Digital Economy Empowers Service Trade Management Innovation in China: Practices and Challenges in Digital Transformation

Xiaohua Wang[1*], Aza Azlina Md Kassim[1]

[1] Graduate School of Management, Management and Science University, University Drive, Off Persiaran Sukan, Section 13 40100 Shah Alam Selangor, Malaysia

wrod0007@163.com (Corresponding author)

ABSTRACT

As an emerging paradigm of economic development, digital economy has already become a pivotal force to drive the evolution for modern trade in services. Utilizing panel data from China spanning the years 2012 to 2022, the research organized a complex evaluation system for digital economy. It employs 2 empirical strategies: first, benchmark regression assess direct effect between digital economy and service trade in China; second, a panel moderation model investigates moderating effect of the industrial agglomeration between digital economy and services trade. Main findings in the study indicate that: (1) Digital economy made significant direct effect on the service trade. (2) Industrial agglomeration made a positive moderating effect as digital economy influencing service trade in China. Based on the conclusions, this study proposes several recommendations, emphasizing that governments enhance policy guidance and promote integrated digital economy and service trade. Research findings not only furnish empirical support for advancing digital transformation of service trade in China but also contribute theoretical and practical insights for digitalization and service trade reforms in developing countries and regions in the world.

Keywords: Digital Economy, Service Trade, Industrial Agglomeration, Management Innovation

1. Introduction

With rapid evolution and pervasive integration of emerging information technologies, the global economic architecture is experiencing a profound structural shift from an industry-centric to a digitally-driven paradigm (Imamov & Semenikhina, 2021; Alrawashdeh, 2023). In response, China has strategically positioned digital economy development as national priority, envisioning it as a pivotal force for cultivating new competitive edges in the global arena (Senin et al., 2024). According to data released by Chinese government and related department, digital economy has consistently demonstrated robust growth in China, accounting for more than 40% of GDP, and has established itself as a crucial catalyst for both economic expansion and societal progress (Jin & Choi, 2024). Within this broader context of economic transformation, the service sector has undergone particularly accelerated digitalization, giving rise to innovative operational models and formats—including digital trade, platform-based economies, and remote service delivery—that are fundamentally reconfiguring the global landscape of services trade, value chains, and competitive dynamics.

As an essential constituent of international trade and a key domain for global economic and trade collaboration (Goldberg et al., 2023), service trade has been being instrumental in promoting structural refinement and service industry upgrading in China, as well as in facilitating formation of a new international development framework. Nevertheless, conventional services trade is inherently hampered by challenges

such as elevated transaction costs, the non-storable nature of services, and pronounced spatio-temporal constraints (Serrano, 2023; Vijūnė, 2023). The emergence of the digital economy offers novel technological pathways and remedial mechanisms to address these impediments: by alleviating information asymmetry, transcending geographic barriers, and improving transactional efficiency. This not only accelerates traditional service digital transformation—like finance, transportation, and tourism—but also propels the emergence of new modalities of digital services trade, centered on data flows and enabled by digital platforms, encompassing domains like software services. These statuses constitute a significant impetus for sustainable development for service trade in China.

Consequently, a systematic investigation into the influencing of digital economy on service trade, along with mechanisms underpinning the relationship, has emerged as a critical research agenda, carrying substantial theoretical significance and practical relevance.

To address this gap, the research employs original data in 30 provinces in China between the year 2012 to 2022, with an aim of examining the effects through which digital economy affects service trade innovation and development. The study design comprises three principal components: first, entropy method is to organize a complex index system to assess digital economy; second, baseline regression evaluates direct effect between digital economy and service trade; and third, a moderation investigates moderating effect of industrial agglomeration as digital economy influencing service trade. The organization for study is below: Chapter 2 shows relevant reviews; Chapter 3 outlines a methodological framework; Chapter 4 shows the econometric models, and empirical findings; Chapter 5 concludes with major conclusions, and policy implications.

2. Research Methodology

2.1. Research Methods

2.1.1. Entropy Method

The entropy method objectively determines weights for evaluation indicators based on the information entropy derived from the data themselves. By quantifying the degree of dispersion among observed values, this technique yields relatively impartial weight assignments, irrespective of whether the indicators are positive or negative in nature. A higher entropy value reflects greater variability for basis data, which leads to the assignment of a higher weight for the corresponding indicator within the comprehensive evaluation framework. Conversely, if an indicator exhibits no variation across observations, it provides no discriminative information and thus exerts no influence on the evaluation results. In this study, entropy method assess digital economy level from 2012 to 2022 in China.

2.1.2. Moderating Effect Model

The testing of moderating effects generally unfolds in two sequential stages. The first phase entails the specification of a direct effect to evaluate the effect of digital economy on service trade in China. Secondly, moderating variable are introduced into the analytical framework to examine whether the allocation of innovative resources significantly alters the extent to which digital economy facilitates development and innovation of service trade in China. Initially, in accordance with hypotheses, a baseline model was constructed to assess the direct effect between digital economy and service trade all over China.

$$ST_{i,t} = \alpha_0 + \alpha_1 DE_{i,t} + \alpha_n CV_{i,t} + \epsilon_{i,t} \qquad (1)$$

Then, constructing a moderating effect model.

$$ST_{i,t} = \alpha_0 + \alpha_1 DE_{i,t} + \alpha_2 IA_{i,t} + \alpha_3 DE \cdot IC_{i,t} + \alpha_n CV_{i,t} + \epsilon_{i,t} \qquad (2)$$

In formula 2, i represents i-th region, t represents t-th year, $ST_{i,t}$ represents service trade; $DE_{i,t}$ represents digital economy; $IA_{i,t}$ represents industrial agglomeration; $CV_{i,t}$ represents the total effect of control variables; $\varepsilon_{i,t}$ represents random error.

2.2. Variables and Data Resource

2.2.1. Variables

The dependent variable. This study measures service trade through the export market share of service trade (ST).

The independent variable. Digital economy (DE) should be a complex variable based on 3 perspectives: digital infrastructure, digital industrialization, and industrial digitalization, this research measures digital economy by using entropy method.

Table 1: Indicators System for Digital Economy

Objective Layer	Criterion Layer	Indicator Layer
Digital Economy	Digital Infrastructure	Broadband access rate
		Broadband penetration rate
		Scale of mobile phone facilities
		Optical cable length
		Number of webpages
		Number of domain names
	Digital Industrialization	Per capita telecommunications services
		Mobile phone penetration
		Number of legal entities in the information service industry
		Employment in the information software industry
		Patent application and authorization
		Patent application acceptance
	Industrial Digitization	Digital inclusive finance
		E-commerce enterprises
		E-commerce sales
		Websites numbers per 100 enterprises
		Added value of the secondary and tertiary industries
		Investment in scientific and technology innovation
		Express delivery volume

Control variables. This study selects openness (OPEN), marketization index (MARKET), aging (OLD), and transportation (TRA) as control variables.

Moderating variable. Industrial agglomeration (IA) describes the phenomenon in which identical, similar, or related industries are densely clustered in a particular geographic region, with industrial capital resources continuously gathering within that area. This research uses industrial agglomeration as the moderating variable.

2.2.2. Data Resource

The research collected original data from 30 provincial regions in China from year 2012 to 2022. Data sources include Wind database, government work reports, and statistical Yearbooks. The raw data

underwent cleaning and preprocessing to ensure suitability for quantitative analysis and to mitigate issues of heteroscedasticity. Furthermore, missing values for certain provinces and years were addressed through interpolation methods. Descriptive statistics is showed in Table 2.

Table 2: Descriptive Statistics

Variables	Obs	Mean	SD	Min	Max
ST	330	0.017	0.028	0.000	0.146
DE	330	0.139	0.112	0.020	0.702
IA	330	0.965	0.211	0.324	1.528
TRA	330	11.714	0.852	9.437	12.913
OPEN	330	0.265	0.268	0.008	1.354
MARKET	330	8.250	1.915	3.359	12.864
OLD	330	0.202	0.077	0.077	0.469

3. Theory and Reviews

With global transition into the digital era accelerates, digital economy has been being a powerful driver for reallocating global resources, restructuring the international economic landscape, and transforming competitive dynamics worldwide (AL-Tai & Alabawy, 2024; Jin & Choi, 2024). Against this backdrop, China's service trade sector is confronted with both an imperative need for transformation and upgrading and unprecedented historical opportunities. Digital technologies are infusing new momentum into trade in services by fundamentally altering the modes of production, exchange, and delivery of services (Fan, 2021).

Prevailing scholarly consensus indicates that the digital economy facilitates trade in services primarily through two mechanisms: "cost reduction and efficiency enhancement" (Zhang et al., 2022) and "business model innovation" (Shcherbakova, 2019). The inherent characteristics of services—like intangibility, and simultaneity of production and consumption—have long constituted natural barriers to their tradability. Digital technologies have effectively diminished these constraints. Technologies have substantially reduced costs related to searching information, and payment processing.

For instance, online professional service platforms efficiently connect serving providers and consumers globally, enabling "small and medium-sized enterprises" to take part in world trade at markedly lower costs, thereby markedly expanding both the scale and scope of trade.

In addition to optimizing traditional service trade, the digital economy has also catalyzed the emergence of a new form of trade in services—centered on data as a core resource and digital delivery as a primary mode (REZNIKOVA et al., 2023). Firstly, traditional services including education, healthcare, consulting, and entertainment have become increasingly tradable via digital channels, as exemplified by MOOCs, telemedicine, online consulting, and streaming media, thus transcending geographical limitations (Lu et al., 2024; Hu & Liu, 2024). Secondly, digital services have undergone industrialization: technologies such as AI and search engines have themselves evolved into tradable digital service products (Burinskienė et al., 2024), generating new engines of growth for service trade. Empirical studies suggest that a country's digital infrastructure and scale of digital industry are strongly and positively correlated with the competitiveness of its service exports (Capello et al., 2022; Lu et al., 2024).

Thus this research posits the first hypothesis—H1: Digital economy made positive influence on the service trade in China.

The effect of industrial agglomeration on trade is theoretically grounded in Marshallian externalities and the new economic geography framework (Steijn, 2022). Firstly, knowledge spillovers and learning effects

play an essential role. The geographic concentration of firms, skilled labor, and institutions facilitates knowledge exchange, technology diffusion, and idea sharing, thereby accelerating innovation and enhancing the overall productivity and competitiveness of firms within the cluster (Wu & Shao, 2022; Abendin & Duan, 2021). This is particularly critical for modern service industries, which are highly dependent on knowledge and information (Nosheen et al., 2022). Secondly, specialization and economies of scale further strengthen trade competitiveness (Fan, 2021). The agglomeration of service industries fosters a robust labor market, diversified intermediate inputs, and shared infrastructure, yielding substantial economies of scale and scope (Liu et al., 2023). These advantages reduce operational costs and risks for enterprises, enhancing their price competitiveness and resilience in global markets (Cao et al., 2024). Thirdly, industrial agglomeration contributes to the formation of regional brand reputation and signaling effects. A well-developed cluster serves as a powerful regional brand, signaling professionalism, reliability, and innovation to the international market. This helps attract global clients and investments while mitigating uncertainties in cross-border transactions (Nasri et al., 2023).

Furthermore, industrial agglomeration is likely to act as a "catalyst" in the process through which the digital economy enhances service trade. Clusters provide an ideal environment for the deployment of digital technologies. A high degree of agglomeration implies concentrated market demand (Chang et al., 2024), abundant application scenarios, a rich talent pool, and a mature industrial ecosystem—all of which facilitate the rapid adoption, iteration, and commercialization of digital solutions. Consequently, digital technologies can realize their potential more fully within agglomerated regions (Wu & Yu, 2022). Thus, the enabling effect of digital economy must be much significant in regions with advanced industrial agglomeration (Liu et al., 2023; Capello et al., 2022). In other words, industrial agglomeration constitutes a critical contextual factor that amplifies positive effect of digital economy on service trade.

Nonetheless, there remains a scarcity of research directly examining the moderation industrial agglomeration between digital economy and service trade. The research tries to address this gap by empirically analyzing how industrial agglomeration moderates digital economy directly affecting service trade in China. The findings are expected to offer theoretical and empirical evidence to support tailored regional policies aimed at fostering the growth of digital service trade. Accordingly, the study proposes a second hypothesis:

H2: Industrial agglomeration significantly and positively moderates the empowering effect for digital economy affecting service trade in China.

4. Results and Discussion

4.1. Benchmark Regression Model

First, benchmark regression model confirms a direct and positive effect between digital economy and service trade in China. The first column in Table 3 showed estimated effect of digital economy on service trade without control variables, while second column displays direct effect results with control variables. Regardless of the regression specification employed, the findings remain statistically significant.

The estimates indicate that a one-unit increase in the digital economy index is associated with a 0.112-unit rise in service trade volume. Similarly, a one-unit increase in the level of openness leads to a 0.068-unit growth in service trade. A one-unit improvement in transportation infrastructure corresponds to a 0.014-unit increase in service trade. In contrast, a one-unit increase in the aging index is associated with a 0.064-unit decline in service trade, suggesting a potential constraining effect due to labor supply shortages. Marketization level, however, does not exhibit a statistically significant impact on service trade, implying that further market-oriented reforms may still be necessary. The results verify empirical support for H1.

Table 3: Results for Benchmark Regression

	(1)	(2)
Variables	ST	ST
DE	0.191***	0.112***
	(0.009)	(0.010)
OPEN		0.068***
		(0.005)
TRA		0.014***
		(0.001)
OLD		-0.064***
		(0.014)
MARKET		0.001
		(0.001)
Constant	-0.009***	-0.171***
	(0.002)	(0.014)
R²	0.567	0.773
F-value	431.49	225.1
N	330	

Noted:***, **, and * indicate significance at 1%, 5%, and 10%.

4.2. Robustness test

To verify precision and stability of direct regression results, the research made robustness test through alterations in the regression methodology and reductions in sample size. First, the sample period is limited to the years 2016－2022, and the 4 direct-controlled municipalities—Beijing, Shanghai, Tianjin, and Chongqing—are excluded from analysis. Second, dependent variable would be replaced, with export market share being substituted by the revealed comparative advantage index. The regression outcomes subsequent to the sample reduction and variable replacement are presented in Table 4, respectively. The results remain statistically significant, thereby affirming a strong robustness for the direct empirical finding in study.

Table 4: Robustness Test

	(1)		(2)	
Variables	ST	ST	ST	ST
DE	0.648***	0.815***	0.230***	0.148***
	(0.208)	(0.264)	(0.007)	(0.010)
OPEN		0.510***		0.094***
		(0.145)		(0.007)
TRA		-0.174***		0.003**
		(0.032)		(0.001)
OLD		0.305		-0.036***
		(0.384)		(0.011)
MARKET		-0.080***		-0.002**
		(0.021)		(0.001)
Constant	0.409***	2.880***	-0.021***	-0.034***
	(0.037)	(0.378)	(0.001)	(0.013)

R²	0.029	0.297	0.857	0.941
F-value	9.67	27.42	1084.44	557.29
N	330		182	

4.3. Moderating Effect

Estimation results regarding moderating effect were reported in Table 5. As shown, both industrial agglomeration and its interaction term with the digital economy exhibit statistical significance, regardless of whether including control variables. The results indicate that industrial agglomeration made a substantial positive moderating effect as digital economy influencing service trade in China, thereby verifying empirical support for H2.

Table 5: Moderating Effect Results

	(1)	(2)
Variables	ST	ST
DE	0.186***	0.124***
	(0.008)	(0.007)
IA	0.023***	0.028***
	(0.004)	(0.003)
DE · IA	0.231***	0.266***
	(0.030)	(0.018)
OPEN		0.075***
		(0.004)
TRA		0.008***
		(0.001)
OLD		-0.038***
		(0.010)
MARKET		-0.002***
		(0.001)
Constant	-0.031***	-0.117***
	(0.004)	(0.010)
R²	0.677	0.891
F-value	230.69	387.20
N	330	

5. Conclusions

The research examines influencing of digital economy on service trade in China, yielding following principal conclusions: First, digital economy made a positive influencing on service trade in China. Second, industrial agglomeration made a positive moderating effect as digital economy affecting service trade in China. Thus, the research proposes several recommendations aimed at fostering digital transformation for China's service trade.

First, both governments and enterprises should construct more inclusive and collaborative digital infrastructure. This includes establishing credible data trading platforms, strengthening foundational

support for digital technology innovation and service delivery, promoting collaborative R&D and problem-solving across government, industry, academia, and research institutes, and implementing governance frameworks that ensure secure and efficient data flows.

Second, policy interventions should directly facilitate the digital transformation of service trade by guiding the restructuring of management models, business processes, and market development strategies. Efforts should also focus on supporting innovation in digitalized trade governance and assisting enterprises in adopting digital operational and management practices to comprehensively advance the sector's digital transition.

Third, China should deepen institutional openness by establishing a new high-standard system for service industry liberalization, refining the negative list management mechanism for cross-border service trade, and actively engaging in and leading negotiations on bilateral and multilateral service trade agreements.

Fourth, enhancing modern logistics infrastructure is essential. This includes developing integrated digital logistics hubs, strengthening multimodal transport capabilities through digital technologies, vigorously modernizing air logistics systems, and streamlining port clearance procedures.

Fifth, new competitive advantages in service trade should be cultivated by embracing the "silver economy." Efforts should promote standardization and internationalization of health and elderly care services, encourage digital empowerment for smart aging and health innovation, and strengthen international labor cooperation and human resource development in geriatric care.

Sixth, revitalizing market entities requires constructing a fair, efficient, and transparent market environment, and dismantling administrative monopolies and market entry barriers.

Seventh, policy support should be directed toward developing digital and virtual industrial clusters, fostering an open and cooperative digital industry ecosystem, and enhancing regional coordination and global connectivity through digital networks.

This study acknowledges several limitations. For instance, the selected statistical indicators may not fully capture the complexity of the phenomenon or reveal deeper underlying mechanisms. Future research could explore more thoroughly how digitalization shapes service trade when more comprehensive and granular data become available.

References

Abendin, S., & Duan, P. (2021). International trade and economic growth in Africa: The role of the digital economy. Cogent Economics & Finance, 9(1). https://doi.org/10.1080/23322039.2021.1911767

Alrawashdeh, N.(2023). Bibliometric Analysis on the Central Bank Digital Currency and Monetary Policy, Journal of Logistics, Informatics and Service Science, Vol.10, No.2, 43-58. https://DOI.org/10.33168/JLISS.2023.0204

AL-Tai, W.S., Alabawy, A.Y.(2024).Cultivating Learning orientation and Support to Empower Hospital Technology Users in Digital Reforms, Journal of Logistics, Informatics and Service Science, Vol.11, No.5, 21-37. https://DOI.org/10.33168/JLISS.2024.0502

Burinskienė, A., Hamidishandiz, S., Aghayi, S.S., Elafify, A.M.(2024).Bibliometric Analysis on Product Innovation, Journal of Management Changes in the Digital Era, Vol.1, No.1, 14-30. https://DOI.org/ 10.33168/JMCDE.2024.0102

Cao, Y., Zhang, C., & Cui, H. (2024). Digital economy and its effect on total factor productivity in services: evidence from China. Applied Economics, 1–19. https://doi.org/10.1080/00036846.2024.2424497

Capello, R., Lenzi, C., & Panzera, E. (2022). The rise of the digital service economy in European regions. Industry and Innovation, 30(6), 637–663. https://doi.org/10.1080/13662716.2022.2082924.

Capello, R., Lenzi, C., & Panzera, E. (2022). The rise of the digital service economy in European regions. Industry and Innovation, 30(6), 637–663. https://doi.org/10.1080/13662716.2022.2082924

Chang, K., Zhang, H. & Li, B.(2024). The Impact of Digital Economy and Industrial Agglomeration on the Changes of Industrial Structure in the Yangtze River Delta. J Knowl Econ 15, 9207–9227. https://doi.org/10.1007/s13132-023-01448-w

Fan, X. (2021). Digital Economy Development, International Trade Efficiency and Trade Uncertainty. China Finance and Economic Review, 10(3), 89-110. https://doi.org/10.1515/cfer-2021-0018

Fan, X. (2021). Digital Economy Development, International Trade Efficiency and Trade Uncertainty. China Finance and Economic Review, 10(3), 89-110. https://doi.org/10.1515/cfer-2021-0018

Goldberg, P.K., & Reed, T. (2023). Is the Global Economy Deglobalizing? If So, Why? And What Is Next?Brookings Papers on Economic Activity 2023(1), 347-423. https://dx.doi.org/10.1353/eca.2023.a919362

Hu, B., & Liu, T. (2024). LIBERALIZATION OF SERVICE TRADE, DIGITAL ECONOMY AND THE INTEGRATION OF" M&P INDUSTRIES. World Journal of Management Science, 10. https://DOI: 10.61784/wms3031

Huo, L.(2024).Performance Evaluation and Optimization of China-Central Asia Agricultural Trade Supply Chain Using Grey Relational Analysis, Journal of Logistics, Informatics and Service Science, Vol.11, No.9, 76-90. https://DOI.org/10.33168/JLISS.2024.0905

Imamov, M., & Semenikhina, N. (2021). The impact of the digital revolution on the global economy. Linguistics and Culture Review, 5(S4), 968-987. https://doi.org/10.21744/lingcure.v5nS4.1775

Jin, X., Choi, Y.S.(2024). Coupling Evaluation and Spatial Analysis of Regional Economy and Logistics Development Based on Digital Twin, Journal of Logistics, Informatics and Service Science, Vol.11, No.2, 10-26. https://DOI.org/10.33168/JLISS.2024.0202

Jin, X., Choi, Y.S.(2024). Coupling Evaluation and Spatial Analysis of Regional Economy and Logistics Development Based on Digital Twin, Journal of Logistics, Informatics and Service Science, Vol.11, No.2, 10-26. https://DOI.org/10.33168/JLISS.2024.0202

Liu Y, Li L, Yang X (2023) The impact of collaborative agglomeration of manufacturing and producer services on carbon emission intensity: Influence mechanism and spatial effect. PLoS ONE 18(12): e0295948. https://doi.org/10.1371/journal.pone.0295948

Liu, J., Fang, Y., Ma, Y., & Chi, Y. (2023). Digital economy, industrial agglomeration, and green innovation efficiency: empirical analysis based on Chinese data. Journal of Applied Economics, 27(1). https://doi.org/10.1080/15140326.2023.2289723

Lu Y, Meng Y, Chen L, Zhang Y. (2024). Can the digital economy contribute to rural revitalization? A case of from China? PLoS ONE 19(10): e0310313. https://doi.org/10.1371/journal.pone.0310313

Nasri, S., Karnit, L., Shamandour, M., Khnouf, V.(2023). The Effect of Brand Image on Customer Purchase Decision, Journal of Service, Innovation and Sustainable Development, Vol. 4, No.1, 58-71. https://DOI.org/10.33168/SISD.2023.0106

Nosheen Rafi, Alia Ahmed, Imran Shafique, Masood Nawaz Kalyar.(2022).Knowledge management capabilities and organizational agility as liaisons of business performance. South Asian Journal of Business Studies, 11 (4): 397–417. https://doi.org/10.1108/SAJBS-05-2020-0145

REZNIKOVA, N., SHLAPAK, A., & IVASHCHENKO, O. (2023). From industrial ecosystems to digital economy ecosystems: New business models and models of competition in the conditions of digitalization of international trade in goods and services. ВІСНИК, 2332.DOI:10.31891/2307-5740-2023-316-2-52

Senin, S.M., Juhdi, N.H., Che Omar, A.R., Hashim, N.A.(2024). A Systematic Review of Adaptation of IR 4.0 during COVID-19 Pandemic among Global SMEs, Journal of Logistics, Informatics and Service Science, Vol.11, No.2, 61-83. https://DOI.org/10.33168/JLISS.2024.0205

Serrano, A.L.M., Ferreira, L.O.G., dos Santos, P.G., Peixoto, M.G.M., Peña, C.R., Neumann, C., Caldas, L.S., Martins, P.H.S., Granemann, S.R.(2023). A Logistics Management study proposal in a Service Sector through the perspective of the Theory of Constraints, Journal of Logistics, Informatics and Service Science, Vol.10, No.2, 15-28. https://DOI.org/10.33168/JLISS.2023.0202

Shcherbakova,T.S. (2019).Proceedings of the 1st International Scientific Conference "Modern Management Trends and the Digital Economy: from Regional Development to Global Economic Growth".Transformation of the service industry in digital economy.Atlantis Press,288-292https://doi.org/10.2991/mtde-19.2019.55

Steijn, M. P. A. (2022). The dynamics of agglomeration economies and channels of economic change. [Doctoral thesis 1 (Research UU / Graduation UU), Universiteit Utrecht]. Utrecht University. https://doi.org/10.33540/1396

Vijūnė, J.(2023).Identification of Strategic Directions for Change Management in Social Services Sector, Journal of Service, Innovation and Sustainable Development, Vol. 4, No.2, 91-105. https://DOI.org/10.33168/SISD.2023.0208

Wu T, Shao W. (2022). How does digital economy drive industrial structure upgrading: An empirical study based on 249 prefecture-level cities in China. PLoS ONE 17(11): e0277787. https://doi.org/10.1371/journal.pone.0277787

Wu, H. X., & Yu, C. (2022). The impact of the digital economy on China's economic growth and productivity performance. China Economic Journal, 15(2), 153–170. https://doi.org/10.1080/17538963.2022.2067689

Zhang L, Pan A, Feng S, Qin Y. (2022). Digital economy, technological progress, and city export trade. PLoS ONE 17(6): e0269314. https://doi.org/10.1371/journal.pone.0269314