

# *Research on the Impact of Digital Economy on High-Quality Economic Development: Based on the Analysis of the Intermediary Effect of Industrial Structure*

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**Abstract:** Based on the provincial panel data from 2011 to 2017, this paper first studies the impact of digital economy on high-quality economic development, and analyzes the regional heterogeneity of the impact of digital economy. Secondly, by constructing the intermediary effect model, this paper tests the mechanism of digital economy promoting high-quality economic development through optimizing industrial structure. The study found that: Digital economy in general helps to improve the high-quality development of the economy, and the impact of digital economy has regional heterogeneity. The promotion effect of digital economy is more obvious in the eastern region and high-income areas, and the industrial structure has a significant intermediary effect. Digital economy can jointly promote the high-quality development of the economy through the upgrading and rationalization of industrial structure.

## **1. Introduction**

Digital economy is mainly driven by digital technology innovation. Through integration with the real economy, it constantly improves the digital, networked and intelligent level of the economy and society, and accelerates the construction of a new economic form of economic development and governance mode. Digital economy plays an increasingly significant role in the primary, secondary and tertiary industries, and plays an important role in promoting consumption, promoting the digital transformation of traditional industries, cultivating new employment models, and promoting green development. At present, the epidemic has profoundly changed the mode of economic growth in various countries, and the digital economy has increasingly become the main driving force of economic growth in various countries. 5g, industrial Internet, big data, etc. have shown great potential in the epidemic and played an important role in restoring production and life. In 2020, China's digital economy reached US \$5.4 trillion, ranking second in the world in total. The scale of digital economy increased by 9.6% year-on-year, and the growth rate ranked first in the world [1]. Therefore, the research on digital economy is of great significance to China's economic development.

At present, we should deepen the upgrading of the traditional industrial structure, change from the past high energy consumption and high pollution to the centralized type, carry out structural

reform in the supply side, and constantly improve China's scientific and technological innovation ability. Let scientific and technological innovation become a strong support for economic growth. As a new economic form, digital economy can accelerate the development of China's innovation ability. For example, 5g, big data, artificial intelligence and other modern digital technologies. It has strong innovation potential, improves production and operation efficiency, saves production costs, and fundamentally changes production and lifestyle. The application of digital technology has improved the productivity of various elements of the economy and promoted the high-quality development of the economy. On the other hand, it can stimulate the development of emerging industry models and industries such as online finance, information services, online education, and the overall economy, and effectively eliminate the distortion of capital allocation. Promote the upgrading of industrial structure, promote the increase of the relative demand for social consumption and quality, greatly simplify the situation of consumers, stimulate consumption, promote employment, and promote high-quality economic development. Because the situation of digital economy is difficult to quantify, there is no consensus on whether the development of digital economy will help improve the quality of economic growth, and how digital economy will affect the quality of economic growth. If the role of digital economy is too big or too small, it will be detrimental to the implementation of China's macroeconomic policies. Therefore, it is still an important issue to correctly evaluate the role of digital economy. Now many scholars are studying the impact of digital economy. Considering the impact of digital economy on total factor productivity, most scholars believe that digital economy can effectively stimulate the growth of total parameter productivity and promote high-quality economic development. They discuss the content and evaluation methods of high-quality economic development [2,3]. From the perspective of digital economy path, most scholars consider the efficiency of resource allocation, technological innovation, employment and other aspects from the perspective of intermediary and regulation [4,5]. There is no answer to this question within the unified scope.

Based on the above discussion, this paper selects the relevant sample data from 2011 to 2017 on the basis of existing research, constructs the provincial high-quality economic development and digital economy index measurement system, and calculates the regional high-quality economic development and digital economy index. First, it empirically tests the impact of digital economy on high-quality economic development, and tests the robustness and endogenous test, and tests the robustness of the benchmark conclusion. Secondly, it tests the heterogeneity of the impact of digital economy on high-quality economic development, and analyzes the heterogeneity of the impact of digital economy. Finally, in order to clarify the mechanism of digital economy, this paper constructs an intermediary effect model from the path of industrial structure, and tests the channels through which digital economy acts on the quality of economic growth.

## **2. Theoretical Mechanisms and Research Assumptions**

### **2.1. Digital Economy and High-quality Economic Development**

First of all, the digital economy has the effect of economies of scale, in the context of the digital economy, through the support of the digital economy infrastructure, it is possible to collect and analyze consumption behavior, thereby expanding the consumer market and optimizing the consumption structure, while the new industrial model supported by digital technology also provides new supply, making data also become a production factor driven by land, labor and innovation [6], thus promoting high-quality economic development; Secondly, the digital economy has an innovation empowerment effect, on the one hand, the digital economy can be integrated with traditional industries, through the application of the Internet, big data, artificial intelligence in production activities, so that the traditional industry in the organization and management,

production factor structure, production methods, etc. have undergone tremendous changes, but also make the product more intelligent, have higher added value, reduce production costs. On the other hand, the digital economy has created new business models, such as online shopping, online live broadcasting, online teaching, Internet finance, etc., with the characteristics of convenience, efficiency and low cost, resulting in the integration of online and offline, constantly creating new business models, and providing new momentum for high-quality economic development [7]. Finally, the digital economy has a cost-saving effect, in the era of the Internet, big data, for consumers, can effectively reduce the cost of search, can easily find more cost-effective goods on the network, and then make more reasonable purchase decisions, reduce the cost of information search for goods [8]. For enterprises, you can improve the production process by using digital technology, save production costs, management costs, etc., but also reduce the cost of enterprises in logistics, warehousing, transportation, etc. In terms of financing, the Internet financing platform also provides a more convenient financing model for enterprises, and to a certain extent, provides enterprises with faster and lower-cost financing channels. Based on the above analysis, this article proposes the following assumptions:

H1: The digital economy helps to promote high-quality economic development

## **2.2. The Digital Economy Enhances the Mechanism of High-quality Economic Development by Optimizing the Industrial Structure**

This paper analyzes the optimization of industrial structure from two aspects: The upgrading of industrial structure and the rationalization of industrial structure. The seniorization of industrial structure refers to the process of gradual transformation of the proportion of various industrial sectors in the national economy from the primary to secondary and tertiary industries, and the proportion of each industrial sector in the national economy is different at different stages of economic development [9], there is a trend of shifting from the primary industry characterized by labor-intensive and low added value to the secondary and tertiary industries characterized by capital-intensive, technology-intensive and high added value. Industrial structure rationalization refers to the optimization of the allocation of resources within the industrial sector and the coordinated development of industries, mutual promotion of the process, with technological progress, the survival of the industry, technological progress appears to improve production efficiency, input and output is more reasonable, the efficiency of resource utilization is further improved, and this process is manifested as the rationalization of the industrial structure.

The optimization of the industrial structure of the digital economy is mainly manifested in the following three aspects: First, the upgrading and transformation of traditional industries. The digital economy is based on digital technology to produce digital economy industries, and the digital economy industry and traditional industries are intertwined and integrated, constantly upgrading and transforming traditional industries, and the digital economy gradually penetrates into the production, sales and other links of traditional industries, improving the production efficiency of traditional industries, thereby promoting the optimization of industrial structure. Second, promote the formation of emerging industries. The development of the digital economy has enabled the traditional industrial boundaries to be broken, forming a new industrial model online and offline, while accelerating the formation of an emerging industrial model and providing new supplies, such as Internet + Different formats have been formed under the mode, promoting innovation in all walks of life, promoting the optimal allocation of resources, adjusting the industrial structure, and promoting the optimization and upgrading of industrial institutions. Third, it has promoted the upgrading of consumer demand structure. Supply and demand are two aspects of the market economy, on the one hand, the digital economy creates new supply. On the other hand, the digital

economy also promotes the upgrading of the consumption structure, data products affect the consumer's consumption behavior, consumption mode, etc., and the huge amount of consumption information of big data affects the supply structure, both of which continuously promote the optimization of the industrial structure and drive the rapid development of the digital industry.

At present, the main contradiction in China has become the contradiction between the growing demand for a better life and the imbalance and insufficiency of development. High quality economic development is a process of changing from "quantity" growth to "quality" growth. In order to solve the main contradiction in China's economic development, we must optimize the industrial structure. First, optimizing the industrial structure can improve the efficiency of resource allocation, increase output and promote economic growth. Secondly, the optimization of industrial structure improves the overall factor productivity, increases the share of input and output, and promotes economic growth [10]. Finally, the optimization of industrial structure will also help to change the development mode of high energy consumption and high pollution into green and low carbon dioxide development, and promote high-quality economic development. Based on the above analysis, the following assumptions are proposed:

H2: The digital economy enhances high-quality economic development by optimizing the industrial structure

Figure 1 illustrates the relationship between digital economy, industrial structure optimization and high-quality economic development.

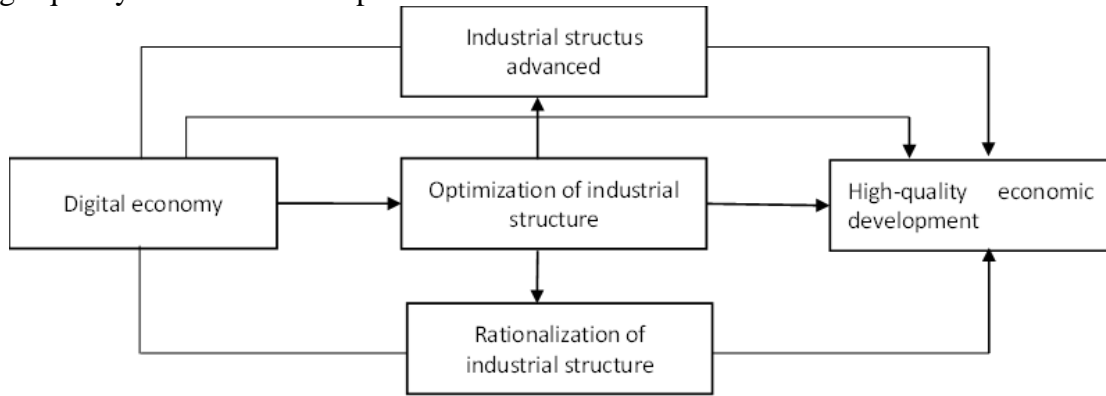


Figure 1: Mechanism of digital economy promoting high-quality economic development

### 3. The Model Setting and Data Description

#### 3.1. Model Setting

This paper mainly examines the impact and mechanism of the digital economy on the quality of China's economic growth, and constructs the following benchmark model for this purpose:

$$Growth_{it} = \beta_0 + \beta_1 \ln Dige_{it} + \beta_2 Control_{it} + \varepsilon_{it} \quad (1)$$

Where  $i$  and  $t$  indicate provinces and times, respectively;  $Growth_{it}$  indicates the level of economic growth;  $Dige_{it}$  stands for digital economy;  $Control_{it}$  is the control variable, mainly government support (Gov), infrastructure (Inf), investment (In), human capital (Hu), Ofdi, Financial Development Level (Finance);  $\varepsilon_{it}$  is a random perturbation term.

### 3.2. Variable Selection

Table 1: Provincial high-quality economic development and digital economy evaluation index system

Primary indicators	Secondary indicators	Basic indicators	Metric properties	weight
High-quality economic development index	Technological innovation	R&D expenditure accounted for GDP specific gravity	+	10.83%
		Number of patent applications	+	21.36%
	Financial development	Balance/GDP of financial institutions	+	7.39%
	Industrial structure	Tertiary industry output value / secondary industry output value	+	12.86%
	Consumer investment structure	Consumption rate	+	5.32%
		Investment rate	+	8.20%
	Coordination capacity	Fiscal expenditure on education accounts for the proportion of total expenditure	+	3.03%
		Fiscal health expenditure as a proportion of total expenditure	+	4.54%
	Opening	Total Imports and Exports/Gross Regional Raw Value	+	20.66%
	Ecological environment	The harmless treatment rate of domestic garbage	+	1.84%
		Comprehensive utilization rate of industrial solid waste	+	3.97%
Digital Economy Index	Internet penetration	Internet users account for the proportion of the resident population	+	12.21%
	Internet-related practitioners	Proportion of computer services and software practitioners	+	30.88%
	Internet-related outputs	Telecom traffic per capita	+	28.79%
	Mobile phone penetration	The number of mobile phone users as a proportion of the resident population	+	15.49%
	Digital financial development	China Digital Financial Inclusion Index	+	12.62%

1). The interpreted variable economic growth level (Growth): High-quality economic development is a broader concept of connotation different from the amount of economic growth, considering the extensive connotation of high-quality economic development, this article refers to the practice of Cao Xiaojing [11], starting from the concept of innovation, coordination, green, openness and sharing. Construct an index of high-quality economic development that includes 11 basic indicators. In the calculation method, the entropy value method is used, and the high-quality economic development index of each province is obtained according to the linear sum of the calculated weights, and the specific indicators are shown in Table 1.

2). Explanatory variable digital economy (Dige): At present, most of the literature on the digital

economy is represented by the "Digital Inclusive Finance Index" compiled by the Digital Finance Research Center of Peking University, and the measurement of the digital economy should comprehensively consider many factors, drawing on the methods of Zhao Tao and others [7], taking into account the availability of data, this paper uses Internet penetration, Internet-related practitioners, Internet-related output, mobile phone penetration, digital finance development of the five aspects of the indicators, the above 5 indicators of the actual correspondence of the content is detailed in Table 1, in the calculation method using entropy method, according to the calculation of the weight of linear sum, to obtain the digital economy index of each province.

3). Intermediary variable industrial structure (Indstr): According to the previous analysis, the industrial structure is selected as the intermediary variable, and this paper refers to the practice of Meng Hao and Zhang Meisha [12], Describe the industrial structure from the two aspects of industrial structure upgrading (indh) and industrial structure rationalization (indr), in which the industrial structure upgrading (indh) is measured by the structural hierarchy coefficient. By assigning values to the three industrial coefficients, the proportion of the added value of the three industries in GDP is calculated, which shows the process of gradual upgrading of the industrial structure. The larger the industrial structure upgrading index is, the higher the industrial structure tends to be and the higher the degree of optimization is; The rationalization of industrial structure (indr) is measured by the Theil index, which is expressed by the ratio of output value between three industries to employees. The Theil index is a negative indicator. The larger the Theil index is, the more unreasonable the industrial structure is, and vice versa.

4). Control variable (Control): In order to accurately estimate the impact of the digital economy on high-quality economic development, this paper also controls a series of variables that will have an impact on high-quality economic development, mainly for government support (Gov) in terms of the proportion of fiscal expenditure to GDP; Infrastructure (Inf) is expressed in terms of road area per capita; Urbanization (Urb) is expressed as a proportion of the urban population to the permanent population at the end of the year, and human capital (Hu) is expressed in terms of average years of education; Foreign Capital Dependence (FDI) is expressed as a share of FDI in GDP.

### 3.3. Data Description

Table 2: Descriptive statistics

variable	Variable description	Observations	mean	standard deviation	minimum	maximum
Growth	High-quality economic development index	210	0.250	0.100	0.130	0.595
Dige	Digital Economy Index	210	0.231	0.147	0.023	0.880
Indh	Industrial structure is advanced	210	2.349	0.126	2.166	2.801
Indr	Rationalization of industrial structure	210	0.222	0.136	0.017	0.640
Gov	Government Spending/GDP	210	0.264	0.117	0.121	0.758
Inf	Road area per capita	210	15.096	4.546	4.040	25.820
In	Fixed asset investment/GDP	210	1.754	0.792	0.447	4.079
Hu	The average number of years of schooling is logarithmic	210	2.211	0.091	2.011	2.528
FDI	FDI/GDP	210	0.022	0.017	0.000	0.094

This paper selects the balanced panel data of 30 provinces (cities, autonomous regions) in China from 2011 to 2017 from the China Statistical Yearbook, China Urban Statistical Yearbook and Peking University participatory digital finance index, excluding Tibet. In order to unify the dimensions and reduce heteroscedasticity, we use the natural logarithm of high-quality economic

development index, digital economic development index and average learning time, as shown in Table 2. The results show that the maximum value of high-quality economic growth index is 0.595 and the minimum value is 0; 130, with an average of 0. The minimum value of digital economic indicators is 0.023, the maximum value is 0.880, and the average value is 0.

## 4. The Analysis of Empirical Results

### 4.1. Benchmark Regression

In order to test the impact of the digital economy on the high-quality development of the economy, this paper performs a regression test on model (1).

In order to ensure the validity of the regression results, quantile regression is used to re-estimate the model, and the estimate is made at the 25% quantile in column (3), and the results show that the digital economy index coefficient is significantly positive; In the estimation made at the 50% quantile in column (4), the coefficient of the Digital Economy Index remains highly significant and positive; Column (5) shows estimates made at a quantile of 75 per cent, with a significantly positive coefficient for the Digital Economy Index. which may be due to the relatively early development of the digital economy relatively early relative to the areas with high economic development, so the "dividends" released by the development of the digital economy will be relatively small, and the development of the digital economy is relatively weak in areas with low economic development. Its promoting utility is also not very obvious [8]. In summary, it is assumed that H1 is verified.

Table 3: Results of the regression of the digital economy and high-quality economic development

	(1) FE	(2) FE	(3) Q25	(4) Q50	(5) Q75
Dig	0.1681*** (5.2021)	0.1312*** (4.5138)	0.0931* (1.8377)	0.1398*** (2.9675)	0.0933** (2.1005)
Gov		0.5859** (2.3033)	0.4242 (0.9314)	0.5725 (1.4390)	0.6316 (1.5815)
Inf		0.0094** (2.0487)	0.0056 (0.7369)	0.0145* (1.7975)	0.0076 (0.9450)
In		0.1538*** (3.7240)	0.3083** (2.4091)	0.2396** (2.0168)	0.0770 (0.7048)
FDI		-0.0618 (-0.1151)	0.2071 (0.2052)	0.4244 (0.3070)	-0.0693 (-0.0440)
Hu		-0.3946 (-1.3357)	-0.1871 (-0.3722)	-0.7075 (-1.4780)	-0.0292 (-0.0659)
Constant term	-1.225*** (-18.52)	-0.8279 (-1.2717)	-0.5354 (-0.4390)	0.7257 (0.6258)	-0.7953 (-0.7492)
Individual fixation effect	Y	Y	Y	Y	Y
Time fixation effect	Y	Y	Y	Y	Y
R2	0.7447	0.7299	0.8493	0.8463	0.8799
Observations	210	210	210	210	210

Note: \*and \*\* and\*\*\*, respectively, indicate that the coefficients are significant at the 10%, 5%, and 1% levels.

### 4.2. Heterogeneity Test

The above verification is that the digital economy helps to promote high-quality economic

development, but through statistical description, it is found that there are large differences between regions of digital economy and high-quality economic development, and there are obvious heterogeneity, so it is necessary to test the heterogeneity of the impact of the digital economy on high-quality economic development. In this paper, the sample was first divided into eastern regions and central and western regions by geographical location, and secondly, the samples were divided into high-income areas and low-income areas by using the disposable income of urban population in various provinces.

Table 4: Heterogeneity test of digital economy and high-quality economic development

	(1)	(2)	(3)	(4)
	Eastern region	Midwest	High-income areas	Low-income areas
Dig	0.2714*** (3.0497)	0.0270 (0.7726)	0.2436*** (4.0837)	0.0387 (1.2172)
Gov	1.3228* (1.8072)	0.6018** (2.4018)	-0.1261 (-0.1908)	0.7094*** (3.1881)
Inf	-0.0013 (-0.1271)	-0.0013 (-0.2324)	-0.0028 (-0.3724)	0.0090* (1.7569)
IN	-0.0356 (-0.4955)	0.1999*** (3.7761)	-0.0103 (-0.1543)	0.2266*** (4.4389)
FDI	-0.3527 (-0.4208)	0.0901 (0.1398)	0.6628 (0.7999)	-0.3809 (-0.6545)
Hu	-0.7253 (-1.2046)	-0.2116 (-0.6780)	-0.6095 (-1.3677)	0.2148 (0.6488)
Constant term	0.6042 (0.4587)	-1.5897** (-2.2984)	0.4567 (0.4576)	-2.6610*** (-3.7228)
Individual fixation effect	Y	Y	Y	Y
Time fixation effect	Y	Y	Y	Y
R2	0.4573	0.8348	0.5378	0.8708
Observations	77	133	105	105

Note: \*and \*\* and\*\*\*, respectively, indicate that the coefficients are significant at the 10%, 5%, and 1% levels.

The test results are shown in Table 4, and the regression results in column (1) and column (2) show that the digital economy in the eastern region has a significant role in promoting high-quality economic development, while the central and western regions are not significant; Column (3) and column (4) regression The results show that the digital economy in high-income areas has a significant role in promoting high-quality economic development, but not significantly for low-income areas. Therefore, the digital economy in the eastern region and high-income areas has significantly promoted high-quality economic development, possibly because the development of the digital economy in the eastern region and high-income areas is more perfect, and it is more closely related to the development of various industries, providing a stronger impetus for high-quality economic development.

### 4.3. Robustness Test

#### 4.3.1. Replace the Interpreted Variable

In the preceding benchmark regression, the high-quality economic development method is calculated by the entropy method to calculate the economic high-quality development index, and this paper refers to the practice of Wang Siwen and Sun Yahui [12], and selects the per capita actual



regional GDP as the explanatory variable to indicate the level of high-quality economic development in different regions. In order to exclude price factors, the base period of 2011 is used to convert the real GDP per capita and then take the logarithm. The regression results are shown in Table 5, and the column (1) is the regression result without the inclusion of control variables, and the regression coefficients of the digital economy are positive; The regression coefficient of the digital economy is still significantly positive, that is, the digital economy has a significant role in promoting the high-quality development of the economy, which is consistent with the previous conclusions, indicating that the conclusions of this paper are stable.

#### 4.3.2. Replace the Explanatory Variables

In order to test the robustness of the benchmark model in this paper, the explanatory variable Digital Economic Index is replaced with the number of Internet access ports, and the number of Internet ports is logarithmic. The regression results are shown in Table 5, and the regression results listed in (3) are the regression results without any control variables, and the regression coefficient of the number of Internet access ports for high-quality economic development is significantly positive; The regression coefficient of the number of Internet access ports is still significantly positive after the addition of the control variable in column (4), that is, the conclusion of this paper is still stable after the explanatory variables are replaced.

#### 4.3.3. Endogenous Test

Table 5: Robustness test of digital economy and high-quality economic development

	(1) Replace the interpreted variable	(2) Replace the interpreted variable	(3) Replace the explanatory variables	(4) Replace the explanatory variables	(5) Endogenous testing
Dig	0.1218*** (5.3566)	0.0767*** (3.9571)	0.1143*** (2.9380)	0.1118*** (3.1276)	0.2466*** (4.5440)
Gov		-1.7283*** (-10.1854)		0.4906* (1.8869)	0.6312*** (2.9667)
Inf		-0.0031 (-1.0172)		0.0133*** (2.8394)	0.0101** (2.1170)
IN		0.0959*** (3.4814)		0.1903*** (4.6320)	0.0816 (1.5856)
FDI		0.5669 (1.5835)		0.2571 (0.4636)	0.2065 (0.4133)
Hu		0.0714 (0.3625)		-0.4557 (-1.4997)	-0.3869 (-1.4493)
Constant term	10.7060*** (204.5668)	10.8380*** (24.9573)	-2.3518*** (-9.2582)	-1.7833** (-2.5161)	0.1429 (0.2154)
R2	0.9020	0.9390	0.6482	0.7138	0.9706

Note: \*and \*\* and\*\*\*, respectively, indicate that the coefficients are significant at the 10%, 5%, and 1% levels.

In order to avoid possible endogenous problems, this paper draws on the practices of Fan Hejun, Wu Ting selects the lag of the digital economy index as a tool variable for testing [3], and uses the GMM method to conduct endogenous testing, GMM The method, also known as the generalized matrix method, can effectively alleviate the endogenous problems of the model by using the method of lag data. The test results are shown in Table 5, and the first (5) column is the regression result of the digital economy lagging behind, indicating that the digital economy is selected as the first phase of the lag After the tool variables alleviate the possible endogenous nature of the model, the

conclusions of this paper are still robust.

#### 4.3.4. Testing the Mechanism of Action of Industrial Structure

The above research shows that the development of the digital economy is conducive to promoting the high-quality development of the economy, but through what path does the digital economy have an impact on the high-quality development of the economy? In order to clarify the mechanism of the digital economy, this paper proposes to construct a mediation effect model from the perspective of industrial structure path, as follows:

$$M_{it} = \beta_0 + \beta_1 Dige_{it} + \beta_2 Control_{it} + \varepsilon_{it} \quad (2)$$

$$Growth_{it} = \gamma_0 + \gamma_1 Dige_{it} + \gamma_2 M_{it} + \gamma_3 Control_{it} + \varepsilon_{it} \quad (3)$$

Among them, M is the intermediary variable, specifically the industrial structure is advanced and the industrial structure is rationalized, and i and t indicate the province and time respectively; Growth<sub>it</sub> indicates the level of economic growth; Dige<sub>it</sub> stands for digital economy; Control<sub>it</sub> is the same as the control variable and equation (1). Formula (2) examines the impact of the digital economy on intermediary variables, formula (3) examines the impact of the digital economy and intermediary variables on the high-quality development of the economy, measures the mediation effect, and if  $\beta_1$  and  $\gamma_2$  all are significant, it shows that the mediation effect is established.

1) The industrial structure premiumization index is measured by the structural level coefficient, and the calculation formula is:

$$Indh = \sum_{i=1}^n \beta_i q(i) \quad (4)$$

In Equation (4), q(i) is the proportion of the added value of each industry in GDP, i represents the industry, n is the number of sectors, and the  $\beta_i$  is the weight of the three industries, the current scholars generally recognize the law of the development of the tertiary industry is: With the development of the economy, the proportion of the primary industry gradually decreases, the proportion of the secondary industry rises first and then falls, and the proportion of the tertiary industry continues to rise, according to which the first, second and third industries are assigned a weight of 1, 2 and 3 Based on the above equation, the industrial upgrading index of various provinces in China is calculated.

2) The industrial structure rationalization index is measured by the Thiel index, and the calculation formula is:

$$Indr = \sum_{i=1}^n \left( \frac{Y_i}{Y} \right) \ln \left( \frac{Y_i}{L_i} / \frac{Y}{L} \right) \quad (5)$$

In equation (5), Y represent output value, L represent employment, i represents industry, n is the number of sectors, and the larger the Theil index, the more unreasonable the industrial structure is, and vice versa.

In order to study the mechanism of industrial structure between digital economy and high-quality economic development, regression equations (2) and (3) are proposed. The regression results are shown in Table 6. The first column is the impact of digital economy on the upgrading of industrial structure, and the regression coefficient is obviously positive. The second part is the impact of digital economy and industrial structure upgrading on high-quality economic development. The regression coefficient between digital economy and industrial structure growth is still significantly

positive correlation. It points out the influence of digital economy on the rationalization of industrial structure, and the regression coefficient is negative. The second problem is the rationalization of industrial structure of digital economy and high-quality economic development. Based on the rationalization of industrial structure, the regression coefficient between digital economy and the rationality of industrial structure is still significant, indicating that the rationality of industrial structure has a significant intermediary effect.

Table 6: Mechanism of action of the digital economy test

	(1) Andndh	(2) Growth	(3) Ied.	(4) Growth
Dig	0.1170** (2.0790)	0.1206*** (4.1489)	-0.0500*** (-3.0068)	0.1662*** (4.8953)
Indh		0.0906** (2.3019)		
indr				-0.4247*** (-2.7687)
Gov	0.2390 (0.4853)	0.5643** (2.2449)	0.0816 (0.6663)	0.6826*** (2.7989)
Inf	0.0177** (1.9905)	0.0078* (1.7013)	-0.0106*** (-4.8151)	0.0039 (0.8307)
In	0.0102 (0.1279)	0.1529*** (3.7484)	-0.0242 (-1.1951)	0.1174*** (2.9004)
FDI	-0.7683 (-0.7396)	0.0078 (0.0148)	0.1269 (0.4933)	0.0880 (0.1720)
Hu	-1.4142** (-2.4735)	-0.2664 (-0.8973)	0.1852 (1.3053)	-0.2954 (-1.0421)
Constant term	4.6781*** (3.7126)	-1.2518* (-1.8719)	-0.1189 (-0.3802)	-0.7941 (-1.2763)
Individual fixation effect	Y	Y	Y	Y
Time fixation effect	Y	Y	Y	Y
R2	0.3941	0.7367	0.4360	0.7540
N	210	210	210	210

Note: \*and \*\* and, respectively, indicate that the coefficients are significant at the 10%, 5%, and 1% levels.

Therefore, digital economy can promote the value-added and rationalization of industrial structure, and pricing in industrial structure and pricing in industrial structure play a prominent intermediary role. Digital economy can stimulate high-quality economic development by optimizing industrial structure. One possible reason is that the digital economy can initially create new business forms. E-commerce based on digital technologies such as big data and artificial intelligence accelerates the integration of traditional industries and service industries, promotes the development of service industries, and thus promotes the upgrading of industrial structure. In addition, the digital economy affects the efficiency of resource allocation, optimizes the industrial structure, and coordinates the development of various departments. The development of digital economy accelerates the mobility of production, consumption and communication, reduces production costs, transaction costs and learning costs, stimulates technological innovation, and effectively promotes the rationalization of industrial structure. Finally, the optimization and modernization of industrial structure contribute to economic growth, improve labor productivity in all aspects, and thus improve the quality of economic development. As mentioned above, the H2

hypothesis has been confirmed.

## 5. Conclusions and Policy Recommendations

The main conclusions are: The digital economy is generally advantageous in enhancing the quality of economic development. The conclusion is still valid through stability and endogenous tests: Using a regression regression model, we conclude that the accelerating effects on the higher economic development of the digital economy are both small and intermediate at both ends. Next, the impact of the digital economy is regional and heterogeneous. Promoting the digital economy in the eastern and high income areas is more remarkable, but the digital economy's promotion of the digital economy to the quality economic development of the Chubu and low-income areas is not remarkable. Third, the industrial structure has a remarkable intermediate effect. Digital economy can promote quality economic development through optimization of industrial structure. Based on the above conclusion, the body submitted the following policy proposal:

1). Digital economy infrastructure is the cornerstone of digital development. All regions should speed up the research and development intensity of digital technology, build big data industrial parks, big data industrial chain centers, etc., promote the construction of smart cities, and provide the necessary guarantee for the development of digital economy. The government should introduce corresponding policies to support the development of digital economy according to local conditions, simplify the approval procedures in the approval of digital projects, reduce the entry threshold, actively implement the development policy of digital industry, at the same time, increase the financial support for digital industry, promote the tax preferential system for digital industry, effectively promote the development of local digital industry, and increase credit support for digital economy infrastructure projects, Attract capital inflows by means of government led financial security, promote the agglomeration of digital industries, give play to the leading role of local leading enterprises, and improve the infrastructure of digital economy.

2). Promote the coordinated development of digital economy regions. The central and western regions should strengthen the exchange and interaction with the eastern region, actively learn the advanced experience and technology of digital economy development in the eastern region, and at the same time, give full play to their inherent advantages, increase investment in the construction of digital economy infrastructure, so that the digital economy can inject new impetus into the development of the western region, In addition, we should mobilize the strength of scientific research institutions, improve the training system of high-quality talents such as technical and management, establish talent introduction policies, strengthen innovation incentives, formulate talent training strategies, solve the problems of human capital mismatch with market demand, and promote the development of digital economy in the central and Western Regions through various ways. The government should also actively guide the development of digital economy in the East and West through industrial policies, laws and regulations, financial support and other means, adjust measures to local conditions, guide the healthy and orderly development of the local market environment.

3). Develop digital economy and promote the optimization of industrial structure. First, we should promote the digital transformation of traditional industries. We should speed up the digital integration of traditional industries, expand the functions of products, improve the efficiency of resource allocation, reduce product production costs, and improve the technical added value of products through digitization. As an emerging economic form, the digital economy should include the development of new business forms of the digital economy, such as e-commerce, online education, sharing economy, etc., realize the sharing of production and consumption, and make timely adjustments where the new business forms are inconsistent and conflict with the traditional

economic development. Secondly, at the micro level, enterprises should also strengthen the deep integration of digital technology and production and operation, use the Internet to achieve coordination and accuracy in the production process, constantly improve the intelligent and digital level of production, keep up with the tide of digital economy, improve the innovation ability of enterprises, and provide inexhaustible power for economic development. Finally, we should strengthen the innovation ability of digital technology, make digital technology a favorable guarantee to promote technological innovation, improve production efficiency through data computing, information technology and other aspects, realize digital production, optimize resource allocation, and realize intensive and intelligent production, Save the input of production resources, so as to effectively promote the optimization and upgrading of industrial structure.

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