



## Digital Business Environment Empowers New Quality Productivity of Entities——Influence Mechanism and Enhancement Strategies

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**SUMMARY:** *This investigation selects Chinese publicly listed firms on A-shares from 2016 to 2021 as the analytical sample to empirically study the effect and mechanism of digital environment for commercials optimization on the new productive powers of entities. This investigation finds that the refinement of the digital environment for commercials has a positive impact on the new productive powers of entities. The mechanism test indicates that the refinement of the digital environment for commercials can facilitate the improvement of the new productive powers of entities by enhancing market competition and facilitating the digital restructuring of entities. The heterogeneity analysis demonstrates that the positive effect of the digital environment for commercials on the new productive powers of entities is more salient in entities in central-western China, technology-intensive entities, and entities in the growth stage. Further analysis utilizing the fsQCA method indicates that no single element of the digital environment for commercials constitutes a requirement for high commercial entity new productive force, and there are four types of digital environment for commercials element configurations that can generate high commercial entity new productive powers.*

**KEYWORDS:** *Digital environment for commercials; New productive powers; Market competition level; Commercial entity digital restructuring; fsQCA*

### 1 Introduction

Driven by the dual forces of the global digital wave and R&D innovation, the improvement of productive powers is undergoing an unprecedented transformation [1]. In 2023, in the process of his inspection and research tour in Heilongjiang Province, China first advances the conceptualization of "new-quality productive forces (NQF)" and affirmed that it is imperative to "firmly grasp the primary task of high-quality development and develop NQF in line with local conditions." This innovative formulation not only points out a new path for the improvement of productive powers in the contemporary era but also lays a solid theoretical foundation and provides a clear guide for action for the future industrial advancement of China. Compared with traditional productive powers, NQF are driven by R&D and innovation as its core engine, facilitating an essential leap in productive powers through tech-scientific advancements. This breaks through the constraints of conventional economic development and leads the Chinese economy towards a path of higher-quality and more sustainable development [2].

Data indicates that in 2022, the magnitude of China's digitally empowered economy attained 50.2 trillion-yuan, amounting to 41.5% of GDP, becoming a crucial pillar for the quality-driven advancement of the macroeconomy [3]. Concurrently, with its characteristics

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of high innovativeness, strong permeability, and wide coverage, the digitally empowered economy is reshaping global production factors and economic structures, emerging as a vital source for fostering, strengthening, and upgrading NQF. As a fundamental condition and critical guarantee for the improvement of the digitally empowered economy, the digital environment for commercials determines the speed, quality, and level of digital economic development. Optimizing the digital environment for commercials can therefore exert a far-reaching influence on the improvement of market players' NQF [4]. On the one hand, as a systematic external environment in the digital market, the digital environment for commercials encompasses numerous elements required for market players' digital restructuring and upgrading, such as digital foundational facilities, rule of law in the digital age, digital economy professionals, and internet-based government services. A sound digital environment for commercials effectively alleviates the internal as well as external constraints on market players' transformation and upgrading, stimulates their inherent motivation, and reinforces the external conditions, thereby facilitating the upgrading and leapfrogging of market players' productive powers. Meanwhile, the improvement of the digital environment for commercials creates a broader, fairer, and more transparent digital market environment for entities, enriches market competition patterns, and intensifies market competition [5]. This in turn forces entities to pursue continuous R&D and innovation and accelerates the cultivation and advancement of their NQF.

An overview of the literature demonstrates that previous researches on NQF could be primarily divided into two categories. Category 1 concentrates on the analysis of its connotation and evolution pathways. For example, some studies argue that NQF are innovation-driven at their core, fully tapping the underlying of the priority of talent, technology, and innovation [6]. Some studies advocate for facilitating the quality-driven advancement of NQF through digital reform, proposing that the government, entities, and universities should form a synergy to strengthen the institutional environment and technological breakthroughs required for its development. Category 2 involves constructing assessment index frameworks for NQF and empirically testing its influencing factors. These include researches on the effect of corporate environmental, social and governance performance, big data development, commercial entity digital-intelligent transformation, and digital inclusive finance on NQF. Regarding the entrepreneurial environment, some studies found that improvements in the traditional entrepreneurial environment can facilitate the enhancement of market players' NQF by fostering commercial sphere fairness and alleviating financing constraints, with a more pronounced effect in central and western regions and for large entities [7]. In reality, the traditional entrepreneurial environment primarily reflects the sum of external environments involved in market players' non-digital market activities, whereas the digital environment for commercials represents a digital restructuring and upgrade of the traditional one [8]. It pays greater consideration to the characteristics of the digitally empowered economy era, factualizing on the various external environments that entities face when engaging in digital market activities, and is more aligned with the "new-quality" connotation of NQF. Therefore, in the context of the practical landscape where the digitally empowered economy and digital industries have emerged as crucial media of NQF, exploring how the refinement of the digital environment for commercials facilitates the enhancement of market players' NQF is crucial for China to drive the transformation of production modes and achieve quality-oriented economic development, holding critical practical implications [9].

According to the above analysis, this investigation selects Chinese publicly listed firms on A-shares from 2016 to 2021 as the analytical sample and by empirical investigation conduct an analysis of the effect of digital environment for commercials optimization on market

players' NQF utilizing a model with fixed effects and the fsQCA method (fuzzy-set Qualitative Comparative Analysis method). The underlying marginal implications of this investigation are [10]: First, quantitative research on the digital environment for commercials remains limited, with existing studies mainly factualizing on youth entrepreneurship, consumption upgrading, common prosperity, and export competitiveness. Based on the intension of the digital environment for commercials, this investigation constructs a systematic evaluation system for the digital environment for commercials and explores its impact on micro-market players' NQF from the lens of the external macro-environment, broadening this investigation horizon and enriching the relevant literature [11]. Second, this investigation utilizes the fsQCA method to conduct an analysis of the synergistic mechanism of various digital environment for commercials elements on the improvement of market players' NQF, providing a new lens for subsequent research regarding the connection between the digital environment for commercials and market players' NQF.

## 2 Theoretical Analysis and Research Hypothese

### 2.1 Development and Definition of the Digital environment for commercials

The entrepreneurial environment can be described as the totality of external environments—including administrative, legal, innovation, financial, market, and cultural contexts—that market players encounter throughout their participation in market activities. It exerts a profound impact on the microeconomic activities of a country or region [12]. With the accelerated emergence of the era of digital technology, the intertwining of "physical space" and "digital space" has grown increasingly intimate, bestowing new connotations upon the entrepreneurial environment.

In November 2020, China first proposed the conceptualization of a digital environment for commercials and issued an initiative: "Improve the digital environment for commercials, unlock the dynamism of market players, and unleash the underlying of the digitally empowered economy." Subsequently, the Digitally empowered economy and the Overall Layout Plan for Building a Digital China, released in succession, provided policy guidance for rapidly advancing the institution of a sound digital environment for commercials [13].

Against this landscape, Chinese scholars have initiated research into the intension of the digital environment for commercials. some studies posit that the digital environment for commercials constitutes an optimization of the traditional entrepreneurial environment through digital and intelligent means [14]. Some studies define it as the totality of external environments—such as administrative, legal, market, and technological contexts—that influence the actions of market players amid the rapid advancement of digital applications and digital markets. Some studies emphasize a distinction between broad and narrow senses: broadly, it can be described as the new type of entrepreneurial environment faced by market players in the era of digital technology; narrowly, it denotes the restructuring and advancement of the traditional entrepreneurial environment by digital technology [15].

In summary, Chinese scholars' elaborations on the digital environment for commercials are all grounded in the traditional entrepreneurial environment. Therefore, this investigation concentrates on the empowerment of traditional entrepreneurial environment elements by digital technology, selecting digital foundational facilities development, digital legal environment, digital economy professionals supply, internet-based government services development, digital financial environment, and digital market environment as the evaluation dimensions of the digital environment for commercials. These aspects are both independent

and interrelated, systematically and systematically reflecting the quality of China's digital environment for commercials construction.

## **2.2 Theoretical Analysis of the effect of the Digital environment for commercials on Market players' NQF**

China pointed out: "It is imperative to deepen reforms of the economic and tech-scientific systems, strive to remove bottlenecks and blockages constraining the improvement of new quality productive powers, establish a high-benchmark market system, innovate the allocation of production factors, and enable the smooth flow of all sophisticated and high-quality factors of production toward the improvement of new quality productive powers." This critical exposition has clearly indicated the pivotal role of a sound institutional environment and resource allocation in fostering new quality productive powers. As a systematic external environment in the digital market, the digital environment for commercials encompasses both institutional and non-institutional factors involved in market players' participation in digital market activities [16]. It plays an essential role in reducing market access costs in the digital sphere, lowering the degree of information asymmetry, and optimizing the allocation of production factors. A favorable digital environment for commercials provides entities with more convenient and efficient channels for information exchange and resource sharing, ensures the efficient circulation of all sophisticated and high-quality factors of production, and accelerates the improvement of new quality productive powers.

Under the "techno-economic paradigm," the dynamic changes in technology and other production factors determine the transformation of the factor structure, which in turn enables the upgrading and renewal of the industrial structure. In accordance with economic institutionalism theory, the digital environment for commercials, as a new type of production factor, will also drive the improvement of new quality productive powers by forging a new factor structure. On one hand, a sound digital environment for commercials facilitates the agglomeration of digital industries and talent, lowers the barriers for entities to acquire digital production factors, and accelerates the fusion of digital applications such as cloud computing, cognitive technologies, and big data with traditional factors [17]. This spawns' new industrial models and growth drivers, endowing productive powers with a "new" connotation. Conversely, optimizing the digital environment for commercials elevates government capacity policy transparency and improves the digital market system. This effectively reduces the external risks associated with market players' transformation of production methods, reinforces their confidence in reform, deepens the fusion of digital applications with traditional factors, and facilitates a qualitative leap in productive powers. Therefore, according to the above analysis, this investigation puts forward Hypothesis H1.

H1: The refinement of the digital environment for commercials contributes to the enhancement of market players' new quality productive powers.

## **2.3 Transmission Mechanism of the Digital environment for commercials Affecting Market players' NQF**

### **2.3.1 Market Competition Level**

The improvement of NQF cannot be separated from commercial entity R&D and innovation. A critical catalyst for commercial entity R&D and innovation is external pressure. Under moderate competition, entities tend to use existing resources and capabilities to improve their performance and meet customer demand, rather than increasing investment in production and technology R&D [18]. Optimizing the digital environment for commercials will further

intensify market competition, force entities to carry out R&D and innovation, and facilitate the improvement of NQF.

On the one hand, the digital environment for commercials breaks the geographical constraints of traditional markets, enriches market supply, and allows more entities to participate in market competition. Conversely, it overcomes factor constraints and highly intelligently integrates information, capital, resource, and institutional factors required for commercial entity production and operation, lowers market entry barriers, stimulates entrepreneurial activities, and further intensifies market competition [19]. To gain a competitive edge, entities must continuously pursue technological and innovation in management, improve product quality and production efficiency, thereby fostering the improvement of NQF.

In addition, optimizing the digital environment for commercials reshapes the forms of competition among entities, enhances the diversity of market competition, and stimulates the innovation vitality of market players. In traditional market competition, entities usually focus on price and quality competition. Leading entities can easily gain advantages in price and quality by controlling production factors, mastering production techniques, and achieving economies of scale, which to some extent inhibits industrial diversity. The refinement of the digital environment for commercials, with its high spatiotemporal extensibility, breaks the “information cocoon” in the consumer market. While consumers pay consideration to price and quality, they also focus on other product characteristics such as environmental friendliness, creative design, intelligence, and technical safety. This activates market opportunities rooted in consumption, enabling start-ups to gain a market position with unique ideas and technologies, thus improving the diversity and innovation vitality of market competition.

Finally, the refinement of the digital environment for commercials reinforces market supervision and regulation and improves the fairness of market competition. With digital regulatory tools, the government can monitor market behavior in real time, identify and punish unfair competition, maintain a fair competitive order, and provide a more equitable and transparent environment, encouraging entities to compete based on their own strength and innovation. Meanwhile, the improvement of internet-based government services helps build an efficient and clean administrative environment, facilitates the construction of a new type of “cordial and clean” government–commercial relationship, reduces non-productive rent-seeking activities, and encourages entities to invest limited resources in production and R&D, thereby improving production efficiency and facilitating NQF.

According to the above analysis, this investigation puts forward Hypothesis H2.

H2: The refinement of the digital environment for commercials facilitates the improvement of market players’ NQF by improving the quality of market competition.

### **2.3.2 Commercial entity Digital restructuring**

In accordance with organizational change theory, digital restructuring is a continuous process wherein entities use digital applications to systematically reshape organizational models, improve efficiency, and enhance competitive advantages (Hess et al., 2016). In this process, the in-depth application of digital applications not only reinforces market players’ competitive advantage in the market, but also improves their scientific and R&D and innovation capabilities, thereby rapidly advancing the activation and advancement of NQF [20].

Based on dynamic capability theory, entities reorganize, construct, and combine internal as well as external resources for the purpose of addressing dynamic changes in the external environment to obtain competitive advantages. Therefore, when the external digital environment for commercials improves, entities tend to adjust their operation and production

structures to achieve digital restructuring.

Specifically, optimizing the digital environment for commercials facilitates commercial entity digital restructuring from three dimensions: benefit-driven motivation, factor supply, and risk expectation. First, benefit-driven motivation is the internal force for digital restructuring. The refinement of the digital environment for commercials accelerates the digital restructuring of the economic structure. To pursue sustained economic benefits, entities must adapt to the new market environment through digital restructuring. Second, digital restructuring relies on the support of various digital factors. Optimizing the digital environment for commercials improves digital foundational facilities, attracts digital economy professionals, and develops digital finance, providing a solid material foundation, sufficient talent reserve, and convenient financing for market players' digital restructuring. Third, facilitating internet-based government services and the rule of law in the digital age through a better digital environment for commercials helps improve the transparency of regional policies and laws [21]. Entities can obtain systematic and accurate policy and legal information, clarify government planning and industry orientation, enhance market predictability, and reduce the risks of digital restructuring.

According to the above analysis, this investigation puts forward Hypothesis H3.

H3: The refinement of the digital environment for commercials facilitates the improvement of market players' NQF by facilitating commercial entity digital restructuring.

## 3 Research Design

### 3.1 Model Specification

#### 3.1.1 Basic Regression Model

This investigation establishes the basic model as follows.:

$$NPro_{it} = \gamma_0 + \gamma_1 DBE_{it} + \gamma_2 Z_{it} + \sum ind + \sum area + \sum year + \varepsilon_{it} \quad (1)$$

$NPro_{it}$  represent the quality of NQF of commercial entity  $i$  in year  $t$ .  $DBE_{it}$  represent the quality of digital environment for commercials of the city where commercial entity  $i$  is located in year  $t$ ,  $Z_{it}$  a selected set of control indicators.  $ind$ ,  $area$  and  $year$  represent industry fixed effects. Regional fixed effects and year fixed effects. respectively.  $\varepsilon_{it}$  is the random disturbance term.

#### 3.1.2 Mediating Effect Model

To address the underlying endogeneity issue inherent in the traditional three-step mediating effect analysis, Combined with Model (1), the mediating effect model of This investigation is established as follows,  $M_{it}$  represents the mediating indicators of This investigation:

$$M_{it} = \gamma_0 + \gamma_1 DBE_{it} + \gamma_2 Z_{it} + \sum ind + \sum area + \sum year + \varepsilon_{it} \quad (2)$$

$$NPro_{it} = \gamma_0 + \gamma_1 M_{it} + \gamma_2 Z_{it} + \sum ind + \sum area + \sum year + \varepsilon_{it} \quad (3)$$

$$NPro_{it} = \gamma_0 + \gamma_1 M_{it} + \gamma_2 DBE_{it} + \gamma_3 Z_{it} + \sum ind + \sum area + \sum year + \varepsilon_{it} \quad (4)$$

## 3.2 Variable Definition

### 3.2.1 Dependent Variable: Corporate NQF (Npro)

This investigation adopts the indicator evaluation system of corporate NQF to measure the quality of NQF of China's A-share listed companies from 2016 to 2021. Based on the two-factor theory of productivity, this index system provides a detailed and systematic assessment of market players' NQF from two dimensions: labor and production instruments.

### 3.2.2 Key Independent Variable: Digital environment for commercials (DBE)

At the current stage, there is no unified benchmark for the assessment of the digital environment for commercials. Most existing evaluation systems remain at the provincial cross-sectional level, which makes it difficult to systematically and deeply reveal the dynamics and urban heterogeneity of the digital environment for commercials. Therefore, to obtain panel data of the digital environment for commercials at the prefectural municipality level, this investigation first constructs a provincial-level evaluation system covering six dimensions: digital foundational facilities construction, digital legal environment, digital economy professionals supply, internet-based government services development, digital market environment, and digital financial environment. We interact the provincial digital environment for commercials scores with the occurrence of digitally empowered economy policy-related words in the official policy reports of subordinate prefectural municipality, and finally obtain the digital environment for commercials scores of each prefectural municipality.

The provincial-level digital environment for commercials evaluation index constructed in This investigation is shown in Table 1. Since the provincial government transparency index was not released in 2016, it is replaced by the government transparency index of the capital city of each province in that year. For a small number of missing values, this investigation uses the linear interpolation method to supplement the data based on the available data of other years, and then uses the entropy weight method to assign weights to each indicator and calculate the systematic score of the digital environment for commercials for each province. Regarding the occurrence of digitally empowered economy policy-related words, this investigation can be described as existing studies and determines a keyword group related to digitally empowered economy policies. With the help of Python, we conduct word segmentation on the collected official policy reports of 226 prefectural municipality to obtain the occurrence of digitally empowered economy policy-related words, and eliminate prefectural municipality samples with zero frequency in the current year.

Table 1: Indicator System of the Digital environment for commercials

	First-level Indicators	Second-level Indicators	Third-level Indicators	Data Sources
Total Score of Digital environment for commercials	Digital foundational facilities Construction	Mobile Communication Development	Number of mobile phones per 100 households	China Social Statistical Yearbook
		Internet Development	Number of internet broadband access ports	
			Number of computer users per 100 people	
			Number of IPv4 addresses	
	Digital Legal Environment	Policy Transparency	Government Transparency Index	China Government Transparency Index Report
		Judicial Civilization	Judicial Civilization Index	China Judicial Civilization Index Report
		Judicial Services	Number of lawyers per 100,000 people	China Social Statistical Yearbook
	Digital economy professionals Supply	Internet User Base	Proportion of mobile internet users in total population	China City Statistical Yearbook
			Proportion of people with higher education in total population by province	China Statistical Yearbook
		Talent Employment Ratio	Proportion of employees in information transmission, software and IT services in total employment	China Labor Statistical Yearbook
			Proportion of employees in scientific research and technical services in total employment	
	Internet-based government services Development	Government Care	Government Concern Index	Report on China's Government-Commercial Relations
		Government Integrity	Government Integrity Index	
		Government Efficiency	General public budget expenditure / Regional gross domestic product	China City Database
			E-service Capacity Index	Report on China's Provincial and Municipal Government E-service Capacity Index
	Digital Market Environment	Market Demand	E-commerce sales volume	China Statistical Yearbook
			E-commerce purchase volume	
	Commercial entity Proportion	Proportion of entities with e-commerce transactions		
	Digital Financial Environment	Digital Finance Development	Digital Inclusive Finance Index	Peking University Digital Inclusive Finance Index

### 3.3 Control Indicators

This investigation selects firm size (Size), firm age (Age), board size (Boa), return on assets (Roa), Tobin's Q (Tqv), shareholding ratio of the largest shareholder (Soh), asset-liability ratio (Lev), and audit opinion (Opi) as control indicators. Specifically, firm size is measured by the natural logarithm of total assets; return on assets is measured by the ratio of net cash flow to total assets; asset-liability ratio is measured by the ratio of total liabilities to total assets; firm age is measured by the natural logarithm of the number of years since the firm's listing, with a value of 0 for firms listed for less than one year; board size is measured by the natural logarithm of the number of directors; and audit opinion takes a value of 1 for a benchmark audit opinion and 0 otherwise.

## 4 Empirical Analysis

### 4.1 Illustrative Quantitative data of Main Indicators.

Table 2 reports the illustrative quantitative data of all indicators. The greatest value of corporate NQF is 27.63 and the mean value is 5.3, indicating considerable disparities in the quality of NQF across entities. Meanwhile, the digital environment for commercials has a mean value of 4.56, a greatest value of 19.21, and a minimum value of 0.04, which suggests that the improvement of the digital environment for commercials among Chinese cities is unbalanced, with a generally low level and substantial room for improvement. The collinearity test results show that the correlation coefficients between all indicators in the model are less than 0.44, indicating that the multicollinearity problem of the selected indicators is negligible.

Table 2: Illustrative Quantitative data of Indicators

	Variable	Observations	Mean	Std. Dev.	Min	Max
Dependent Variable	Npro	10664	5.300	2.480	0.0500	27.63
Independent Variable	DBE	10664	4.560	3.570	0.0400	19.21
Control Variable	Size	10664	22.43	1.280	17.81	28.29
	Roa	10664	0.0500	0.0800	-0.710	0.680
	Soh	10664	0.320	0.140	0.0300	0.870
	Tqv	10664	2.100	2.020	0.680	92.25
	Lev	10664	0.440	0.200	0.0100	0.997
	Age	10664	11.30	7.650	0	31
	Boa	10664	2.110	0.200	1.100	2.830
	Opi	10664	0.950	0.220	0	1

Furthermore, this investigation uses Stata 17.0 to draw spatial distribution maps of digital environment for commercials scores at the provincial and prefectural municipality levels in China for 2017, 2019, and 2021. As could be seen from Figure 1, the development level of the digital environment for commercials in China's eastern coastal provinces has consistently taken the national lead, while central provinces along the Yangtze River basin are at a sub-optimal level. Moreover, extending westward, southward, and northward from the central Yangtze River region, the development level of the digital environment for commercials shows a downward trend. Figure 2 further displays the spatial distribution of the digital

environment for commercials across prefectural municipality in China. It demonstrates that cities with a relatively well-developed digital environment for commercials are mainly concentrated in the Beijing-Tianjin-Hebei region, the Yangtze River Delta, the Pearl River Delta, and provincial capitals along the Yangtze River. Overall, it still exhibits an agglomeration pattern characterized by “high in the east and low in the west” as well as “high in the center and low on both sides”.

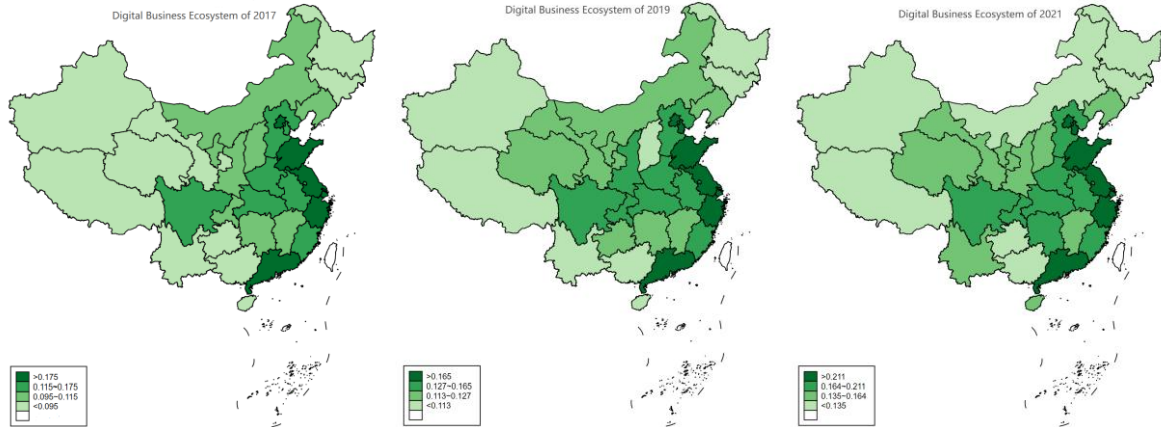


Figure 1: Spatial Distribution of the Development Level of Digital environment for commercials in China’s Provinces in 2017, 2019 and 2021

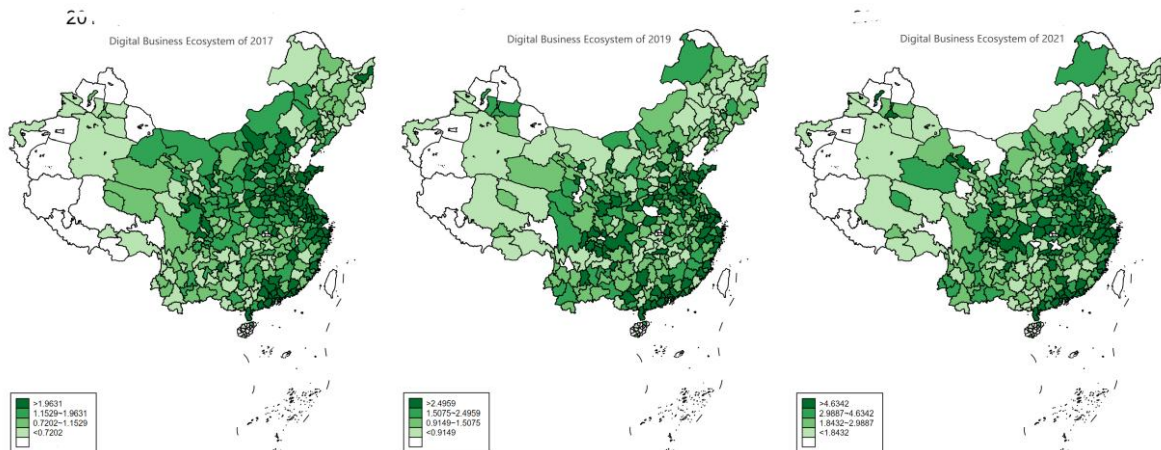


Figure 2: Spatial Distribution of the Development Level of Digital environment for commercials in Prefectural municipality of China in 2017, 2019 and 2021

## 4.2 Baseline Regression Results

Table 3 reports the baseline regression results, wherein the dependent variable is the quality of corporate NQF and the core independent variable is the digital environment for commercials. In accordance with the results from Column (1) to Column (4), the regression coefficients of the digital environment for commercials reject the null hypothesis at the 1% significance level in all models, indicating that the refinement of the digital environment for commercials significantly facilitates the improvement of corporate NQF, thus verifying Hypothesis H1 of This investigation.

Table 3: Baseline Regression Estimation Results

	(1)	(2)	(3)	(4)
DBE	0.0198*** (2.84)	0.0174** (2.55)	0.0415*** (3.96)	0.0449*** (4.35)
Size		0.1968*** (6.97)		0.2334*** (8.57)
Roa		2.1985*** (5.57)		1.8501*** (4.82)
Soh		-0.9153*** (-5.15)		-0.3297** (-2.01)
Tqv		0.1001*** (3.57)		0.0959*** (3.48)
Lev		-0.9603*** (-6.35)		-0.3100** (-2.14)
Age		-0.0236*** (-6.51)		-0.0189*** (-5.42)
Boa		0.5665*** (4.48)		0.4679*** (3.96)
Opi		0.1141 (1.01)		0.1685 (1.56)
Cons	5.2099*** (137.62)	0.1614 (0.25)	4.1957*** (8.78)	-1.4206* (-1.95)
Industry fixed	NO	NO	YES	YES
Regional fixed	NO	NO	YES	YES
Year fixed	NO	NO	YES	YES
N	10664	10664	10664	10664

Note: \*\*\*, \*\* and \* denote significance at the 1%, 5% and 10% levels, respectively. t-quantitative data are reported in parentheses. The same applies to Tables 4 to 8.

### 4.3 Robustness Test

#### 4.3.1 Replacing the dependent variable

Considering the positive relationship between productivity and productive powers, this investigation adopts the method of replacing the dependent variable to conduct a robustness test. Corporate NQF are replaced with total factor productivity calculated based on the LP method, and the regression is re-performed. The empirical results are shown in Column (1) of Table 4. The effect of the digital environment for commercials on total factor productivity is significantly positive at the 5% level, which further confirms the above conclusion.

#### 4.3.2 Lagging the independent variable

In addition, considering that the improvement of the digital environment for commercials may have a time lag in affecting corporate NQF, the key independent variable, the digital environment for commercials, is lagged by one period and the regression is re-conducted. The empirical results are presented in Column (2) of Table 4. The coefficient of the digital environment for commercials remains significantly positive, indicating that the previous conclusion is robust.

Table 4: Results of Robustness Tests

	(1)	(2)	(3)	(4)	(5)
DBE	0.0057** (2.06)		0.0822*** (3.83)	0.1350* (1.94)	0.0493*** (4.94)
L.DBE		0.0494*** (3.83)			
Control Indicators	Control	Control	Control	Control	Control
Cons	-7.8335*** (-19.03)	-1.3049 (-1.62)	-2.0727*** (-2.82)	-2.3310*** (-3.21)	-2.0119** (-2.15)
Industry fixed	Yes	Yes	Yes	Yes	Yes
Regional fixed	Yes	Yes	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes	Yes	Yes
N	10266	8426	8426	10664	10643

### 4.3.3 Instrumental variable approach

To avoid endogeneity problems caused by reverse causality and unobservable factors that may bias the estimation results, This investigation can be described as the design of Wang Yan and Wen Rong (2024) and selects the one-period lagged digital environment for commercials as the instrumental variable. The regression results obtained utilizing the two-stage least squares (2SLS) method are reported in Column (3) of Table 4. The coefficient of the digital environment for commercials remains significantly positive at the 1% level. In addition, to avoid underlying estimation bias caused by utilizing lagged explanatory indicators as instrumental indicators, This investigation further selects the spherical distance between each region and Hangzhou as another instrumental variable for the digital environment for commercials. On the one hand, the digitally empowered economy originated in Hangzhou, and cities closer to Hangzhou are more easily influenced by the digitally empowered economy and thus attach greater importance to the construction of the digital environment for commercials. Conversely, as a natural geographic variable, the spherical distance between cities can well satisfy the exogeneity requirement of instrumental indicators (Zhang Xun et al., 2020). Column (4) of Table 4 reports the re-regression results utilizing the 2SLS method. The coefficient of the digital environment for commercials is still significantly positive at the 10% level, which further verifies the robustness of the baseline conclusions of This investigation.

### 4.3.4 Propensity score matching

To mitigate the effect of sample selection bias on empirical results, This investigation utilizes the propensity score matching (PSM) method to match samples before conducting regression. First, cities with a digital environment for commercials score greater than or equal to the median score are defined as the treatment group and assigned a value of 1, while cities with a score below the median are defined as the control group and assigned a value of 0. Second, firm-level control indicators including firm size, return on assets, shareholding ratio of the largest shareholder, Tobin's Q, firm age, board size, and audit opinion are selected as covariates to estimate the propensity score through Logit regression, and one-to-one nearest-neighbor matching with replacement is implemented. The test results shown in Table 5 indicate that the absolute values of the t-quantitative data for all covariates decrease and emerge as insignificant after matching, suggesting that the PSM balancing test is satisfied. Column (5) of Table 4 reports the regression results utilizing the PSM-matched sample. It could be found that the coefficient of the digital environment for commercials remains significantly positive at the 1% level, indicating that the baseline conclusions of This

investigation are still robust after addressing the sample selection bias.

Table 5: Results of the PSM Balancing Test

Covariate	Matching Status	Treatment Group	Control Group	Benchmarkized Bias (%)	Bias Reduction (%)	t-value	p-value
Size	Unmatched	22.355	22.517	-12.7	85.3	-6.57	0.000
	matched	22.359	22.335	1.9		0.98	0.325
Roa	Unmatched	0.05083	0.0517	-1.2	61.7	-0.60	0.549
	matched	0.05113	0.05146	-0.4		-0.23	0.817
Soh	Unmatched	0.32268	0.31953	2.2	46.8	1.13	0.258
	matched	0.32251	0.32419	-1.2		-0.60	0.545
Tqv	Unmatched	2.1339	2.0677	3.3	69.6	1.69	0.090
	matched	2.1351	2.1553	-1.0		-0.52	0.603
Age	Unmatched	10.1	12.544	-32.3	98.3	-16.70	0.000
	matched	10.099	10.057	0.6		0.29	0.770
Boa	Unmatched	2.092	2.1234	-15.9	96.7	-8.21	0.000
	matched	2.0927	2.0917	0.5		0.27	0.783
Opi	Unmatched	0.95485	0.94727	3.5	75.7	1.82	0.069
	matched	0.95597	0.95781	-0.9		-0.47	0.637

#### 4.4 Mechanism Analysis

##### 4.4.1 Mechanism of market competition level

As a critical catalyst for corporate innovation, market competition is of great significance to industrial technological development and the improvement of commercial entity NQF. To test whether the refinement of the digital environment for commercials can facilitate the improvement of commercial entity NQF by raising the quality of market competition (MCL), This investigation uses the logarithm of the number of new entrants in the city and industry where the firm is located in the current year as the measure of market competition level to conduct a mechanism test. The empirical results are shown in Table 6. The coefficient of market competition level in Column (3) is significantly positive, indicating that an increase in market competition level can facilitate the improvement of commercial entity NQF. The coefficients of the digital environment for commercials in Columns (2) and (4) are both significantly positive, and the coefficient in Column (4) is smaller than that in Column (1). This indicates that optimizing the digital environment for commercials facilitates the improvement of commercial entity NQF by improving the quality of market competition. Furthermore, This investigation conducts the Sobel test and Bootstrap sampling test with 1,000 replications. The results show that the Z-statistic of the Sobel test is 2.699, which is significantly positive at the 1% level. In the Bootstrap test (1,000 times), the 99% confidence interval of the mediating effect is [0.0008, 0.0061], which does not contain 0. The above results further confirm the mechanism role of market competition level, verifying Hypothesis H2 of This investigation.

Table 6: Results of Mechanism Test on Market Competition Level

	(1)	(2)	(3)	(4)
Variable	Npro	MCL	Npro	Npro
DBE	0.0449*** (4.35)	0.0527*** (14.14)		0.0405*** (3.93)
MCL			0.1001*** (2.82)	0.0826** (2.32)
Control Indicators	Control	Control	Control	Control
Industry fixed	Yes	Yes	Yes	Yes
Regional fixed	Yes	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes	Yes
Sobel Z		2.699		
Mediating effect (%)		0.0970		
Indirect effect / Direct effect		0.1074		
Bootstrap (1,000 replications)Confidence interval of the test		[0.0008 , 0.0061]		
N	10664	10664	10664	10664

#### 4.4.2 Mechanism of commercial entity digital restructuring.

The refinement of the digital environment for commercials stimulates market players' willingness to undertake digital restructuring, eases factor constraints for their digital restructuring, and reduces uncertainty in the process. To further examine whether the refinement of the digital environment for commercials can facilitate the improvement of commercial entity NQF by facilitating commercial entity digital restructuring (EDT), This investigation follows the design of Wu Fei et al. (2021) and measures the degree of commercial entity digital restructuring utilizing the logarithm of the word frequency of digital restructuring-related terms in corporate annual reports to conduct the mechanism test.

The test results are shown in Table 7. The coefficient of commercial entity digital restructuring in Column (3) is significantly positive, indicating that commercial entity digital restructuring can facilitate the improvement of commercial entity NQF. The coefficients of the digital environment for commercials in Columns (2) and (4) are both significantly positive, and the coefficient in Column (4) is smaller than that in Column (1). This indicates that optimizing the digital environment for commercials facilitates the improvement of commercial entity NQF by rapidly advancing commercial entity digital restructuring.

Furthermore, this investigation conducts the Sobel test and Bootstrap sampling test with 1,000 replications. The results show that the Z-statistic of the Sobel test is 2.973, which is significantly positive at the 1% level. In the Bootstrap test (1,000 times), the 99% confidence interval of the mediating effect is [0.0007, 0.0041], which does not contain 0.

The above results further confirm the mechanism role of commercial entity digital restructuring, verifying Hypothesis H3 of This investigation.

Table 7: Results of Commercial entity Digital restructuring Test

	(1)	(2)	(3)	(4)
Independent Variable	Npro	EDT	Npro	Npro
DBE	0.0449*** (4.35)	0.0399*** (7.18)		0.0425*** (4.12)
EDT			0.0649*** (3.19)	0.0597*** (2.94)
Control Indicators	Control	Control	Control	Control
Industry fixed	Yes	Yes	Yes	Yes
Regional fixed	Yes	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes	Yes
Sobel Z		2.973		
Mediating effect (%)		0.0532		
Indirect effect / Direct effect		0.0561		
Bootstrap (1,000 replications)Confidence interval of the test		[0.0007, 0.0041]		
N	10644	10644	10644	10644

## 4.5 Heterogeneity Analysis

### 4.5.1 Regional Heterogeneity Analysis

There are obvious differences in economic development levels and resource endowments across regions in China. To examine the heterogeneous impacts of the digital environment for commercials on the improvement of market players' NQF in different regions, This investigation divides the sample into eastern region and central-western regions for regression analysis respectively, in accordance with the regional classification benchmarks of the National Bureau of Quantitative data. As shown in Columns (1) and (2) of Table 8, The refinement of the digital environment for commercials exerts a significant positive effect on the improvement of NQF for entities in both eastern and central-western regions, with a stronger facilitating effect on entities in central-western regions. This may be because the central-western regions are inferior to the eastern region in natural and geographical conditions, digital foundational facilities, industrial development level and other aspects, leaving greater room for improvement in the improvement of market players' NQF. When the digital environment for commercials is optimized, entities in central-western regions are more likely to break through development bottlenecks, thus realizing the cultivation and advancement of NQF.

### 4.5.2 Industrial Heterogeneity Analysis

Entities in different industries differ in factor intensity, technological level and labor productivity (Qian & Zhu, 2013). In accordance with the industry classification benchmarks of the China Securities Regulatory Commission, This investigation classifies entities into labor-intensive, capital-intensive and technology-intensive ones for separate regression. As shown in Columns (3), (4) and (5) of Table 8, The refinement of the digital environment for commercials significantly improves the quality of NQF of technology-intensive entities, while having no far-reaching influence on that of labor-intensive and capital-intensive entities. The possible reason is that labor-intensive and capital-intensive entities do not take R&D and innovation as the main production factor, but rely more on labor quantity and capital scale.

Therefore, when the digital environment for commercials is optimized, such entities tend not to optimize their production modes and structures, resulting in an insignificant improvement effect of the digital environment for commercials on their NQF.

### 4.5.3 Life Cycle Heterogeneity Analysis

Entities at different life cycle stages have different decision-making and organizational structures, which also lead to differences in production modes and productivity. Referring to the method of Anthony & Ramesh (1992), This investigation divides entities into three stages: growth stage, maturity stage and decline stage, and conducts regression respectively. The test results are shown in Columns (6), (7) and (8) of Table 8. The refinement of the digital environment for commercials significantly improves the quality of NQF of entities in the growth and maturity stages, while having no far-reaching influence on that of entities in the decline stage. The possible reason is that entities in the growth and maturity stages focus on long-term future development, and thus tend to take advantage of the optimized digital environment for commercials to carry out continuous R&D and innovation, adjust production structure and achieve the improvement of NQF. However, entities in the decline stage are under pressure such as cash flow constraints, making it difficult to upgrade the existing production mode. They can only improve the current situation with existing production capacity, thus failing to realize the improvement of NQF.

*Table 8: Regression Results of Heterogeneity Analysis*

	Eastern region (1)	Central and Western regions (2)	Labor-intensive (3)	Capital-intensive (4)	Technology-intensive (5)	Growth stage (6)	Mature stage (7)	Decline stage (8)
DBE	0.0441*** (4.00)	0.1071*** (3.16)	0.0116 (0.55)	0.0058 (0.36)	0.0638*** (4.19)	0.0495** (2.42)	0.0475*** (3.15)	0.0203 (1.02)
Control Indicators	Control	Control	Control	Control	Control	Control	Control	Control
Cons	-0.2326 (-0.25)	-4.6925*** (-4.01)	1.7580 (1.55)	-0.1521 (-0.14)	-2.3576** (-2.18)	-1.8308 (-1.26)	0.4045 (0.38)	-0.5967 (-0.46)
Industry fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	7892	2772	2415	2915	5334	2519	5530	2545

## 4.6 Extended Analysis

### 4.6.1 Data Processing and Calibration

The digital environment for commercials has a rich connotation, covering six dimensions: digital foundational facilities construction (DIC), digital legal environment (DLE), digital economy professionals supply (DTS), internet-based government services development (DGD), digital market environment (DME), and digital financial environment (DFE). To investigate how various elements in the digital environment for commercials ecosystem synergistically facilitate the improvement of market players' NQF, this investigation adopts fuzzy-set qualitative comparative analysis (fsQCA) to explore the configurations of digital environment for commercials factors affecting market players' NQF. First, based on the previous analysis, non-technology-intensive entities and entities in the recession stage are excluded from the sample. Then, the city-level mean values of market players' NQF and all

dimensions of the digital environment for commercials are calculated (Liu & Li, 2024), resulting in 142 cities as research objects. Second, the fsQCA method requires variable calibration to convert indicators into set membership scores. Referring to existing studies (Zhang & Du, 2019), This investigation adopts the direct calibration method and sets three quantile points of 0.95, 0.5, and 0.05 to calibrate the data. The calibration anchors and illustrative quantitative data of each variable are shown in Table 9.

Table 9: Variable Calibration and Illustrative Quantitative data

Variable		Calibration			Illustrative Quantitative data			
		Full Membership	Crossover Point	Full Non-membership	Mean	Std. Dev.	Min	Max
Conditional Indicators	DIC	8.4709	3.0728	1.2272	3.8049	2.4620	0.4040	15.8819
	DLE	6.8944	3.6171	1.5005	3.9564	2.0850	0.6206	14.2203
	DTS	1.3631	0.4634	0.1718	0.6136	0.5141	0.0695	3.5062
	DGD	8.6250	3.2548	1.2798	3.9747	2.5818	0.4372	17.5215
	DME	11.8880	2.0882	0.3313	3.4514	3.4943	0.1600	17.5470
	DFE	15.3413	6.8593	1.9642	7.9472	4.8870	0.4978	43.0627
	Npro	7.9467	5.1773	3.1254	5.2354	1.4439	2.1673	9.7669

#### 4.6.2 Necessity Analysis

This investigation uses fsQCA software to conduct necessity analysis for high-level and low-level NQF of entities respectively. The results are shown in Table 10. The consistency scores of all conditional indicators are less than 0.9, indicating that no single condition is a requirement for the occurrence of high-level or low-level NQF of entities. The quality of market players’ NQF is the result of the joint effect of multiple conditions.

Table 10: Analysis Results of the Necessary Conditions for Commercial entity NQF

Conditional Indicators	Outcome Indicators	
	High Commercial entity NQF	Non-High Commercial entity NQF
DIC	0.6463	0.6552
~DIC	0.6661	0.5942
DLE	0.6862	0.6734
~DLE	0.6462	0.5938
DTS	0.6776	0.6838
~DTS	0.6508	0.5829
DGD	0.6444	0.6443
~DGD	0.6855	0.6191
DME	0.6462	0.6702
~DME	0.6969	0.6096
DFE	0.7109	0.6677
~DFE	0.6416	0.6153

#### 4.6.3 Conditional Configuration Analysis

To further conduct an analysis of the conditional configuration paths for the improvement of market players’ NQF, this investigation sets the frequency threshold at 1 and the raw consistency threshold at 0.8. Referring to the design of Du and Jia (2017), a PRI consistency threshold of 0.7 is also specified. When conducting “benchmark analysis” for high-level NQF,

“presence or absence” is selected without any artificial counterfactual analysis. The results are shown in Table 11. There are 6 digital environments for commercial configurations that generate high-level NQF of entities. The consistency scores of both individual configuration solutions and the overall solution exceed the minimum benchmark of 0.75, indicating the validity of the results. Meanwhile, the overall coverage is 0.6204, suggesting that these six configurations can explain 62.04% of the city cases with high-level NQF. Based on the antecedent indicators of the six configurations and the overall characteristics of the solutions, This investigation further classifies the configurations into four types and conduct an analysis of them with typical cases.

Table 11: Results of Conditional Configuration Analysis for High Commercial entity NQF

Conditional Indicators	Configuration results					
	Sa	Sb1	Sb2	Sc1	Sc2	Sd
DIC	⊗	●	●	⊗	⊗	●
DLE	●	⊗	●	●	⊗	●
DTS		●	●	●	●	⊗
DGD	●	⊗	⊗		⊗	●
DME	⊗	●	●	⊗	⊗	●
DFE	⊗	⊗	●	●	⊗	
Raw coverage	0.3053	0.2919	0.3655	0.3467	0.3270	0.3400
Unique coverage	0.0122	0.0142	0.0662	0.0128	0.0463	0.0564
Consistency	0.8518	0.8677	0.8473	0.8535	0.8649	0.8248
Overall coverage	0.6204					
Overall consistency	0.8002					

Note: ● indicates the **presence of a core condition**. ⊗ indicates the **absence of a core condition**. ● indicates the **presence of a supporting condition**. ⊗ indicates the **absence of a supporting condition**.

**Government-Driven Type.** In configuration Sa in Table 11, the core conditions are digital legal environment + internet-based government services development. This configuration highlights the essential role of the digital legal environment and internet-based government services environment in generating high-level NQF of entities, representing a typical “government-driven” configuration. Typical cities of this type include Shenzhen, Anshun and Qingdao. For example, Shenzhen has continuously attached importance to the construction of internet-based government services. In 2018, it issued the *Overall Plan for the Construction of a New Smart City in Shenzhen*, emphasizing that the improvement of “internet-based government services” is an critical part of smart city construction. In 2021, it further released the *Several Opinions on Rapidly advancing the Construction of Smart Cities and Internet-based government services*, proposing to build an active, precise and intelligent integrated internet-based government services. This has vigorously facilitated the prosperity of the market economy and fostered a sound policy environment for nurturing NQF of entities.

**Market-Driven Type.** Both configurations Sb1 and Sb2 in Table 11 emphasize the critical role of digital foundational facilities construction, digital economy professionals supply and digital market environment in generating high-level NQF of entities, thus belonging to the “market-driven” configuration. It indicates that even if a region performs poorly in rule of law in the digital age and internet-based government services, sound digital foundational facilities, sufficient digital economy professionals supply and strong digital

market demand can still generate high-level NQF of entities. In this configuration, entities can obtain strong product demand and identify emerging opportunities through the digital market, and spontaneously adjust their production structure with the help of convenient external digital conditions to realize the cultivation and advancement of NQF. Taking Ningbo as an example, it not only has a population of over 9.5 million, but also boasts relatively complete digital foundational facilities, such as the Ningbo Cognitive technologies Supercomputing Center, a new type of digital foundational facilities prioritized in the 14th Five-Year Plan period. With certain advantages in digital foundational facilities and digital market, Ningbo has encouraged entities to accelerate transformation and R&D and innovation continuously.

**Factor-Driven Type. Although** configurations Sc1 and Sc2 in Table 11 are different in core conditions, the core conditions of Sc1 include digital financial environment with digital economy professionals supply as a supporting condition, and the core conditions of Sc2 include digital economy professionals supply. Both configurations stress the critical role of digital factors in generating high-level NQF of entities, thus falling into the “factor-driven” type. This configuration indicates that even if a region is underperforming in digital foundational facilities and digital market, it can achieve high-level NQF of entities as long as it has abundant digital factors, especially the key factor of digital economy professionals. Taking Chengdu and Hefei as examples, on the basis of the *Plan for Chengdu-Chongqing Jointly Building a Western Financial Center* issued by the People’s Bank of China, the National Development and Reform Commission and other authorities, the Chengdu municipal government has successively launched policies such as “relocation subsidies” and “green finance subsidies” for financial institutions, and launched inclusive financial service platforms such as “Rongyi Loan”. This has simultaneously improved the financial scale and service efficiency, easing the financial constraints on commercial entity transformation and upgrading. Hefei boasts a solid foundation in science and technology industries with industrial clusters in software R&D, information technology, energy technology and other fields, cultivating and attracting a large number of digital economies professionals, which jointly drives the improvement of NQF of regional entities.

**Dual-Driven by Market and Government Type.** In configuration Sd in Table 11, the core conditions are digital foundational facilities construction + digital legal environment + internet-based government services development + digital market environment. This configuration indicates that a region with an efficient internet-based government services and a sound digital market environment can generate high-level NQF of entities even with insufficient digital economy professional’s supply. Taking Wuxi as an example, its industries are concentrated in manufacturing sectors such as equipment parts, integrated circuits, clothing and textiles. With a smaller population and fewer universities than neighboring Suzhou and Shanghai, Wuxi is less attractive to digital economy professionals. However, located in the core area of the Yangtze River Delta urban agglomeration, Wuxi enjoys well-developed digital foundational facilities and digital market. Moreover, the Wuxi municipal government has persistently facilitated the construction of digital public services, with its data openness ranking among the top nationwide for consecutive years. Supported by the “One-Stop Online Services” platform, it has continuously advanced the digitalization, intellectualization and facilitation of government services. Therefore, driven by both internet-based government services and digital market, entities in Wuxi present a high level of NQF.

#### 4.6.4 Robustness Tests

In accordance with existing studies, robustness test methods mainly include modifying the consistency threshold, adjusting the calibration threshold, and adding or deleting cases.

Following the design of Zhou and Xu (2023), This investigation conducts robustness tests by modifying the consistency threshold, adjusting the original threshold from 0.8 to 0.85. The configurations obtained after adjustment are consistent with the original ones. In addition, this investigation adjusts the anchor quantiles of each variable from 0.95, 0.5, 0.05 to 0.75, 0.5, 0.25. The adjusted results basically cover the original configurations, indicating that the results of This investigation are robust.

## 5 Conclusions and Policy Implications

This investigation selects Chinese publicly listed firms on A-shares from 2016 to 2021 as research samples to empirically examine the effect and mechanism of digital environment for commercial optimization on market players' NQF. The main conclusions are as follows: First, The refinement of the digital environment for commercial significantly facilitates the improvement of market players' NQF, and this conclusion remains robust after addressing endogeneity and sample selection bias. Second, the underlying mechanism through which the digital environment for commercial affects market players' NQF is that its optimization intensifies market competition and accelerates commercial entity digital restructuring. Third, The refinement of the digital environment for commercial exerts a significant positive effect on the improvement of NQF for entities in both eastern and central-western regions, with a stronger impact on entities in central-western regions. Fourth, digital environment for commercial optimization facilitates the improvement of NQF in technology-intensive entities, while showing no significant effect on labor-intensive and capital-intensive entities. Fifth, The refinement of the digital environment for commercial significantly improves the NQF of entities in the growth and maturity stages, but has no significant effect on entities in the decline stage. Sixth, no single element of the digital environment for commercial constitutes a requirement for high-level NQF, and four types of digital environment for commercial factor configurations can generate high-level NQF.

Based on the above conclusions, this investigation puts forward the following policy recommendations:

First, give full play to the driving role of digital environment for commercial optimization in the improvement of market players' NQF. Governments at all levels should recognize the digital characteristics that distinguish the digital environment for commercial from the traditional entrepreneurial environment, dynamically optimize policy mechanisms, and jointly advance the improvement of the digital environment for commercial from multiple dimensions including digital foundational facilities, rule of law in the digital age, digital economy professionals, internet-based government services, digital market, and digital finance.

Second, actively facilitate the reform of "streamlining administration, delegating power, and improving services" in the digital market, establish access and regulatory systems adapted to digitally empowered economy development, reduce burdens on markets and entities, and encourage more entities to participate in market competition. Innovate digitally empowered economy supervision and governance tools, build refined and agile regulatory capacity tailored to different commercial forms and risk levels, and ensure fair and orderly competition in the digital market.

Third, continuously advance the improvement of regional internet-based government services and rule of law in the digital age, streamline administrative service procedures, and use digital applications to build a transparent and impartial administrative and legal environment to strengthen market players' willingness and confidence in digital restructuring. Meanwhile, strengthen digital foundational facilities construction, improve digital economy

professionals training and incentive mechanisms, simplify loan approval procedures, and provide solid factor support for commercial entity digital restructuring.

Fourth, formulate strategies for optimizing the digital environment for commercials in line with local conditions. While learning from the practices and experience of advanced regions in building a digital environment for commercials, regions should also base themselves on local factor endowments, industrial structures, and commercial entity characteristics to implement targeted differentiated development strategies. Strengthen communication and cooperation between governments and entities, build a sound internet-based government services and digital market, and facilitate the sustainable advancement of NQF.

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