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ORIGINAL ARTICLE

# Digital infrastructure and economic growth—Evidence for China

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## ABSTRACT

China's economic structure has made subtle changes with the development of digital economy. Along with the marginal diminishing effect of Chinese monetary policies and the increase of the overall leverage ratio, the Chinese economic growth mode of relying on real estate, trade and infrastructure construction in the past will not be sustainable in the next decade. This paper makes a theoretical analysis on the reduction of the search cost in digital economy. Also, this paper used empirical methods to study the relationship between China's economic growth and digital infrastructure construction. In conclusion, the digital economy has reduced the search cost for people, and big data will become a product factor participating in labor distribution. In addition, this paper proposes for the first time that digital economy can effectively restrain inflation. The Chinese government needs to attach importance to the issue that current internet enterprise oligarchs will probably monopolize the usage of big data in the development of digital economy in the future and become the obstacle to effective economic growth. In addition, close attention should be paid to the vulnerabilities of financial and taxation systems for digital economic entities to avoid continuous disguised tax subsidies to internet oligarchs, thus preventing industrial monopoly.

***Keywords****: digital infrastructure; digital economy; economic growth*

## 1. Introduction

In the past 40 years, China has offered internal impetus to the global economy by being a world factory through global trade and selling goods made in China to the rest of the world. With the restraints that the Chinese government put into effect in real estate development and with the rise of the urbanization rate, the construction of infrastructure can hardly bring continuous growth to China's economy (Song et al., 2011). The end of China's current financial cycle has also, to a certain extent, constrained the role of financial development in supporting economic growth. Moreover, as can be seen from **Figure 1**, the implementation of the one-child policy in the early years of China completely ended the advantage of China's demographic dividend in the 2010s (Hesketh et al., 2005). In this context, what will dominate China's effective economic growth in the next decade?

The digital economy is broader in scope, and it is the summation on the scale of online consumer economy, online service economy and digital technology-driven economy (Goldfarb and Tucker, 2019).

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The efficient allocation of resources made by digital economy can go beyond space and time to enhance the efficiency of resource allocation objectively. China's digital economy has benefited from the rapid popularization of mobile internet, and the 4G technology of mobile communication has made China become the world's largest market of mobile internet. The quick development of digital economy has reduced the cost of residents' commodity search (Stigler, 1961; Brynjolfsson and Oh, 2012) and realized the residents' 24/7 consumption at all times and places. The contribution of China's digital economy to the overall economy has exceeded 30%[1]. With the continuous improvement of China's 5G infrastructure, the interconnection of everything will be realized in the future, and the contribution of science and technology infrastructure construction to economic growth will be immeasurable and will continue to promote rapid economic growth in China in the coming period (Ding et al., 2021).

Additionally, the infrastructure of digital economy has driven the development of a number of online resources, and big data has cut the cost of searching and realized the perfect combination of supply and demand. With the end of Chinese financial circle and population dividend in this round, the conventional mode of economic growth faces great challenges. The historical condition of taking advantage of the age structure of the population and the dividend of the financial circle to support economic growth is unprecedented. In the future, the proportion of digital economy will rise and face a new round of economic structural reconstruction, becoming a new economic growth point.

Digital economy invalidates regional price discrimination, which is a pricing method often used by manufacturers when they produce goods. Manufacturers can keep the competitive advantage of their products and maximize their profits through regional price discrimination. With the rapid development of digital economy, the residents of a country can realize low-cost searching and

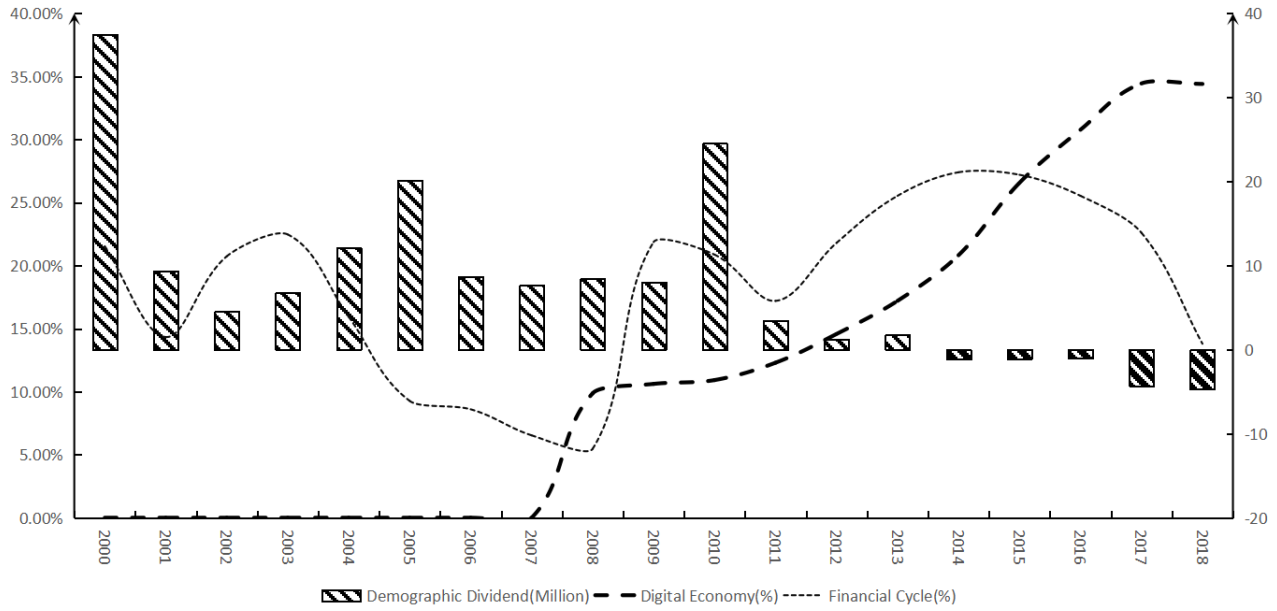


**Figure 1.** Demographic dividend, financial cycle and digital economy.

[1] As early as 2016, China's e-commerce volume was over 30% of China's GDP and increased to 34% in 2020.

shopping across the whole country (overseas online shopping that involves tariffs and related issues is not considered in this article), and thus regional price discrimination cannot work anymore. In a sense, when the commodity price of a country has formed the state of complete competition, the trend of unified pricing can be presented and the welfare loss of the residents can be reduced to the minimum (Borenstein and Saloner, 2001; Fudenberg and Villas-Boas, 2012; Brynjolfsson et al., 2019). In the meantime, the Chinese government is fighting against the abuse of big data to prevent price discrimination and improve economic operating efficiency.

As digital economy boosts consumption, the impact of the external epidemic on Chinese consumption is limited. Digital economy can provide consumers with abundant products and can realize a unified national market for the consumption of internet services. The inclusive service of the internet has changed the traditional directional service (Brynjolfsson et al., 2003) and has promoted the upgrading of residents' consumption structure and the replacement of products, thus enhancing the utility of the overall welfare of society. The Covid-19 epidemic has shown an important impact on economies around the world. However, the structure of China's digital economy has been upgraded in a short period of time, lifting the consumption of internet-based services (Athey, 2017) and forming an effective defense against external shocks. The internet-based consumption patterns are beginning to be transformed and upgraded, such as quickly-delivered fast food, online movie premieres, etc. Mobile internet has reshaped business models in China during the epidemic, and the importance of the digital economy has increased dramatically.

Big data has become a production factor participating in the allocation of labor. The economic growth of China in the past 40 years benefited from the continued release of the demographic dividend and the effective supplement of the financial cycle. It is worth noting that with the end of the demographic dividend and the downturn in the financial cycle, the development of digital economy has become a new engine of economic growth. Extremely high efficiency of substituting the labor force has occurred in the development of digital economy. In the process of production and sales, institutions that master big data can take part in the allocation of labor. In the future, with the development of digital economy, mastering big data will be similar to the mastery of factors of production, such as factory buildings and workers.

Digital economy plays a vital role in social production and people's daily life in China. Whether China can undertake the mission of achieving the growth as the largest economy is the major topic of discussion in the following sections.

## 2. Model

The biggest feature of digital economy is that the search cost can be reduced through big data and other methods. In finance, search cost refers to the cost of the search activity itself in the financial market (Fink et al., 2020). We analyzed the effectiveness of digitization on economic growth using the search cost model and big data as the production factor model.

### 2.1. Reduction of search cost

This study adopted the model by Stigler (1961) for reference in making a theoretical analysis on the reduction of the search cost in the digital economy.

It is assumed that there are a total of $M$ consumers, and each consumer selects the firm with the lowest price by enquiring for $q$ times in $n$ firms. The probability that a firm with the lowest price $p_i$ the consumer can get is $[1-F(p_i)]^{q-1}$, in which $F(p_i)$ is the cumulative distribution function of equilibrium price and $p_i$ represents the price of the ith firm. Therefore, there are $C_n^q$ different ways in which consumers can pick and choose a firm. The probability that the ith firm will be selected by the consumer by way of inquiry is:

$$\frac{C_{n-1}^{q-1}}{C_n^q}[1-F(p_i)]^{q-1} = \frac{q}{n}[1-F(p_i)]^{q-1} \tag{1}$$

Suppose that each consumer has 1 unit of demand of the product, when the firm's price is $p$, then the expected demand is:

$$D(p) = M\frac{q}{n}[1-F(p)]^{q-1} \tag{2}$$

The expected profit of the firm will be:

$$\pi(p) = M\frac{q}{n}[1-F(p)]^{q-1}p \tag{3}$$

If the product is manufactured by a monopoly, when the price is $b$, the expected profit of the firm will be:

$$\pi(b) = Mb \tag{4}$$

According to the nature of the symmetric equilibrium strategy of the search theory (Stiglitz, 1987), the price set by the firm has a positive probability density, and the firm's returns under the price are equal, which means that the price set by the firm must maximize the profit. Therefore, the monopoly price under the equilibrium price and the price under the positive probability density of the equilibrium policy have the same corresponding expected profit of the firm, and Equation (3) is equal to Equation (4), from which it can be known that:

$$F(p) = 1-(\frac{bn}{qp})^{\frac{1}{q-1}} \tag{5}$$

After taking partial derivatives of the unselected firms' cumulative probability density function, we can obtain the following formula:

$$\frac{\partial ln[1-F(p)]}{\partial q} = -\frac{1}{(q-1)q} - \frac{1}{(q-1)^2}(ln\frac{bn}{pq}) \tag{6}$$

It can be seen from Equation (5) that $F(p) = 1-(\frac{bn}{qp})^{\frac{1}{q-1}} > 0$, and so the lower bound of the equilibrium price $p$ will be:

$$p \equiv \frac{bn}{q} \tag{7}$$

Because $q > 1$, according to Equation (6), when $p > \frac{bn}{q}e^{\frac{q}{q-1}} > \frac{bn}{q}$, it can be found that:

$$\frac{\partial ln[1-F(p)]}{\partial q} < 0 \tag{8}$$

When $\frac{bn}{q}e^{\frac{q}{q-1}} > p > \frac{bn}{q}$, it can be found that:

$$\frac{\partial ln[1-F(p)]}{\partial q} > 0 \tag{9}$$

For goods whose price is higher than the critical value ($(p > \frac{bn}{q}e^{\frac{q}{q-1}})$), with the increase in inquiries,

the cumulative distribution function F($p$) of the equilibrium price increases and the average price decreases. If not, it goes up.

Therefore, in real life, big data on the internet can make the value of $q$ close to infinite, and the equilibrium price can be effectively reduced with almost no cost. Therefore, the regional price discrimination of general goods is completely lost, and manufacturers will determine their production scale based on big data conclusions, thus achieving the highest production efficiency and improving the efficiency of economic operation.

### 2.2. Production factors of big data

Productions factors can effectively supplement the deficiency of human capital, and its marginal replacement rate of human capital is high.

In the Cobb-Douglas function, it is assumed that $K$, $L$ and $M$ represent capital, labor and big data, respectively, as factors of production. Thus, the Cobb-Douglas production function can be concluded as:

$$F(K^{\alpha},L^{\beta},M^{\theta}) = AK^{\alpha}\,L^{\beta}\,M^{\theta} \text{ (where } \alpha+\beta=1,\ \theta>0) \tag{10}$$

It is assumed that the production of a specific commodity, $N$, and the input of capital, $K$, stay the same, and hence the marginal product is:

$$MP_L(\bar{K},L,M) = \beta A\bar{K}^{\alpha}L^{\beta-1}M^{\theta} \tag{11}$$

$$MP_M(\bar{K},L,M) = \theta A\bar{K}^{\alpha}L^{\beta}M^{\theta-1} \tag{12}$$

The technology replacement rate of big data is:

$$TRS = -\frac{MP_L(\bar{K},L,M)}{MP_M(\bar{K},L,M)} = -\frac{\beta}{\theta}\frac{M}{L} \tag{13}$$

The input of big data is huge, and it has the absolute advantage of the substitution of the labor force. Therefore, the development of digital economy for the effective replacement of human capital can play the same role as technological progress did in economic growth, and big data owns the function of allocating capital income as a production element.

To sum up, the growth of digital economy can promote the sustained growth of the economy to a large extent. With the increase of the proportion of digital economy, this growth engine will provide more motivation for the Chinese economy in the future.

## 3. Data

Data from the National Statistics Bureau were selected as the authorized data source in this study to increase the credibility of empirical analysis. In order to guarantee the accuracy of economic growth indexes, the growth rate data of actual GDP for all provinces[2] from 1999 to 2018 from the National Statistics Bureau were selected, and the industrial power consumption for all provinces from the National Statistics Bureau was selected as the characteristic index of economic growth

[2] Including 31 Chinese provinces, cities and autonomous regions in the Chinese mainland and excluding Hongkong, Macao and Taiwan.

to realize the verification to GDP data. Moreover, in order to manifest the development of digital economy, the growth rate of the mobile phone inventory of China was selected as the characteristic variable of digital economy growth, and these data were from CEIC's database. The comprehensive development of Chinese mobile communication's 3G technology was initialized in 2009, and the comprehensive development of 4G technology was started in 2014. The classification was performed in the course of the subsequent empirical test. Furthermore, in order to reduce the influence of the political cycle of the Chinese government on the explaining variable of economic growth, the instrumental variable of time has been introduced. The Chinese government completed the change to the term of office at the beginning of 2013, and thus the instrumental variable after the change to the term of office was assigned as 1 and the previous period was assigned as 0. In order to testify the relationship between the development of digital economy and inflation, where according to scholars' opinion the development of the internet is helpful in reducing inflation (Goolsbee and Klenow, 2018), this paper introduced the CPI data of all provinces as the variable. The descriptive statistics for the relevant data are shown in **Table 1**. In addition, in order to stabilize the conclusion, we adopted multiple regressions to ensure the stability of all variable relationships.

## 4. Empirical results

The starting of Chinese internet was late, but its development speed is fast due to the large market in China. Based on the technical innovations of the internet, they all have high returns on investment. The regression result in **Table 2** shows that the growth rate of mobile terminals has a strong positive correlation with the actual growth rate of the Chinese economy and has a strong negative correlation with inflation. During a certain period, the number of mobile terminals has a strong correlation with digital economy. Therefore, it can be seen from the digital development that

**Table 1.** Descriptive statistics

| Variable | Meaning | Mean | Median | Stdev | Minimum | Maximum |
|---|---|---|---|---|---|---|
| GDP growth rate | Economic growth rate | 0.1314 | 0.1210 | 0.0642 | −0.2240 | 0.3227 |
| Power growth rate | Power consumption's growth rate | 0.0956 | 0.0902 | 0.0711 | −0.2831 | 0.5031 |
| Internet growth rate | Growth rate of mobile phone users | 0.2590 | 0.1600 | 0.2926 | −0.0978 | 2.0152 |
| Time | 1999–2012: 0<br>2013–2018: 1 | 0.3100 | 0.0000 | 0.4629 | 0.0000 | 1.0000 |
| CPI | Consumer price index | 2.1450 | 1.9000 | 2.0640 | −3.3000 | 10.1000 |

**Table 2.** Regression result 1

| | GDP growth rate | | Power growth rate | | CPI |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Internet growth | 0.0320** (2.5351) | 0.0335*** (2.5922) | | | −2.6909*** (−10.0290) |
| Internet growth(−1) | | | 0.0400* (1.8943) | 0.0376* (1.7386) | |
| Internet growth*time | | −0.0341 (−0.5480) | | | |
| Internet growth(−1)*time | | | | 0.0530 (0.5213) | |
| C | 0.1233*** (33.7410) | 0.1235*** (33.5482) | 0.0854*** (13.8955) | 0.0849*** (13.6487) | 2.8414*** (26.8469) |
| Year | Yes | Yes | Yes | Yes | No |
| Province | No | No | No | No | Yes |
| Fixed/Random | Fixed | Fixed | Fixed | Fixed | Fixed |
| Observation | 608 | 608 | 570 | 570 | 608 |
| $R^2$ | 0.69 | 0.69 | 0.38 | 0.38 | 0.16 |

*Notes:*
**** Significant at 1-percent level*
*** Significant at 5-percent level*
** Significant at 10-percent level*
*(−1) represents lag of order 1, which is the same below*

it has a positive correlation relationship with the economic growth in the regression equation. There are two policies for sustaining economic growth: monetary policy and fiscal policy, both of which cannot avoid the increase of money supply. The development of digital economy increases the effective supply, enhances the efficiency of supply and expands the effective market. By improving the efficiency of supply, the digital economy effectively restrains inflation.

**Table 3** demonstrates the relationship between the number of mobile terminals and economic growth in China during different periods. It can be seen that the regression from 2009 to 2013 is the most significant. During this period, 3G communication technology in China was spreading and the mobile internet was officially developed. The previous 2G technology was not able to directly participate in the digital economy, and thus the reference's significance for the conclusion was not great. Along with the popularity of 3G technology in China, the Chinese government officially started to promote 4G technology in 2014, and the three large oligarch operators promoted their own 4G network. It should be noted that 4G technology is a replacement for 3G technology. The Chinese mobile terminals were popularized during the five years from 2009 to 2013. It can be seen from **Figure 2** that the number of China's mobile terminals exceeded the number of Chinese population and its growth did not have practical significance. Therefore, the regression from 2014 to 2018 revealed the conclusion that the growing number of terminals negatively correlated with economic growth. In addition, since 2015 the Chinese government has required that SIM cards that are connected to communication terminals need to be in the real-name registration system, which has restrained the growth in the number of terminals in the saturated mobile communication market.

**Table 3.** Regression result 2

| | GDP growth rate | | | | ELE growth rate | | | |
|---|---|---|---|---|---|---|---|---|
| | **1999–2003** | **2004–2008** | **2009–2013** | **2014–2018** | **1999–2003** | **2004–2008** | **2009–2013** | **2014–2018** |
| Internet growth | −0.0251*** (−7.1602) | 0.0312 (1.5025) | 0.1051*** (4.2883) | −0.0639*** (−3.5688) | | | | |
| Internet growth(-1) | | | | | −0.1038*** (−3.9606) | −0.2512** (−2.5327) | 0.3549*** (3.2157) | 0.1710* (1.8168) |
| C | 0.1186*** (45.0453) | 0.1249*** (28.7357) | 0.1023*** (26.4126) | 0.0797*** (58.9140) | 0.1887*** (8.7977) | 0.1658*** (7.9126) | 0.0532*** (2.8798) | 0.0491*** (8.0470) |
| Year | No | No | No | No | No | No | No | No |
| Province | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Fixed/ Random | Fixed | Fixed | Fixed | Fixed | Fixed | Fixed | Fixed | Fixed |
| Observation | 143 | 155 | 155 | 155 | 108 | 122 | 124 | 124 |
| $R^2$ | 0.63 | 0.57 | 0.55 | 0.65 | 0.43 | 0.35 | 0.51 | 0.35 |

*Notes: The mobile communication technology in China has undergone several stages. The comprehensive use of 3G technology by the Chinese mobile communication network started from 2009, and the comprehensive use of 4G technology started from 2014. We selected ranges of five years and performed the regression analysis on them.*
**** Significant at 1-percent level*
*** Significant at 5-percent level*
** Significant at 10-percent level*

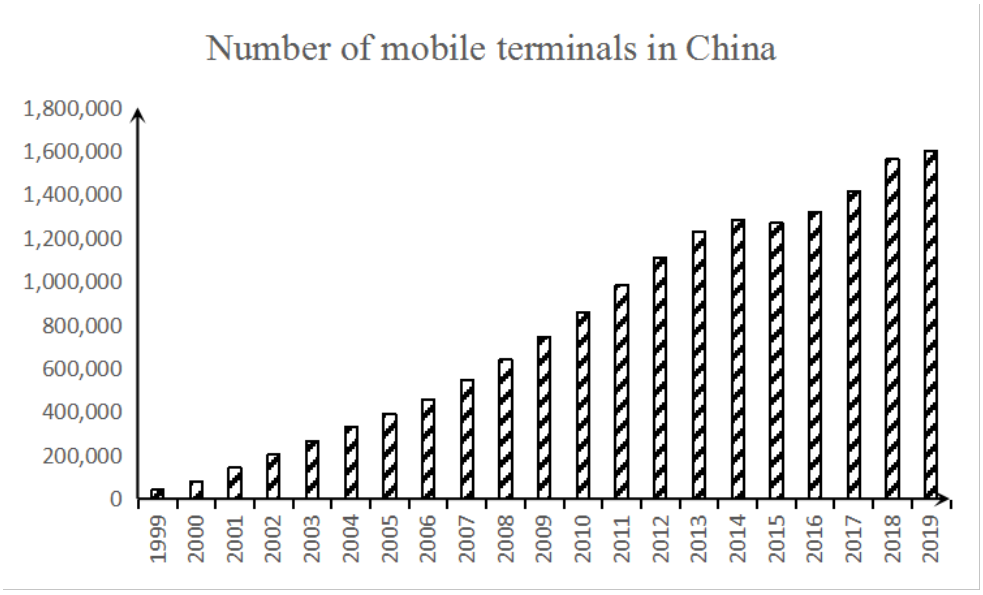


**Figure 2.** Changes in number of mobile phone terminals in China.

**Table 4** indicates the relationship between the number of Chinese mobile terminals and the economic growth in different regions. It can be noted that the regression in the eastern regions of China was significant, but insignificant in the western and central regions. The major reason for

this phenomenon is that the industrial chain of digital economy is in the eastern regions. Despite people in the central and western regions consuming through the internet, the industrial chains are not in the central and western regions. In addition, the development of internet economy is also mainly distributed in developed provinces, which are mainly concentrated in the eastern regions. It can be even identified that there was a negative correlation between the growth rate of communication terminals and economic growth in the western regions—the reason for which is that the digital economy is not the main driving force for the economic growth in these regions, since the population in these provinces is small. The economic growth in the western regions of China mainly relies on the transfer payment from the Chinese government and on infrastructure construction. With the background that the Chinese government is developing the western regions, the speed of economic growth will far exceed the growth speed of the number of mobile terminals.

The empirical results hold that the core competitiveness of Chinese economic growth still exists. It is an objective fact that digital economic technology is supporting Chinese economic growth. However, it should be pointed out that the supporting effect is structural, and this kind of support is efficient and sustainable within certain regions and time.

**Table 4.** Regression result 3

| | GDP growth rate | | | Power growth rate | | |
|---|---|---|---|---|---|---|
| | Eastern region | Central region | Western region | Eastern region | Central region | Western region |
| Internet growth | 0.0322*** (3.0277) | −0.0016 (−0.2118) | −0.0109** (−2.2528) | | | |
| Internet growth(-1) | | | | 0.0783*** (4.2342) | 0.0246 (1.5941) | 0.0049 (0.2973) |
| C | 0.1001*** (32.2289) | 0.1039*** (38.0544) | 0.1133*** (48.5044) | 0.0711*** (12.8486) | 0.0808*** (14.1324) | 0.1087*** (13.8236) |
| Year | No | No | No | No | No | No |
| Province | Yes | Yes | Yes | Yes | Yes | Yes |
| Fixed/Random | Fixed | Fixed | Fixed | Fixed | Fixed | Fixed |
| Observation | 172 | 196 | 240 | 163 | 186 | 221 |
| $R^2$ | 0.13 | 0.04 | 0.12 | 0.22 | 0.18 | 0.08 |

*Notes: Since the national territorial area and the population size of China are all taking a leading position worldwide, the development among all regions in China still has imbalance and inconsistency. Some provinces have reached the economic development level of developed countries (mainly distributed to the coastal areas), while some provinces (mainly distributed in the central and western areas) still need the transfer payment from the central government of China. Therefore, in the course of researching the increase in the number of mobile internet terminals, it was required to distinguish the provinces of China according to regions. This paper divided the 31 provinces and autonomous regions in China into the eastern regions, central regions and western regions according to their geographic locations. This classification method is similar to the official classification method by Chinese government. The eastern regions include Beijing, Tianjin, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong and Guangdong; the central regions include Shanxi, Hebei, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, Hunan and Hainan; and the western regions include Inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shanxi, Gansu, Ningxia, Qinghai and Xinjiang.*
**** Significant at 1-percent level*
*** Significant at 5-percent level*
** Significant at 10-percent level*

## 5. Related policies

The urban-rural dual economic structure is developing towards integration under the background of digital economy. China's economy has always been a system of dual-economy, and there is a natural separation between urban economy and rural economy. In order to break this division and stimulate economic vitality, the Chinese government has promoted the integrated development of urban and rural areas through the reform of the household registration system and the construction of new rural areas. The development of digital economy has enabled a large number of rural labor forces to be involved in online production and sales activities, which has given birth to many "Taobao Villages". With the development of the internet, the urban-rural dual economic structure has been broken completely in space, and rural manufacturing and urban consumption can be connected seamlessly.

In addition, the rural vitalization strategy carried out by the government of China can realize the intensive management of rural land, as well as production and living, through capital operation, which can provide rural residents with re-employment opportunities and pension services (Jiang et al., 2021). It provides the scale effect of digital economy with external security and makes the production of rural areas realize the intensive management. Digital economy can make the goods produced in any rural area of the country be delivered precisely to consumers through the developed transport capacity of the road network. Similarly, the rural revitalization strategy implemented by the Chinese government allows China to continue the secondary industrial transfer from urban areas to rural areas after the industrial transfer from coastal areas to inland areas, which has stimulated the vitality of economic growth.

Loopholes exist in the fiscal and taxation systems of digital economy. The fiscal and taxation systems in China adopt the localization management, while in the development of digital economy, there is no concept of localization. In general, it accepts the registration of tax payment and supervision, as well as other activities in the places where internet platforms are registered. However, China's local governments apply tournament-style assessment, which means that in the process of attracting investment, the local tax revenue can be retained. The internet oligarch enterprises can choose the areas where they settle for registration privately through carrying out the bids to minimize their own tax rate. In a sense, it makes use of the loopholes in the fiscal and taxation systems of China's local governments to achieve the goal of legal tax avoidance, which will have an impact on the tax revenue of local governments in China if this situation continues.

However, there is another fact that should be noted, which is that these tax avoidance methods used by the subjects of digital economy have formed a disguised government tax subsidy behavior to internet oligarchs, which can rapidly expand the development of China's digital economy industry and form a large-scale big data oligopoly (Agrawal and Fox, 2021). As digital economy grows stronger, the government is bound to suppress such subsidies until they are eventually withdrawn, and the doors to the industry will be closed.

The tertiary industry of digital economy is booming in China. China's digital economy began in the secondary sector of the economy, and the Covid-19 epidemic has affected Chinese consumption in the tertiary sector by shifting the consumption economy of physical stores to online digital consumption economy, such as online fresh delivery, teleconference, online consultation, short

videos, online education, etc. The tertiary sector of the economy has made effective services more intensive and benefited a wider range of people. During this epidemic period, the development of digital economy in the tertiary sector of the economy is leading to the flow of social capital to digital economy. Moreover, the Chinese government and the public sector will also increase the policies and the financial support for the development of the digital economization of the tertiary sector of the economy after observing these phenomena.

In addition, the development of digital economy in the tertiary sector of the economy will have a major alternative impact on physical services. Due to the replicability and the dual-track system of the price of online services, offline physical services may be replaced or impacted in the short term. However, in the long run, some physical services can adopt the combination of online and offline services, in which online services can be a useful complement to offline services, thus meeting the needs of different groups.

The management of digital economy is an essential topic in the future. If the output function of economic growth changes, the whole economic operating system will change. Hence, it is not exaggerated to call the digital economy the fourth industrial revolution. In the process of thoroughly changing the conventional economic mode, more laws and regulations will be formulated on how to manage digital economic platforms, infrastructures, etc. In this process, the expansion and taxation of many internet giants will be further restricted; otherwise, the new mode of economic growth will pose a challenge to the fiscal system.

## 6. Discussion

The issuance of digital currency from the People's Bank of China has promoted the development of digital economy. The People's Bank of China is planning the pilot program of digital currency and will perform an internal closed pilot test. Different from Alipay and WeChat payment systems, the digital currency is issued by the People's Bank of China and can replace paper money. The issuance of digital currency demonstrates that the payment medium of digital economy has been formed and that digital economy will become a key component of the economy in the future. Through the testing and usage of digital currency, the Chinese government will completely grasp the capital transaction between the consumers and enterprises, which is of great significance to anti-money-laundering as well as tax collection and management. Digital currency will play an important role as the guarantee of the financial system for the development of digital economy in China. The development of digital economy will enable Chinese currency sovereignty to flow globally to play the function of global currency. During this round of global financial crisis, the US dollars have progressively lost the position of global hegemony currency under the condition of the Federal Reserve's unlimited quantitative easing. Currently, the digital currency completely complies with the requirements of the global economy, and the global currency system will be possibly rebuilt after the crisis.

Digital economy is non-competitive with the scale effects. Different from the exclusiveness of the traditional economy, digital economy has a better non-competitiveness. Some services for one consumer will not affect the same service for others. All consumers are relatively equal in digital economy, which has realized the approximate Pareto improvement that the traditional economy is not able to reach. In addition, the marginal cost of digital economy is almost zero and it has a

complete scale economy. Under the circumstance that the marginal input is extremely low or zero, the output can continuously increase with the number of users, which cannot be explained in the traditional economy. In the digital economic system, it is almost impossible that marginal cost and marginal profit are equal.

The digital economy has reduced the cost of innovations and further promoted the industrial upgrading of China. The costs of innovations are further compressed in digital economy, since the fixed cost and marginal cost that are required by traditional innovations have all been saved. The time for implementing a project of "innovation" in digital economy can be significantly shortened with an extremely low cost. As we all know, Google was founded in the garage and Facebook was established on campus in a very short time. The development of Chinese digital economy has been driving on the fast lane in the past decade. A large part of the upgrading of the Chinese industrial structure relies on digital economy, which improves its own functions in the industrial chain through the non-competitiveness and the scale economy effect of digital economy.

Based on China's important leading role in global economic growth, as long as China's economic growth is sustainable, the stable growth of the global economy can be expected.

## 7. Conclusion

On the basis of the above theoretical derivation and empirical analysis, conclusions can be drawn as follows. First of all, digital economy will become the important source of power for Chinese economic growth in the next decade. The empirical results proved that the development of Chinese mobile internet has promoted the rapid increase of digital economy in China and provided a guarantee for Chinese economic growth in the next decade. Secondly, digital economy has provided a solution for breaking through the dual economic structure in China. The digital economy will be fully applied in the production factors in rural areas of China, such as labor force, land, etc., to promote the rapid transfer of the industrial structure from urban areas to rural areas. Thirdly, the production factors of digital economy, such as big data, will progressively participate in labor distribution.

In the future, whoever grasps the big data technology can own the entire market, completely breaking the government's monopoly of the market. Fourthly, digital economy can effectively restrain inflation. The development of digital economy means creating a new market, which will have better effects in restraining inflation.

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