

2023

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Recommended Citation

shanshan, Yang; Peng, Zhang; and Man, Xiao (2023) "Research on the Influence of the Digital Economy on Transforming Consumption Behavior Among Residents," *Contemporary Social Sciences*: No. 3, Article 1.

DOI: <http://dx.doi.org/10.19873/j.cnki.2096-0212.2023.03.001>

Available at: <https://css.researchcommons.org/journal/vol2023/iss3/1>

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Research on the Influence of the Digital Economy on Transforming Consumption Behavior Among Residents

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Abstract: Drawing on the essence of Marxist consumer economy theory, this paper argues that the innovations of digital technology can effectively facilitate the integration of economies of scale, economies of scope, and long-tail economies. Through careful analysis of the practical case of Xiaomi's business ecosystem, this paper highlights the notion that data serve as both a key production factor and a critical consumption carrier within the context of digital consumption. We thoroughly investigated the influence of the digital economy on transforming consumption behavior among residents by analyzing a range of typical business cases and the latest data that triggered this transformation. Based on the analysis, this paper argues that such transformation can lead to the platform agglomeration effect, the inclusive diffusion effect, and the push-pull effect by highlighting the specific ways in which the digital economy disrupts the consumption-production model and contributes to the upgrading and transformation of traditional industries. Additionally, this paper demonstrates how the digital economy can expand and promote emerging business forms, providing insights into the ways in which digital innovation is reshaping the contemporary economic landscape. This study intends to provide several policy suggestions that can expand domestic demand, promote consumption, drive the high-quality and integrated development of China's digital and real economy, and position China as a strong cyber and consumer nation by using digitalized consumption as a starting point.

Keywords: the digital economy, resident consumption, economic effect, high-quality development

DOI: <http://dx.doi.org/10.19873/j.cnki.2096-0212.2023.03.001>

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This study was supported by the Sichuan Landscape and Recreation Research Center 2023 Project (grant no. JGYQ2023011).

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During the G20 Hangzhou Summit in 2016, the proposal to prioritize the development of China's digital economy as a primary path for China's innovation and growth received warm responses and widespread support from both the government and enterprises. In 2017, the term "digital economy" was included in the *Report on the Work of the Government* for the first time, stating that China will push forward with the Internet Plus action plan and accelerate the development of the digital economy, which will benefit both businesses and Chinese people. Ma Huateng, also known as Pony Ma, Chairman of Tencent, has asserted that the digital economy is closely related to the Internet. "Internet +" emphasizes connectivity, while the digital economy emphasizes the output and benefits behind the connectivity. The digital economy has emerged as a vital strategic development direction for China and a new engine of China's economic growth, occupying a significant position in the country's macro economy. In 2020, the scale of China's digital economy reached RMB 39.2 trillion, accounting for 38.6 percent of China's GDP. In 2021, the scale increased to RMB 45.5 trillion, up 16.2 percent year on year, accounting for 39.8 percent of China's GDP. This figure was close to or even higher than that of some Western developed countries, indicating that China has gained first-mover and comparative advantages in the field of global digital economy application. In 2020, China's digital economy grew at more than three times the rate of GDP, becoming a key driver of stable economic growth. China's data output reached an average annual compound growth rate of 30.2 percent from 2016 to 2021. In 2021, it ranked second in the world in terms of data output. According to the *Annual Report on the Development of Global Digital Economy Competitiveness* (2019), the United States was the leader in the world when it came to the overall competitive advantage in the digital economy, and China's total scores earned in developing strategic opportunities for the digital economy was roughly equal to those of the United States, Singapore, and other countries. China's digital economy ranked first in the world in terms of digital industry competitiveness (71.34 points), overtaking that of the United States (65.99 points). While the United States is currently positioned at the forefront of the world in terms of digital facilities and governance, China is expected to embrace steady growth in this regard with the rise of its digital industry and the improvement of its legal system, as they are the derivative products after the development of the digital industry.

In recent years, consumption has emerged as the primary driver of China's economic growth, occupying the first position in the troika (investment, consumption, and exports), which has driven China's economic growth for multiple years. According to the Boston Consulting Group (2017), China's digital economy is poised to expand significantly with a projected scale of USD 16 trillion and a penetration rate of 48 percent by 2035. The Goldman Sachs Group predicts that artificial intelligence (AI) will generate an annual revenue of USD 41 billion in the retail sector by 2025. Alibaba, China's largest

e-commerce company, boasts a considerable digitally active consumer base of more than 600 million people, and its affiliate company Ant Group boasts over 700 million annual active users in China, which means the “Taobao Shopping Carts” have been utilized by nearly 45 percent of China’s population. During the Double 11 Shopping Festival in 2016, Alibaba achieved sales revenues of RMB 120.7 billion from product sales, and more than 81.87 percent of these transactions were completed using mobile payment methods. The global COVID-19 pandemic starting from 2020 has made people more aware of the enormous benefits brought by the deep integration of information technology and digital transformation. As people adapt to new ways of living and working amid the pandemic, they have increasingly turned to digital technologies, such as big data, telemedicine, e-commerce, and mobile payments, to control the spread of the virus and facilitate the resumption of work and production. Additionally, tools such as Cloud Office, Health Code, and electronic consumer vouchers have gained wider acceptance among the public. Short video live-streaming platforms such as Douyin and Kuaishou are becoming increasingly popular due to their ability to provide engaging and entertaining content that accurately connects businesses with their target consumers. By leveraging these platforms, businesses can generate sales and drive customer traffic, thus contributing to their recovery and stable development amid economic challenges. The Chinese government has made it a top priority in recent years to give full play to the essential role of consumption and continuously unleash the potential of domestic demand as a key driver of the country’s economic growth. The state has introduced a series of policies and measures aimed at promoting consumption, including accelerating the removal of institutional barriers to consumption, expanding product distribution channels, and promoting business model reforms and innovations in consumption content, thus improving and upgrading residents’ consumption structures. In August 2019, State Council issued a comprehensive plan outlining 20 policies and measures to promote stable and sustainable growth of consumption, including fostering consumption hotspots, promoting the “Internet plus resource circulation,” facilitating the cross-field integration of business, tourism, culture, and sports by using big data, cloud computing, and mobile Internet information technology, and fostering new models, such as customized consumption, smart consumption, information consumption, and fashion consumption, thus creating more new circulation platforms and new forms of business. In 2020, the State Council launched a plan to boost and unleash rural consumption potential. It is undeniable that digital consumption has played a significant role in boosting economic development during the COVID-19 pandemic from 2020 to 2022. The widespread restrictions in place during the pandemic have fostered the surging demand for online consumption content, such as games, reading materials, and videos, which has boosted the rapid development of the digital economy. As a result, enterprises began to explore

ways to commercialize the contactless delivery approach within the new consumption scenario of the digital economy. The emergence of fresh food e-commerce platforms, characterized by instant delivery, has opened new supply-and-demand channels in the market. This innovative solution has made affordable dishes that are originally supplied to restaurants available for ordering and distributing among individuals. As a result, the digital consumption habits of consumers have been steadily consolidated over time, leading to an increasing user base.

Compared with traditional consumption patterns, the digital economy performs better in reshaping residents' consumption behavior, habits, levels, and structures, which has become an important complementary force and guarantee for traditional sales patterns. Therefore, it is essential to conduct a thorough study on the influence of the digital economy on driving residents' consumption transformations under the background of digital technology and clarify the specific ways in which the digital economy creates incremental finance for the real economy, which is also of great significance in advancing the digital economy, addressing the current problems faced by consumers, and improving relevant laws and regulations.

Literature Review

Connotation of the Term “Digital Economy”

The digital economy is a new economic form that takes data as a key factor of production while relying on modern information networks and information and communications technology (ICT), which is primarily focused on improving the quality and efficiency of social and economic development and promoting technological reforms (World Bank, 2016). The digital economy has become an essential component of the current macroeconomic strategies in various countries, whose output is captured in estimates of GDP (Ahmad et al., 2017, p. 9). Currently, researchers have been exploring the digital economy from various perspectives, including its description methods, activity forms, multiple viewpoints, qualifying conditions, and industry types. Dan Schiller, a scholar specializing in the political economy of communications, coined the term “digital capitalism” to depict how the development of cyberspace had widened market boundaries and expanded the range of economic organizations (Schiller, 2001, p. 12). The International Monetary Fund defines the digital economy as online platforms and economic transaction activities that owe their existence to such platforms (International Monetary Fund, 2018, p. 7). Ahmad et al. divided the conceptual framework of the digital economy from the perspective of transactions, including the production, investment, exchange, transaction, and consumption of digital information, so as to better establish the

connotative boundary of the digital economy (Ahmad & Ribarsky, 2018, pp. 1–32). In the same research, Ahmad et al. suggested that a transaction qualified as a digital economy transaction when it met either of two conditions: It was either digitally ordered or digitally delivered. The products or services involved in such transactions were considered the output of production activities within the digital economy (Ahmad et al., 2018, p. 8). Since 2018, several organizations, including the U.S. Bureau of Economic Analysis (BEA), Statistics Canada, and the Australian Bureau of Statistics, have implemented this conceptual framework to identify and measure the digital economy industries within their respective sectors (Wang, 2020, p. 4).

Literature Review of the Digital Economy and Resident Consumption

In recent years, the digital economy and consumption issues have gradually become a hot topic in the academic circle. According to the existing research, the main topics include the following four categories.

First, research on factors that influence the transformation of consumption fields and modes among residents against the backdrop of the digital economy and its resulting implications. Lin Ting and Zhang Shimeng argued that household consumption preferences under the “Internet plus” circumstance exhibited several characteristics distinguished by a focus on quality, intelligence, value, and precision (Li & Zhang, 2017, p. 156). Dai Debao et al., drawing on the theory of consumer behavior and the theory of consumption value, found that the personalized recommendation experience was a significant factor that stimulated consumer behavior under the background of the “Internet plus” (Zhang et al., 2015, p. 163). Yang Jirui et al. summarized that the advent of the “Internet plus” has significantly transformed the consumption mode of residents, thereby giving rise to a new consumption pattern featuring interactive consumption demands, rational consumption structures, the elimination of geographical barriers, shared consumer behavior, and autonomous consumption choices. Moreover, they found that the Internet played a crucial role in stimulating the consumption growth of the middle class, which was why it was imperative to support platform enterprises so they could evolve into bigger and stronger entities (Yang et al., 2015, p. 3). The “Internet plus” has created a channel to coordinate the spatiotemporal consistency among consumers, which is conducive to maximizing the timing arrangements of consumption utility (Feng & Chen, 2016, p. 101). Ekachat Tansiri and Sirivimol Devahastin studied media exposure, utilization, satisfaction, and the service businesses’ need for information regarding consumers in the era of the digital economy, examined the relationships between media exposure, utilization, and satisfaction of consumers with service information, and summarized the basic meaning of the development of the digital economy from the perspective of consumption (Tansiri & Devahastin, 2019, p. 90). Wei Qing et al. (2022)

conducted a study on the potential impacts of the digital economy on consumption and concluded that the advancement of information and communication technologies offered fresh prospects for both consumers and enterprises, which in turn, had a considerable impact on transforming people's lifestyles. The onset of the digital economy has led to an increase in the number of consumers who engage in e-commerce, which offers them more convenient and faster access to a vast array of products and services. However, it also presents several challenges unique to online transactions, which may differ from those present in offline commercial transactions.

Second, research on the basic relationship between the digital economy and consumer objects and social production. Huang Qunhui and He Jun conducted research to evaluate the influence of China's digital economy on social production and consumption over the course of the next three decades (Huang & He, 2019, p. 102). Liu Shuchun (2019) pointed out that the progress of the digital economy showcased a trend of reverse infiltration from the primary industry to the secondary industry and to the tertiary industry. Moreover, "soft industries," such as consumption and circulation, witnessed more significant penetration of digital technologies, so it was necessary to reinforce the guidance for the development of the industrial Internet, which has emerged as a dominant trend (Liu, 2019, p. 52). Liu Yuqi and Wang Qiang (2019) analyzed the restructuring effects of data production factors on resource allocation from the perspective of new retail, arguing that the digital transformation was in full swing from the consumer end to all links of the economy in an orderly manner. In their study, Thierry Rayna and Ludmila Striukova illustrated the significant influence of digital technology on production and user innovations. They pointed out that digital technology was transforming the production and innovation processes by giving consumers a more dominant and specialized role (Tansiri & Devahastin, 2019, p. 90). Benedict G.C. Dellaert highlighted that digital technology had restructured the relationship between consumption and production, with the sharing economy inviting consumers to participate as co-producers in production activities. As a result, firms need to reconsider their role in the value-creation process of marketing (Dellaert, 2018, p. 238).

Third, research on the consumption levels and payment abilities of residents in the digital economy. Tang Caikun conducted an empirical test to investigate the impact of the "Internet plus" on the consumption structure of rural residents in China by using the Internet and rural residents' expenditure data and found that the effects of the Internet on the consumption structure varied depending on the income sources of residents and the consumption levels in different regions (Tang, 2015, p. 117). Xie Jiazhi and Wu Jingru (2020) discovered that digital finance had a substantial incentive effect in promoting consumption among low-income and rural households and argued that the low-cost and inclusive nature of digital finance had a positive impact on effectively resolving

consumption downturns (Xie & Wu, 2020, p. 9). Xia Jiechang and Xiao Yu argued that as digital entertainment consumption continued to grow, consumers would gradually develop the habit of paying for the online content they consumed (Xia & Xiao, 2019, p. 56). Zhang Xun and Tan Ying discovered that the growth of the digital economy in large countries could contribute to an increase in residents' consumption levels, leading to improvements in per capita income (Zhang & Tan, 2019, p. 27). Song Xiaoling found that the development of the digital economy could play a positive role in bridging the income gap between urban and rural residents (Song, 2017, p. 17). Xie Xuanli et al. suggested that promoting digital finance could drive entrepreneurship (Xie, Shen, Zhang, et al., 2018, p. 1557). Fitzgerald et al. discovered that social media, mobile Internet, data analytics, and embedded devices could bring about noteworthy technological advancements, specifically in enhancing customer experiences, simplifying sales processes, and reshaping consumption patterns based on a survey of 1,559 senior executives from diverse industries in the United States (Fitzgerald et al., 2014, p. 2).

Fourth, research on consumption concepts, consumption views, and consumer rights protection in the context of the digital economy. Zhang Feng and Liu Lulu (2020) depicted a vision of “targeted consumers” generated by big data and proposed recommendations to steer residents' consumption perspectives, values, and technological beliefs regarding digital consumption. Moreover, a wealth of research has been conducted around the world on the impact of economic changes driven by digital technological changes. According to Amuso et al., digital technology can transcend the physical constraints of time and space via online collaborations and connect scattered elements to provide consumers with innovative services (Amuso et al., 2019, p. 124). Irene C. L. Ng (2014) considered consumption data as an economic resource that could change business models and suggested that industries in various fields would benefit from the connectivity of consumption-related technologies (Ng, 2014, p.149). According to the Organisation for Economic Co-operation and Development (OECD), the digital economy is expected to embrace vast opportunities for growth in areas such as products, networks, services, and hardware, which will produce a long-tailed effect on consumption and circulation, thus bringing a significant rise in the availability of diverse products (OECD, 2006). The World Bank (2016) acknowledged the positive impact of digital technologies in reducing transaction costs, fostering technological innovations, increasing production efficiency, and promoting social welfare. The study conducted by Carter et al. demonstrated that the approach employed by social media users to manage their stealth and visibility could increase the likelihood of such users revealing their personal information, identity, and experiences (Carter & Eger, 2021, p. 373). We believe that the present information systems, payment structures, and cultural practices around online communications tend to grant more transparency to individuals who opt to expose themselves to others in

manners that may augment their vulnerability. Cochoy et al. expressed concerns related to the monitoring of consumption tracking data. They argued that Internet search trackings were easily stored and analyzed, which could lead to surveillance of users' individual consumption needs and preferences. If such information is utilized for commercial purposes, it could cause a violation of the rights and interests of consumers (Cochoy et al., 2020, pp. 1–11).

Based on the above research, we concluded that research on the digital economy and resident consumption lagged behind both theoretically and empirically, and there seemed to be a gap in comprehending how digital technology-driven consumption and retail transformations could create incremental wealth for society.

Fundamental Theories and Practical Cases Related to Consumption Reform in the Digital Economy

Development of the Marxist Consumer Economy Theory in the Context of the Digital Economy

According to the Marxist consumer economy theory, consumption plays a crucial role in creating new objects for production and enabling the value of products to be recognized. The evolution and development of digital technologies will bring about significant changes to the supply side of production and generate new demands for consumption. This leads to a profound transformation in the relationship between production and consumption in the modern economy, along with new changes in residents' consumption structure and concepts. Moreover, it also results in a circular relationship between residents' consumption behavior and new production activities. According to Liu Yuqi and Wang Qiang, data and information boast much higher mobility compared to traditional factors of production such as land, capital, and labor. The higher the mobility of factors, the easier it is to achieve a multiplier effect (Liu & Wang, 2019, pp. 5–7). The digital revolution is characterized by the emergence of enterprise organizations or platforms that integrate information from all stages of production, exchange, distribution, and consumption, which fundamentally transforms the processes involved in social production and reproduction activities, enabling smoother resource allocations and recycling, ultimately leading to gradual improvements in the allocation of the original production factors. The impact of the rapid development of digital platforms on residents' consumption validates the practical value and scientific basis of Marxist consumer economy theory. Thus, it is essential to adhere to historical materialism in the process of vigorously promoting the digital economy so that its development can be effectively utilized to improve people's comprehensive literacy and quality of life (Xie et al., 2019,

p. 81). Historically, consumers have played a passive role in the production process since the first Industrial Revolution. However, in recent decades, the emergence of user innovation, DIY culture, and individual solutions has significantly impacted the role of consumers in production. With the help of digital technologies, consumers are now able to actively participate in the entire production process, from design to manufacturing and distribution. This shift has made consumer input truly crucial in shaping the production process. The increasing involvement of consumers in the production process disrupts the conventional model of consumption and production. Thus, consumers have gradually gained a more dominant role in production, becoming key players and customizers in shaping the production process.

Integrated Development of Economies of Scale, Economies of Scope, and Long-Tailed Economies Amidst the Digital Economy

In the digital economy, data is regarded as the prime factor of production, leading to data dependence for all economic activities across different sectors such as industry, agriculture, and service domains. This has facilitated the emergence of platform-based, shared, open, and equal development of organizational activities. The digital economy, as a representative of an advanced productive force, has reversed the traditional mode of capital formation and profit accumulation. Moreover, it integrates the economies of scale and economies of scope that originated from traditional Western economics, and focuses on developing long-tailed markets, thereby giving rise to new business entities, organizational models, and industrial structures. The industrial economy era promoted economies of scale by adjusting production scale to the optimal output that corresponded to the lowest long-term average cost to maximize benefits. According to Metcalfe's law, the value of a network increases exponentially as the number of users grows. When the number of users surpasses a certain critical point, the value of the network increases rapidly, leading to an explosive penetration, expansion, and aggregation of the network. Data is an essential factor of production with characteristics such as high mobility, wide dissemination, and sustained accumulation with zero marginal cost. The economies of scale supported by digital technology infrastructure increase average profits by increasing the number of users or market share, making it easier to create a winner-takes-all scenario or monopoly in the market, as seen in the typical case of Didi Chuxing. According to Li Junhua and Ouyang Yao, an increase in population size can stimulate regional economic growth. Therefore, population accumulation also offers natural advantages for innovative development in the digital economy (Li & Ouyang, 2016, pp. 27–40). The “great power effect” brought by China's large population and land area means that China has greater potential advantages in terms of economies of scale and resource endowments compared with other countries. This can result in reduced marginal costs for manpower and greater

market demand for digital financial services, which can then drive the rapid development of China's digital economy (Zhang & Tan, 2019, pp. 27–36).

The growth and aggregation of the digital economy can indeed give full play to the economies of scope, which is another secret of the digital economy that disrupts the traditional profit model. When economies of scale and scope are fully integrated in the digital economy, niche markets can fully benefit from the long-tailed effect, creating a generalized and borderless market support system for modern data products and services.

In traditional economies of scope, total cost savings are achieved by supplying parallel products, and the correlation between products directly affects the realization effect of the economy of scope. However, the digital economy relies on achieving scale economy by amassing a vast user base that enables it to meet divergent consumer demands. The profitability of the digital economy does not rely only on digital products themselves, but also stems from creating new services and products that complement existing offerings.

This approach is radically different from the inherently single-profit model of traditional manufacturing industries, which rely on cutting costs or increasing selling prices to enhance profit margins. Thus, in the digital economy, both generalized and niche products become new revenue sources, alongside “less relevant” advertising revenue or other potential revenue that may be attached to them. Figure 1 illustrates the path toward achieving economies of scale, economies of scope, and long-tailed economies during the technological transformation of the digital economy. In fact, many network enterprises generate most of their profits from advertising revenue, while the main products or services they offer are free. This creates a business model where high gross profit Internet services with a high turnover rate subsidize low gross profit and low cost-effective hardware services or subsidize consumer rights and interests by absorbing advertising input payments.

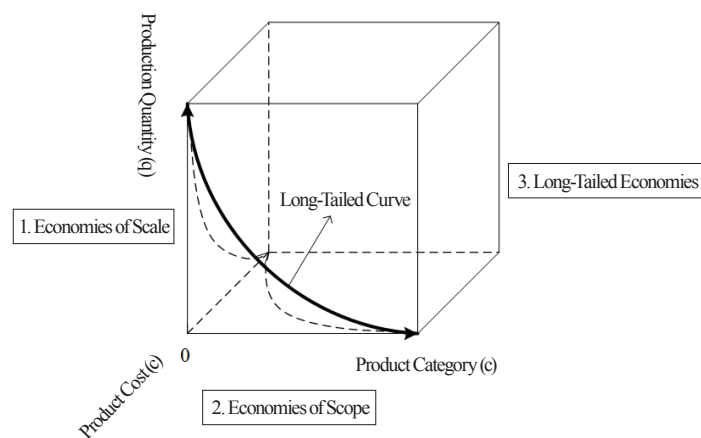


Figure 1 Integrated development of economies of scale, economies of scope, and long-tailed economies amidst the digital economy
Source: Drawn by the authors.

A Case Study Regarding the Efficient Integration of Economies of Scale, Economies of Scope, and Long-Tailed Economies Amidst the Digital Economy

Xiaomi has created a business ecosystem that is built on the Android system, with

three main businesses at its core, namely smartphones, IoT^① & consumer goods, and Internet services. This has enabled Xiaomi to establish its own business empire in the digital economy, which is quite different from the mode adopted by Apple. In terms of hardware and Internet services, due to the increasingly fierce competition in the mobile phone market, Xiaomi Group split Xiaomi and Redmi into two brands for independent operation and adopted a “dual engine + Internet service” strategy to constantly introduce new products. In terms of IoT & consumer goods, Xiaomi is leading the way in the market, with 45 affiliated enterprises actively working behind the scenes to create a robust ecosystem. These enterprises form a diverse chain, with some unique players catering to different markets, such as ZMI, Aqara, Viomi, and Zepp, all belonging to the Mi-generation (as shown in Figure 2). Viomi is the most prominent brand within Xiaomi’s ecological system and is primarily responsible for the Internet household appliance business. By utilizing AI technology and the product matrix based on IoT, Viomi has developed the Small V Hyperterminal Connector that can connect a water purification system to other household appliances in the kitchen, living room, bedroom, and bathroom. This transforms the devices from “passive” to “active” and enables data sharing and linkage between them, making them truly interconnected and intelligent to benefit thousands of households. Established only four years ago, Viomi has obtained 628 patents and has applied for more than another 1,000. It is a brand that really specializes in smart home appliances. Viomi achieved a significant milestone in September 2018 when it successfully went public in the United States, which was an important move for Xiaomi’s

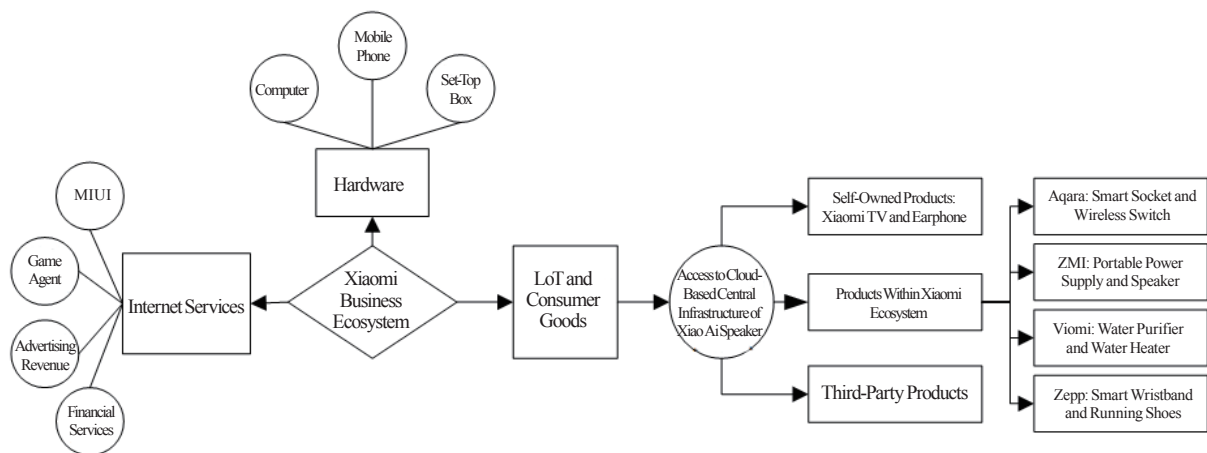


Figure 2 Global Production and Marketing Ecosystem of Consumer Goods After the Digital Transformation of Xiaomi Group
Source: Drawn by the authors.

① IoT is the abbreviation of the Internet of Things.

ecosystem. Following its successful public offering, Viomi released its first financial report. In the third quarter, Viomi's sales revenue reached RMB 565 million, and the number of offline experience stores increased to 1,200. According to Xiaomi's 2019 financial report, the smartphone business, as Xiaomi's largest revenue source, contributed RMB 122.1 billion in revenue, with a year-on-year increase of 7.3 percent. However, its proportion of revenue dropped from 70 percent in 2017 to 59.3 percent in 2019. The IoT & consumer goods business, as the second largest revenue source for Xiaomi, achieved a revenue of RMB 62.1 billion, with a year-on-year increase of 41.7 percent. This represented a year-on-year rise from five percent to 30.2 percent. Additionally, the total number of devices connected to the IoT platform was 235 million (excluding mobile phones and laptops), and more than four million households installed five or more IoT devices made by Xiaomi. It is also noteworthy that Xiao Ai, Xiaomi's voice assistant, had more than 60 million monthly active users. The Internet service business, Xiaomi's third largest revenue source, achieved a gross profit rate of 65 percent, reaching RMB 19.8 billion in 2019, up 24.4 percent year on year. This accounted for 9.6 percent of the total revenue and was mainly derived from MIUI advertising, game intermodal transportation/agency, entertainment content, and financial services^① (see Table 1). The growth of the user base is one of the key pillars of Xiaomi's digital business empire, via which the company can achieve interactions among various data information and enhance data applications. This means that Xiaomi's platform can effectively enable the interconnection of hardware devices, thus expanding its reach and influence. Moreover, this approach enables Xiaomi to fully leverage the economic benefits of its product range and increase user engagement and loyalty over time. The scale connection and interaction of active users will further form fan groups, communities, and enthusiasts, to maintain the diversified and multi-dimensional development of products, amplify and multiply the effect of economies of scale and scope, and extend its tentacles to niche markets, enabling Xiaomi to successfully realize the unique business profit model of the Internet digital economy that can stand the test in the short term.

Table 1 Composition and Proportion of Xiaomi's Annual Operating Revenue in 2019

	Operating revenue in 2019	YoY growth rate	Revenue proportion
Smartphone business	1221	7.3 percent	59.3 percent
IoT & Consumer goods	621	41.7 percent	30.2 percent
Internet services	198	24.4 percent	9.6 percent

Source: 2019 Annual Financial Statements of Xiaomi Group, Unit: RMB 100 million.

Digital economy technologies dominated by big data, the Internet, and new

^① The data is recorded as of December 2019.

infrastructure have transformed residents' consumption behavior, habits, structure, and levels, thereby reshaping their modern consumption modes. So, what are the economic effects and consequences of the transformation of residents' traditional consumption patterns brought by the digital economy? To date, no thorough research by the academic community has been conducted regarding such issues. To address this gap, we utilized Marxist theory of the identity of production and consumption, as well as typical cases and recent data from the development of the digital economy, to conduct an extensive study on the economic effects of resident consumption in the context of the digital economy. By doing so, the present study intends to provide several policy suggestions to bolster domestic demand and encourage consumption by promoting the high-quality and integrated development of China's digital economy and real economy, thus building China into a consumption power and a cyber power.

Economic Effects of the Transformation of Residents' Traditional Consumption Patterns Attributable to the Digital Economy

Online consumption reflects the final demand of residents (and some government departments) in the digital economy. In 2012, China's online consumption exceeded RMB 1 trillion for the first time, and the proportion of household consumption has risen steadily since then. According to data analysis, the scale of online consumption is expected to reach RMB 10 trillion, accounting for 20 percent of the total retail sales of consumer goods (Tang, 2019, p. 217). The digital economy, with consumers at its core, Internet platforms as its carriers, and information and communication technology (ICT) as its means, is gradually emerging as a core growth force. The era of the digital economy has seen consumer demand becoming the dominant force in the economy, reversing traditional models of economic development that depended on fixed asset investments. This transformation will have far-reaching and profound impacts on economic and social life across three primary areas. First, the expanding scope of Internet platforms will emerge as a key organizational form for economic activities. This will boost efficiency and spur innovation across agriculture, manufacturing, and service industries. Second, the inclusive development of digital technology will foster an e-commerce sales ecosystem and improve infrastructure in underdeveloped areas. It will provide rich and innovative information services to poverty-stricken populations, thus saving on consumption costs, increasing incomes, and narrowing the digital divide between urban and rural areas. Third, modern manufacturing and service industries will benefit from the Internet-based consumption mode among residents and direct feedback from consumers, thus facilitating the development of products and innovations that meet market needs. It will reduce resource waste and ineffective R&D, thereby shaping a new model for sustainable and

endogenous growth.

Platform Aggregation Effect

The digital technology system provides a global application platform that transforms traditional industrial production, manufacturing, and sales processes and facilitates the increment of values and restructuring of the entire chain of production and consumption, thus creating more diverse employment opportunities through a richer social division of labor. As an emerging organizational form of social production and reproduction tailored to the digital technology framework, international platform companies like Amazon, Facebook, and Alibaba leverage advanced algorithm systems and robust data-processing and transmission technologies to foster cross-regional consumption and production. This approach has a wide impact on the manufacturing industry worldwide. The COVID-19 pandemic restrictions implemented in 2020 have significantly elevated the value of Internet platforms, enabling them to become a critical tool in bolstering global resilience by facilitating adjustments across production, distribution, exchange, and consumption. For instance, streaming video has emerged as a crucial lifeline for the traditional film, television, and entertainment industry, and even the education industry. In terms of consumers, according to Alibaba's third-quarter financial data for Financial Year 2019, the Taobao mobile app recorded a monthly count of 699 million active users and an annual base of 636 million active customers. More than 70 percent of these new annual active consumers came from incrementally declining markets, becoming significant drivers of consumption growth. Regarding the manufacturing supply, Internet platforms leverage a combination of advanced digital technologies, including big data, artificial intelligence, mobile Internet, cloud computing, and IoT, to enable effective information management and control capabilities and computational advantages for complex tasks. By integrating logistics, business flows, capital flows, and information flows, these platforms provide a robust, efficient, sustainable, and tailored industrial development service system that differs significantly from traditional industrial manufacturing processes and builds a bridge for the transfer of digital capabilities between the consumer end and the supply end, thus facilitating a win-win scenario for the entire upstream and downstream industrial chain.

Over the past two decades, Alibaba has evolved from a business-to-business (B2B) operator focused on domestic wholesale trade to a retail e-commerce platform with Taobao at its core. So far, Alibaba has formed a comprehensive business operating system based on intelligent interconnections, information integration, data decision-making, and digital operations and management to provide products and services for both the consumer and the supply ends with its advantages in retail. By doing so, Alibaba can drive and promote the full-chain and full-cycle development of commodity production, circulation, and retail

as a whole, becoming the core means and important force of the third market resource allocation in addition to the “invisible hand” (micro market regulation) and “visible hand” (macro market regulation). In 2018, Alibaba’s retail platform in China generated 40.82 million jobs, of which 15.58 million were direct jobs, and 25.24 million were associated with upstream and downstream production, logistics, and other links.^① JD’s global supply chain management platform leverages the technical advancements and talent resources offered by Internet platforms to facilitate efficient supply and demand matching for consumers, purchasers, and suppliers. The system streamlines processes from the front-end supply chain to mid-tier logistics transportation and back-end goods management, making it possible to accurately measure consumption demand, scientifically schedule operations, and achieve precise distribution. Through inventory sharing and order integration processing, products are collected and allocated in a digital and systematic manner. Furthermore, by deconstructing elements such as people, goods, and locations, a centralized control system is formed that involves such processes as commodity warehousing, ex-warehouse, receipt, and review of products. With JD Logistics, goods are dispatched directly from production enterprises to consumers with same-day or next-day delivery. This approach not only improves the safety, punctuality, and stability of goods transportation, but also fundamentally transforms residents’ consumption patterns, fields, objects, content, and concepts, thereby enhancing the overall efficiency of social production supply chains.

The Internet digital platform prioritizes achieving a large-scale aggregation effect, network effect, and social influence effect, giving full play to the advantages of online and offline interconnections, and presenting triple logic featuring winner-take-all situation, cross-border circulation, and long-tailed markets. The concept of the platform stretches beyond the notion of “linking tools” and encompasses two core meanings: a platform owner and the enabling purpose of the platform. Thomas John Sargent, the winner of the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2011, cited GitHub as a case study to investigate the ownership dynamics of platform-based businesses. GitHub is a global platform that provides free sharing services, bringing together thousands of virtual retailers, digital products, and product lists. Scientists around the world are using GitHub to access their programs, software, and virtual products for labor reproduction, making it a mutually beneficial platform for all parties involved. As consumers, users contribute the vast majority of the data and materials to the platform, thereby becoming producers of platform content. Thomas thus argued that he was unsure about the actual ownership of GitHub and stated that content

^① Aliresearch & Research Group of the School of Labor & Human Resources at Renmin University of China. (March 2019). Research report on employment opportunity calculation and platform employment system of Alibaba retail platform.

created by platform users out of hobbies or career needs was a source of motivation for the platform to continue to develop new users. The platform was not solely established for a single entity or individual, but rather designed to benefit all stakeholders. It operates as a living body comprised of all participants. Each individual consumer can represent not only themselves but their family or community as well. Similarly, each seller operates as part of a network rather than in isolation, with both parties playing a critical role in facilitating the seamless integration of production and consumption through free development and digital aggregation, thus helping to expand social demand and increase the overall value of goods. Ahmad et al. proposed an innovative conceptual framework for the digital economy, dividing it into digital enabling industries and process behavior such as production and consumption based on the enabling tools (Ahmad et al., 2018, p. 21). Through unrestricted development, Internet platforms establish trust mechanisms for consumers, small businesses, and small producers on online platforms, providing a relatively fair market and creating a digital network ecosystem that supports the growth and sustainability of small-scale players using advanced technology and enabling tools. Internet platforms can also reduce marketing costs and business layout expenses for small and medium-scale merchants and expand their reach to broader market segments with the help of inclusive logistics networks. In addition, they can break the traditional business competition dominated by standardized brands with monopolized advantages of offline channels, enabling a new competitive landscape. The application of data technology provides algorithmic services that facilitate seamless connections between small and medium-sized enterprises (SMEs) and consumers. These services enable businesses to gain a clear understanding of what products to offer, at what price points, and to what specific audience segments. By leveraging data technology, businesses can further meet the diverse or even niche consumer preferences in the Chinese market. The transformation in consumption preferences has prompted another round of consumption upgrading and industrial-scale expansion throughout society. While rapidly improving operation and management levels and identifying profit growth points, small and medium businesses can improve productivity and obtain more independent choices, thereby providing more economic benefits to consumers. However, contemporary consumers encounter a range of issues in the realm of consumption. Intelligent consumption recommendations pose inherent risks, such as the unauthorized use of personal data. When a consumer registers or utilizes a digital consumption terminal, platforms often label and categorize them based on their previous consumption records to conduct preference analysis and recommend products accordingly. For instance, upon completing a purchase on a major online shopping platform, if a consumer revisits the app, the homepage will automatically display product advertisements based on their previous search and purchase history. While coupon consumption simplifies the payment process, it does not necessarily simplify the

overall consumer activities. These problems will be effectively solved with the continuous development of digital consumption.

The ever-changing business environment and evolving consumer needs necessitate continuous innovation. The “Internet + platform” is more than a mere augmentation of existing physical processes, but also embodies a transformative chemical reaction between the digital and real economies fueled by the new infrastructure, such as the “cloud, network, and terminal,” thus contributing to the formation of a brand-new business environment. Leveraging powerful and agile data processing “aircraft carriers” in the form of online platforms, the integration of the digital economy and real economy has become increasingly seamless. Search, algorithms, products, and networks are now intricately interconnected and actively interacting with one another, leading to a business landscape in which data-driven decision-making has become ever more essential. This approach enables companies to capture and transform more valuable products and more diverse opportunities (see Figure 3).

Inclusive Diffusion Effect

The term “Inclusion,” as indicated by its literal English translation, refers to the idea of incorporating all groups and categories of individuals into the economic and social development process, thus ensuring that the benefits of development are available to the widest possible range of people, regardless of social class or other differentiators. Viewed through a historical lens, the evolution of the Internet during the era of the digital economy has facilitated unprecedented global connectivity among people, countries, and companies and fostered a rapid transition of society from an industrial civilization to an emerging information civilization. There is no denying that human society is currently undergoing a transformative process marked by unprecedented advances in the degree of inclusion and a corresponding increase in the dispersion of inclusive opportunities. In

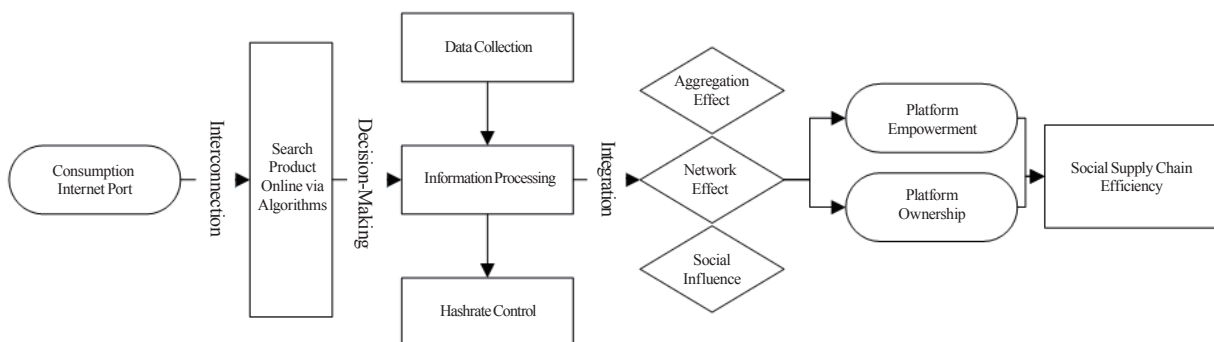


Figure 3 Internal Mechanism and Realization Path of “Internet + Consumption Platforms” in Affecting the Efficiency of Social Supply Chains
Source: Drawn by the authors.

2015, all 193 member states of the United Nations came together to unanimously approve the 2030 Global Sustainable Agenda, which encompassed a total of 17 Sustainable Development Goals (SDGs) focused on reducing poverty, promoting inclusivity, driving innovation, improving education, and addressing other societal challenges. This symbolized the world's consensus on inclusive economic and social development. As affirmed in the report of the 19th National Congress of the Communist Party of China (CPC) in 2017, as China is currently navigating a critical juncture in building a moderately prosperous society in all respects, the principal contradiction facing Chinese society in this context is the one between unbalanced and inadequate development and the people's ever-growing needs for a better life. To address this challenge, the CPC has emphasized the need to "improve systems and mechanisms for stimulating consumer spending and leveraging the fundamental role of consumption in promoting economic growth."

Over the 50 years since the 1970s, the increasing adoption of digital technologies and the advancing drive towards inclusive development have been instrumental in creating a more inclusive, balanced, and sustainable landscape for economic and social growth across all countries. In 2010, China's household consumption rate was only 35.6 percent, lower than the world average of 57.9 percent, and ranked last among the world's 12th largest economies. However, since 2011, China's household consumption rate has gradually increased (Yi & Zhou, 2018, p. 48). Meanwhile, China's provincial digital financial inclusion index grew at an average annual rate of 36 percent from 2011 to 2018.^① China regards the strategic system of "low cost, wide coverage, and deep reach" as its foundational implementation blueprint in driving the development of its digital inclusive finance. By implementing this framework, the country has made notable strides in expanding financial inclusivity through innovative mobile payment solutions, liquidity-easing measures, and other strategies. This approach has facilitated the expansion of household consumption patterns, elevating their fundamental role in driving economic development, even as they become more efficient in using digital financial technologies that create more value with less capital input. China saw a significant contribution rate of final consumption expenditure to GDP growth, reaching 76.2 percent in 2018, and the Engel coefficient decreased to 28.4 percent (National Bureau of Statistics, 2019). According to the analysis and prediction by AliResearch in 2018, the digital economy would provide uniform and high-quality services for consumers around the world. By 2030, the digital economy will serve seven billion consumers around the world, accounting for 82 percent of the global population.^② In addition, poverty reduction, as the

① Institute of Digital Finance Peking University. (April 2019). Peking University digital inclusive financial index (II, 2011-2018). <https://www.idf.pku.edu.cn/yjcg/zsbj/485016.htm>.

② The forecast data comes from AliResearch's the digital economy series reports II. Digital economy: A new engine in the inclusive 2.0 era. https://www.sohu.com/a/218065253_100096472.

first goal of the United Nations SDGs and a core element of China's national governance framework, remains a top priority for governments and communities around the world. Household consumption is recognized not only as a central driving force of economic growth, but also as a critical potential enabler of poverty alleviation, employment improvement, and industrial structure transformation in developing countries. (Yi & Zhou, 2018, pp. 47–67). Zhang et al. argued that digital finance could facilitate inclusive growth by boosting household income and encouraging entrepreneurial activities among individuals with less physical or social capital in less developed regions (Zhang et al., 2019, p. 71).

“Enabling” and “Inclusion” are the most fundamental values of Alibaba. Since its inception, the company has been embracing a mission of “making it easy to do business anywhere” and carrying forward the inclusive ethos of the Internet featuring “extensive participation and co-building and sharing” to assume its social responsibility as an Internet enterprise to address the issue of unbalanced and insufficient development. By leveraging the inclusive commercial carrier and financial platform provided by “Taobao” and “Alipay,” the digital growth model not only bridges regional development gaps but also empowers disadvantaged groups, such as small and micro-enterprises and impoverished individuals, enabling them to build a complete industrial chain, cultivate industrial advantages, and directly participate in the inclusive trade competition in the context of consumption globalization. Taobao boasts inherent inclusion during its development. As of 2018, there were 3,202 Taobao villages and 363 Taobao towns in China, with more than 660,000 active online stores and 1.8 million jobs created. This has significantly lowered the entrepreneurial threshold for disadvantaged groups, such as small and micro-enterprises, women, and disabled individuals.^① From April 2016 to March 2017, Taobao recorded 2.46 million purchases made by individuals with disabilities, with a total online shopping expenditure of RMB 22.1 billion. Through this service, the negative impacts of travel inconvenience on disabled individuals were circumvented, enabling them to enjoy the same timely and dignified shopping benefits as non-disabled individuals, effectively fulfilling their needs for self-reliance and self-development.^② International (Business-to-Customer) B2C cross-border e-commerce platforms support individuals in registering and engaging in cross-border trade. SMEs can directly connect with customers through various e-commerce platforms, which has facilitated their participation in the global trade networks and broken the traditional trade patterns of consumers only being able to obtain foreign products from domestic importers. The continuous gathering and creation of e-commerce platform data (including data on sellers and consumers), alongside

① AliResearch. (October 2018). Research report on China's Taobao villages (2018). <http://i.aliresearch.com/img/20200103/20200103164038.pdf>.

② China Disabled Persons' Federation & Alibaba Group (March 2017). Helping the disabled in the network era: Inclusiveness and wealth creation.

the value generated during the process, have resulted in the dominant role of such data in reconstructing international trade rules. This has led to lower transaction and data search costs, increased market transparency, and precise customer segmentation, thus enabling consumers and SMEs to get access to high-quality resources and diversified channels and providing them with a more precise understanding of market dynamics. With the connection of digital technologies, innovation and creativity capabilities will be greatly increased, leading to the emergence of a new production and consumption model represented by the extensive participation of individuals in manufacturing, trading, and logistics. This enables every individual to gain the right to obtain commodities on a global scale, thus fostering a new economic landscape where everyone participates in and benefits from economic activities. By focusing on massive data, the potential of big data can be fully explored, and it can be made available to global trading partners. The Internet plays a key role in promoting inclusive trade in China, which will increase the exports of high-value-added products and services while also providing equal opportunities for the country to participate in global value chain competition, enabling it to penetrate from the middle and low-end markets to the middle and high-end markets. Moreover, inclusive trade will drive the transformation and upgrading of the manufacturing industry.

The rapid development of China's digital economy and digital finance has facilitated inclusive growth, leveraged the inclusive diffuse effect, and balanced fairness and efficiency. On the one hand, inclusive digital finance has expanded the service scope and penetration depth of economic activities, enabling more consumer groups to overcome financial constraints, improving financial market efficiencies, and increasing the likelihood of commodity discoveries and information flows. On the other hand, the establishment and improvement of the household consumption systems and mechanisms will further stimulate business growth and enable the transformation of the supply-side structure of social production. This will result in technological progress, economic growth, and significant social welfare reform, benefiting more disadvantaged groups and small and micro-enterprises, while also guiding them to participate in high-tech economic activities within the global value chains. These efforts will contribute significantly to addressing imbalanced development, eliminating predatory development, and working towards inclusive and shared growth (see Figure 4).

Push-Pull Effect

In 2016, China recorded a double decline in its population growth rate and birth rate for the first time, leading to a gradual aging of the population structure due to changes in population increments. The consumer Internet industry's extensive growth mode has ended due to the rising awareness of consumers, resulting in more intense competition among retail industry players. Traditional product development is often based on

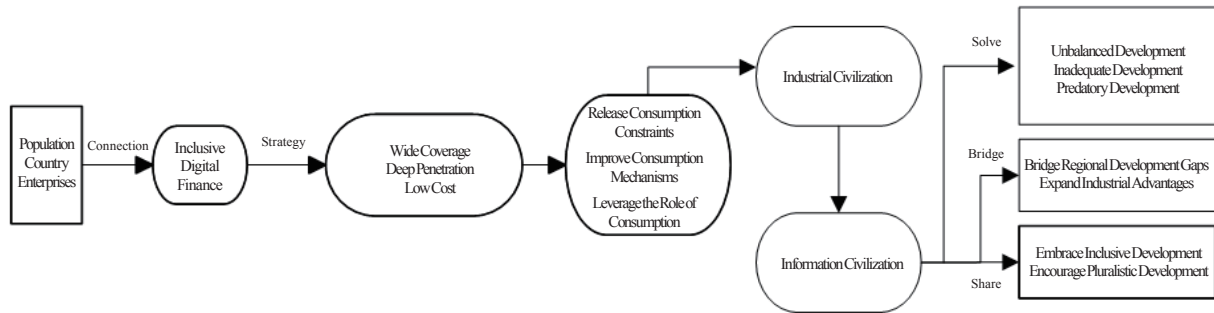


Figure 4 Internal Mechanism and Economic Significance of Inclusive Growth of Finance Inclusion in the Era of Digital Economy
Source: Drawn by the authors.

surveys or empirical research, which will cause difficulty for consumers to connect with the production system once products are launched in the market, thus resulting in slower growth and a misaligned market where consumer demands do not align with the products or services offered. Demand-oriented development is an inevitable trend of the future business paradigm, and China’s improving production efficiency and product competitiveness will “push” and “compel” enterprises to pursue greater growth via innovation. The evolution of the digital economy has progressed from the emergence of digital technology to the expansion of the digital industry, gradually reaching greater maturity (Xu & Zhang, 2020, pp. 23–41). Amidst the ongoing and deepening division of labor, data and information are the main carriers and the only way for the manufacturing industry to achieve efficient innovation, transformation, and upgrading (Huang et al., 2019, pp. 5–23). How to further stimulate marginal growth of consumption and how to transfer and transmit China’s new division of labor system fostered by leading digital capabilities at the consumer end to the supply end may be common challenges that need to be addressed by all Internet digital economies in maintaining continuous innovation. As the consumer Internet continues to play a pivotal role in revitalizing the manufacturing industry and facilitating digital capacity transfers between the supply and consumption ends, it is highly imperative for Chinese enterprises to embark on the digital and intelligent transformation process (see Figure 5).

China ranks high in the world in terms of digital penetration among its consumers, with a digital adoption rate of 44 percent,^① which makes it a valuable and substantial source of intellectual resources for generating digital content and information. As consumer demands become more individualized and diversified, data intelligence technology not only digitalizes consumer behavior but also empowers consumers to gain a better understanding of themselves and focus more on the personalized experience of

① Consumer digitalization: The proportion of online shopping in the total population. Source: AliResearch. (December 2019). Report on enterprise digital and intelligent transformation and development in 2019. <http://i.aliresearch.com/img/20191231/20191231172329.pdf>.

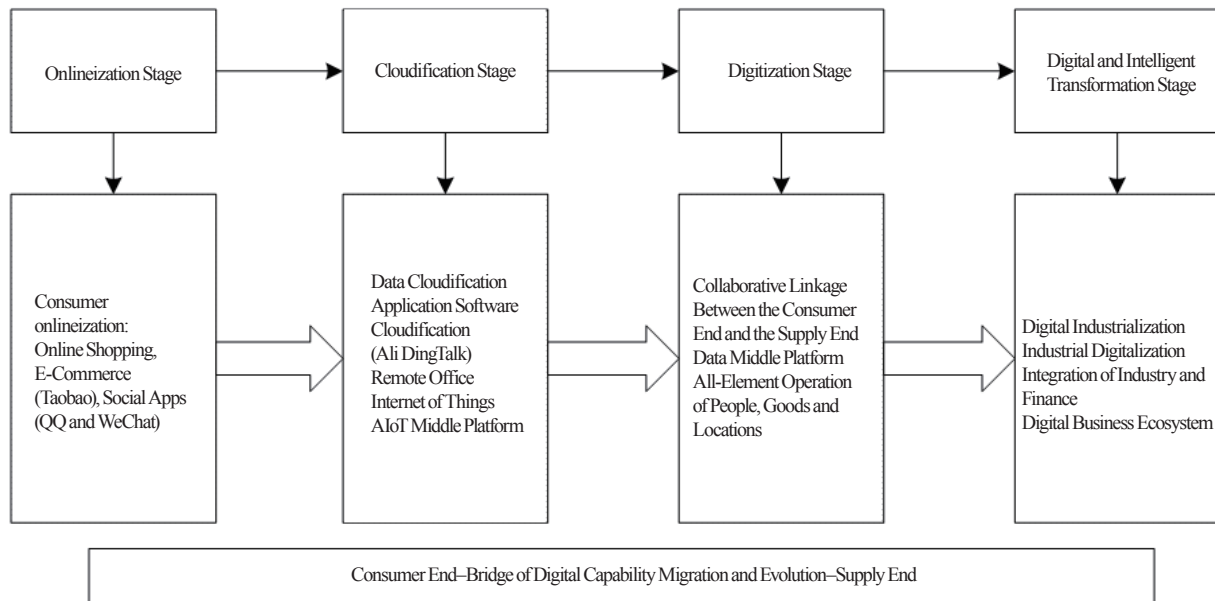


Figure 5 Evolution Path of the Digital and Intelligent Transformation of Enterprise Supply Chains Driven by the Internet Consumer End
Source: Drawn by the authors.

products. Achieving digital and intelligent transformations in enterprises necessitates a comprehensive approach where all business elements should begin at a professional digital service port, extend towards the frontlines, and eventually promote a systematic process of intelligent reorganization in each supply port based on practical implementation. Taking consumer demand into full account, professional digital user research tools utilize full-cycle data generated by consumption ports to create billions of digital information pieces through a process that involves the recording, storing, transmitting, analyzing, and operating of personalized consumption behavior information at each node. This process establishes a communication mechanism for the consumption-production chain, providing decision-making guidance based on efficient insights and analyses of consumers' functional needs and emotional demands. Achieving supply and demand alignment is a critical aspect of business operations, and intelligent digital operations driven by the "Internet plus" can provide transaction subjects with professional services during the transaction process. This has become a core engine for enterprises to achieve upgrading and transformation, improve quality and efficiency, and create value. Moreover, it is necessary to reconstruct and improve the digital infrastructure of manufacturing sectors, which includes resource cloudification, big datafication, ubiquitous connectivity, and mobile middle-platforms, via digital technology professional services and data intelligent collaborative platforms to enhance the specialized, refined, and differentiated development in production and manufacturing links, thus ultimately improving the

efficiency of R&D in the manufacturing sectors. Alibaba, starting from the retail end, offers consumers more options by leveraging the omnichannel and full-cycle consumption data collected at the front end for powerful information processing and demand insight analysis in the middle. This information is then transmitted to the back end to accurately guide product development and iteration, which in turn enables the generation of more opportunities for the marginal growth of consumption.^① The division of labor systems with distinctive attributes and characteristics fostered in China's consumer Internet over the last two decades has effectively transitioned into the specific division of labor system industrial Internet with the help of intermediaries such as Alibaba's business operating system, featuring the free flow of data and widespread adoption of Internet, IoT, and network collaboration technologies.

According to data from "Tmall" New Product Innovation Center in 2019, after the adoption of professional digital operations, the R&D and launch cycle of new products by collaborative enterprises was shortened to less than six months. More than 70 percent of these new products outperformed others in their respective categories, with a higher success rate of five percent compared to traditional fields. Additionally, "explosive products" were found to have an average premium of over 30 percent. This advancement led the way to a high-end product value chain, cultivation of brand and transformation development, and an effective transition into scientific innovation practices.^② Moreover, in addition to taking the initiative to embrace digital transformation to guide their various production activities, enterprises also adopted another scenario-based application approach to drive the intelligent transformations of their business models. Xiaomi's Xiao Ai smart speaker is described as a "universal remote-control panel" powered by voice-controlled intelligent technology to facilitate voice interactions. Xiao Ai smart speaker, designed to function on a household unit model, provides voice network distribution and intelligent control for smart home device developers across all categories. It also integrates a cloud-based central infrastructure with "digital + intelligence + network" interconnections. As of June 3, 2019, the accumulated number of voice interactions for the Xiao Ai speaker serial products had exceeded 10 billion instances. Xiao Ai speaker has boosted the overall sales of at least three layers of household brand manufacturers. First, sales of all intelligent devices in Xiaomi's own ecosystem chain; second, the sales of traditional large household appliances manufactured by enterprises such as Midea and Gree; and third, sales of emerging ecological household appliances, including smart door locks, smart kitchen appliances, and other similar products. Chinese suppliers currently have a digitalization rate of 17.6 percent, while manufacturers have a rate of

① AliResearch. (December 2019). Report on enterprise digital and intelligent transformation and development in 2019. <http://i.aliresearch.com/img/20191231/20191231172329.pdf>.

② AliResearch. (October 2018). Report on online new product consumption trend in 2018. <http://i.aliresearch.com/img/20191224/20191224192432.pdf>.

13.7 percent, both of which are comparably lower than the high level of digitalization among Chinese consumers.^① This suggests that there remains a significant opportunity for the development of technological paradigms that incubate and guide new supplies and stimulate and sustain growth based on data utilization.

Under the guiding principles of innovation, coordination, green initiatives, openness, and sharing, the digital economy is utilizing information and data as key factors of production to drive digital industrialization and industrial digitization. This, in turn, is accelerating the integration of the Internet into all aspects of life. To enhance the intelligent transformation of enterprises, it is vital to reduce the misallocation of resources, alleviate management imbalances, coordinate gradual reorganization and sequential transmissions of enterprises, and achieve intelligent development via data and empowerment via intelligence, thus forming a comprehensive industrial pattern featuring supply-demand coordination.

Conclusions and Policy Suggestions

Drawing on Marx's theory of the identity of production and consumption, we contend that digital technology innovation can effectively facilitate the integration of economies of scale, economies of scope, and long-tailed economies by citing the practical case of Xiaomi's ecological chain, highlighting the notion that data serves as both a key production factor and a critical consumption carrier within the context of digital consumption. We also examined the economic and social effects brought by the consumption reforms driven by digital technology and illustrated the ways via which the digital economy promotes the reform of consumption modes as well as reshapes and transforms traditional industries while simultaneously introducing emerging business forms from three aspects, namely, the aggregation effect of digital platform clusters, the diffusion effect of digital financial inclusion, and the push-pull effect of digital-intelligence integration. Our main conclusions follow. First, the transformation of resident consumption driven by the development of digital technology is characterized by the reduction in time and physical distance between consumers and goods and services through the Internet, which has resulted in a surge in consumers' willingness to purchase. Digital technology has substantially extended the boundaries of production and marketing. The introduction of live streaming, showrooms, and other marketing forms has further strengthened the emotional and spiritual connections between consumers and businesses and successfully stimulated consumers' desire to purchase. The rapid

^① Supplier digitalization: The proportion of supplier enterprises that have realized digital management. Manufacturer digitization: The proportion of manufacturer enterprises that have realized online business collaboration. Source: AliResearch. (December 2019). Report on enterprise digital and intelligent transformation and development in 2019. <http://i.aliresearch.com/img/20191231/20191231172329.pdf>.

growth of the digital economy and financial technology has significantly bolstered the concept of advanced consumption. Second, the emergence of a new economic pattern driven by consumer demand has reversed the traditional models of economic development that depend on fixed asset investments. This transformation will have far-reaching and profound impacts on economic and social lives across three primary areas, namely, the expanding scope of Internet platforms, the inclusive development of digital technology, and the evolving growth modes of modern manufacturing and service industries. Third, the economic effects of the digital economy in driving the transformation of residents' consumption patterns are reflected in three aspects, namely, the platform aggregation effect, the inclusive diffusion effect, and the push-pull effect. Under the guiding principles of innovation, coordination, green initiatives, openness, and sharing, the digital economy is driving digital industrialization and industrial digitization. This, in turn, is accelerating the integration of the Internet into all aspects of life.

It is undeniable that the developments of the digital economy may bring about potential risks for residents during their consumption process. First, in the digital economy, consumers may face potential issues regarding the return and exchange of goods, and they may not always have access to insurance to address these matters. Within the virtual realm of the Internet, sellers may exploit the disparity between online and offline transactions to defraud consumers or conceal the actual quality of the goods. Furthermore, the goods could become damaged during the delivery process. Under such circumstances, consumers who wish to return or exchange goods may have to bear the postal costs by themselves, which will lead to an increase in the cost of time and money for consumers. If a similar situation arises, online platforms could consider establishing insurance and monitoring mechanisms to compensate consumers for their losses. An effective insurance mechanism should be established to waive postage fees for the return and exchange of goods and distribute small gifts to consumers as compensation for delays. Given that most delivery services are outsourced to third-party providers, both the seller and the delivery company should share the insurance premiums and jointly oversee the monitoring mechanisms. Online platforms can also establish a separate investigation and punishment mechanism focused on combating fraudulent behavior by sellers. Direct communication with consumers will help sellers understand consumers' true experiences when using the products. Rewards should be given to those who provide valuable feedback in the form of texts, pictures, and videos. Second, many online operators do not have an actual business address. In the virtual world of e-commerce, the actual geographic distance between consumers and operators can be vast. Additionally, sellers may establish multiple warehouses across the country to facilitate the prompt and efficient transfer of goods, thereby exponentially expanding the shopping range of consumers and the sales radius of operators. However, in this case, if sellers cannot promptly transfer the goods or provide

unclear information due to the far distance of their place of shipment, it will prolong the delivery time for consumers and significantly affect consumers' shopping experiences. The implementation of monitoring mechanisms can prevent misunderstandings by consumers. Alternatively, sellers can also inform consumers of specific delivery locations in advance, enabling consumers to readjust their plans and accommodate delivery time frames. Third, digital technology can monitor, record, and track consumers' behavior. When consumers search online, digital traces will be generated, which are easily stored, analyzed, and marketed, creating potential risks to the protection of their rights. Digital technology and encryption standards also pose great challenges to data preservation. This will undoubtedly bring huge legal risks to the economy and society.

Existing digital consumption practices suffer from several significant challenges. However, if manufacturers, sellers, and distributors can address these issues from the following aspects, they could help drive a significant improvement in consumers' digital experiences. In summary, we propose the following suggestions.

First, comprehensively promoting and deepening the strategy for the high-quality development of digital technology in all sectors of China to break the unsaturated, inadequate, and unbalanced development of digital technology in China. It is necessary to take the Internet as an effective vehicle and use modern technologies to drive innovation and entrepreneurship throughout society. Digital infrastructure, such as the 5G network projects, big data collaboration centers, information and industrial intelligent interconnections, industrial Internet platforms, digital economy innovation incubators, and pilot zones, should be built to promote the integrated innovations and applications of big data, cloud computing, cloudification, AI, and IoT. Efforts should also be made to foster a range of enterprises that can generate significant employment within the digital economy to cultivate digital industrial clusters across the eastern, central, and western regions of China that are competitive and influential in the global markets, extending to both rural and urban areas.

Second, strengthening the legal system and improving network governance. With the growth of the digital economy, it is essential to encourage residents to consume in a scientific, moderate, and rational manner, thus reducing the occurrence of extravagant consumption and the waste of resources. Additionally, strong measures should be taken to prevent the illegal extraction of consumers' personal information, such as location and address, through the use of big data crawler technology. Such actions violate consumers' privacy rights, which often lead to provocations and troubles. To counteract these negative impacts, it is necessary to work diligently to combat bad business practices, such as Internet digital copyright theft and other technology abuses. In addition, it is critical to carry forward traditional Chinese culture and prevent the abuse and misuse of network technology. It is necessary to leverage technological developments to improve society while creating a green network environment to promote sustainable social and economic development. Efforts should also be made

to foster a harmonious, equitable, and fair environment to ensure economic and social development, empowering residents to partake reasonably and legally in the digital economy era and share fully in the results of new scientific and technological innovations.

Third, improving data governance to ensure consumer privacy. The issue of data monitoring, resulting from consumers' consumption traces, puts consumers at risk of being watched and monitored during their digital consumption experiences. Through the analysis and potential misuse of personal data, unethical merchants create targeted marketing campaigns aimed directly at consumers, which often result in unwanted marketing notifications. To ensure effective data governance, various participants in the economic system, including the government, platforms, enterprises, and consumers, should work together to create a collaborative governance mechanism. Regulatory authorities should carefully study the role of digital equipment in shaping consumer behavior and address the manipulation of consumer data by technology companies through advanced infrastructure and systems. Institutional construction efforts should also be made to purify and standardize the digital consumption environment while actively addressing the collection, tracking, positioning, and matching of personal consumption data. Illegitimate behavior, such as stealing, leaking, and selling personal information, must be resolutely combated to protect the privacy of online consumers.

REFERENCES

- Ahmad, N., & Ribarsky, J. (2018). *Towards a Framework for Measuring the Digital Economy. The 16th Conference of IAOS*, pp. 1–32.
- Ahmad, N., Ribarsky, J., & Reinsdorf, M. (2017). Can potential mismeasurement of the digital economy explain the post-crisis slowdown in GDP and productivity growth? *The OECD Statistics Working Papers*, pp. 1–47.
- Amuso, V., Poletti, G., & Montibello, D. (2019). Digital economy: Opportunities and challenges. *Global Policy*, 11(1), 124–127. doi: 10.1111/1758-5899.12745.
- Carter, D., & Eger, E. K. (2021). Visibility and vulnerability in online marketing practices. *Journal of Cultural Economy*, 14(4), 373–387.
- Cochoy, F., Licoppe, C., McIntyre, M. P., & Sörum, N. (2020). Digitalizing consumer society: Equipment and devices of digital consumption. *Journal of Cultural Economy*, 13(1), 1–11.
- Dai, D. B., Liu, X. Y., & Fan, T. J. (2015). Research on the adoption intention of the online personalized recommender in the “Internet+” era. *China Soft Science*, (8), 163–172.
- Dellaert, B. G. (2019). The consumer production journey: marketing to consumers as co-producers in the sharing economy. *Journal of the Academy of Marketing Science*, 47(2), 238–254.
- Feng, H., & Chen, Y. Q. (2016). Research on platform business model innovation: Based on a spatiotemporal analysis under the internet environment. *China Industrial Economics*, 336(03), 101–115.
- Fitzgerald, M., Kruschwitz, N., Bonnet, D., et al. (2014). Embracing digital technology: A new strategic imperative. *MIT Sloan Management Review*, 55(2), 1–12. Retrieved from <https://search.proquest.com/docview/1475566392?accountid=28769>
- Huang, Q. H., & He, Q. (2019). Major trends of China's industrialization process and industrial transformation in the next 30 years. *Study & Exploration*, (08), pp. 102–110.
- Huang, Q. H., Yu, Y. Z., & Zhang, S. L. (2019). Internet development and productivity growth in manufacturing industry: Internal mechanism and China's experience. *China Industrial Economics*, (08), pp. 5–23.



- International Monetary Fund. (2018). *Measuring the Digital Economy*. Retrieved from <https://www.imf.org/en/Publications/Policy-Papers/Issues/2018/04/03/022818-measuring-the-digital-economy> [March 2nd 2019].
- Jiang, B. (2022). The Necessity and Implementation of Measures to Protect Consumer Rights and Interests under the Background of the Digital Economy. *Information Systems and Economics*, 3(5), 15–19.
- Li, J. H. & Ouyang, Y. (2016). Great power effect, transaction cost and economic structure: A general equilibrium analysis of rich and poor countries. *Economic Research Journal*, 51(10), pp. 27–40.
- Lin, T., & Zhang, S. M. (2017). Evolutionary study on the preference of household consumption behavior of urban residents from the perspective of "Internet+." *Price: Theory & Practice*, 398(08): 156–159. doi:10.19851/j.cnki.cn11-1010/f.2017.08.040.
- Liu, S. C. (2019). Targeted path and policy supply for high-quality development of China's digital economy. *Economist*, (06), pp. 52–61.
- Liu, Y. Q., & Wang, Q. (2019). Research on the allocation and reconstruction of data production factors and resources from a digital perspective: New retailed and digital transformation. *Journal of Commercial Economics*, (16), pp. 5–7.
- Ng, I. C. (2014). New business and economic models in the connected the digital economy. *Journal of Revenue and Pricing Management*, 13, pp. 149–155. doi: <http://dx.doi.org/10.1057/rpm.2013.27>.
- Rayna, T., & Striukova, L. (2021). Involving consumers: The role of digital technologies in promoting 'presumption' and user innovation. *Journal of the Knowledge Economy*, 12, pp. 218–237. <https://doi.org/10.1007/s13132-016-0390-8>.
- Schiller, D. (2001). *Digital Capitalism*. (L. P. Yang, Trans.). Jiangxi People's Publishing House, p. 12.
- Song, X. L. (2017). Empirical analysis of inclusive digital finance bridging the urban-rural residents' income gap. *Finance & Economics*, (06), pp. 14–25.
- Tang, C. K. (2018). Analysis of the influence of "Internet +" on the consumption structure of rural residents. *Statistics & Decision*, 34(21), pp. 117–119.
- Tang, X. (2019). The Digital Economy: New Technology, New Model and New Industry Affecting the Future. *Posts & Telecom Press*, p. 217.
- The Boston Consulting Group. (2017). The year 2035: 400 million job opportunities in the digital age. Retrieved from <https://www.bcg.com/zh-cn/search.aspx?q=2035&redir=true>
- The National Bureau of Statistics. (2019). Statistical Communiqué of the People's Republic of China on the 2019 National Economic and Social Development. Retrieved from http://www.stats.gov.cn/english/PressRelease/202002/t20200228_1728917.html.
- Wang, S. Y. (2020). Research on the definition of the digital economy from a statistical perspective and its industry division. *The World of Survey and Research*, (01), pp. 4–9.
- Wei, Q., Wang, C., Yao, C., Wang, D., & Sun, Z. (2022). Identifying the spatiotemporal differences and driving forces of residents' consumption at the provincial level in the context of the digital economy. *Sustainability*, 14(21).
- World Bank. (2016). *World development report 2016: Digital dividends*. Retrieved from <https://www.worldbank.org/en/publication/wdr2016>.
- Xia, J. C., & Xiao, Y. (2019). Development trend and future orientation of digital entertainment consumption. *Reform*, (12), pp. 56–64.
- Xie, F. S., Wu, Y., & Wang, S. S. (2019). Political, economic analysis of platform economy globalization. *Social Sciences in China*, (12), pp. 62–81.
- Xie, J. Z., & Wu, J. R. (2020). Digital finance, credit constraints, and household consumption. *Journal of Central South University (Social Sciences)*, 26(02), pp. 9–20.
- Xie, X. L., Shen, Y., Zhang, H. X et, al. (2018). Can digital finance promote entrepreneurship? Evidence from China. *China Economic Quarterly*, 17(04), pp. 1557–1580.
- Xu, X. C., & Zhang, M. H. (2020). Research on the scale measurement of China's digital economy: Based on the perspective of international comparison. *China Industrial Economics*, (05), pp. 23–41.
- Yang, J. R., Xue, X., & Wang, R. (2015). Reflections on the transformation of consumption patterns under the background of "Internet +." *Consumer Economics*, 31(06), pp. 3–7.
- Yi, X. J., & Zhou, L. (2018). Does digital financial inclusion significantly influence household consumption? Evidence from household survey data in China. *Journal of Financial Research*, (11), pp. 47–67.
- Zhang, X., & Tan, Y. Mechanism of economic growth in large countries in the context of the digital economy. *Journal of Social Science of Hunan Normal University*, 2019, 48(06), pp. 27–36.
- Zhang, X., Wan, G. H., Zhang, J. J., et al. (2019). Digital economy, financial inclusion, and inclusive growth. *Economic Research Journal*, 54(08), pp. 71–86.

(Editor: Yan Yuting)