

Guest Editorial Preface

Introduction to Special Issue on Digital Economy and Competitive Advantages

Ziwei Liu, Jilin University, China

Yibing Ding, Jilin University, China

Hugh Dang, Transnational Corporations Council of Studies, Canada

This special issue is to explore the digital economy and competitive advantages, including the digital transformation and global information governance. The digital economy refers to the economic activities that result from everyday online connections among businesses, devices, data, and processes. The digital economy includes industries and sectors that rely on technologies, such as e-commerce, social media, mobile computing, cloud computing, artificial intelligence, blockchain, and the internet of things (IoT). In the digital economy, competitive advantages are often based on data-driven insights, innovative business models, and superior customer experiences. The findings from this special issue reveal that, firms, industries, and countries that are able to leverage digital technologies to transform their operations and deliver value to customers or citizens are often able to gain a significant competitive advantage over their rivals.

1. GENERAL OVERVIEW

As the result of the international development of digital technologies, the world economy has entered a new stage of deep adjustment. The digital economy has played a significant and unique role in mitigating the impact of the pandemic and post-pandemic on economic and social development. It has become a new driving force for economic and social progress. With a wide application of the Internet, digital has transcended its traditional meaning and taken on the concept of economics. Its strong potential for driving economic growth becomes a global trend. The digital economy has emerged as a new business and economic model supported by information technology. The digital economy has become a key feature in leading the world's technological revolution and industrial advancement, profoundly affecting the existing economic form, business production and human lifestyle¹.

The rapid development of the digital economy has attracted widespread attention from academia. In the past two decades, scholars at home and abroad have extended their research on the digital economy from its conceptual framework and measurement methods to applications. The development of the Internet industry has enriched the connotation of the digital economy. According to the Organization for Economic Cooperation and Development (OECD, 2017), a digital economy means a series of economic activities in the use of digital knowledge. Information is the essential production factor. The modern information network is an important carrier. The effective use of information and communication technology is an important approach for the improvement of efficiency and economic structure optimization. Scholars believe that the digital economy is a general term for economic

activities such as production, exchange and consumption supported by digital technology. Its essence and core is digital innovation, which is the inevitable result of digital diffusion to the global economy and society (Xu and Zhang, 2020, UNCTAD, 2019, BEA, 2019; Barefoot, 2018).

The different definitions of the digital economy proposed by scholars have resulted in differences in the measurement methods. Xu and Zhang (2020) construct an index system for evaluating the digital capability from four dimensions: digital use capability, digital profitability, digital leadership capability and digital innovation capability. This index combines the experience of international index construction and optimization to explore Chinese initiatives. Teece et al (2018) argue that innovation in digital business has shifted from internal resource sharing such as technology to external resource sharing, resulting in new forms such as sharing economy and financial crowd-funding.

This special issue includes 16 refined research papers selected from more than 100 submissions. In this introduction, we briefly analyse the digital applications in business and economic activities, including factor allocations, industrial upgrading and economic equilibrium in order to discuss the findings from this special issue. We will then discuss several research prospects based on the existing findings before concluding and remarking implications of the research in this special issue.

2. DIGITAL TECHNOLOGIES AND APPLICATIONS

Digital application is a process of creating and implementing software that utilizes digital technologies to perform specific tasks or solve specific problems. The development process involves a series of stages, including planning, design, coding, testing, and deployment. Digital applications and development are critical components of the digital economy. They enable businesses to leverage technology to create new products, services, and business models. The development of digital applications requires a combination of technical skills, creative design, and a deep understanding of user needs and preferences. By creating applications that meet these criteria, developers can engage digital experiences for users. To review the digital applications, we examine below from micro- meso-macro levels and aspects.

2.1 Factor Allocations

At the micro level, the digital economy uses digital technologies and information as major factors for production. It affects economic development through three main paths, including increasing factor inputs, optimizing factor allocation and improving total factor productivity.

From the perspective of production input factors, under a booming digital economy, digitalized knowledge and information join the production process as factors. It releases the labor force and reduces costs. In this process, on the one hand, the saving of labor and capital are equivalent to the increase of production factor inputs in the original production path, thus promoting economic growth. On the other hand, the increase in production factor adequacy and the application of digital technology in the precise distribution of production materials also contributes for the optimization of factor input.

In terms of optimizing factor allocation, digital information such as data gradually becomes a basic and strategic resource, along with the development and application of big data and cloud computing technology. At the same time, it is an increasingly important factor in production and productivity. In addition to increasing the input of production factors and improving the distribution of production factors, digital technologies and information can also enter the production function independently as one of the production factors. They create new economic growth points from the perspective of the allocation of production factors. The addition of digital production factors can improve output by enriching the variety of production factors. Besides, the application of digital technology can process complex information into effective information. It realizes the transformation of growth path by changing the function form of the production.

From the perspective of improving total factor productivity, the digital economy can improve total factor productivity. It effects by promoting technological innovation and business model innovation,

which in turn can boost economic development. The generation and development of the digital economy are the product of a new round of technological innovation and technological revolution. The advancement of digital technology is one of the significant approaches to promote the quality of economic growth. In return, the emergence and development of the digital economy will also promote the innovation of business models. This is realized by promoting the upgrading of production, consumption and production-consumption relationship. It gives rise to new business models such as sharing economy. Moreover, it further stimulates new supply and consumption demand. This becomes another important channel for the digital economy to lead to high-quality economic development.

2.2 Industrial Upgrading

In this part, we expand the research perspective to a meso dimension. Besides factor allocation, the digital economy also affects the structural optimization of the economy. In detail, it optimizes industrial structure, market structure and regional structure, and then fosters economic development.

In terms of industrial structure, the rapid development of the digital economy has contributed to the quality and quantity of economic growth. The development of the basic parts of the digital economy, including the information industry, has driven the expansion of the overall scale of the digital economy. It has led to the formation of a large number of high-tech industries. Their share in the industrial structure has been increasing, significantly promoting the transformation and upgrading of the industrial structure. In addition, the digital economy has typical characteristics of high penetration and strong integration. Digital technologies and information penetrate into traditional industries, which help improve the operational efficiency of traditional industries, thus promoting the process of digitalization. This even supports the digital transformation of traditional industries, thus realizing the upgrading of industrial structure and the transformation of old and new dynamics.

For the market structure, the digital economy promotes economic development by optimizing the market channels. In the traditional market between consumers and firms, firms usually occupy a relative monopoly position. Consumers need to collect and organize a large amount of information. There is comparative disadvantage in the game between the two sides. The digital economy, especially the development of online platforms, connects a large number of firms with consumers and creates a more competitive market. Moreover, it significantly changes the unequal relationship between consumers and firms through credit guarantee and evaluation mechanisms. It solves the problems of being difficult to clear money and goods and difficult to trace after-sale, thus realizing the reshaping of the traditional market structure.

In terms of the regional structure, under the digital production model, on the one hand, instantaneous production drives the interconnection of firms to form a new production pattern. A more synergistic production and division of labor mechanism is formed between regions based on the digital endowment. On the other hand, the digital economy can effectively realize the restructuring and agglomeration of production factors. Through the integration of regional markets, it exerts system integration and economies of scale effects. This drives the integration and improvement of regional structures, thereby promoting and driving economic development.

2.3 Economic Equilibrium

Let's extend the perspective from meso dimension to macro dimension to look into digital technologies. At the macro level, the important direction of economic and social progress in the new era is coordinated development as a balanced growth sharing for all. The emergence and development of the digital economy provide an important opportunity for the realization of these goals. The generation and application of digital economy (financial) platforms have significantly changed the convenience and accessibility of economic and financial services. It has effectively improved the universality of economic and financial development.

To be specific, the digital economy makes financial service available to groups that would otherwise be unable or inconvenienced to access the financial market by means of Internet and

mobile terminals. Relying on the daily use of the digital economy platform's functions of payment, purchases and payment in the lives of residents provides credit records for residents. It can serve as an important basis for the digital platform's lending audit and alleviates the financial exclusion from the lending constraints of the outside group. The digital economy has greatly reduced the difficulty of cross-regional transactions, and largely compensated for the regional disadvantage of economic development. It blurred the spatial boundaries of economic development and played an important role in narrowing the income gap between regions, cities, and urban and rural areas.

In addition, the development of the digital economy shows the characteristic of faster development in less-developed regions. This plays an important role in raising household income, especially the income of low-income groups, thus promoting inclusive growth and sustainable development.

3. BRIEFING THE SELECTED RESEARCH

As discussed, the digital economy is the economic activity that results from online connections among people, businesses, devices, data, and processes. It encompasses a wide range of industries and sectors, including e-commerce, online advertising, social media, cloud computing, digital payments, and more. In the digital economy, businesses that can leverage technology to create new products, services, or business models often enjoy competitive advantages over their peers. This special issue explores how technology can create competitive advantages in the digital economy. The scholars examine the digital business and economy from a development policy perspective, which includes six research papers. Moreover, the authors look into the business and economic development from digital transformation at an industrial level, which includes five research papers. Finally, the scholars discussed the implications and impacts of digital business and economy from a firm, industry, or country level, which includes five research papers.

3.1 Digital Economy and Development Policy

As the digital economy is the economic activity resulting from online connections, the backbone is hyperconnectivity which refers to the ubiquitous interconnectedness of people, organizations, and devices. The digital economy is increasingly becoming a significant driver for economic growth, job creation, and innovation, especially in developing countries. Development policy is government policies and strategies aimed at fostering economic and social development in a country. It encompasses a range of issues that this special issue explored, including globalization, cross-board e-business, and international trade from a policy perspective.

In their research related to globalization, Jennifer Ma, et al argue that, for a long time, many studies have involved with the globalization research among academia, business practitioners, and policy analysts. It is highly controversial on what globalization is about. Scholars explore globalization from a variety of perspectives with an emphasis on business and economic matters. Many recognize that it was complex of examining globalization. Based on the literature reviewed, this research aims at discussing the globalization as an ongoing integration process. By taking an interdisciplinary approach, the research seeks for clarifying the concept of globalization. It examines globalization from a globalizing process. The authors conclude that globalization is an ongoing process of globalizing culture, economy, and institution towards a global integration (Ma, et al 2023).

Yan Zhang, et al explore the impact of cross-border e-commerce policy on China's imports. From the authors' view, in the coming era of the digital economy, cross-border e-commerce is a specific embodiment of "Internet plus international trade". Based on the promoting policy of "The product lists of cross-border e-commerce retail imports" and Chinese customs transaction data, this research uses a difference-in-differences methodology to analyze the effects of cross-border e-commerce on China's imports. The results show that the implementation of the cross-border e-commerce policy has significantly contributed to the growth of import value, price, and quantity. Digital technology and development determine the policy's effectiveness. The heterogeneous effects of import source countries

and domestic import regions imply an enlarging inequality effect from cross-border e-commerce in a growing digital economy (Zhang, et al 2023).

Natalia Gurbanova, et al, discuss the Chinese experience of developing cross-border e-commerce under the “Belt and Road” framework. In their view, cross-border e-commerce is becoming an important driving force behind the growth of China’s foreign trade. Under the framework of the Belt and Road Initiative, China has released a number of guidelines to accelerate the process regarding the cross-border e-commerce industry, including the Digital Silk Road. Based on an empirical analysis, the authors conclude that the logistics infrastructure has so far been an important factor for cross-border e-commerce’s sustainable development. Thus, a suggestion for the government policy is to improve the existing logistic infrastructure (Gurbanova, et al 2023).

In their research, Da Huo, et al, explore the privacy and information disclosure for dynamic digital governance. The authors take recent pandemic as an example. In their view, the public collects and publishes the epidemic-related information to control and prevent the future outbreak of a pandemic. This information collection in terms of its global governance is essential for companies in the service sector. To realize the function of the digital economy, global governance on information collection should be given the power to sort out and notify involved personnel in cases of public emergencies. This research studies the initiative of conflicts between privacy and information disclosure based on agency theory. It analyzes the resolution of conflicts based on incentive compatibility. The research further discusses the rationale of the balance between private and public interest based on agile governance. This research suggests the necessity of finding a balance between general management needs and personal privacy protection (Huo, et al 2023).

In the research conducted by Ziwei Liu, et al, the authors discuss how digital service trade barriers induce China’s outward foreign direct investment (OFDI). This research analyzes the agglomeration of China’s OFDI across 35 industries in 43 countries from 2014 to 2019. By using the OECD-DSTRI, ADB-MRIO and Zephyr databases, the research provides a characterization of China’s international production system and its dynamic changes. The authors find that China’s OFDI distribution shows a trend of agglomerating at a country-industry level year by year, especially in capital-intensive and technology-intensive industries. The empirical results indicate that digital service trade barriers significantly hinder the agglomeration of China’s OFDI at a host country-industry level. Heterogeneous tests show that digital service trade barriers negatively affect OFDI agglomeration in technology-intensive industries and positively affect labor-intensive industries (Liu, et al 2023).

In their research, Yingjie Fu, et al investigate the interactiveness of digital trade rules and anti-epidemic policies on China’s digital product export. Using monthly data across 241 products from 187 countries from 2018 to 2021, the authors find that adopting stringent anti-epidemic policies improves the value and quantity of digital trade in the presence of digital trade rules. The lack of face-to-face communications due to the policy restrictions is a primary cause of the stimulated digital product exports. This is along with consumer privacy protection and non-discrimination terms playing essential roles, especially for digital consumer products. The research reveals that, when China’s trade partners adopt more stringent anti-epidemic policies, digital trade rules improve the value and quantity of trade (Fu, et al 2023).

3.2 Digital Transformation and Development

Digital transformation means an integration of digital technology into the areas of a business and economy, resulting in fundamental changes in how businesses operate and deliver value to customers and citizens. The main goal of digital transformation is to improve business efficiency, enhance customer experience, and increase revenue through the use of digital technologies. In terms of economic development, digital transformation plays a critical role in accelerating economic growth and reducing poverty by creating opportunities for businesses and industries. By embracing digital technologies, developing countries leapfrog traditional development pathways and access new markets,

services, and resources. This special issue explores the digital transformation at both industry and firm levels. It examines the digital transformation from a development perspective.

Lei Li, et al, explore the digital transformation of the listed Chinese manufacturing companies. In their research, digital transformation has become a new engine driving the development of enterprises. The authors argue that the question is how digital transformation affects the quality of internal control. Based on the data of the Chinese A-share listed manufacturing enterprises from 2008 to 2020, the authors find that digital transformation significantly improves the quality of internal control. The results of heterogeneity analysis indicate that the promotion effect of digital transformation on the quality of internal control is significant in enterprises with small scale and strong managers' ability. Digitization improves the total factor productivity of enterprises by promoting the quality of internal control (Li, et al 2023).

In their research, Xiaoyan Ren, et al examine the impact of the digital economy on the green transformation and upgrading of the Chinese manufacturing industry. Based on the panel data of 29 provinces and cities in China from 2013 to 2020, the authors use the mediating effect model and the moderating effect model to analyze the transmission role of technological innovation and industrial structure optimization. The results of the empirical study show that the digital economy promotes the green transformation of the manufacturing industry through technological innovation and industrial structure optimization. Meanwhile, the intensity of environmental regulation has a moderating effect on the green transformation of the manufacturing industry (Ren, et al 2023).

Kexuan Zhou, et al research the influence and mechanism of cross-border e-commerce on the quality of Chinese exporting agricultural products. From the perspective of the implementation of China's cross-border e-commerce industrial policy, the authors test the impact of cross-border e-commerce industrial policy on the quality of agricultural products exported. They use the HS6-digit export data in CEPII-BACI database from 2006 to 2020 and adopt the Difference-in-Difference method. The research shows that the cross-border e-commerce industrial policy has a significant positive impact on the quality of Chinese agricultural exporting products. The research also finds that there is significant heterogeneity in the impact on agricultural products exported from different regions with different quality levels (Zhou, et al 2023).

In their research, Hongsheng Zhang, et al examine the digital finance and pollution from the Chinese firm-level evidence. The authors use the combined data China Industrial Firm Database, China Industrial Firm Pollution Emission Database, and provincial-level digital financial inclusion index from 2011 to 2013. The research investigates the impact of digital finance on firm pollution. The authors find that digital finance significantly reduces firm SO₂ emission intensity. The inclusive finance attribute of digital finance is conducive to alleviating the firm financing constraints, and promoting firm transformation and emission reduction. Further, digital finance reduces pollution through innovation compensation. Digital finance mainly affects private firms with small and medium-sized, while it plays its role through digital payments and credits (Zhang, et al 2023).

Gaoju Yang, et al explore digital mergers and acquisitions (M&A) and firm innovation from the Chinese evidence. Digital M&A is an important approach for firms to acquire technologies. This is distinguished from other technology M&A due to the inherent characteristics of digital technology and its contribution to the digitalization of firms. The research examines how digital M&A affects firm innovation using the data of Chinese listed companies from 2006 to 2019. The authors find that digital M&A promotes firm innovation. The findings suggest that digital M&A enables firms to break away from technology path-dependence to achieve digital innovation. The analysis of different types of digital M&A shows that the innovation effect of vertical digital M&A is smaller than that of horizontal digital M&A. Vertical digital M&A significantly increases industry concentrations, which may change the competitive structure of the market (Yang, et al 2023).

3.3 Implications of Digital Economy

The digital economy becomes increasingly important, and its implications are vast and far-reaching. Some of the important implications of the digital economy include increasing production and productivity. The digital economy enables businesses to automate processes, access new markets, and reach customers more efficiently, which can increase productivity and reduce costs. As automation and artificial intelligence become more prevalent, some jobs may become obsolete, while new jobs requiring different skill sets may emerge. The digital economy has given rise to new business models such as sharing economy platforms, which have disrupted traditional industries and created new opportunities for entrepreneurs. This special issue examines the implications of digital business with a concentration on employment and business development.

Taking the firm-level evidence from China, Yuni Tang, et al examine the effects of broadband Internet on employment and wages. This research investigates how high-speed Internet development across China's provinces affects firm employment and average annual wages. The research exploits a national policy reform by which the government launched to improve Internet speed in 2000. The authors devise a difference-in-differences with a continuous treatment method for empirical identification. The research finds that high-speed Internet significantly increases employment and slightly reduces average wages. Also, this research shows that the gains and losses from high-speed Internet on firm performance are likely to have risen from the higher probability of firm entry and the improvement of productivity in existing firms (Tang, et al 2023).

Na Chen, et al research the influence of digital transformation on enterprises. Taking China's A-share listed manufacturing enterprises from 2014 to 2020, this research discusses the impact and mechanism of corporate digital transformation on supply-chain relationship transactions. The findings show that digital transformation significantly inhibits supply chain relational transactions. The mechanism testing results reveal that digital transformation is conducive to the alleviation of information asymmetry and agency costs, which thereby reduces the degree of supply chain relational transactions. The regulatory effect analysis demonstrates that the impact of digital transformation on supply chain relationship transactions becomes more significant in non-high-tech enterprises and enterprises with less fierce industry competition (Chen, et al 2023).

Based on the empirical evidence of the listed companies in China, Yunxia Wu, et al explore the effect of the digital economy on labor employment. The research examines the impact of the development of the digital economy on the employment scale and structure of China's listed companies. The results show that overall, digital economic development improves the employment scale of listed companies in China. The development of the digital economy has increased the share of high-skilled labor, medium- and high-skilled labor, and decreased the share of low- and medium-skilled labor. In employment positions, the development of the digital economy increases the share of openings in accounting, sales and other positions, especially in research and development (Wu, et al 2023).

From a survey of the labor dynamics in China, Kai Liu, et al look into robot imports and employment location choice. In the authors' view, modern information technology, such as the Internet, big data, and artificial intelligence (AI), has been rapidly developing, and industries taking advantage of AI with the implementation of robots have been flourishing. To strengthen the integration of AI into daily life, it expands the use of intelligent applications and realizes the new development pattern of the "dual circulation". In elevating the growth of the open economy, AI is particularly significant. This research explores how industrial robot imports affect the employment site-selection behavior of migrant workers and thus have an impact on spatial mobility in the labor market. The authors review and critique the existing literature on the employment site-selection behavior of migrant workers and robotics, AI, and labor force employment (Liu, et al 2023).

Xu Shao, et al conduct an empirical study on the role of big data analytics in corporate decision-making. In the authors' view, bounded rationality prevents firms from achieving their potential.

However, intelligent solutions help eliminate bias in decision-making. This research examines whether biases diminish or disappear when novel and powerful digital resources, such as big data analytics, are applied in management practice. Using a massive matched database of 1,942 large Chinese firms, the authors find significant and positive effects of data processing frequency on high-level metrics of rational decision-making outcomes, such as firms' productivity and profitability (Shao, et al 2023).

4. FUTURE RESEARCH PROSPECTS

The huge social and economic benefits brought by the digital economy have been widely recognized. The future direction and path of its development are drawing the attention of experts and scholars. How to guide the digital economy to maintain a healthy and upward development and weaken the negative impacts brought by the development of the digital economy has become the focus of more and more scholars' inquiry. This section briefly discusses the development of the digital economy itself, the integration of the digital economy with the real economy and the development of the data factor market for future research directions.

4.1 Development of the Digital Economy

In the digital economy, platforms occupy an important position. The platform is an influencing organizational model in the digital economy. In the United States, the digital economy might be eclipsed if platform companies such as Google, Amazon, Facebook, and Apple are removed. The digital economy in China will be eclipsed if platform companies such as Alibaba, Tencent, Meituan, ByteBeat, Baidu, and Jingdong are removed.

The high-quality development of platforms represents, in a sense, the high-quality development of the digital economy itself. Platforms rise rapidly because they greatly reduce the friction cost of matching supply and demand. The network externality across the edge makes platform firms form a winner-take-all situation. While platform firms make important contributions to the digital economy, they face the problems of monopoly and governance. The high-quality development of platforms has to respond to these issues. In addition to the development of the digital economy itself, its integrated development with the economy is also an important research direction (Emamk, et al 2022).

4.2 Digital Economy and Productivity

Theoretically, digital transformation improves the competitiveness of firms. This is due to the fact that big data analytics enable firms to better understand consumers' demand and improve product design and product innovation. For example, digital technologies such as big data and AI enable consumers to participate in the product development process of firms (Sutherland & Jarrahi, 2018). The interaction between firms and consumers generates new product types such as growing products (Cockayne, 2016). Meanwhile, the adoption of technologies such as AI automation improves the productivity of firms. In addition, digital technology helps improve the internal management system of firms and increases management efficiency.

In particular, digital transformation changes an organizational structure and increases the organizational agility and flexibility within an enterprise. For instance, digital technology helps strengthen the communication of information within the enterprise and enhance efficiency (Murthy et al., 2021). In this transformation, digital marketing expands market access and increases demand. It can shorten supply chain links and save costs. We can see that digitalization enables firms to better connect with upstream and downstream firms in the supply chains, share information and achieve value co-creation. Digital finance can ease corporate financing constraints.

4.3 Consumer Welfare in Digital Economy

The digital economy offers a large number of free products and services to consumers. These products, although they do not enter into GDP accounting, actually increase consumer welfare. Scholars have

therefore estimated the value of these free products and services through experimental methods. Brynjolfsson et al. (2018) use experiments to estimate the value of consumers' use of Facebook. For physical product consumption, e-commerce also brings an increase in consumer surplus. Dolfen et al. (2019) use the visa data on credit and debit card transactions between 2007 and 2017 to quantify the consumer surplus generated by e-commerce.

Most of this gain comes from consumers having access to more merchants through online marketplaces, while another portion comes from savings in transportation costs. Of course, Internet consumption can have some negative effects. Research by Pandey et al. (2021) finds that online gaming significantly lowers student achievements.

4.4 Market Transaction Efficiency

There are a number of areas where research has suggested that digital technology can reduce the costs, such as search, replication, transportation, tracking, and verification. For example, the reduction of search costs by digital technology has contributed to the resurgence of consumer search theory in the last two decades. In theoretical terms, the most immediate consequence of lower search costs is a reduction in the level of product prices and price dispersion. From the empirical research, the fact that search costs reduce price level is widely supported. However, the search cost that reduces price dispersion is not supported by sufficient evidence.

Lower search costs will not only lead to lower prices, but also to a wider range of products. It creates a long-tail effect and enriching consumers' choice sets. Lower search costs lead to higher market share for high-quality products, which also leads to higher product quality (Agyapong, 2021). The competitive pressure brought by lower search costs makes manufacturers adopt more differentiated strategies and reduce product homogeneity.

4.5 Digital Economy and Equity

The impact of the digital economy on regional inequality is uncertain. On the one hand, digital technologies favor higher-skilled workers and are more beneficial to cities with strong agglomeration effects. In this context, the digital economy widens the differences between regions. On the other hand, digital technologies make the location of work less important and information flow more abundant in remote areas. They enable to provide richer financial, logistical, and employment opportunities in remote areas, making it more likely to lead to the development of underdeveloped areas and reduce the gap between regions.

The digital economy accelerates the replacement of low-skilled labor by automated technologies and increases the demand for highly skilled and high-quality personnel. It brings about structural unemployment and income disparities. Acemoglu and Restrepo (2020) argue that, while AI increases the labor productivity of workers, its substitution effect reduces the share of labor in economic value added, and the wage income of labor keeps decreasing, widening the income gap between high-skilled and low-skilled workers.

4.6 Development of Data Factor Market

As a brand-new production factor, the construction of the data factor market is still imperfect and there is no mature experience to learn. There are no standard answers to the problems of data rights, privacy protection, data silos, and data trading mechanisms, even in Europe and the United States. The healthy development of data factor markets requires enhanced protection of consumer privacy. Future research should explore how to use legislation and regulation to better protect personal information, while bringing to play the visible hand of government and the invisible hand of the market to jointly promote privacy protection.

In terms of data trading mechanisms, existing literature studies how data sellers design data selling mechanisms to maximize their revenue. In view of the non-exclusivity of data and its high relevance to privacy, scholars are more concerned about how the government should intervene in the process of

data trading and data sharing. Data is an important factor of production in the digital economy. It is likely to be the coal and oil of the digital era. Unlike traditional factors of production such as capital and labor, data factors are intangible, non-exclusive, and highly related to personal privacy. The high-quality construction of the data factor market needs to consider because of the data uniqueness.

5. CONCLUSION

As discussed, the digital economy plays an important role in demand, supply, and the market transaction level in matching supply and demand, and promotes the improvement of economic efficiency. However, the impact of the digital economy on equity, coordinated regional development, employment, and income disparity can be both positive and negative. This is in line with the fundamental principle of economics: markets and technology are inherently neutral and can improve economic efficiency. However, they cannot regulate equity issues by themselves. In order to make the digital economy better integrate with an economy and better promote economic development, we need in-depth studies on the mechanism of the digital economy to improve economic efficiency. We also need to think about how the digital economy can expand or reduce social inequality.

The digital economy is no longer just an economic term. It has become an interdisciplinary and multi-industrial crossover. The digital economy is no longer a simple economic form, but a deep integration of digital technology with industry, agriculture, and services. The disciplines involved in digital economy research are enriched from economics to statistics, management, and computer science. The legal and institutional issues arising from the development of the digital economy have also attracted scholars' attention in the fields of law, international relations, and other humanities and social sciences.

In conclusion from this special issue, we realize that digital technologies, digital transformation, and the digital economy become crucial in advancing development goals. For instance, digital technologies improves access to financial services, create job opportunities, enhances productivity, and supports sustainable development. Developing countries, in particular, can leverage the digital economy to leapfrog traditional economic models and overcome development challenges.

To harness the benefits of the digital economy, governments need to adopt policies and strategies that promote digital inclusion, connectivity, and innovation. These policies should aim to ensure that all citizens have access to affordable and reliable digital infrastructure, including broadband Internet, mobile phones, and other devices. They should also promote digital literacy and skills development to enable people to fully participate in a digital economy. In addition, governments need to create an enabling environment for digital entrepreneurship and innovation. This can be achieved through policies that support the development of digital startups, foster collaboration between the private and public sectors, and incentivize investment in digital infrastructure.

Overall, the digital economy presents significant opportunities for economic development. Realizing these opportunities requires a comprehensive and coordinated approach to policy-making and implementation. Governments need to work with their stakeholders, including the private sector, civil society, and international organizations, to ensure that digital technology contributes to sustainable and inclusive development. This is what we learn from this special issue.

ACKNOWLEDGMENT

The authors appreciate the reviews and comments from the invited colleagues, experts, and advisers. This Introduction is prepared by Ziwei Liu and Yibing Ding from the School of Economics at Jilin University. Hugh Dang from the Transnational Corporations Council of Studies in Canada edits this Introduction by adding the briefs of the selected papers as well as the concluding remarks.

REFERENCES

- Acemoglu, D., & Restrepo, P. (2020). Robots and jobs: Evidence from US labor markets. *Journal of Political Economy*, 128(6), 2188–2244. doi:10.1086/705716
- Agyapong, D. (2021). Implications of digital economy for financial institutions in Ghana: An exploratory inquiry. *Transnational Corporations Review*, 13(1), 51–61. doi:10.1080/19186444.2020.1787304
- Barefoot, B., Curtis, D., Jolliff, W., Nicholson, J. R., & Omohundro, R. (2018). Defining and Measuring the Digital Economy. *BEA Working Paper*.
- BEA. (2019). Measuring the Digital Economy: An Update Incorporating Data from the 2018 Comprehensive Update of the Industry Economic Accounts. *BEA Working Paper*.
- Brynjolfsson, E., Mitchell, T., & Rock, D. (2018). What Can Machines Learn, and What Does It Mean for Occupations and the Economy? *AEA Papers and Proceedings. American Economic Association*, 108, 43–47. doi:10.1257/pandp.20181019
- Chen, N., Yang, S., & Li, L. (2023). Research on the Influence of Digital Transformation on Enterprise Internal Control Quality. *Journal of Global Information Management*, 31(6), 1–21. doi:10.4018/JGIM.321187
- Cockayne, D. G. (2016). Sharing and Neoliberal Discourse: The Economic Function of Sharing in The Digital On-Demand Economy. *Geoforum*, 77, 73–82. doi:10.1016/j.geoforum.2016.10.005
- Dolfen, P., Einav, L., Klenow, P. J., Klopach, B., Levin, J. D., Levin, L., & Best, W. (2019). *Assessing the gains from E-commerce*. Federal Reserve Bank of St Louis. doi:10.3386/w25610
- Emamk, E. (2022). The effect of foreign direct investment on economic growth in developing countries. *Transnational Corporations Review*, 14(4), 382–401. doi:10.1080/19186444.2022.2146967
- Fu, Y. (2023). (Forthcoming). Anti-epidemic Policies, FTA Digital Trade Rules, and China's Digital Product Exports. *Journal of Global Information Management*.
- Gurbanova, N., & Wang, Z. (2023). The Chinese Experience of Developing Cross-Border E-Commerce under the “Belt and Road” Framework: Factors, Challenges and Solutions. *Journal of Global Information Management*, 31(6), 1–21. doi:10.4018/JGIM.321185
- Huo, D. (2023). Privacy and Information Disclosure: Dynamic Digital Governance in Response to COVID-19. *Journal of Global Information Management*.
- Li, L., Yang, S., & Chen, N. (2023). Digital Transformation and Supply Chain Relationship-based Transactions: Empirical Evidence from Listed Chinese Manufacturing Companies. *Journal of Global Information Management*, 31(6), 1–21. doi:10.4018/JGIM.321188
- Liu, K., Hu, K., Wang, Y., & Sun, Y. (2023). Robot Imports and Employment Location Choice: Evidence from a Survey of Labor Dynamics in China. *Journal of Global Information Management*, 31(6), 1–27. doi:10.4018/JGIM.321181
- Liu, Z., & Ding, Y. (2023). Dispersion or Agglomeration: How Digital Service Trade Barriers Induce China's Outward Foreign Direct Investment? *Journal of Global Information Management*, 31(6), 1–17. doi:10.4018/JGIM.321177
- Ma, J., & Dang, H. (2023). Thinking about Globalization as an Integration Process. *Journal of Global Information Management*, 31(6), 1–14. doi:10.4018/JGIM.321175
- Murthy, V. B., Kalsie, A., & Shankar, R. (2021). Digital economy in a global perspective: Is there a digital divide? *Transnational Corporations Review*, 13(1), 1–15. doi:10.1080/19186444.2020.1871257
- OECD. (2017). *Measuring Digital Trade: Towards A Conceptual Framework. Pairs*. OECD Publishing.
- Pandey, N., De', R., & Pal, A. (2020). Impact of Digital Surge During Covid-19 Pandemic: A Viewpoint on Research and Practice. *International Journal of Information Management*, 55, 102171–102171. doi:10.1016/j.ijinfomgt.2020.102171 PMID:32836633

- Ren, X. (2023). (Forthcoming). Research on the Impact of the Digital Economy on the Green Transformation and Upgrading of China's Manufacturing Industry. *Journal of Global Information Management*. Advance online publication. doi:10.4018/JGIM.321179
- Shao, X. (2023). An Empirical Study of the Role of Big Data Analytics in Corporate Decision-Making. *Journal of Global Information Management*, 31(6), 1–19. doi:10.4018/JGIM.321176
- Sutherland, W., & Jarrahi, M. H. (2018). The Sharing Economy and Digital Platforms: A Review and Research Agenda. *International Journal of Information Management*, 43, 328–341. doi:10.1016/j.ijinfomgt.2018.07.004
- Tang, Y. T. (2023). (Forthcoming). The Effects of Broadband Internet on Employment and Wages: Firm-Level Evidence from China. *Journal of Global Information Management*.
- Teece, D. J. (2018). Profiting from Innovation in The Digital Economy: Enabling Technologies, Standards, and Licensing Models in the Wireless World. *Research Policy*, 47(8), 1367–1387. doi:10.1016/j.respol.2017.01.015
- UNCTAD. (2019). *Digital Economy Report 2019 Value Creation and Capture: Implication for Developing Countries*. United Nations Publishing.
- Wu, Y. (2023). (Forthcoming). The Effect of Digital Economy Development on Labor Employment: Based on the Empirical Evidence of Listed Companies in China. *Journal of Global Information Management*.
- Xu, X., & Zhang, M. (2020). Research on the Scale Measurement of China's Digital Economy—Based on the Perspective of International Comparison. [in Chinese]. *China Industrial Economics*, 5, 23–41.
- Yang, G. (2023). (Forthcoming). Digital M&A and Firm Innovation: Evidence from China. *Journal of Global Information Management*.
- Zhang, H. (2023). (Forthcoming). Digital Finance and Pollution: Firm-level Evidence from China. *Journal of Global Information Management*.
- Zhang, Y., Zhang, Y., & Zhao, C. (2023). The Impact of Cross-border E-commerce Policy on China's Import. *Journal of Global Information Management*, 31(6), 1–15. doi:10.4018/JGIM.321178
- Zhou, K., Lu, F., Ruan, Y., Jiang, X., & Yu, L. (2023). Research on the Influence and Mechanism of Cross-Border E-Commerce on the Quality of Agricultural Products Exported by China. *Journal of Global Information Management*, 31(6), 1–23. doi:10.4018/JGIM.321190

ENDNOTES

- ¹ For example, with its ability to understand and generate natural language, ChatGPT has already made significant contributions to conversational interfaces, personalization, and content creation, and it is poised to have an even greater impact in the future (see “Revolutionizing Web Design and Development”, February 17, 2023. <https://www.iqmotion.ai>. Accessed March 13, 2023).