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A Comprehensive Evaluation of Digital Economy Development Level in China Based on the TOPSIS Method

Yining Chen

Central University of Finance and Economics, School of International Trade and Economics, Beijing, China

chinnnnn@126.com

Abstract. Exploring the measurement of the digital economy development level plays a crucial role in analyzing the disparities in digital economy development across China's provinces, formulating differentiated policies, and promoting balanced national digital economy development. This study first constructs an evaluation system for digital economy development levels, comprising 14 tertiary indicators. The weights of each indicator were determined using the Analytic Hierarchy Process (AHP), revealing that the number of domain names, the number of Internet broadband access users, as well as fiber optic cable line length, are significant factors. Subsequently, the TOPSIS method was utilized to measure and compare the digital economy development levels of 31 provinces (autonomous regions and municipalities). The results indicate that coastal provinces such as Guangdong, Jiangsu, and Zhejiang have higher levels of digital economy development, while the development levels in the central and western regions are relatively lagging. The study proposes policy recommendations to narrow the inter-provincial digital economy development gap and promote balanced and sustainable digital economy development nationwide, including strengthening infrastructure construction, implementing differentiated policies, fostering regional coordinated development models, and optimizing the talent cultivation system.

Keywords: Digital Economy; TOPSIS; Analytic Hierarchy Process (AHP); Differentiated Policies; Regional Collaborative Development

1. Introduction

With the rapid advancement of information technologies such as the Internet, big data, and artificial intelligence, China's digital economy has seen swift development, with its scale and influence continuously expanding. In recent years, the Chinese Party Central Committee has placed high importance on the development of the digital economy. In the article "Building Up the Strength, Quality, and Size of China's Digital Economy," Chinese President Xi Jinping emphasized, "We should enable the upgrading and transformation of traditional industry, foster new industries, new business forms and new business models, and build up the strength, quality and size of China's digital economy." The momentum of China's digital economy is robust, with its scale reaching RMB 50.2 trillion in 2022, accounting for 41.5% of the national GDP.

Although the rapid development of China's digital economy has promoted internet penetration nationwide, significant disparities persist in the development levels of the digital economy and its supporting infrastructure across provinces, particularly in remote areas where soft infrastructure, such as credit and market systems, remains underdeveloped. Systematically studying the digital economy development status across provinces and municipalities can more effectively identify and address these regional disparities, thereby supporting the formulation of more equitable and sustainable digital economy policies.

Based on this, this study first constructs an evaluation system for digital economy development levels, comprising 4 secondary indicators and 14 tertiary indicators. Subsequently, the Analytic Hierarchy Process (AHP) is employed to assign weights to each indicator, identifying the number of employees in the information transmission, computer services, and software industries, along with the number of employees in the transportation, warehousing, and postal industries, as significant factors. Finally,

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the TOPSIS method is used to measure and compare the digital economy development levels across all provinces (autonomous regions and municipalities), aiming to provide suggestions and advice to the government.

2. Literature Review

2.1 The Origin and Development of the Digital Economy

The concept of the digital economy was first introduced by American scholar Don Tapscott[1] in his 1996 book "The Digital Economy: Promise and Peril in the Age of Networked Intelligence." Landefeld and Fraumeni[2] consider the digital economy to encompass the information technology production sector, the information technology usage sector, and e-commerce. Barefoot, Kurtis, Jolliff[3], et al., argue that the digital economy includes economic activities primarily based on the internet and related information and communication technologies. Lucendo-Monedero, Ruiz-Rodriguez, and Gonzalez-Relano[4] believe that the digital development level of a region is directly related to that of its neighboring countries, suggesting that geographical proximity is a factor to consider when analyzing digital divide disparities.

Li Changjiang[5] posits that the digital economy is an economic form that primarily conducts production through digital technologies. These technologies include not only the purchase of digital equipment but also the digital skills training of workers. Ding Zhifan[6] asserts that the digital economy is a new socio-economic form supported by networked and intelligent digital infrastructure, where digital knowledge and information (data) are key production factors. Guan Huijuan, Xu Xianchun, Zhang Meihui[7], et al., suggest that the core industries of the digital economy can be divided into two main categories: the digital infrastructure industry and highly digitalized industries.

2.2 Methods for Measuring Digital Economy Development Levels

Liu and Guo[8] applied the Critic-entropy combination weighting method to assign indicator weights and constructed the KOR method based on a digital economy development level evaluation model using grey correlation to study the development levels and influencing factors of the digital economy in eastern and western regions. Xu, Peng, Li[9], et al., combined the Critic and entropy weighting methods to establish a digital economy evaluation indicator system and used the TOPSIS model to assess the indicators, resulting in comprehensive development indices for two economic entities. Liu, Jiang, Pei[10], et al., employed the entropy method, coupled harmony model, theoretical adoption index model, and Tobit model to measure and calculate the interval index differences in marine economic quality and digital economy levels. Liu, Ma, Guo[11], et al., used a combined evaluation method of the AHP and entropy method to calculate the subjective and objective weights of factors influencing the rural digital economy.

Liu Jun, Yang Yuanyun, and Zhang Sanfeng[12] constructed a provincial digital economy evaluation indicator system for China from the three dimensions of informatization development, internet development, and digital transaction development, and analyzed the driving factors of China's digital economy development based on the SAR model. Zhang Yuling, Pang Xuliang, Liu Yang[13], et al., used the entropy-weighted TOPSIS method to comprehensively measure the overall level of digital economy development in 30 provinces of China from 2017 to 2021 and employed the Tobit model to explore the influencing factors of digital economy development levels in each province. Li Le[14] established a four-dimensional digital economy evaluation system and used the entropy weighting method to assess the digital economy development in nine provinces of the Yellow River Basin, finding that the digital economy development level in this region is low with significant inter-provincial differences and varying performance across the four dimensions. Zhang Yao, Cao Junjie, and Han Shidong[15] used the entropy-weighted TOPSIS method, coupled coordination degree model, and panel Tobit model to explore the coupling and coordinated development status of provincial digital economy and new urbanization from 2013 to 2020.

2.3 Comments for Review of Literature

In summary, the definitions of the digital economy by scholars both domestically and internationally vary, with ongoing development in the scope and measurement standards of the digital economy. Scholars have employed methods such as the entropy-weighted TOPSIS method and the AHP to construct indicator systems for evaluating the digital economy, assessing influencing factors, and regional development levels. Previous studies have mainly focused on the eastern regions with higher levels of digital economy development, with relatively few measurements covering the entire country. Additionally, most studies concentrate on the impact of the digital economy on specific industries, with limited timeliness in data. Based on this, this study targets the 31 provincial-level administrative regions in China. First, it constructs an evaluation and measurement model for the digital economy development level. Then, using AHP to assign weights to the relevant indicators, the TOPSIS method is employed to score and compare the digital economy development levels of the 31 provincial-level administrative regions.

3. Construction of AHP

3.1 Preliminary Construction of Indicators and Data Sources

Based on a review of existing literature, this study constructs a system comprising 4 secondary indicators and 14 tertiary indicators. The distribution of the indicator system is shown in Table 1 below:

Table 1 Distribution of the Digital Economy Development Level Indicator System

Primary Indicators	Secondary Indicators	Tertiary Indicators	Unit
Development Level of Digital Economy	Labor Input	Number of labor force in information transmission, computer services, and software industries	10,000 people
		The number of political and business employees in the transportation industry	10,000 people
		Number of employed personnel in the tertiary industry	10,000 people
	Asset Investment	Number of domain names	10,000 units
		Number of Internet broadband access users	10,000 households
		Fiber optic cable line length	10,000 kilometers
		Mobile phone penetration rate	units per 100 people
	Human Capital	Number of patent applications authorized	units
		R&D development funding situation	100 million yuan
		The proportion of education funds in the general public budget expenditure	%
		Full time equivalent of R&D personnel in industrial enterprises above designated size	person-years
	Institutional Environment	Number of government websites	units
		Government organization index	score
		Institutional system index	score

The data used in this study are sourced from the National Bureau of Statistics of China (www.stats.gov.cn), the Shandong Provincial Bureau of Statistics (tjj.shandong.gov.cn), the China Internet Network Information Center (www.cnnic.net.cn), the Qianzhan Database (www.d.qianzhan.com), and the Tsinghua University Center for Data Governance (thucdg.cn/index). The data type is cross-sectional, covering the period from January 2022 to December 2022.

3.2 Weight Construction Using AHP

The AHP is a structured decision-making tool designed to handle complex problems through a hierarchical approach. First, it breaks down a complex problem into multiple levels according to the overall goal and the logical sequence of various sub-goals. Then, it determines the weights of elements at each level relative to an element at the previous level by calculating the eigenvectors of the judgment matrix. Finally, the weighted sum method is used to compute and compare the weights of different options to identify the one with the highest overall goal weight, i.e., the optimal solution.

3.2.1 Establishing the Hierarchical Analysis Model

This study constructs a hierarchical analysis model with 4 secondary indicators: Labor Input, Asset Input, Human Capital, and Institutional Environment, and 14 tertiary indicators. The structure of the model is illustrated in Figure 1 below:

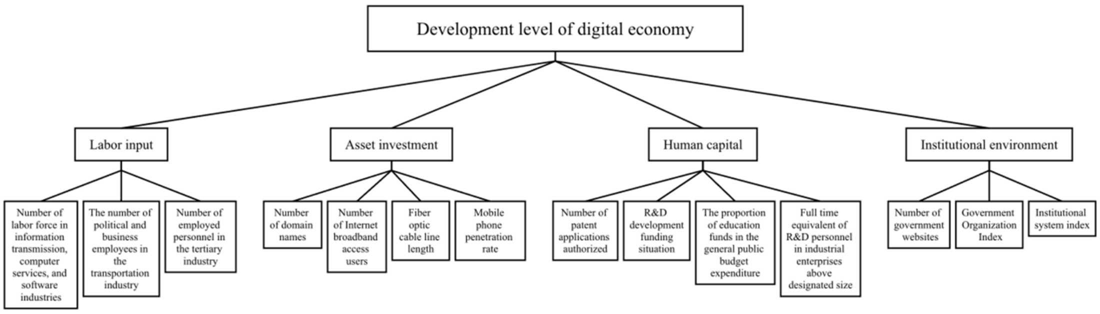

Figure 1. Hierarchical Analysis Diagram of the Digital Economy

3.2.2 Construction of the Judgment Matrix

The judgment matrix forms the computational basis of the AHP. The values of the elements in the judgment matrix reflect people's perceptions of the relative importance of various factors, which directly affects decision-making outcomes. The elements of the judgment matrix typically adopt a scale of 1 to 9 and their reciprocals, as shown in Table 2.

Table 2. Scale and Meaning of the Judgment Matrix

Scale	Meaning
1	Indicates that two factors are equally important
3	Indicates that one factor is slightly more important than the other
5	Indicates that one factor is significantly more important than the other
7	Indicates that one factor is strongly more important than the other
9	Indicates that one factor is extremely more important than the other
2,4,6,8	Represents intermediate values between the above judgments
Reciprocal	Indicates the reciprocal of the above judgments. If the comparison between factors i and j is B_{ij}, then the comparison between factors j and i is $B_{ji}=1/B_{ij}$

3.2.3 Hierarchical Single Sorting and Consistency Test

Hierarchical single sorting refers to the ranking of the importance of various factors within a specific level relative to a certain factor in the higher level. This ranking is represented by the eigenvector of the judgment matrix. For example, the eigenvector W solving the characteristic equation $AW=\lambda_{max}W$ of the judgment matrix A, after normalization, represents the relative importance weights of various factors within the same level relative to a factor in the higher level. This process is known as hierarchical single sorting. To ensure the reliability of hierarchical single sorting, it is necessary to calculate the consistency ratio (CR) to check the consistency of the judgment matrix.

The consistency index (CI) formula is as follows:

$$CI = \frac{\lambda_{\max} - n}{n-1} \tag{1}$$

where λ_{max} is the largest eigenvalue of the judgment matrix A.

Table 3. Random Consistency Index

Number of Factors (n)	1	2	3	4	5	6	7	8	9	10
RI	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49

The consistency ratio formula is as follows:

$$CR = \frac{CI}{RI} = \frac{\lambda_{\max} - n}{RI \cdot (n-1)} \tag{2}$$

Only when CR < 0.1, the results of hierarchical single sorting are considered satisfactory.

After calculations, the CR values of the judgment matrices for "Digital Economy Development Level," "Labor Input," "Asset Input," "Human Capital," and "Institutional Environment" are 0.0265, 0.0036, 0.0574, 0.0171, and 0.0516, respectively. All values are less than 0.1, indicating that they pass the hierarchical single sorting consistency test.

3.2.4 Overall Hierarchical Sorting and Consistency Test

The process of calculating the importance ranking weights of all factors at the same level relative to the topmost factor is called overall hierarchical sorting. This process is conducted layer by layer from the highest level to the lowest level. Through this method, the relative importance of each factor at every level to the overall objective can be determined.

In the study of the AHP, it is also necessary to perform a combined consistency test. When CR < 0.1, the results of the overall hierarchical sorting are considered to have satisfactory consistency. The formula for calculating the combined consistency ratio of level p relative to level (p-1) is as follows:

$$CR^{(p)} = CR^{(p-1)} + \frac{CI^{(p)}}{RI^{(p)}}, \quad p=2, 3 \tag{3}$$

Only when the Consistency Ratio (CR) is less than 0.1, the overall ranking results of the hierarchy are considered to have satisfactory consistency. If the CR value is greater than or equal to 0.1, it is necessary to readjust the elements of the judgment matrix to ensure consistency. In this study, after calculation, CR = 0.0035525 < 0.1, which passes the combined consistency test of the overall ranking of the hierarchy. Therefore, the decision result is reliable, indicating that the construction of the AHP is complete, and the next step of the TOPSIS method can proceed.

3.3 Indicator Weight Table

Through the construction of the AHP described above, the obtained weight distribution table is shown in Table 4, and the indicator weight distribution diagram is shown in Figure 2.

Table 4: Weight Distribution Table of Digital Economy Development Indicators

Primary Indicators	Secondary Indicators	Tertiary Indicators	Weight
Development Level of Digital Economy	Labor Input	Number of labor force in information transmission, computer services, and software industries	0.0766
		The number of political and business employees in the transportation industry	0.0271
		Number of employed personnel in the tertiary industry	0.0144
	Asset Input	Number of domain names	0.1668
		Number of Internet broadband access users	0.1267
		Fiber optic cable line length	0.0963
		Mobile phone penetration rate	0.0634
	Human Capital	Number of patent applications authorized	0.0327
		R&D development funding situation	0.0954
		The proportion of education funds in the general public budget expenditure	0.0610
		Full time equivalent of R&D personnel in industrial enterprises above designated size	0.0725
	Institutional Environment	Number of government websites	0.0233
		Government organization index	0.0556
		Institutional system index	0.0882

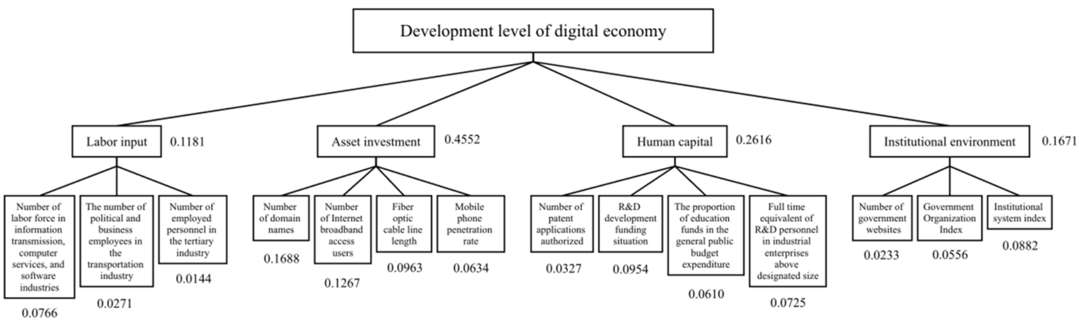

Figure 2: Indicator Weight Distribution Diagram

4. TOPSIS method

The TOPSIS method ranks evaluation objects by measuring their distance from both the optimal and worst solutions. This method assesses the relative superiority and inferiority among the existing objects. If an evaluation object is closest to the optimal solution and farthest from the worst solution, it is considered the optimal solution; otherwise, it is not.

4.1 Constructing the Decision Matrix

Construct the decision matrix $A=(a_{ij})_{m\times n}$, where each column represents an evaluation criterion and each row represents an alternative to be evaluated. To facilitate comparison, the influence of dimensions needs to be eliminated by normalizing the data to obtain $B=(b_{ij})_{m\times n}$, where:

$$b_{ij} = \frac{a_{ij}}{\sqrt{\sum_{i=1}^{m} a_{ij}^2}}, \quad i=1,2,...,m; j=1,2,...,n. \tag{4}$$

4.2 Assigning Weights to Indicators

Based on the varying contributions of each evaluation criterion to the overall evaluation result, assign different weights: $w=[w_1,...,w_n]$. Multiplying the j-th column of B by its weight w_j yields the weighted normalized matrix $C=(c_{ij})_{m\times n}$.

4.3 Positive and Negative Ideal Solutions

Determine the positive ideal solution C^+ and the negative ideal solution C^-:

$$C^+ = \left[c_1^+, c_2^+, ..., c_n^+\right] \tag{5}$$

$$C^- = \left[c_1^-, c_2^-, ..., c_n^-\right] \tag{6}$$

Positive ideal solution:

$$c_j^+ = \begin{cases} \max\limits_i c_{ij}, & j \text{ for extremely large attributes,} \\ \min\limits_i c_{ij}, & j \text{ for extremely small attributes,} \end{cases} \quad j = 1,2,...,n. \tag{7}$$

Negative ideal solution:

$$c_j^- = \begin{cases} \min\limits_i c_{ij}, & j \text{ for extremely large attributes,} \\ \max\limits_i c_{ij}, & j \text{ for extremely small attributes,} \end{cases} \quad j = 1,2,...,n. \tag{8}$$

4.4 Calculating the Distance from Each Alternative to the Positive and Negative Ideal Solutions

The distance from alternative a_i to the positive ideal solution:

$$d_i^* = \sqrt{\sum_{j=1}^{n} (c_{ij} - c_j^+)^2}, i = 1,2,...,m; \tag{9}$$

The distance from alternative a_i to the negative ideal solution:

$$d_i^0 = \sqrt{\sum_{j=1}^{n} (c_{ij} - c_j^-)^2}, i = 1,2,...,m. \tag{10}$$

4.5 Calculating the Relative Closeness

Calculate the relative closeness (evaluation reference value) for each alternative to be evaluated:

$$f_i = \frac{d_i^0}{d_i^0 + d_i^*}, i = 1,2,...,m. \tag{11}$$

Then rank f_i from largest to smallest to obtain the priority ranking of each alternative.

4.6 Empirical Analysis of the TOPSIS Method

Table 5: Scores of Digital Economy Development Levels by Province in China

Provincial Administrative Regions	Scores
Beijing	0.3541
Tianjin	0.1329
Hebei	0.2498
Shanxi	0.1467
Inner Mongolia	0.1263
Liaoning	0.1739
Jilin	0.0824
Heilongjiang	0.0986
Shanghai	0.3985
Jiangsu	0.6342
Zhejiang	0.5641
Anhui	0.2902
Fujian	0.2744
Jiangxi	0.2013
Shandong	0.4942
Henan	0.3416
Hubei	0.2582
Hunan	0.2599
Guangdong	0.8568
Guangxi	0.1574
Hainan	0.0338
Chongqing	0.1816
Sichuan	0.3128
Guizhou	0.1296
Yunnan	0.1343
Tibet	0.0325
Shaanxi	0.1782
Gansu	0.0992
Qinghai	0.0316
Ningxia	0.0229
Xinjiang	0.0843

5. Conclusion

(1) The provinces and cities with high digital economy development scores are Guangdong, Jiangsu, Zhejiang, Shandong, Shanghai, Beijing, Henan, and Sichuan, with scores of 0.8568, 0.6342, 0.5641, 0.4942, 0.3985, 0.3541, 0.3416, and 0.3128, respectively.

From the scores and data, it can be seen that coastal provinces and cities such as Guangdong, Jiangsu, Zhejiang, Shandong, and Shanghai benefit from their advanced marine economy on one hand, and the advantages of being the first regions in the eastern area to undergo reform and opening up on the other hand[13]. This has provided them with a solid material foundation and institutional environment for digital economy development. Additionally, Shanghai, Jiangsu, and Zhejiang have the added advantage of the Yangtze River Delta region, creating conditions for the internal circulation of the digital economy[16]. Beijing, leveraging its policy, technology, geographical, and talent advantages as the capital, stimulates digital economy vitality and is also a hub of innovation and an industry leader. Sichuan, as the central force in western development, relies on the Western Development Strategy[17], with a good economic foundation and scientific and technological talents. Henan, as a major economic and industrial province, vigorously implements a digital transformation strategy under government policies such as the "Smart Island" construction, thus having good conditions for digital economy infrastructure and human capital investment.

The provinces and cities with medium-high digital economy development scores are Anhui, Fujian, Hunan, Hubei, Hebei, and Jiangxi, with scores of 0.2902, 0.2744, 0.2599, 0.2582, 0.2498, and 0.2013, respectively.

The development of digital infrastructure and digital applications in central provinces such as Anhui, Hunan, Hubei, and Jiangxi is not commensurate with the level of digital economy development, hindering further progress in the digital economy[18]. At this stage, their development relies more on labor input in the digital economy and enhancing government service capabilities to promote digital economy development from a strategic level. For example, Hubei's "Optical Core Screen End Network" industrial cluster has formed regional characteristics under government development, and Anhui's "China Sound Valley" construction has also achieved significant success[19]. Fujian and Hebei, in addition to their own government strategic guidance and investment in infrastructure and human capital, also benefit from the collaborative driving effect of the neighboring core regions of the digital economy, namely the Pearl River Delta and Beijing, obtaining strong technical support and talent inflow.

The provinces and cities with medium-low digital economy development scores are Chongqing, Shaanxi, Liaoning, Guangxi, Shanxi, Yunnan, Tianjin, Guizhou, and Inner Mongolia, with scores of 0.1816, 0.1782, 0.1739, 0.1574, 0.1467, 0.1343, 0.1329, 0.1296, and 0.1263, respectively.

Provinces and regions in central and western China, such as Chongqing, Shaanxi, Guangxi Zhuang Autonomous Region, Shanxi, Yunnan, Guizhou, and Inner Mongolia Autonomous Region, have relatively underdeveloped digital economies. On one hand, from the perspective of the digital economy development cluster model of national urban agglomerations such as Chengdu-Chongqing, Central Yunnan, Guanzhong, Hohhot-Baotou-Ordos-Yulin, Beibu Gulf in Guangxi, and Central Guizhou, these regions exhibit low-level clustering characteristics [20] due to poor geographical location, weak economic strength, and low industrial levels. On the other hand, from the perspective of the economic development status of these provinces, they generally have relatively backward digital economy industry labor input levels and limited talent resources. As a result, the development of digital economy-related industries is incomplete, the technical output and support from scientific research institutions are insufficient, and there is a lack of innovation capability, leading to relatively weak digital economy development.

Liaoning Province, as one of the three northeastern provinces, has experienced relatively slow economic development and lagging marketization steps after the reform and opening up. Additionally, the high proportion of heavy chemical industries in the industrial structure has, to some extent, limited the development space of the digital economy. Tianjin, as a former old industrial base, still has traditional manufacturing as its leading industry and faces delays in industrial structure adjustment.

The provinces and regions with low digital economy development scores are Gansu, Heilongjiang, Xinjiang Uygur Autonomous Region, Jilin, Hainan, Tibet Autonomous Region, Qinghai, and Ningxia Hui Autonomous Region, with scores of 0.0992, 0.0986, 0.0843, 0.0824, 0.0338, 0.0325, 0.0316, and 0.0229, respectively.

Heilongjiang and Jilin are located in northeastern China. On one hand, as important industrial bases of China, their industrial structures need optimization. On the other hand, the economic growth rates of the three northeastern provinces have seen a sharp decline in recent years, negatively impacting the development of the digital economy. Additionally, compared to other provinces, government financial investment in digital economy talent cultivation and technological innovation is relatively low, limiting provincial innovation capabilities. This results in constraints on labor input and human capital, leading to relatively underdeveloped digital economy conditions.

Gansu, Xinjiang Uygur Autonomous Region, Tibet Autonomous Region, Qinghai, and Ningxia Hui Autonomous Region are located in remote western regions of China, making it difficult to benefit from the spillover effects of the advanced digital economies in the eastern regions. Internal exchanges within these provinces are also relatively infrequent, with internal exchange intensity lower than the overall provincial level, weakening the digital economy connectivity[20]. Furthermore, these provinces have sparse populations and weak economic foundations, significantly lagging behind other provinces in asset and labor input in the digital economy industry.

Additionally, western regions generally have lower levels of government digitalization, contributing to the underdeveloped state of the digital economy in these provinces.

Hainan, being an island province, faces geographical constraints, leading to high transportation and logistics costs, which restricts e-commerce, logistics, and other digital economy activities that rely on efficient supply chains. It also cannot benefit from the synergistic effects of neighboring advanced digital economy provinces. Furthermore, Hainan's small total population and economic volume limit labor and asset input and innovation, resulting in a lagging digital economy development level.

6. Recommendations

6.1 Strengthen Infrastructure Construction to Unlock Digital Economy Potential

To address the lagging development of the digital economy in certain provinces, it is imperative to accelerate infrastructure construction tailored to local characteristics. This approach not only supports the dual circulation development strategy but also serves as a fundamental means to comprehensively reform production relations and unleash digital productivity. In terms of information infrastructure, efforts should focus on expediting the construction of gigabit fiber optic broadband and 5G networks, while also planning for cloud computing and edge computing power infrastructure to build a comprehensive digital infrastructure network. Additionally, emphasis should be placed on constructing data centers and IoT platforms to support future smart cities and Industry 4.0 needs. By developing these infrastructures and platforms, provinces can unlock their development potential and elevate their level of digital economy development.

6.2 Implement Differentiated Policies to Promote Balanced Regional Development

The state should pay special attention to the relatively underdeveloped digital economies in the central and western regions and implement appropriate macroeconomic adjustments. For these regions, national fiscal policies should allocate resources to accelerate the construction of digital infrastructure. Furthermore, efforts should be made to improve education levels in these areas to enhance the digital economy labor skills, thereby promoting local economic growth and rapid digital economy development. The goal is to bridge the "digital divide" between provinces and achieve balanced and sustainable digital economy development across China. Specific measures may include providing special financial support to specific provinces, implementing tax relief for innovation, and assisting provinces in introducing advanced technologies and management practices to establish an efficient digital economy ecosystem in the central and western regions.

6.3 Develop Regional Collaborative Development Models to Stimulate Digital Economy Potential

Each region should select a central province as the digital economy leader, creating a strong diffusion effect on the digital economic activities of surrounding provinces. This development model can enhance the levels of technology development, management methods, thinking, and values of neighboring provinces through the diffusion of talent, resources, technology, and the adoption of government digital economy development management strategies. Consequently, this will promote the overall digital economy development in the region. For example, provinces with higher levels of digital economy development can establish digital economy cooperation demonstration zones with neighboring provinces, sharing technology platforms and resources, conducting joint research and innovation, and promoting regional collaborative development.

6.4 Formulate "Combination" Policy Measures to Foster a Favorable Digital Economy Environment

Implementing multidimensional and combinatorial policy measures will have a more significant effect on promoting digital economy development. For example, while increasing government budget expenditures, optimizing the business environment, and introducing foreign capital to learn advanced digital technologies and concepts from abroad, fully leveraging knowledge and technology spillover effects, and improving labor quality and talent training levels. Additionally, the government should encourage enterprises to undergo digital transformation by providing financial and technical support, especially for small and medium-sized enterprises, helping them enhance digital capabilities and market competitiveness, thereby leading China's digital economy to higher levels and broader fields.

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