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Research on the Impact of Digital Economy Trend on Urban Agglomeration in China

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Abstract: The rise of the digital economy has profoundly influenced urban agglomeration, highlighting regional advantages and shaping future development trajectories. This paper delves into the complex dynamics of the agglomeration effect in the digital economy era, focusing on its geographical, economic, social, and environmental implications in China. With over 1.5 million college graduates entering the workforce annually, the rapid transformation of industrial structures and the polarization of urban agglomeration present significant challenges and opportunities for individuals and society. This study offers an in-depth analysis of how population expansion affects cities, industries, and individual livelihoods, drawing on historical data and experiences to provide a comprehensive context. It explores the patterns and drivers of urban migration and agglomeration, offering insights into the underlying motivations, psychological factors, and trends that shape these movements. By examining the urban agglomeration effect and population migration in the digital economy, this paper aims to elucidate current social phenomena and provide informed conjectures on the future trajectory of urban development in this rapidly evolving economic landscape.

Keywords: Urban Agglomeration, Polarization Effect, Economic Structure, Tertiary Industry, Involution.

1. Introduction

1.1. Research Background

Agglomeration means gaining an advantage by reducing the distance in space. This advantage can be at any level: resources, environment, opportunity, etc. In China, there has been a steady influx of people from other regions into first-tier cities such as Beijing and Shanghai over the past two decades. In the decades of reform and opening up, the dividends of the development of The Times have gradually become prosperous in many areas. However, with the innovation of science and technology and the saturation of economic development to a certain extent in the era of the digital economy, is the attraction of big cities to resources and people as strong as in the past? The impact of the development of the digital economy on urban agglomeration can more clearly show the advantages of the region and the development of the future. Previous studies have shown that the digital economy can overcome geographical limitations through advantages such as data sharing and cross-regional information dissemination while improving social services and quality through new social services

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models such as e-commerce and online education [1]. While information technology is an important driver of today's cities, on the other hand, it can create a digital divide, where growth in digital infrastructure, for example, contributes to the growth of corporate welfare in the region and impedes the growth of corporate welfare in neighboring regions, that is, impedes urbanization [1].

1.2. Literature Review

Many studies have shown that once-dominant cities in China, such as Shanghai and Beijing, are still of unparalleled importance in the digital age, and the digital economy has become more extreme for urban agglomeration than in the past [2]. At the same time, studies on urban agglomeration have shown that increasing population density alone does not significantly increase labor productivity [2]. Moving to live and work in big cities has become a common phenomenon in China. However, no studies have combined and analyzed the phenomenon of migration to larger cities with the effects of urban agglomeration in the digital age. First, the article will analyze the change in the agglomeration effect in first-tier cities in the era of the digital economy. With the change of The Times and the change of industrial focus, the situation of urban agglomeration has also changed from the change of the focus of urban development under heavy industrialization to the agglomeration of enterprises and the shift of the focus of urban agglomeration under the digital economy. By comparing urban development in different times, the paper tries to find the characteristics of cities in the era of digital economy and analyzes the context of future urban development.

1.3. Research Framework

In the next step, the article will summarize the situation of urban migration and urban agglomeration and try to analyze the purpose, needs, psychology, current situation, and trend behind the migration behavior, as well as the possible direction of future development. Thirdly, this paper will analyze the urban agglomeration effect and urban population migration under the digital economy and try to explain some current social conditions. Finally, the article will give conjectures and reflections on the future of urban agglomeration under the digital economy.

2. Case Description

From a general perspective, the development of the digital economy contributes to the geographical constraints between cross-domain regions and the efficient dissemination of information through digital platforms. That is, the wide application of information technology compresses time and space [2]. However, the rise of the digital economy has only exacerbated regional disparities. For example, Beijing is absolutely dominant in the urban network, and the core network refers to the components connected through a small number of high-level cities [2]. The reason for this is the inherent inequality in every city. Chinese cities are highly unequal in Internet connectivity, and this inequality will become more pronounced over time. This inequality includes the spatial aggregation of economic elements that exist in the city itself [2]. In addition to Beijing's absolute development of vehicles and economic and technological foundation, Shanghai is a good example. The trading city is home to one of the world's largest stock exchanges and one of the world's busiest trading ports. Although the transmission of information in digital technology has a very low cost, the upfront investment in digital information infrastructure has a very high fixed capital [2]. With a solid economic foundation strong capital accumulation, and a special position in national economic development, Shanghai can easily complete the transition from the traditional economy to the digital economy. In addition to Beijing's absolute development of vehicles and economic and technological foundation, Shanghai is a good example. The trading city is home to one of the world's largest stock exchanges and one of the world's busiest trading ports. Although the transmission of information in digital technology has a very low

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cost, the upfront investment in digital information infrastructure has a very high fixed capital [2]. With a solid economic foundation strong capital accumulation, and a special position in national economic development, Shanghai can easily complete the transition from the traditional economy to the digital economy. In contrast, Shenyang, once a brilliant city of heavy industry, faces a lot of difficulties in economic transformation. The structure of heavy industry is single, the upgrading of traditional industries is slow, and industrial pollution is not part of the national policy of sustainable development. The edge of these industries, which once accumulated in the urban core, has gradually been eclipsed by the wave of the digital economy. Another obvious example is Wuhan. As a first-tier city, Wuhan's economy is dominated by large state-owned enterprises and lacks flexibility in the digital economy market. As one of the pilot cities of e-commerce, Hangzhou, also a first-tier city, has a large number of private e-commerce enterprises. With a sound infrastructure, it has a keen perception of the e-commerce market and a steady stream of vitality [2]. Clusters of companies also often choose to connect universities with research institutions. Shenyang is famous for its universities, such as Northeastern University, Shenyang Aerospace University, China Medical University, and so on. In addition to China Medical University and Shenyang Aerospace University, Northeastern University, as the only 985 university, has advantages in metallurgical engineering, materials engineering, and other engineering directions. Wuhan University and Zhejiang University, located in Hangzhou, are the top universities in China. In addition to the advantages of comprehensive disciplines, Wuhan University has a strong scientific research strength, a number of key national laboratories and research bases, and extensive international cooperation. Zhejiang University, located in Hangzhou, is one of China's top five universities. In addition to having a number of campuses, its motto is innovation at the core. It can be seen that the fiscal decentralization in the market, the imbalance of economic development, the development gap of historical accumulation, and the different resources of scientific research and innovation and talent training have caused the different agglomeration effects of cities in the era of digital economy. Therefore, in addition to key cities such as Beijing and Shanghai, Hangzhou, which has better policies, scientific research, and human resources, as well as a freer market, will become a choice for the settlement and gathering of emerging enterprises.

On the other hand, China's urban population migration involves many phenomena and many factors, such as the migration of the rural population to the city, the interval migration of the urban population, the migration within the city, and so on. Most migration factors can be classified as better job opportunities, better living conditions, and so on. Better job opportunities are usually associated with higher pay and better living conditions, and this expectation has created unique social phenomena such as Beijing drift and Shanghai drift. Better life opportunities for their children are needed so that they can enjoy better living conditions and educational resources, as well as food and cultural life. Urban migration also faces corresponding risks, such as the cost of living in big cities, fierce competition, psychological pressure brought by strange and complex environments, and social integration are common influencing factors.

3. Analysis on the Problem: Urban Perspective in the Age of Digital Economy

In the digital age, most traditional enterprises are facing difficulties in transformation, and cities are also facing the phenomenon of contraction and polarization. Under the influence of the digital economy, on the one hand, under the slow development of traditional industries, enterprises are saturated. On the other hand, in addition to the rapid development of the Internet industry, it has a rapid update and iteration speed, and it also shows a high degree of concentration. For example, some companies have an age limit on the number of programmers they can hire, and some companies are expanding their recruitment, but usually only to the leading companies in the industry. The combination of these phenomena has led to an increasingly concentrated and competitive digital

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economy in one region while the economy of the surrounding region has begun to decline. Whether the impact of urban agglomeration caused by the digital economy will change the past habits of urban migration, whether the continuous population agglomeration will bring positive and sustainable benefits to the industry, and whether the quality of people's lives will continue to adapt to the environment of big cities and improve.

The economic development of a city usually involves many factors. Usually, we can judge the scale and productivity of a city through the aggregation of the urban population. In the era of the digital economy, due to the different original foundations of different cities, the development of the digital economy has gradually formed a phenomenon of polarization. It is difficult to determine the changes brought by digitalization directly, but it can temporarily influence the interaction between population change and urban economic resilience. To analyze the current development of the city. On the other hand, the economic transformation of cities mainly relies on the development of industries. By observing the accumulation of workers in various industries, the driving force of different industries in the digital economy is analyzed. Finally, the agglomeration effect is bound to influence the digital age. By analyzing the influences behind it, society, enterprises, and individuals will be helped to understand behaviors and concepts and make changes.

3.1. Population Agglomeration in Cities

A recent study comparing urban economic resilience with demographic change has shown that there are four types of correlations. Cities with expanding populations are more resilient, cities with expanding populations are less resilient, and vice versa. With the development of science and technology and the dramatic changes in the era of the digital economy, the key to urban economic resilience lies in the ability of industrial restructuring and innovation [3]. Although some large central cities still retain the attractiveness of the population due to the difficulties in the transformation of their inherent industries, especially some large cities, the economy will still show a state of decline in the case of continuous concentration of labor resources.

From the perspective of employment, according to the coupling and coordinated development level of China's digital economy development and employment quality from 2014 to 2019, Shanghai, Zhejiang, Guangdong, and other places have better coordination mechanisms and are moving towards a higher stage of development [4]. The expansion of population and the concentration of the labor force in the era of the digital economy have a positive effect on cities with high economic resilience and digital economic foundation.

3.2. Industrial Agglomeration

The first industry, such as agriculture and natural resources exploitation, and the second industry, such as manufacturing, construction, and energy industry, complement each other, as the rapid development of China in the past two decades brought huge dividends and rapidly drove the economy. However, with the development of science and technology into the era of the digital economy, the rapid rise of Internet companies, e-commerce, digital finance, social media, data economy, and other content quickly became the mainstream of the market. In contrast to the inherent industrial model formed by agriculture and industrial manufacturing in the primary and secondary industries, service industries such as finance, trade, information and communication, tourism, and entertainment often provide services rather than physical products. Therefore, the tertiary industry has better adaptability and diversification to the era of the digital economy and can comprehensively improve efficiency and flexibly adapt to market demand through the transformation of digital technology. Meanwhile, primary and secondary industries such as agriculture and manufacturing also need the tertiary industry as a medium of service for marketization and improvement. In the era of the digital economy, the

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tertiary industry accounts for a huge proportion of urban economic growth. While improving people's quality of life and efficiency, its development requires intensive human resources, thus creating a large number of jobs and employment opportunities, especially for large cities. Existing research shows that for cities that maintain population expansion and have high economic resilience, cities with a high proportion of tertiary industry account for more than half of the study data and have a high average number of patents granted [4]. These cities have a flexible and resilient industrial base but are also innovative. With the rapid innovation of Internet technology, cities with high economic resilience have formed highly concentrated centers and gathered supporting factors such as enterprises, labor force, and resources to promote the urban economy. Take Guangzhou, for example, as a gathering place for Internet companies and the digital economy, while other cities in Guangdong Province are still dominated by manufacturing. In the face of the digital economy transformation environment, entering the e-commerce platform has become an indispensable step driven by the environment. At the same time, the closer the hinterland city is to the central city, the more susceptible it is to polarization and spillover [4]. While the population will continue to shrink, the original industry needs to adapt to the market as much as possible and make transformations or new attempts.

3.3. The Influence of Digital Economy Polarization and Agglomeration on Industry

The development of digital technology has undoubtedly accelerated China's economic growth, providing it with new momentum, greatly improving the efficiency of public services in a short time, and facilitating trade. In the digital economy, the benefits of aggregation and network cohesion are even more obvious, with companies, research institutions, and other stakeholders forming close cooperation, such as science and technology parks in cities. The agglomeration of enterprise innovation can not only attract abundant talent but also obtain more resources while enjoying the policy. This short-term explosive growth attracts a large amount of capital investment. In contrast, some industries such as high-tech innovation and development, such as core components, pharmaceutical research and development, and other fields have policy support, but due to their very high investment in the early stage and long-term research and development stage and uncertain prospects and returns, most of the private investment and private equity funds basically focus on short-term returns. Therefore, most of the capital orientation is still the Internet, e-commerce, and others can bring efficient growth track. In the huge market environment, the innovation of digital technology and the short-term explosive growth have intensified the digital divide and the polarization of the urban digital industry, and the industry has gradually entered saturation. On the premise that there is a certain excess of production capacity, China today is facing the transformation of its industrial and economic structure. Economic growth has begun to slow down, because of the uncertainty of the future economic situation, the homogenization of commodities in the market, and people's consumption concepts have gradually changed. The consumption level has begun to degrade. Under the influence of the environment, many industries are facing pressure and crisis, but digital technology is still moving towards new heights of innovation. For example, Haizhu District of Guangzhou gathers a large number of Internet and digital technology head enterprises such as Alibaba, millet, and other industry giants. The gathering of leading industries helps to attract investment, gather resources with the support of policies and funds, play a leading role in many enterprises, and have a market-oriented large model and other technologies. However, the results of the polarization and aggregation of the digital economy, while maintaining growth in other regions of the economic downturn, also mean that many enterprises fall into fierce competition. After all, resources and market share are limited.

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3.4. The Impact of the Polarization and Aggregation of the Digital Economy on Society and Individuals

With the development of digital technology and the extensive application and update in the tertiary industry, a large amount of labor gathered by the service industry began to be replaced with technology. More specialized and advanced skills began to replace repetitive work, and highly educated talents began to be absorbed into high-end service industries such as digital finance, IT industry, law, and so on. According to the "China Digital Economy Employment Development Research Report: New Forms, New Models, New Trends (2021)" information, the tertiary industry digital economy jobs accounted for up to 60 percent. Cities with a highly developed digital economy will attract more labor, and highly educated people usually choose big cities for better opportunities and development prospects [4]. In the face of a large number of talent accumulation and the rigid demand for the labor force in the tertiary industry, the change of digitalization to the industrial structure further promotes the internal examination of academic qualifications. Compared with the primary industry and the secondary industry, over-education is more likely to occur in the tertiary industry of the digital economy.

Therefore, the digital economy will greatly affect the quality of employment. Repetitive physical or mental workers are more likely to face unemployment, while interactive, complex mental work, creativity, and the ability to solve complex problems become more important. For the continuous development and innovation of digital technology, the resources of high-level talents are crucial for enterprises [4]. On the other hand, taking the active development of large model artificial intelligence as an example, the application of large models in the industry has been able to replace work content such as overcoming and service consulting, which has saved manpower costs while improving efficiency. Moreover, the application scenarios of large models are wide. In addition to the application of more industries, the large model tools open to the people also have a huge market value. Behind the large model, the underlying algorithm, computing power, etc., require highly professional technical personnel to develop, operate and maintain.

As the digital economy industry has formed a consensus on the requirements of academic qualifications, the phenomenon of over-education exists in jobs. For individuals, the phenomenon of diploma inflation increases the unreasonable squeeze on the job market space with the wave of popularization of higher education [4]. With the continuous superposition of a highly educated labor force in the market, especially in large cities with a high concentration of talent, the competition for limited employment opportunities and resources is bound to become more intense. Due to the existence of social differentiation and social accumulation, a small number of "elite of the elite" will pass the screening of the head enterprise and become the symbol of the effectiveness of the higher diploma, while the general elite in the university will integrate into the society and will no longer be regarded as the elite [4]. As economic growth shifts, the employment problem will become more pronounced. For employment difficulties and other problems, most students will choose to continue to improve their academic qualifications after graduation and, at the same time, enrich their resumes, improve their experience, and obtain certificates. The point, however, is that this phenomenon is reflected at the level of society rather than individual thinking and clear goals. Under the influence of the big environment, the pursuit of success is reflected in college students, and the demand for skills and efficient goal completion has become normal. External environment and individual factors are the reasons for this phenomenon. In the era of the digital economy, especially in highly digitized big cities, people are living in a flood of data and information, wrapped by social software and digital media, and are more likely to fall into a state of involution than in the past.

Involution can describe an individual, a business, or even an entire industry, that is, "growth without development [5]." For example, some enterprises rapidly expand within a short period of

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time, gathering a large amount of labor force, but lack a long-term layout, a large number of human resources to complete the KPI as the goal, and the ability to innovate and future development. As a kind of social norm, intense involution can indeed bring certain growth to the short-term growth of enterprises, but for individuals, its root is the gradual scarcity of resources in the face of population expansion and other changes so that individuals will produce competitive behavior, psychological pressure, and other negative factors due to changes in the environment. This also explains why the concentration of the labor force and the polarization of industry will bring opposite growth and bury certain hidden dangers.

4. Suggestions

4.1. Development from a City Perspective in the Digital Economy

The rapid growth brought about by the era of digital economy is undeniable. While the population of cities with high economic resilience is expanding, we can put the perspective on those cities with a certain trend of population contraction while the economic resilience is improving. The technology brought by the era of the digital economy promotes the reorganization of diversified industries, and the growth of urban resilience is fundamentally based on the breakthrough innovation of technology and resource base to form a new path [6]. At the same time, these cities with industrial diversification and innovation abilities can form rapid industrial transformation and upgrade by undertaking the industrial and technological radiation of the central city, even in the case of population contraction under the polarization of the central city.

4.2. The Digital Economy Changes the Industry

On the other hand, the application of digital technology has greatly improved the flexibility and efficiency of the industry. The digital economy has promoted the development of globalization, new technologies, digital marketing, etc., and can connect with customers' suppliers, upstream and downstream of the industry on a global scale. More and more companies are starting to aim at globalization, setting up branches in other regions, which can better serve different markets and effectively promote the local economy. In the era of information technology developed by the Internet, enterprises can even be completely separated from entities. A student named West conducts Internet private domain activities through the Internet and has formed a certain scale. By registering various social media platforms, he conducts content marketing, user interaction, and brand co-branding to promote customers. Operate the community 24/7 by remotely managing a team of 70 people with employees around the world. In the Chinese market, where competition is extremely fierce in the Internet private domain environment, we turn to the same model for global services. The digital economy has shifted from the radiation of polarization and aggregation to the construction of an expanded scope of industry, making full use of the convenience provided by information technology and Internet platforms.

4.3. Digital Economy's Polarization and City-Level Economic Diversification

Although in a state of polarization and agglomeration of the digital economy, the economic development of cities is largely limited by the digital economic base of their provinces, and it is also an opportunity for some cities to achieve breakthroughs in the path. Heavy industry cities such as Wuhan and Shenyang are facing a reshuffle [7]. In addition to local policies and early development, Hangzhou, Chengdu, and other cities have a wide range of diversified digital industries, including but not limited to e-commerce, film and television, animation, and other industries, which have also begun to rise with the development of digital economy. Although it is also affected by the polarization

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and agglomeration of the digital economy, such as Shanghai and Beijing, it will also achieve external economic performance by undertaking cooperation and division of labor in the urban network due to the flexible and diversified industrial characteristics, thus enhancing the economy [8].

4.4. Navigating Involution and Opportunity in the Digital Economy

The rise of the digital economy has created the status quo of the market, changed the economic architecture of the market, and also created new opportunities and models. In other words, the development of the digital economy has changed the competitive environment of the market, and by broadening the scope of competition and opening more channels, it can mitigate the impact of the decline in the return on efforts brought by the involution of industries and individuals to a certain extent [9]. The spread of the Internet and digital technologies has provided a wider range of employment channels and more creative opportunities. For example, Bilibili is a video website similar to YouTube, which provides a platform for video content creation. Countless people can create content by registering platform accounts. Many companies take content creation as their main business or sideline business and even initiate enterprises and organizations to produce content full-time. Huge traffic accumulates on the platform, and the platform and up master can monetize the traffic in a variety of ways. Among them, compared with the middle-skill group, the high-skill group and the low-skill group have more benefits in the development of the digital economy [9].

Just like digital platforms, bigger platforms mean more traffic. In the digital economy, the highly resilient cluster cities, even the polarized centers, still attract more people. For the industry, innovation and high-level technology, as well as for individuals, solid ability and innovative thinking are what individuals can grasp in the fierce competitive environment. Just as it takes years of research and development, trial and error, and technology accumulation for businesses to try new possibilities, so do individuals. The Internet brings too much information of choice and possibility. From the perspective of individual perception, when individuals perceive stronger upward social comparison, their behavior norms and compliance will be stronger, especially in the polarized and clustered big cities in the digital age [10]. Involution in such a rapidly changing situation is more like a knee-jerk reaction, which leads to the expansion of academic qualifications and the involution in the workplace. However, involution and other phenomena such as personal development, degree inflation, overeducation, and involution reflect the lack of meaning, purpose, humanistic feelings, and care in education and social environment [11]. Therefore, how to calm down the mind, stand firm in the flood of information, and, in turn, use the environment to improve themselves has become extremely important, such as using the learning network to hone themselves and intellectual training. For individuals in a chaotic and complex environment, the cultivation of morality and the shaping of personality can help them to have persistent beliefs to drive themselves and stand on their feet in the face of field logic [11]. At the same time, economic return and height can not simply measure individual happiness and success, personal interest development, lifestyle, intimate relationship, comfort degree of correlation, emotional positive feedback is to help a person in the society and life virtuous circle, so as to have a deeper understanding of the more diversified meaning of employment success [11].

5. Conclusion

This article focuses on the development and agglomeration effect of cities in the era of the digital economy, as well as the impact and problems brought about by the rapid change of industries. In the era of the digital economy, this paper analyzes population agglomeration, industry agglomeration, and the social impact and social status quo caused by the polarization of urban development. The content analyzes the impact of the central cities of the polarization of the digital economy on the

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surrounding areas, as well as the different attributes held by different regions leading to different growth trends, the rapid growth of the digital economy on the tertiary industry, and the impact on other industries. For the rapid growth of industry and labor force, concepts such as education inflation, overeducation, and involution are introduced to trace the development of industry to the status of individuals.

Taking the digital economy and urban agglomeration as the entry point, this paper summarizes the trend and state of the economy from a macro perspective, the transformation and dilemma faced by the industry, as well as the constraints and pressures faced by individuals in the big environment. It also concludes that while taking advantage of the trend and convenience of the digital age, the perspective of industry and individuals should return to their own accumulation and creativity. Possess scholars' own determined drive and judgment in a complex environment, complemented by a holistic perspective.

This paper is limited by the lack of original data and the lack of in-depth research on specific problems. In the future, the paper can be divided into multiple levels and explored regularly and logically.

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