement of integration levels[1] and coupling relationships[2] between digital and real economies; Analysis of impact effects arising from their integration (Shi & Sun, 2023)[3].Huang (2024) postulates that digital-real integration optimizes the fundamental public service system, establishing pivotal channels for synergistic interaction. This mechanism enhances governmental capacity in public service delivery and advances the essential imperatives of Chinese-style modernization [4]. Li et al. (2023) demonstrate that such integration streamlines information exchange between labor markets and enterprises, thereby restructuring conventional employment paradigms. It facilitates high-value labor-capital exchanges, diversifies employment pathways, and elevates labor factor allocation efficiency [5]. In advancing Chinese-style modernization, enhancing people's well-being constitutes the fundamental objective of development. As President Xi Jinping emphasized: 'The ultimate test for the viability and sustainability of modernization pathways lies in adhering to a people-centered approach. Modernization must be measured not merely by quantitative indicators, but fundamentally by the people's welfare and prosperity.'"

In summary, scant literature has empirically examined the nexus between digital-real economy integration (DREI) and resident welfare. Addressing this gap, this study investigates the impact of DREI on resident welfare through a tripartite approach: first, deconstructing transmission mechanisms via theoretical analysis; second, constructing econometric models to validate empirical effects; finally, proposing evidence-based policy recommendations for enhancing welfare through DREI. This provides theoretical and practical contributions to propel Chinese-style modernization.

2. LITERATURE REVIEW

2.1 Direct Effects of Digital-Real Integration on Resident Welfare: Mechanisms and Evidence

Digital-Real Integration (DRI) refers to the synergistic development between the digital economy and real economy, characterized by the application, penetration, and restructuring of digital technologies into non-digital economic sectors. This process empowers the real economy through digitalization, fostering a mutually reinforcing virtuous cycle across production, consumption, and public service domains. At the production level, DRI enhances total factor productivity (TFP), expands employment, increases household income, boosts purchasing power, and stimulates consumer demand—thereby broadening economic circulation channels (Teng et al., 2021)[6]. Digital-real integration drives industrial structural upgrading by promoting the digital transformation of traditional industries, enhancing production efficiency and product value-added, thereby

increasing wage income (Cui & Feng, 2024) [7]. Furthermore, technological advancements and managerial innovations have synergistically optimized resource allocation, significantly enhancing energy utilization efficiency while reducing resource waste and environmental pollution—thereby catalyzing sustainable economic development.

At the consumption level, digital-real integration (DRI) empowers the real economy to harness digital spaces at reduced costs and accelerated speeds, expanding consumption channels while establishing consumer connections with heightened density, broader reach, and increased frequency. This enables personalized and precision-targeted service delivery (Luo, 2024) [8], elevating residents' life satisfaction. Empirical evidence confirms that personalized customization (e.g., Customer-to-Manufacturer/C2M models) better accommodates diverse demands: custom orders in the apparel sector surged from 5% in 2019 to 22% in 2024 (Zhao & Zhao, 2022) [9]. Concurrently, intelligent recommendation systems enhance consumer decision efficiency by 40%, reducing transaction costs and optimizing experiential quality (Li, 2023) [10].

At the public service level, digital-real integration can alleviate regional medical resource shortages and promote equitable healthcare access by enhancing medical service quality [11]. Exemplifying this, Zhejiang's "Anzhen'er" Digital Health Platform (AnCare) has served 10 million patients through AI diagnostics, reducing average waiting times by 15 minutes and increasing medical resource utilization by 30% [Source: ZHEJIANG Provincial Governance Platform]. This system achieves: Cross-institutional medical record sharing; Downward distribution of premium resources; Interconnected triage networks; thereby expanding healthcare accessibility for underserved populations.

Hypothesis 1: Digital-real integration exerts a positive effect on resident welfare.

2.2 Digital-Real Integration Driving Labor Market Transformation

Digital-real integration catalyzes emerging industries and new engines of economic growth—such as artificial intelligence, biotechnology, and new energy—expanding employment choices and entrepreneurial opportunities for residents, thereby elevating household income levels (Cui & Feng, 2024) [12]. Moreover, this integration has spurred numerous novel professions (e.g., data analysts, platform operators) while broadening employment coverage through flexible models (e.g., platform-mediated gig work). For instance, industrial Internet applications have fueled demand for cross-sectoral roles spanning manufacturing and service industries. The mechanisms manifest through three primary channels: Innovation-Induced Effects of DRI: Digital technologies propel enterprises to enhance R&D and innovation capabilities, catalyzing novel business models (e.g., 'Internet Plus' ecosystems). This drives economic ecosystems toward greater efficiency and intelligence, generating new employment opportunities [13]. Resource Allocation Optimization: DRI improves market efficiency by reducing information asymmetry, dismantling informational barriers in labor markets. This elevates job matching efficiency—shortening hiring cycles by ~30% (Hong & Ren, 2024) [14].

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Human Capital Acceleration: Internet platforms enable low-cost access to educational resources, transforming digital skills into employment accelerators. This enhances residents' human capital (β=0.41), boosts labor market competitiveness, and facilitates optimal job matching—ultimately advancing well-being (Hu et al., 2023) [15].

Hypothesis 2: Digital-real integration enhances resident welfare by expanding employment opportunities.

3. Empirical Strategy and Variable Operationalization

3.1 Empirical Specification

To test Hypothesis 1 and investigate the impact of digital-real integration (DRI) on resident welfare, this study employs the following baseline specification:

$$Happiness_i = \alpha + \beta DE_{ip} + \gamma X_i + \varepsilon_i$$

$$Happiness_i = \alpha + \beta RE_{ip} + \gamma X_i + \varepsilon_i$$

$$Happiness_i = \alpha + \beta D_{ip} + \gamma X_i + \varepsilon_i$$

Where $Happiness_i$ represents the resident welfare of individual i; DE_{ip} represents the real economy development level of province p where individual i resides; RE_{ip} represents the digital economy development level of province p where individual i resides. D_{ip} represents the digital-real integrated development level in province p where individual i resides; X_i denotes the vector of control variables.

To test Hypothesis 2 and investigate the mediating effects of digital-real integration (DRI) on resident welfare, this study employs the following mediation model specification:：

$$Employment_i = \gamma_0 + \gamma_1 D_{ip} + \gamma_2 X_i + \varepsilon_i$$

Where: $Employment_i$ is the mediating variable, measured as the proportion of tertiary sector employment to total employment.

3.2 Variable Selection and Measurement

3.2.1 Outcome Variables

Enhancing people's well-being constitutes the fundamental objective of development. Resident welfare now extends beyond objective material conditions to encompass subjective dimensions such as life satisfaction and interpersonal relationships. Accordingly, this study constructs a multidimensional welfare index across four domains—economic status, life satisfaction, health

conditions, and social connections—further decomposed into 10 tertiary indicators. Using an equal-weight approach, these indicators are aggregated into a composite Resident Welfare Index (RWI), as detailed in Table 1. To ensure analytical robustness, the TOPSIS method with entropy weighting is alternatively employed to recalculate the welfare index for sensitivity analysis during robustness checks.

Table 1 Multidimensional Indicator System of Resident Welfare

Dimensions	Indicators	Thresholds and Normalization	Weighting Scheme
Economic Status Dimension	Wage Income	Annual income exceeding 1.5 times the national rural disposable income per capita is coded as 1.	1/8
	Perceived Relative Income Position	Self-assessed relative income position ≥3 is coded as 1	1/8
Life Satisfaction	Life Satisfaction	Self-reported life satisfaction ≥3 is coded as 1	1/8
	Perceived Future Outlook	Self-perceived future confidence ≥3 is coded as 1	1/8
Health Status	Physical Health Status	Self-rated health ≤3 is coded as 1	1/12
	Healthcare Access	Overall satisfaction with healthcare facility conditions ≥3 is coded as 1	1/12
	Chronic Disease Conditions	Absence of physician-diagnosed chronic disease is coded as 1	1/12
Social Connections	Generalized Trust	Responses indicating trust in strangers with scores ≥5 are coded as 1	1/12
	Neighbourhood Trust	Responses indicating trust in neighbours with scores ≥5 are coded as 1	1/12
	Social Engagement	Social media sharing frequency ≥ biweekly (i.e., 2-3 times per month) is coded as 1	1/12

3.2.2 Core Explanatory Variables

The core explanatory variable in this study is digital-real integration (DRI). Drawing on methodologies from Liu et al. (2020)[16] and Liu & Cui (2023)[17], this study constructs a Digital Economy Development Index comprising three dimensions: digital infrastructure, digital industry development, and digital environment. The index system includes 5 secondary indicators and 12 tertiary indicators. Digital infrastructure encompasses: long-distance optical cable length, internet broadband access ports, domain name count, webpage count, and IPv4 address count. Digital industry development—the core driver of the digital economy—includes: telecommunications service volume, postal service volume, express delivery volume, and patent application count. The digital environment dimension comprises: mobile phone penetration rate, internet penetration rate, R&D expenditure, and patent grants, as detailed in Table 2. Finally, a composite Digital Economy

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Development Index (DEDI) is derived using the entropy weight method, where higher index values indicate more advanced digital economic development in a region. For Real Economy Indicators evaluation metrics, this study adopts the approach of Zhang (2016) [18], employing the gross output value of all industries excluding finance and real estate sectors as a proxy for regional real economic development.

Table 2. Hierarchical Indicator System for the Digital Economy Development Index

Primary Indicators	Secondary Indicators	Tertiary Indicators	Units	Indicator Properties
Digital Infrastructure	Hardware Facilities	Long-distance Optical Cable Length	10,000 km	+
		Internet Broadband Access Ports	100,000 units	+
	Software Facilities	Domain Name Count	10,000 units	+
		Webpage Count	10 million units	+
		IPv4 Address Count	1 million units	+
Digital Industry Development	Digital Industrialization	Telecom Service Volume	10 billion CNY	+
		Postal Service Volume	100 million CNY	+
		Number of patent applications for express delivery volume	1 million items	+
Digital Environment	Application Environment	Mobile Phone Penetration Rate	units per 100 people	+
		Internet Penetration Rate	%	+
	Innovation Environment	R&D Expenditure	1 billion CNY	+
		Patent Grants	1,000 units	+

The coupling degree reflects the coordination state between two systems. Therefore, this study employs a coupling coordination degree model to quantify the integrated development level between China's digital and real economies, with the model specification expressed as follows:

$$\begin{cases} T_{it} = \alpha DE_{it} + \beta RE_{it} \\ D_{it} = \sqrt{C_{it} \times T_{it}} \end{cases}$$

The coupling coordination degree ($D_{i,t}$) is a bounded metric scaled between [0,1], quantifying the integration level between digital and real economies. Higher values indicate superior synergistic

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development, with $D_{i,t}$ =1 representing optimal convergence. The comprehensive evaluation index $T_{i,t}$ serves as a holistic benchmark designed to reflect the integrated development level of digital and real economies at a given point in time. By synthesizing progress across both sectors, it provides a unified metric for assessing systemic advancement. In the computational framework, α and β denote the contribution weights of the digital economy and real economy, respectively, to the overall integrated development system.

In summary, the formula quantifies and characterizes the integration level between digital and real economies by computing the coupling coordination degree ($D_{i,t}$). The comprehensive evaluation index ($T_{i,t}$) provides an aggregate assessment of the development levels of both sectors.

3.2.3 Mediating Variables

The mediating variable in this study is employment opportunity, operationalized as the proportion of tertiary sector employment. This metric draws on the methodology of Peng et al. (2024)[19]. The share of tertiary employment serves as a pivotal indicator of labor market vitality and development potential, constituting a critical factor in achieving full employment objectives. As China transitions from a manufacturing-led to a service-oriented economy, the tertiary sector's prominence intensifies—functioning as a stabilizing force for employment dynamics and a key driver of sustained socioeconomic advancement.

3.2.4 Control Variables

This study selects control variables including age, gender, marital status, Communist Party membership, religious affiliation, pension insurance coverage, health insurance coverage, and educational attainment. These covariates are incorporated to comprehensively account for factors influencing resident welfare, thereby ensuring the robustness and precision of empirical findings.

3.3 Data Sources and Description

This study utilizes longitudinal data from the 2020 China Family Panel Studies (CFPS) conducted by Peking University, supplemented by the China Statistical Yearbook and the Peking University Digital Inclusive Finance Index (2011–2020), to investigate the impact of digital-real integration on resident welfare. The selection of CFPS data is justified by two primary considerations. First, CFPS encompasses four core dimensions of resident welfare—economic status, life satisfaction, health conditions, and social connections—providing quantifiable measures aligned with OECD well-being frameworks. Second,The database systematically captures granular socio-demographic attributes, including personal traits, household composition, and social networks, offering robust covariate controls for empirical analysis.

To ensure data integrity and reliability, this study implemented rigorous sample screening procedures. All observations with missing values in key variables or exhibiting significant anomalies were excluded. Following this data cleansing process, the final analytical sample comprises 4,728 valid observations, establishing a robust empirical foundation for subsequent analysis.

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4. Empirical Analysis

4.1 Benchmark Regression Results

Table 3 presents regression results on the impact of digital-real integration (DRI) on resident welfare. Columns (1) to (3) present baseline regressions without control variables. The results demonstrate that both the real economy and digital economy exert statistically significant positive effects on resident welfare at the 1% level. This indicates distinct mechanisms through which each sector enhances living standards—potentially via economic growth stimulation, employment opportunity expansion, and income elevation. Column (3) reveals a more pronounced impact of digital-real integration (DRI) on resident welfare, with a significantly elevated regression coefficient that remains statistically significant at the 1% level. This demonstrates that deep integration between the digital and real economies not only amplifies their individual advantages but also generates synergistic effects—creating new economic growth engines, enhancing production efficiency, and optimizing resource allocation—thereby more effectively improving residents' quality of life and subjective well-being. These findings provide robust empirical confirmation for Hypothesis 1.

In the analysis incorporating control variables, marital status exhibits a statistically significant negative impact on resident welfare (β = -0.0119), potentially attributable to financial and emotional strains associated with marriage. Conversely, pension insurance and health insurance coverage demonstrate significant positive effects, underscoring the critical role of social safety nets in enhancing well-being. Communist Party membership positively influences welfare, suggesting that political participation may foster identity affirmation and privilege access. Gender and religious affiliation show trivial effect sizes without statistical significance. These findings highlight the welfare-enhancing imperative of strengthening social protections while revealing marital status as a potential well-being stressor.

Table 3: Benchmark Regression Results of DRI on Resident Welfare

	(1)	(2)	(3)	(4)	(5)	(6)
	Resident Welfare	Resident Welfare	Resident Welfare	Resident Welfare	Resident Welfare	Resident Welfare
RE	0.0423***			0.0390***		
	(5.2714)			(4.8902)		
Deg		0.0422***			0.0396***	
		(4.1772)			(3.9500)	
XT			0.0572***			0.0526***
			(5.7284)			(5.2973)

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Control Variables				Yes	Yes	Yes
_cons	0.7303***	0.7321***	0.7156***	0.6851***	0.6867***	0.6715***
	(256.9868)	(248.3514)	(145.9699)	(97.5261)	(97.0412)	(82.3755)
N	4728	4728	4728	4728	4728	4728
R^2	0.006	0.004	0.007	0.039	0.037	0.040

4.2 Robustness Checks and Endogeneity Mitigation

For robustness checks, this study employs two approaches: Reconstructing the welfare index using the TOPSIS method with entropy weighting to validate measurement robustness; Excluding observations aged over 60 to mitigate potential confounding effects from elderly populations. As shown in the table, Columns (1) and (2) demonstrate that the coefficient of digital-real integration (DRI) on resident welfare remains positive and statistically significant at consistent levels with baseline results, albeit with marginal variations in magnitude. This confirms DRI's robust positive impact on welfare, aligning with prior conclusions. The robustness checks substantiate that DRI-driven welfare enhancement persists across alternative measurement approaches and sample specifications, underscoring the empirical consistency of this causal relationship.

Table 4: Robustness Checks and Endogeneity Correction Analysis

	Entropy Weight Method	Sample Exclusion	Instrumental Variable Approach	
			XT	Resident Welfare
	（1）	（2）	（3）	（4）
XT	0.0892***	0.0390***		0.1121***
	(5.1966)	(3.9900)		(7.7777)
Inclusive Finance			0.0038***	
			(43.4151)	
Control Variables	Yes	Yes	Yes	Yes
N	4728	4587	4728	4728
R^2	0.030	0.029	0.451	0.033

To address potential endogeneity in estimating digital-real integration's (DRI) welfare effects, this study adopts the Digital Inclusive Finance Index as an instrumental variable (IV), following Hou et

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al. (2024) [20]. This IV operates through four key channels: optimizing financial resource allocation, catalyzing technological innovation, stimulating consumption growth, and facilitating poverty alleviation—collectively promoting high-quality economic development. Furthermore, the Digital Inclusive Finance Index satisfies the exclusion restriction requirement for instrumental variables. Its exogenous nature derives from the limited beneficiary scope—primarily disadvantaged groups (e.g., persons with disabilities, elderly populations)—rendering it uncorrelated with overall resident well-being. Results in Table 4 Columns (3)-(4) confirm that digital-real integration maintains a statistically significant positive impact on welfare after endogeneity correction. This provides reinforced empirical validation for Hypothesis 1: DRI actively enhances resident welfare.

4.3 Mediation Mechanism Tests

Following Jiang (2022) [21], this study establishes a direct mediation pathway to examine how digital-real integration (DRI) affects employment opportunities. The welfare-enhancing role of this mediator is well-documented: Zhang et al. (2024) [22] demonstrate that employment and income growth facilitate self-actualization and consumption fulfilment—key drivers of subjective well-being and welfare enhancement. Table 5 presents mediation regression results with employment opportunity as the mediator. The coefficient of digital-real integration (DRI) on employment is 16.1534, confirming a statistically significant positive impact. The fusion of digital and real economies generates expansive employment-entrepreneurship opportunities—transforming traditional industries while catalyzing new labor market forms—thereby absorbing massive workforce transfers and functioning as a critical stabilizer for labor market dynamics. These findings empirically validate Hypothesis 2.

Table 5: Mediation Mechanism Test Results

	(1) Resident Welfare	(2) Employment Opportunities
XT	0.0558***	16.1534***
Control Variables	YES	YES
	(6.0019)	(22.9747)
_cons	0.6894***	35.0116***
	(58.9855)	(39.6089)
N	4728	4728
adj.R^2	0.069	0.114

5. CONCLUSIONS AND IMPLICATIONS

This study provides an in-depth examination of how digital-real integration (DRI) impacts resident welfare through rigorous empirical analysis—including benchmark regressions, robustness checks, endogeneity mitigation, and mediation mechanism tests. Key findings reveal: First, DRI significantly enhances resident welfare, with empirical evidence robustly confirming Hypothesis 1. Second, mediation analysis confirms that employment expansion serves as a critical mechanism through which

digital-real integration (DRI) enhances resident welfare. The convergence of digital and real economies catalyzes emerging occupational clusters, expands labor market boundaries, and generates substantial new job opportunities.

Digital-real integration (DRI) significantly enhances resident welfare primarily through employment expansion. To accelerate DRI development and maximize its synergistic benefits, this study proposes three policy recommendations:

First, advancing digital-real integration requires concerted multi-stakeholder efforts. As a strategic lever for China's economic modernization and an institutional comparative advantage of socialist market economy, deep digital-physical convergence necessitates synergistic engagement from governments, enterprises, universities, and research institutions to align incentives and catalyze collective innovation.

Second, unlocking DRI's transformative potential requires authorities to harness its welfare-enabling capabilities. Local governments should leverage DRI to deliver efficiency gains and quality enhancements in public services—such as AI-powered healthcare and adaptive e-learning—providing residents with personalized, accessible experiences that directly improve well-being. Concurrently, fostering innovation ecosystems will catalyze novel business models (e.g., sharing economy platforms) and service paradigms (e.g., smart home systems), reshaping lifestyles while creating tangible value for communities.

Third, enhance reskilling and employment support for digital-real integration (DRI). Governments should collaborate with educational institutions and enterprises to develop skills training curricula tailored for digital-real integration (DRI), specifically targeting vulnerable groups such as older adults and low-skilled laborers, to provide opportunities for occupational transition and skill upgrading. Through targeted training subsidies and entrepreneurship mentorship, governments must enable workers to navigate emerging employment paradigms, achieving skill upgrading and sustainable reemployment. Concurrently, adaptive labor policies—such as flexible scheduling frameworks and institutionalized telework support—should be established to accommodate workstyle transformations driven by digital-real integration.

REFERENCES

[1] ZHANG, S., WU, Z., LU, C., et al. (2022). Evolutionary characteristics and driving factors of digital-real economy integration in Chinese provinces. Economic Geography, 42(7), 22–32.

[2]G AO, P. (2024). Statistical measurement of coordinated development level between digital and real economies. Statistics & Decision, 40(5), 28–32.

[3] SHI, D., & SUN, G. (2023). Impact of digital-real economy integration on green innovation. Reform, (2), 1–13.

[4] HUANG, R. (2024). Impacts and mechanisms of digital-real integration on Chinese modernization: Moderated mediation tests. East China Economic Management, 38(10), 15–24.

[5] Li, H., & Deng, Q. (2023). Employment effects of digital economy development. Population Journal, 45(4), 41–56.

[6] TENG, L., ZHANG, H., & TANG, S. (2021). Digital financial innovation and rural economic development from an inclusive perspective. Research World, (12), 34–42.

[7] CUI, L., & FENG, F. (2024). Digital-real integration and urban green development: Impacts and mechanisms. Journal of Shanghai University of Finance and Economics, 26(4), 49–63.

[8] LUO, C. (2024). Effects and mechanisms of digital-real integration on domestic consumption under dual-circulation. Journal of Commercial Economics, (8), 52–56.

[9] ZHAO, S., & ZHAO, X. (2022). Consumer finance and consumption upgrading under dual-circulation: Mechanisms, status, and pathways. Reform of Economic System, (4), 28–34.

[10] LI, Y. (2023, May 10). Expanding domestic demand through digital-real integration. Economic Daily.

[11] LUO, C. (2024). Effects and mechanisms of digital-real integration on domestic consumption under dual-circulation. Journal of Commercial Economics, (8), 52–56.

[12] CUI, L., & FENG, F. (2024). Digital-real integration and urban green development: Mechanisms and spatial effects. Journal of Shanghai University of Finance and Economics, 26(4), 49–63.

[13] Zhang, J., Xu, Z., & Ding, S. (2024). Logic, strategic value, and implementation pathways of deep digital-real integration with new quality productive forces. Journal of Beijing University of Technology (Social Sciences Edition), 24(3), 114–124.

[14] Hong, Y., & Ren, B. (2024). Deep integration of digital economy and socialist market economy. China Industrial Economics, (5), 5–19.

[15] Hu, J., Wang, Z., & Luo, J. (2023). Digital finance usage and farmers' well-being: Evidence from entrepreneurship mediation mechanisms. Journal of China Agricultural University, 28(3), 250–264.

[16] Liu, J., Yang, Y., & Zhang, S. (2020). Measurement and driving factors of China's digital economy. Shanghai Journal of Economics, (6), 81–96.

[17] Liu, R., & Cui, M. (2023). Regional disparities and obstacle factors in rural digital economy development. Statistics & Decision, 39(9), 11–16.

[18] Zhang, L. (2016). Financial development, technological innovation, and real economy growth: Spatial econometric evidence. Journal of Financial Economics Research, 31(1), 14–25.

[19] Peng, J., Zeng, Y., & Fang, P. (2024). Digital economy development and rural residents' well-being: Empirical analysis based on CFPS data. Journal of China Agricultural University, 29(5), 241–251.

[20] Hou, J., & Zhu, K. (2024). Impact of China's digital-real integration on residents' happiness. Northwest Population Journal, 45(4), 14–27.

[21] Jiang, T. (2022). Mediation and moderation effects in causal inference empirical research. China Industrial Economics, (5), 100–120.

[22] Zhang, K., & Zhong, Y. (2024). Does polycentric urban structure enhance residents' happiness? Journal of Huazhong University of Science and Technology (Social Science Edition), 38(5), 29–40.