

Does the development of digital economy promote Chinese urban entrepreneurship

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Abstract. With the accelerated layout of new infrastructure represented by data, 5G networks, artificial intelligence and other new technologies, the digital economy is in full swing in all fields in China. The digital economy development strategy has been aimed at boosting economic growth and industrial upgrading since it was put forward. Among them, digitalization to enrich factor supply, intelligentization to promote innovation and entrepreneurship, network to improve factor allocation efficiency, so as to stabilize foreign investment and promote foreign trade are the key areas of digital economy construction, which will greatly affect the development of regional economy, the transformation of old and new driving forces, as well as business models and investment decisions at the enterprise level. So, does the digital economy increase the level of entrepreneurial activity in cities? This unanswered question provides the main research direction for this paper, which will prove through scientific analysis and data that digital Economist Progress does drive urban employment.

Keywords: Digital economy, development, Chinese urban entrepreneurship.

1. Introduction

The expansion of China's digital economy over the previous ten years, from 11 trillion yuan (\$1.52 trillion) to 45 trillion yuan (\$6.20 trillion), has significantly accelerated the nation's economic and social development [1].

The digital economy has played a crucial role in the formation of the new dual cycle by fostering new prospects for regional innovation and entrepreneurship. Due to the rapid growth of the digital economy, many new items have emerged. Consider e-commerce, virtual currency, and other examples. Also, companies can trade more readily with one another, which promotes regional and global economic growth. Such a setting is more entrepreneurship friendly. The digital economy has recently grown at an unprecedented rate, scale, and relevance. As the competition, factor resources, and global economy are reformed, it is emerging as a significant force [2]. The extensive blending of the digital economy and traditional industries not only optimizes the city's business environment and economic and ecological value chain through knowledge spillover, technological change, and improved resource allocation efficiency but also cultivates more entrepreneurial opportunities through the building platforms for digital networks. To effectively exert the guiding influence of the digital economy on local entrepreneurship, the Chinese government should hasten the process of digital development in various cities and utilize digital technology and information platforms.

The value-added scale of China's digital economy reached 39.2 trillion-yuan in 2020, accounting for 38.6 percent of GDP, according to the 2021 White Paper on the Growth of China's Digital Economy published by the CACIT [3]. The digital economy uses its high penetration, speed, and external economy characteristics to thoroughly integrate with many economic and societal sectors, giving rise to a range of new industrial growth that fosters entrepreneurship by bringing a wealth of knowledge and technological support. Hence, making the most of the digital economy's potential to stimulate entrepreneurship in urban areas is crucial if we are to realize the objective of achieving shared prosperity.

Whether or not the growth of the digital economy has increased entrepreneurship in Chinese cities is the main topic of this report's investigation. This report examines, using data from 2005 to 2022, the relationship between the regional entrepreneurship and the digital economy, as well as its internal

mechanisms, with regard to the development trend of urban entrepreneurship in China. The structure adopted in this paper is MRD structure. To prove its thesis, this report will cite verified data from CNKI, Statista, and pertinent authority papers. In addition, this study will present pertinent hypotheses in light of the whole scenario before concluding with a verification of the findings.

2. Theories and Hypothesis

The conclusion that the "digital economy fosters the development of urban entrepreneurship" may be drawn from the development pattern of China's digital economy and the shift in the number of urban entrepreneurs over the past several years [4].

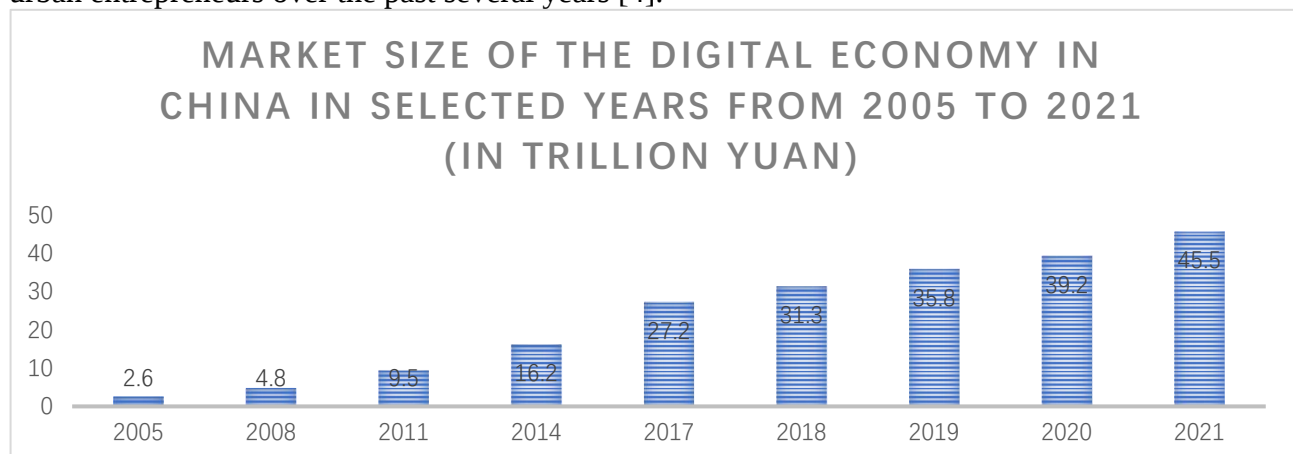


Figure 1: Market size of the digital economy in China in selected years from 2005 to 2021 (in trillion yuan)

Resource form: CAICT

The overview of Doing Business states that between 2013 and 2019 [5], the China Ease of Doing Business Index likewise experienced a significant increase. This is in line with the country's rapidly expanding digital economy.

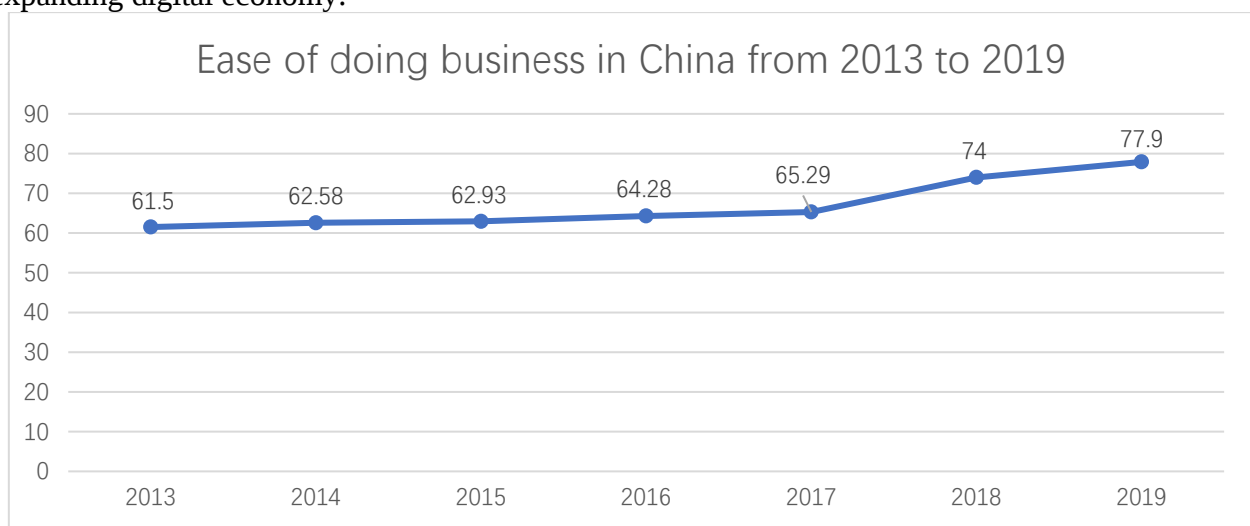


Figure 2: Ease of doing business in China from 2013 to 2019

Resource from: Doing Business

It can be seen from comparing the two graphs that China's digital economy is developing under pioneer conditions. For China's domestic business environment, the sooner the digital economy grows, the better. Entrepreneurs have greater investment prospects thanks to the scale economy and consumer expansion effect created by the digital economy. The use of the Internet, big data, artificial intelligence, and other digital technologies has led to the emergence of numerous large-scale platform businesses that are able to overcome physical constraints such as time and space, accurately formulate

services and goods to satisfy the varied needs of customers, and quickly achieve economies of scale. Economies of scale lower long-term unit costs, boost operational income, and enable economies of scale to grow further [6]. The process of conventional industries' digital transformation has been aided by the digital economy. Local businesses can pool resource services and lower internal transaction costs thanks to the consequent agglomeration of digital network resources, creating a user market for digital goods with enormous potential.

First, as the digital economy grows, larger economies of scale open up more business opportunities. The major companies in China's digital economy have grown their markets, with little overlap. For instance, Baidu concentrates on search engines, mapping, and cloud storage, Alibaba on commerce, payments, and finance, and Tencent on social media, payments within its apps and online games, and public services [7]. All of the mentioned businesses have cutting-edge technologies and accurate data analysis capabilities, which are advantageous for growing the local economy and maximising the use of human resources. In the early stages of China's digital economy's growth, the majority of people see economic potential and transform their industries. They depend on the digital economy to launch enterprises, gain market share quickly, establish monopolies, and take advantage of openings in the market before others do. The growth of the digital economy has also raised consumer demand, improved the consumption structure, and scaled up consumer consumption. Consumers and businesspeople now have a stronger supply-demand relationship. But, as China's digital economy has grown, so too have foreign companies' investments, and this flow-on effect of foreign direct investment has encouraged the emergence of homegrown innovative and entrepreneurial businesses [8]. FDI will promote cross-cultural understanding and literacy among local business owners, expand relevant industries, and strengthen relationships between foreign-funded firms and local entrepreneurs.

Hypothesis 1: The development of China's virtual economic system fosters city entrepreneurship.

Hypothesis 2: The expansion of the digital economy and the rise of entrepreneurship in China's cities, have not coincided.

3. Research design

Data from 2005 through 2022 are utilized in this analysis. From various angles, compare the state of growth of China's urban entrepreneurship and digital economy, and examine their interrelationship. The information in this section is primarily drawn from reports produced by the government, the CACIT database, and CSMAR. The tail reduction was performed at the level of 1% before and after continuous variables to limit the impact of outliers on regression results.

3.1. Explained variables

Entrepreneurial activity (TEA) adopts the score measurement of the number of new enterprises in the "Longrun-Longxin Innovation and Entrepreneurship Index" report.

3.2. Explain variables

Digital economy (DE) comes from the Digital Financial Inclusion Index Research Report compiled by the Center for Digital Finance of Peking University [9].

3.3. Controlled variables

In addition to the fixed effects of the city I and the year (t), control variables included the industrial structure (Indstr), urban economic development status (PerGdp), human capital (Hucap), financial development level (Fin), education, and science and technology expenditure (Scedu). Also, the fixed effects of the year (t) and the city (I) were both controlled [10].

Table 1. Variable

Variable	Variable symbol	Variable meaning	Variable value method
Explained variable	TEA	Entrepreneurial activity	New Business entry index
Explanatory variable	DE	Intellectual economy	Comprehensive index
Control variables	Industr	Industrial structure	Ratio of value added of tertiary industry to secondary industry
	Pergdp	State of economic development	Local GDP per capita
	Hucap	Human capital	The number of students in an ordinary institution of higher learning is logarithm
	Fin	Financial development level	Ratio of outstanding loans of financial institutions to GDP at year-end
	Scedu	Educational science and technology expenditure	The proportion of investment in education, science and technology in local government expenditure

An econometric model must be built to test the hypothesis.

$TEA_{it} = \alpha_0 + \beta_1 DE_{it} + \beta_2 Industr_{it} + \beta_3 Pergdp_{it} + \beta_4 Hucap_{it} + \beta_5 Fin_{it} + \beta_6 Scedu_{it} + \mu_i + \lambda_t + \epsilon_{it}$, where i and t stand for city and year, respectively. I and T stand for a city and a year fixed effect, respectively. I and t represent city fixed effect and year fixed effect, respectively. I and t also stand for random error terms in the model. If assumption 1 is correct, the model contains random error terms. The regression coefficient of DE (β_1) is anticipated to be significantly bigger than zero if hypothesis 1 is correct. The regression coefficient of DE (β_1) is anticipated to be significantly bigger than 0, the regression coefficient of de (β_1) is anticipated to be much higher than 0, showing that the growth of China's digital economy can boost local businesses' entrepreneurship.

4. Descriptive Analysis

Table 2. Descriptive statistics analysis

	Sample number	Average value	Standard deviation	Min	Max
TEA	1705	54.3581	27.3095	5.119	99.317
DE	1705	-0.0125	0.9329	-1.237	4.1665
Industr	1705	0.8862	0.4044	0.2944	2.7414
Pergdp	1705	10.6555	0.5471	9.5458	12.0655
Hucap	1705	10.5804	1.2581	7.4395	13.6265
Fin	1705	0.9181	0.5379	0.2941	3.2308
Scedu	1705	0.1989	0.0414	0.1034	0.2939

Urban entrepreneurial activity (TEA) has a mean value of 54.36, a minimum value of 5.12, and a maximum value of 99.32. The entry index of new businesses varies significantly among regions,

which could be attributed to disparities in local entrepreneurship policy and economic development among cities. Second, the digital economy (DE) has a mean value of -0.01, a minimum value of -1.24, and a maximum value of 4.17. It is clear that different Chinese cities have quite varying levels of digital economic development.

5. Correlation Analysis

Table 3. Outcome of Correlation Analysis

Variables	TEA	DE	Indstr	Pergdp	Hucap	Fin	Scedu
TEA	1	-	-	-	-	-	-
DE	0.5609***	1	-	-	-	-	-
Indstr	0.1576***	0.4486***	1	-	-	-	-
Pergdp	0.4330***	0.5429***	0.1123***	1	-	-	-
Hucap	0.7565***	0.6082***	0.2682***	0.4184***	1	-	-
Fin	0.3655***	0.5364***	0.5726***	0.2961***	0.4693***	1	-
Scedu	0.3217***	0.019	-0.1600***	-0.0830***	0.0975***	-0.1547***	1

The correlation analysis of the variables is displayed in Table 3. First, the relationship between the digital economy and entrepreneurship is strongly beneficial (TEA). Preliminarily, it has been determined that a city's growing digital economy may significantly boost its entrepreneurial activity. Second, the correlation coefficients between variables are all lower than 0.8, indicating a low level of collinearity. The presence of multicollinearity between variables was also examined using the variance inflation factor (VIF). According to the findings, none of the variables' variance inflation factors above the threshold of 10, passing the collinearity test. In conclusion, the chosen variables do not exhibit any multicollinearity issues.

6. Regression Analysis

Table 4. Regression analysis

Variables			
DE	16.4203*** (30.90)	3.4849*** (6.22)	1.371*** (3.2)
Indstr	—	-4.1294*** (-3.91)	-1.5823 (-1.04)
Pergdp	—	6.6356*** (7.07)	5.3375*** (3.03)
Hucap	—	12.7740*** (34.79)	-0.0709 (-0.08)
Fin	—	3.2202*** (3.91)	-0.4927 (-0.53)
Scedu	—	180.1628*** (18.61)	-11.0715 (-1.21)
Constant term	54.5634*** (99.70)	-186.6707*** (-18.45)	42.4574* (1.86)
Urban fixed effect	Uncontrolled	Uncontrolled	Controlled
Year fixed effect	Uncontrolled	Uncontrolled	Controlled
This is the adjusted R squared	0.3146	0.6709	0.9552
Sample number	1705	1705	1705

The effects of the digital economy on entrepreneurship in cities are depicted in the table above. The findings reveal that the digital economy coefficient (DE) is 1.37, which is highly positive at the

1% level and shows that as China's digital economy develops, urban entrepreneurial activities also significantly rise. The new business models and company forms created by the growth of the digital economy may be the cause, as they amplify entrepreneurs' enthusiasm and promote an upbeat environment for urban innovation and entrepreneurship. Hence, while hypothesis 2 is false, hypothesis 1 is correct.

7. Conclusion

The report concludes that as the overall size of the global digital economy grows, the government should increase investment in new infrastructure, such as the Internet and artificial intelligence, in order to help the digital economy become a new driving force for high-quality economic development and further unleash the benefits of the digital economy. Also, the government ought to give more assistance to the "boosting entrepreneurship" that the digital economy does in cities. One thing is for sure: the purpose of the public welfare innovation and entrepreneurship lectures is to encourage the creation and use of digital entrepreneurship platforms. On the other side, we should aggressively support entrepreneurs' individual initiative, implement fiscal and tax policies that support digital entrepreneurship, and achieve the coupling and coordinated growth of the digital economy and entrepreneurial activities. In order to attract FDI inflow and promote social consumption, the government should increase subsidies for digital development, innovation, and entrepreneurship in the central and western regions, implement precise and differentiated digital economy development strategies based on local conditions, give full play to the driving role of digital economy in high-quality urban development, and make full use of digital platforms to give full p realising the region's coordinated growth.

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