

Digital Economy, Business Environment and Foreign Trade Competitiveness

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Abstract

With the global digital technological changes, the digital economy has become the new focus of trade among countries. How to optimise the business environment and strengthen trade competitiveness is also an urgent problem to be solved in deepening opening up. As a result, whether improving the trade environment is conducive to enhancing the positive effect of digital economy on trade competitiveness becomes very important. This paper adopts the macro panel data of 30 provinces across China from 2013 to 2020, and employs the fixed effect model to verify how the business environment regulates the effect of digital economy on trade competitiveness. The paper finds that improving legal provisions, strengthening financial regulation and optimising public services are all conducive to strengthening the positive effect of digital economy on trade competitiveness, and the effect of digital economy on trade competitiveness is not significant in the southern region, while the northern region is in the same direction as the main effect. Based on the above results, this paper puts forward corresponding policy recommendations.

Keywords

Digital economy, trade competitiveness, business environment, fixed effects, random effects.

1. Introduction

With the spread of the new crown epidemic around the world, the gradual acceleration of the trend towards unilateralism and anti-globalisation, the treacherous geopolitical evolution, and the complexity and volatility of the global trade situation. In the face of the complex international economic environment, economies have continued to improve the organisation of production, raise the level of technological innovation, and optimise the soft environment and other forms in order to enhance the competitiveness of international trade. In recent years, domestic digital technology has continued to make breakthroughs, the digital economy has become an important engine of economic development in the new era, and its rapid development speed, wide range of radiation, and profound impact are unprecedented by accelerating the flow of factors, narrowing the time and space barriers, and expanding the industrial chain, thus injecting new momentum into the national economy, which is of pivotal significance to strengthening and consolidating the high-quality development.

Currently, the domestic economy is in the excessive stage from the rough development to the intensive development, deepen the opening up has gradually entered the "deep water zone", factor cost price increase, trade friction escalation, the new crown epidemic crisis and other uncertain events on China's trade competitiveness presents a strong impact. 2022 Government Work conference, expanding high quality At the government work conference in 2022, expanding high-quality opening to the outside world and promoting the sound development of foreign trade and investment have become the "new two wings" of opening to the outside world.

To this end, we should actively build a soft environment, optimise the business environment, stimulate the vitality of market players, strengthen the accumulation of market factors, and enhance the competitiveness of foreign trade.

The development of digital technology has effectively promoted the process of optimising the business environment. In terms of digitisation of government governance, convenient management systems such as "Palm Office" and "One Net Office" have strengthened the efficiency of government governance through data sharing and interoperability, effectively reducing the cost of processing for the public and enhancing communication between the government and enterprises. In terms of market management, digital technology has to a certain extent reduced the communication barriers between governments, eliminated the phenomenon of "information silos", promoted the cross-regional flow of factors of production, strengthened joint market supervision, and improved the mechanism of resolving commercial civil disputes by enterprises with big data technology, prevented unfair competition in the industry, and ensured orderly and fair competition in the market. From public services, digital technology has promoted the field of social services, strengthened the supply and demand rationing in education, medical care, sports, culture and tourism, pension and other fields, improved the efficiency of energy allocation, and created a smart city with multi-disciplinary cooperation and interconnectivity. Obviously, the digitalisation of the soft environment makes doing business easier and faster, and the new soft environment will also have an impact on domestic trade competitiveness.

Based on the above background, this paper conjectures the effects of the digital economy on the soft environment? Can it improve the soft environment and thus trade competitiveness? And what are the impact effects in different regions of China? As a result, this paper will focus on exploring the above questions. The research value of this paper is to explore whether digital economy can optimise trade competitiveness through soft environment.

2. Literature Review and Research Hypotheses

2.1. Impact of the Digital Economy on Trade Competitiveness

The booming development of the global digital economy has created conditions for enhancing trade competitiveness, and its promotional effect is mainly realised through the following paths: firstly, digital technology reduces the information cost of the whole society, enterprises can adjust their business strategies according to consumers' needs through big data technology, and the Internet platform realises the information interoperability between consumers and producers, which is conducive to improving product quality and optimising services to enhance productivity, thus enhancing the trade competitiveness[1] (Hua Junguo, Liu Chang, Zhu Di, 2022). Secondly, the digital economy, by virtue of the Internet platform, reduces the barriers to information circulation, realises inter-temporal exchanges between market subjects, greatly enriches the channels for enterprises to obtain information, weakens the possibility of human control of information, improves the transparency of market information, encourages the free competition of different business subjects, and thus promotes enterprises to improve their production efficiency[2] (Han Meng, Jiang Feng, 2022). Thirdly, the progress of digital technology promotes digital industrialisation and industrial digitisation, and after ushering in technological breakthroughs in the higher value-added services and industries, the social production factors will inevitably tilt towards the high value-added industries, forming new business forms and new industrial chains, and promoting industrial upgrading[3] (Sun Yong et al., 2022), which attracts domestic high-quality factors to flow to the high-value-added and high-profit industries, improves the efficiency of market resource allocation, and promotes market competition mechanism plays the function of elimination of the fittest, forcing

domestic products to improve quality and efficiency, and improving the competitiveness of domestic enterprises. Thus, this paper puts forward hypothesis H1:

H1: The digital economy can significantly optimise trade competitiveness.

2.2. The Moderating Role of the Financing Environment

As digital technology is updated and iterated, data accelerates the dissemination of information and knowledge, and the spillover of knowledge forms an oligopolistic pattern in some areas while enhancing the operational efficiency of enterprises. For example, in the platform economy, digital technology combines software and hardware with traditional business operations to provide users with tools and systems that are shared, interactive, and open, thus forming a platform economy through the integration of market resources. However, the intensification of competition in the market has led to the gradual monopolisation of digital technology and data elements and the emergence of a situation of "winner-takes-all".[4] (Chen, Shuxing, and Zheng, Lingfeng, 2022). This phenomenon can be understood as the "traffic thinking" in the era of digital economy; under the influence of this thinking, enterprises are more willing to reduce prices and increase marketing to attract traffic to capture the market, dominate the supply chain, package the traffic as a credit to realise profits and invest in the financial market, and the risk of false credit increases the risk of credit default. [5] (Peng Yuchao et al., 2022). In digital finance, due to the impact of networking, financial risks will show a multiplier effect, seriously threatening the corporate financing environment.[6] (Tang Song et al., 2019). In particular, the investment sentiment of risk aversion of financial subjects restricts micro-enterprises from obtaining financing from the financial market, affects the stability and sustainability of financing, and leads to high costs of enterprise financing.[7] (Huang Rui et al., 2021), which is not conducive to the competitive development of enterprises. As a result, the hypothesis H2 is obtained:

H2: The financing environment weakens the positive effect of the digital economy and trade competitiveness.

2.3. The Regulatory Role of the Legal Environment

The development of trade and foreign investment and the supporting rule of law are mutually reinforcing. The promotion of domestic foreign trade is for the purpose of expanding openness to the outside world, in order to broaden the international market, meet the needs of overseas consumers, and protect the interests of investors, it is necessary to improve the reform of the domestic legal system and sectoral mechanisms, [8] (Li Zhenran, Shen Wei, 2022). The development of digital technology has accelerated the process of building the legal system. First, algorithms can be embedded in social governance, such as public services, judicial environment, economic activities, etc., to create a new governance model, and the powerful cognitive ability of algorithmic technology empowers the forensics, retrieval, dispute resolution, arbitration and other aspects of judicial activities to safeguard the fairness and objectivity of the judiciary[9] (Hong Xuejun, 2021). Secondly, blockchain technology allows data to be distributed in different servers, so that participants cannot change the content of the records at will, and blockchain technology also has the function of backtracking, preventing the phenomenon of administrative intervention in the law, which is conducive to the independence of the judiciary; moreover, blockchain technology strengthens the interaction between different subjects, and the decentralised characteristics provide space for social co-governance, and encryption technology effectively protects the basic rights of market subjects[10] (Zhang Peng, 2022). Thirdly, big data technology solves the problem of "data silos", provides information support for judicial activities, facilitates judicial personnel to carry out dynamic analysis based on data, improves the efficiency of case processing, reduces the cost of legal services, and optimises legal services. A sound legal environment can effectively protect the rights and interests of market players, a perfect communication mechanism can reduce the cost of inter-enterprise

communication and promote cooperation, and a fair market environment protects the market order and creates conditions for expanding the trade market. Thus, this paper puts forward hypothesis H3:

H3: The legal environment significantly optimises the promotional effect of the digital economy on trade competitiveness.

2.4. Moderating Effects of the Public Service

Because of the non-exclusive and non-competitive nature of public goods, it is very easy to cause the market to "free-rider" behaviour, resulting in the private sector being reluctant to supply, and the public sector is mainly responsible for public services. When government departments provide public services, they can supply products according to market demand and maximise the efficiency of social resource allocation. Therefore, how to improve the efficiency of the government to provide public services and strengthen the supply of supporting facilities is crucial to reducing the operating costs of enterprises and enhancing their competitiveness. Big data, cloud computing and other digital technologies have changed the way of information interaction between points and points, with real-time and cross-regional digital technology to form an intelligent city management system, which helps the government to accurately locate the market demand, helps to control the balance of energy supply and demand, plan and formulate industrial policies, and regulate the ecological balance, and is the intermediate link for the upgrading of the competitiveness of the regional development[11] (Zhou Lixing and Xie Linrong, 2022). As a result, this paper obtains hypothesis H4:

H4: Public services reinforce the positive effect of the digital economy on trade competitiveness.

3. Research Design and Data Description

3.1. Model Setting

Based on the availability of data, this paper mainly selects 30 provinces (excluding Tibet) in China from 2013 to 2020 as data samples. According to the above literature review and assumptions, this paper constructs the main construction model as follows:

$$inter_{i,t} = a_0 + a_1 dig_eco_{i,t} + a_2 control_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$inter_{i,t} = b_0 + b_1 dig_eco_{i,t} + b_2 envi_{i,t} + b_3 dig_eco_{i,t} * envi_{i,t} + b_4 control_{i,t} + \varepsilon_{i,t} \quad (2)$$

The first equation focuses on the total effect of the digital economy on trade competitiveness. Where t denotes time, i denotes region, and $dig_eco_{i,t}$ denotes the independent variable digital economy index, $inter_{i,t}$ denotes the dependent variable trade competitiveness, $envi_{i,t}$ denotes the moderating variable soft environment, and $control_{i,t}$ denotes the control variables that have an effect on trade competitiveness, the a_0 、 a_1 、 a_2 denote the coefficient of intercept term, the coefficient of digital economy on trade competitiveness, and the coefficient of control variable on dependent variable, respectively, The 2nd equation mainly examines the moderating effect of digital economy on trade competitiveness after adding the business environment. The b_0 、 b_1 、 b_2 、 b_3 、 b_4 denote the coefficient of the intercept term, the coefficient of the digital economy on trade competitiveness, and the coefficient of the interaction term between doing Business and the digital economy (the interaction term has been centred on the centralized data processing), and the coefficient of the control variable on the dependent variable, respectively.

3.2. Variables and Data Description

3.2.1. Explained Variables

Trade competitiveness (inter). Trade competitiveness is mainly reflected in the ability of an economy to sustainably and profitably grow its trade. Michael Porter's "diamond model" theory, that a country's trade competitiveness needs to be measured comprehensively, the factors of national industrial competitiveness is divided into four, namely, factors of production, market demand, supportive industries, corporate strategy and competition, as well as the two auxiliary elements of government support and opportunities. (1) Factors of production. Divided into primary and advanced parts, primary factors usually refer to natural factors, while advanced factors mainly refer to complex labour force, technical knowledge and infrastructure, therefore, this paper adopts regional years of education per capita as a measure. (2) Market demand. This indicator mainly measures the impact of domestic market demand on the competitiveness of enterprises in the international arena, so this paper mainly adopts the degree of openness to the outside world to express market demand. The degree of external openness is equal to the ratio of the region's combined trade volume to local GDP. (3) Supportive industries. It refers to the domestic industry that has a significant impact on the competitiveness of international trade, and the development of such industry will form industrial agglomeration. In order to measure the results of industrial agglomeration, this paper uses the ratio of the tertiary industry to the secondary industry to represent the upgrading of industrial structure. (4) Enterprise strategy and competition. Porter believes that maintaining enterprise competitiveness is inseparable from a favourable domestic competitive environment and that other countries can also maintain competitiveness by adopting similar approaches. This paper draws on the method of Lan Qingxin and Dou Kai[12] (2022) and uses OFDI as a proportion of GDP. (5) Government intervention. Porter believes that government procurement and subsidies and other protective behaviours may adversely affect industrial competition, and this paper uses the level of general government expenditure as a percentage of GDP to represent the government intervention indicator. (6) Opportunity. Porter believes that opportunities include invention, technological innovation, sharp fluctuations in production costs and other reasons, so this paper uses effective invention to represent the opportunities of a region. Combining the above indicators, this paper uses entropy weight method to get the trade competitiveness index.

3.2.2. Core Explanatory Variables

Digital Economy Index (*dig_eco*). This paper refers to the idea of Luo Liangzhong, Lin Jiahao and Tan Yunqing[13] (2022), which is mainly considered from three perspectives, namely digital industrialisation, industrial digitisation and digital infrastructure, and this paper handles the data in the following steps: (1) Standardise, homotheticise and centrally process the raw data, and transform the different indexes into a uniform scale, so as to avoid the extreme values from having an impact on the regression results. (2) Use entropy weighting method to extract the effective information of each variable and calculate the weights occupied by each variable, the entropy weighting method still maintains the objectivity in the process of assigning weights, which is more accurate compared with the subjective dimension reduction method. (3) Finally, this paper adopts TOP-SIS method to carry out TOPSIS calculation on the weights occupied by each index of digital economy on the basis of the weights already obtained by entropy weight method, and then get the digital economy index.

After the entropy weight TOPSIS method, the digital economy development index is calculated as shown in Table 1:

Table 1 . Indicator weights and measures of the Digital Economy Development Index (DEDI)

Level 1 indicators	Secondary indicators	percentage	Measurement indicators	proportion
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Digital Economy Index	digital industrialisation	47.51 %	Courier services per capita	7.83 %
			Patents granted per 10,000 people	6.61 %
			Per capita income from information technology services	10.13 %
			Technology market turnover per capita	13.31 %
			Software business income per capita	9.65 %
	Industrial digitisation	31.89 %	Number of Internet Top 100 companies	15.05%
			E-commerce sales as a share of GDP	4.91%
			Total telecommunication services	3%
			E-commerce purchases as a share of GDP	5.22 %
			Number of computers per 100 population	3.7%
	digital infrastructure	20.60 %	Internet penetration	2.54 %
			Internet access ports per capita	2 %
			Mobile phone base stations per capita	2.59 %
			Fibre optic cable line length	6.39 %
			Mobile phone penetration rate	7.08 %

3.2.3. Mediating Variables

In order to comprehensively reflect the business environment, this paper measures the business environment in each province across the country from three perspectives: enterprise legal services, factor markets and public services.

Corporate legal services (med). The law safeguards the trade order of an economy as well as the maintenance of its interests. Good legal services can not only protect foreign trade enterprises from losses, but also attract overseas enterprises to enter the mainland market, and high-quality intermediary services can reduce the transaction costs and information costs of market players. This paper adopts the Enterprise Business Index from the China Sub-Provincial Enterprise Business Environment Index Report as an indicator.

Financial Environment (Fac). Drawing on Sun Shaoqin and Qiu Bin[14] (2014), this paper argues that exporting firms are unwilling to take on too much risk and relatively value stable financial flows. Therefore, this paper uses the proportion of medium- and long-term loans to total loans to reflect the financial environment.

Public services (pub). Enhancing the government's public service capacity is an important means to strengthen trade competitiveness. In this paper, we refer to the public service environment index in the Doing Business indicators of Wang Xinliang, Du Zhuangzhuang, and Liu Fei[15] (2022), and add social security on top of infrastructure and health services. Infrastructure includes water supply, electricity supply and natural gas; health services include

the number of beds per capita; and social security includes the number of urban and rural medical insurance, unemployment insurance, pension insurance, industrial injury insurance and maternity insurance participants. The above indicators are also obtained by constructing them through the entropy weight method.

3.2.4. Control Variables

This paper mainly adopts the following indicators as control variables: (1) economic growth. This paper adopts the per capita growth rate to reflect the level of regional economic development, the faster the growth rate of per capita income, the faster the regional economic growth rate on behalf of the region, the stronger the trade competitiveness of the region. (2) Technological input. The higher the degree of technological innovation to enhance trade competitiveness is more obvious, this paper is mainly divided into human factor input and capital factor input. The human factor input adopts the R&D personnel equivalent at that time, which indicates the number of researchers who spend 90% of their time on R&D activities throughout the year; the ratio of R&D expenditure to local GDP is used as a measure of the capital factor input indicator. (3) Carbon emissions. With the rising awareness of environmental protection and the emergence of green economic development model, low-carbon trade is gradually institutionalised, and more and more countries take low-carbon as part of trade protection, the size of carbon emissions has a profound impact on trade competitiveness. This paper takes the logarithm of carbon emissions of each province as an indicator.

Some of the indicators for the empirical evidence in this paper come from 30 provinces across the country (excluding Tibet) in 2013-2020, and the data are all from the China Statistical Yearbook 2014-2021.

Table 2. Descriptive statistics for each variable

variant	norm	Indicator symbols	unit (of measure)	average value	Max	Min	standard error
explanatory variable	trade	Inter	-	0.156	0.737	0.029	0.129
	competitiveness						
	Digital Economy Development Index	dig_eco	-	0.171	0.765	0.040	0.147
moderator variable	financial environment	Fac	-	0.982	0.999	0.892	0.020
	business legal environment	Law	-	3.502	3.94	2.93	0.211
	public service	pub	-	0.236	0.658	0.051	0.120
control variable	Per capita income	PI_inc	%	106.62	117.83	93.49	3.01
	growth rate						
	carbon footprint	LnCO2	-	10.316	11.71	8.73	0.583
	R&D staff equivalent at that time	RDP	-	36458.75	700017	82	77956.24
	R&D investment intensity	RDF	-	0.0107	0.023	0.002	0.711

4. Regression Results

4.1. Baseline Regression

This paper adopts a fixed-effects model to measure the extent to which the digital economy affects trade competitiveness under the adjustment of the business environment. In order to avoid the problem of multicollinearity arising from interaction, this paper has centred the interaction term and the benchmark regression results are shown in Table 3.

Table 3. Moderating effect of business environment on digital economy and trade competitiveness

variant	Trade competitiveness			
	(1)	(2)	(3)	(4)
dig_eco	0.222** (2.06)	0.227** (2.20)	0.098 (0.89)	0.097 (0.87)
Fac × dig_eco		-1.978*** (-2.93)		
Law × dig_eco			0.637*** (3.57)	
Pub × dig_eco				1.638*** (3.36)
district	containment	containment	containment	containment
vintages	containment	containment	containment	containment
F	86.58	91.42	89.54	62.86
sample size	240	240	240	240

The above table indicates t-values in parentheses, and ***, **, and * indicate that the regression results are significant at the 1 per cent, 5 per cent, and 10 per cent levels, respectively. The following regression results are identical.

Column (1) of Table 3 shows the impact of the digital economy on trade competitiveness without considering the business environment, and the results show that the digital economy is positively related to trade competitiveness and is significant at the 5% level, which suggests that the development of the digital economy is conducive to improving the competitiveness of China's trade, and verifies that hypothesis H1 is correct. Columns (2)-(4) mainly show the relationship between digital economy and trade competitiveness considering each business environment condition. The results in column (2) show that the interaction term of market integration and digital economy has a positive effect on trade competitiveness and is significant at the 1% level, which indicates that with the accelerated progress of market integration, the factor and product markets are gradually integrated, which optimises the promotional effect of digital economy on trade competitiveness, proving that hypothesis H2 is valid. The results in column (3) show that with the development of enterprise legal services, the construction of market institutions tends to improve, which is conducive to promoting the promotion effect of digital economy on trade competitiveness, and the coefficient is significant at 1% level, proving that hypothesis H3 is correct. The results in column (4) show that when the government provides more public services, it significantly improves the promotion effect of digital economy

on trade competitiveness, and the coefficient is significant at 1% level. The above results prove that there are moderating effects of non-state economic development, intermediary organisations and legal services, market integration and public services, proving that hypothesis H4 is correct.

4.2. Heterogeneity Test

In order to further study the moderating effect of business environment in the digital economy and trade competitiveness under different regions, this paper divides the sample into two regions, the North and the South, and uses the data from 2013 to 2020, as well as the fixed effect model, to carry out regression experiments for the North and the South, and the regression results for the North and the South are shown in Table 4 and Table 5, respectively.

Table 4. Heterogeneity test regression results for the northern region

variant	Trade competitiveness			
	the northern part of the country	the northern part of the country	the northern part of the country	the northern part of the country
dig_eco	0.296** (2.07)	0.202 (1.44)	0.224 (1.62)	0.187 (1.31)
Fac × dig_eco		-2.680** (-2.51)		
Law × dig_eco			0.980*** (4.20)	
Pub × dig_eco				2.399*** (2.76)
district	containment	containment	containment	containment
vintages	containment	containment	containment	containment
sample size	120	120	120	120

Table 4 shows the regression results for the Northern region. On the total effect, the digital economy has a significant optimising effect on trade competitiveness, and its coefficient is significant at the 5% level; in column (2), the coefficient of the interaction term between the financial environment and the digital economy has a negative effect, and the coefficient is significant at the 5% level, which indicates that the improvement of the financial environment weakens the promotional effect of the digital economy on trade competitiveness; in column (3), the legal environment and the interaction term of the digital economy and trade competitiveness show a positive In column (3), the coefficient on the interaction term of legal environment with digital economy and trade competitiveness is positive and the coefficient is significant at the 1% level, indicating that the improvement of the legal environment in the North has a significant optimising effect on the promotion of trade competitiveness by the digital economy; in column (4), the coefficient on the interaction term of public services with the digital economy and trade competitiveness is positive and the coefficient on the improvement of public facilities has a significant optimising effect and the coefficient is significant at the 5% level.

Table 5. Heterogeneity test regression results for the southern region

variant	Trade competitiveness			
	the southern part of the country	the southern part of the country	the southern part of the country	the southern part of the country
dig_eco	0.160 (0.91)	0.262 (1.50)	0.056 (0.28)	0.028 (0.16)
Fac × dig_eco		-1.174 (-1.21)		
Law × dig_eco			0.412 (1.50)	
Pub × dig_eco				1.218** (1.99)
district	containment	containment	containment	containment
vintages	containment	containment	containment	containment
sample size	120	120	120	120

From the regression results reported in Table 5, the positive effect of digital economy development in the South on trade competitiveness is weak, and the coefficient is not significant within the 10 per cent level. This paper thus concludes that the development of the digital economy in the North plays a significant role in promoting trade competitiveness, and that the improvement of the business environment will play an important role in promoting the effect.

5. Robustness Tests

5.1. Addition of Control Variables

In this paper, in order to consider that price changes have an impact on import and export trade, which in turn affects trade competitiveness and leads to regression results that may be inaccurate, this paper adds inflation as a control variable and re-examines the regression test. The results after the fixed effects test are shown in Table 6:

Table 6. Regression results of adding control variables for robustness tests

variant	Trade competitiveness			
	(1)	(2)	(3)	(4)
dig_eco	0.225** (2.12)	0.186* (1.75)	0.100 (0.92)	0.127 (1.14)
Fac × dig_eco		-0.003*** (-2.71)		
Law × dig_eco			0.642*** (3.65)	
Pub × dig_eco				0.819** (2.50)
district	containment	containment	containment	containment

vintages	containment	containment	containment	containment
F	88.86	85.44	89.54	85.67
sample size	240	240	240	240

From the above regression results, it is found that the digital economy still significantly and positively affects trade competitiveness after the inflation variable is added; strengthening financial regulation strengthens the promotional effect of the digital economy on trade competitiveness; strengthening legal services strengthens the positive effect of the digital economy on trade competitiveness; and at the same time, increasing the government's public services strengthens the positive effect of the digital economy on trade competitiveness.

5.2. Replacement of Models

In this paper, the random effects model is replaced, and the robustness of the empirical results is tested again. The empirical results are shown in Table 7:

Table 7. Robustness test regression results with additional control variables

variant	Trade competitiveness			
	(1)	(2)	(3)	(4)
dig_eco	0.442*** (7.39)	0.431*** (7.79)	0.393*** (5.97)	0.166** (2.18)
Fac × dig_eco		-1.751** (-2.33)		
Law × dig_eco			0.464** (2.52)	
Pub × dig_eco				2.314*** (5.34)
district	containment	containment	containment	containment
vintages	containment	containment	containment	containment
F	148.09	184.50	146.62	187.56
sample size	240	240	240	240

The above tables indicate z-values in parentheses, and ***, **, and * indicate that the regression results are significant at the 1 per cent, 5 per cent, and 10 per cent levels, respectively. The above results show that the digital economy is positively significant to trade competitiveness, with the coefficient significant at the 1% level; the improvement of the financial environment will weaken the positive effect of the digital economy on trade competitiveness, with the coefficient of the cross term significant at the 5% level; and the improvement of the legal environment and the public service both strengthen the positive effect of the digital economy on trade competitiveness, with the coefficients of the cross terms significant at the 5% and 1% levels, respectively. The above random effects model test results all prove that the results of the underlying regression model are robust.

6. Conclusions and Policy Recommendations

6.1. Conclusion

Through the above empirical test, this paper finds that the business environment can regulate the positive effect of the digital economy and trade competitiveness, and the specific experimental results are found as follows: first, the development of the digital economy does significantly optimise trade competitiveness. Second, if we strengthen the construction of the local legal system, especially supplementing the laws and regulations in the field of digital economy, we can effectively regulate the market order, promote the market to play the function of the competition mechanism, help to create a fair and open market environment, promote the domestic enterprises to improve quality and efficiency, and optimise the impact of the digital economy on China's trade competitiveness; third, strengthen the financial supervision, constrain the disorderly expansion of capital, focus on the prevention of financial risks, and moderately Thirdly, strengthening financial regulation, restraining the orderly expansion of capital, focusing on the prevention of financial risks, moderately strengthening the regulation of financial institutions' lending and borrowing, and safeguarding the safety of the capital chain of domestic enterprises can strengthen the promotional effect of the digital economy on trade competitiveness; fourthly, promoting the digitisation of public services, comprehensively improving the management efficiency of the government and the market main body, and meeting the personalised needs of enterprises, which is conducive to reducing the cost of enterprises, so that the strengthening of public services can strengthen the promotional effect of the digital economy on trade competitiveness. Fifth, the improvement of business environment shows heterogeneous effects on different regions, in which the effect is obvious in the northern region, and the moderating effect of business environment is consistent with the base regression, while the moderating effect of business environment in the southern region seems to be insignificant.

6.2. Policy Recommendations

6.2.1. Improving the Legal Construction of the Digital Economy

From the perspective of digital economy technologies and production models, there is an urgent need to regulate both the algorithm and platform economies. First, based on the technical characteristics and potential risks of algorithms, summarise their inherent laws and introduce laws and regulations on algorithm transparency, punishment mechanisms, rights and discrimination, and other technologies to prevent others from using algorithmic mechanisms to seize undue benefits; secondly, improve the regulations of Internet platforms, especially clarifying property rights, safety supervision and clear responsibilities, so as to encourage small and medium-sized enterprises to move into the platforms, strengthen the research of platform technologies, strengthen the market rights protection mechanism, reduce the threshold of market access, guide win-win cooperation among market players, develop in the direction of high quality and high value, and create an open, orderly and fair platform economy. From the perspective of market governance, the current focus should be positioned in a timely manner to strengthen areas, such as the relationship between market subjects, the means and scope of governance objects, and capital expansion. By legislating the key issues of the digital economy, a systematic governance programme should be identified to form a solid legal system for the digital economy. From the perspective of data elements, relevant regulations on data collection, dissemination, rights, processing and handling should be embarked upon to strengthen the security management of data elements, safeguard the security and fairness of cross-border transactions of data, and guard against unfair competition in data elements to avoid the emergence of monopoly phenomena.

6.2.2. Optimising Public Services

With the help of digital technology, the government should shift from being the sole provider of public services to an organiser, guiding enterprises and social organisations to participate in digital urban governance, breaking down information barriers between all parties, and guaranteeing real-time sharing of data and information. It should strengthen the digital transformation of social services, promote the integration of cloud and computing networks, achieve digital universal services for education, healthcare, pension and other livelihood areas, expand the scope of digital livelihood services, improve the quality of basic needs of the labour force, and prepare for the attraction of high-quality talents. At the same time, the government should develop blockchain technology, build a big data centre, implement an integrated and intelligent management system, upgrade and update the digital infrastructure, strengthen the government's management of public resources, ensure timely and accurate supply according to the needs of enterprises, and also help enterprises manage their internal production and operations, make and adopt appropriate decisions, optimise the efficiency of public resource allocation, and create an open and intelligent digital city.

6.2.3. Strengthening Financial Regulation to Prevent Uncontrolled Capital Expansion

The construction of a credit system should be strengthened with the help of digital technology, especially to safeguard the security of cross-border financial data, which carries market transactions and has a strong value. In this regard, data privacy should be reasonably safeguarded, and the issuance of domestic financial licences should be dealt with strictly, such as strict auditing of functions, business and operations. Strengthen cooperation with other countries in the regulation of cross-border financial transactions, coordinate regulatory standards as well as communication mechanisms, study the top-level design plan for digital finance, clarify pricing and trading mechanisms, promote the integration of offshore and onshore financial markets, and establish cross-border non-cooperation mechanisms. Cultivate digital finance reserve talents, enhance the professionalism of financial regulatory teams, promote the unity of fairness and efficiency, and improve the efficiency of financial regulation. In addition, the Government should actively cooperate with science and innovation-based enterprises to obtain digital technology support and develop cross-sectoral coordination and cooperation.

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