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China's Digital Economy: Examining Its Impact on Inequality Through the Lens of Employment, Income Disparity, Innovation, and Competition

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Abstract: This paper examines the impact of China's digital economy on inequality, focusing on employment, income inequality, innovation, and competition. Overall, the digital economy creates inequality in individuals and firms. It exacerbates the income disparity between high-skilled and low-skilled workers, and/or across different regions. It also creates an oligopolistic structure in the digital markets and new industries, where big firms use network effects and incumbency advantage to reduce competition. Therefore, challenges arise for antitrust enforcement due to the dynamic nature of the digital economy and attention platforms. Nevertheless, the digital economy optimizes employment structure, having a net effect of greater creation effect than substitution effect. It also increases innovation efficiency and opportunities for smaller players in the traditional sectors. Therefore, the digital economy has positive implications for economic growth. Overall, it is crucial to encourage equality and stimulate economic growth by implementing certain policies, including measures to enhance labor quality, reduce regional disparities, and strengthen antitrust regulations.

Keywords: digital economy, inequality, innovation, competition, employment

1. Introduction

The constantly evolving digital economy is the most significant economic form today. The G20 [1] described it as "a broad range of economic activities that include using digitized information and knowledge as the key factor of production, modern information networks as an important activity space, and the effective use of information and communication technology (ICT) as an important driver of productivity growth and economic structural optimization."

The Chinese digital economy continues to expand. It reached a scale of 50.2 trillion yuan in 2022, an increase of 4.68 trillion yuan compared to the previous year, and its share of GDP surpassed 40% to reach 41.5% from 2021 to 2022 [2]. The digital economy increases marginal returns and diminishes marginal costs; economic benefits increase exponentially [3]. Furthermore, ensuring equality is crucial for sustainable economic growth and social stability. In China, regional inequality is significant, which can be noted in regional urbanization rates and regional per capita GDP[4]. Moreover, only 77.5% of the Chinese population were internet users in December 2023 [5]. Therefore, it is important to understand the effect that this new economic form has on China's inequality. This paper explores the influence of the digital economy on China's inequality by discussing its effects on

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individual and firm inequality, focusing on employment, income inequality, competition, and innovation.

2. Employment and Income Inequality

2.1. Economy of Scale and Efficiency

The development of the digital economy introduces new jobs, new machines, and new industries. Since 2015, the government has added 158 new occupations to the list of recognized professions, with 97 related to the digital sectors [6]. Moreover, the technologies in the digital economy lead to automated production, thereby enhancing efficiency. This results in lower costs and higher production output, prompting companies to expand their operations and hire more labor [7].

Furthermore, the digital economy expands its scale by blurring geographical boundaries in employment, creating a new "work ecosystem." Since the COVID-19 pandemic of 2019, flexible work arrangements emerged, which refers to any of various work structures that change the regular time and/or location of work [8]. The proportion of employees in new flexible employment increased to 19.1 percent of all employees in the first quarter of 2023, compared to 13.8 percent in the same period of 2020 [9]. Furthermore, flexible employment especially increased in industries dependent on digitalization, including in the transport and logistics sectors, where flexible employment was at 44% [10]. Nevertheless, even though this enhances employment absorption capacity and total employment, challenges include concerns about providing adequate legal protection and social security coverage for the flexible workforce [11].

2.2. Employment Structure Optimization and its Risks

Advanced technologies in the digital economy optimize employment structure by creating high-skilled jobs while substituting low-skilled jobs. High-skilled job positions in financial accounting, sales, and research and development significantly increased, which is called the creation effect [12]. On the other hand, repetitive tasks performed by low-skilled workers are automated, which is known as the substitution effect. Indeed, nearly 50% of work tasks in China could be automated by 2030 [13]. Moreover, Ding et al.[14] found that there is a notable decrease in manufacturing employment where the substitution effect exceeds the creation effect. Therefore, the digital economy will exacerbate inequality in China by increasing the wage gap between high and low-skilled workers [15]. Under the versatile and evolving circumstances of the digital economy, highly educated human capital gains more value due to the ability to adapt to new tasks [16]. To this end, CSIS warns that China's education and health services may not adequately prepare workers for high-skilled jobs, especially in rural areas. Government intervention is necessary to improve these services and support disadvantaged groups.

Nevertheless, future projections indicate that the substitution effect will weaken, while the creation effect is expected to become more significant in the long term. [17]. Now, the substitution of digital technology for low-skilled labor does not significantly hinder employment due to increased high-skilled tasks, thereby increasing overall employment [18]. Furthermore, As automation grows, and costs relative to wages decrease, businesses might delay investing in advanced automation, favoring labor-intensive tasks instead. This helps maintain stable employment levels and ensures a substantial share of national income for labor.

2.3. Differentiated Development Across Regions and its Risks

The digital economy exacerbates income inequality across regions [19]. Employment is enhanced in eastern and western regions but not in the central region due to uneven regional development of the

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digital economy and skill gaps [20]. Ma and Zhang [21] found similar results, stating that the digital economy exacerbates the income gap between Han Chinese and ethnic minorities among low-income groups. Therefore, the cross-regional mobility of labor is increased, potentially causing job shortages for developed regions and vice versa. Thus, there is a strong inverse relationship between the Gini coefficient of the digital economy and the employment quality index; it is crucial to narrow the gap between these regions to enhance employment quality for all [22].

Nonetheless, the digital economy could help narrow the income gap between regions.. With the rapid expansion of digital finance and e-commerce in rural areas, certain household incomes have increased significantly, especially among low-income groups [23]. Furthermore, the “spatial spillover effects” of the digital economy can also help reduce regional income inequalities if effective policies apply.

3. Competition & Innovation

3.1. The Network Effect and Challenges for Antitrust Enforcement

The digital economy increases inequality between firms due to the formation of an oligopolistic structure in China’s leading digital industries [24]. The network effect can lead to market concentration, potentially leading to market tipping [25]. Specifically, network effects create a positive feedback loop where a platform's value rises with user numbers. This results in a winner-takes-all scenario and reduces competition. For example, the ecosystem developed by China's "BAT" (Baidu, Alibaba, Tencent) tech giants has been a key driver of the digital economy's growth. In addition, reduced prices due to pricing strategies or scale advantages strengthen incumbents’ market power, limiting competition. Even though this can benefit consumers in the short term, in the long term, it results in limited choices, diminished quality, and reduced bargaining power for fair wages. [26].

Furthermore, the presence of multi-homing should suggest alternatives to market concentration in the digital market [27]. However, in China’s case, the digital market relatively exhibits less of this phenomenon due to the oligopolistic structure; dominant firms can deter new entrants by using strategies like killer acquisitions and mergers. For example, Tencent is providing a comprehensive suite of services on a single platform [28], reducing multi-homing. Furthermore, Didi consolidated the Chinese ride-hailing market in 2016 by combining with its competitor, so multi-homing was no longer prevalent[29]. In addition, large digital platforms in China, such as the "BAT" (Baidu, Alibaba, Tencent) companies, have been acquiring promising startups and emerging players [30].

Accordingly, challenges arise for antitrust enforcement. Firstly, antitrust authorities must perform a case-by-case examination of the strategies of dominant firms. Secondly, attention platforms complicate traditional market power assessments based on pricing strategies. Thirdly, traditional frameworks for assessing anti-competitive pricing may not fully capture the dynamics of digital markets. Indeed, the Central Economic Work Conference [31] has prioritized intensifying antitrust enforcement to prevent disorderly capital expansion.

3.2. Increased Innovation Efficiency and Increased Competition in Traditional Sectors

The digital economy has substantially reduced costs and increased the benefits of innovation while lowering risk [32]. For instance, it promotes the building of innovation networks [33] and reduces information asymmetry between firms [34]. Overall, data and technology in the digital economy optimize innovation, bolstering innovation capacity and fostering competition. Indeed, the digital economy boosts both the volume of patent applications and the probability of patent authorization for manufacturing firms [35], and the ratio of R&D capital expenditure to the enterprise’s operating income increases with the digital economy index [36].

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Furthermore, Despite oligopoly in new industries, there is an increase in small and medium firms in traditional sectors, facilitated by their ease of market entry and connection with large consumer bases at low cost. This has led to the rising influence of smaller firms rather than the dominance of large companies.

4. Suggestions

Enhance the quality of labor in response to the digital economy: Encourage R&D studies at higher education levels to drive the development of core technologies essential for the digital economy. Additionally, integrate digital economy-related education, including technology skills and vocational training, into lower levels of education to better prepare individuals for the digital workforce.

Reduce the development gap between western, central, and eastern regions through targeted policies: Implement differentiated policies to support industries with comparative advantages in each region. Offer preferential tax policies, land grants, and other incentives to attract domestic and foreign investment in key sectors of the economy in less developed regions. Facilitate the transfer of technology and knowledge from more advanced regions to less developed ones to mitigate regional disparities and foster innovation and competitiveness.

Strengthen antitrust regulations: Develop robust mechanisms to address the impacts of killer acquisitions and mergers on innovation. Conduct thorough case-by-case assessments and ensure greater transparency in the review process. Establish clear guidelines and criteria for assessing impacts to ensure effective regulation.

5. Conclusion

In conclusion, the digital economy increases inequality for both individuals and firms, but it holds promising implications for economic growth. Its challenges and limitations can be effectively tackled by improving government policies.

Regarding employment, the digital economy has optimized job quality, leading to a net creation effect outweighing substitution. It creates employment opportunities through increased scale, flexibility, and improved quality. Yet, it also heightens uncertainty for low-educated individuals in rural areas while favoring high-educated individuals in urban centers. Although currently benefiting economic growth, this trend widens the income gap, posing a threat to long-term sustainability.

In terms of innovation and competition, China's digital markets and emerging industries exhibit an oligopolistic structure, dominated by large firms due to network effects, killer acquisitions, mergers, and incumbency advantages. These present challenges for antitrust enforcement, but the Chinese government is already addressing them through developed measures, which can be further strengthened and adjusted as the digital economy evolves. Nonetheless, the digital economy enhances efficiency through technological advancements, reducing startup risks and costs. This fosters more innovation, entrepreneurship, and opens avenues for smaller players to enter traditional sectors.

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