

Research on the Nonlinear Influence of Data Assets on Enterprise New Quality Productivity

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Abstract

Based on data of Chinese A-share listed firms from 2009 to 2024, this paper investigates the impact of data assets on corporate new quality productivity(NQP). The empirical results show that there exists a nonlinear dynamic relationship between data assets and NQP. Specifically, data assets exert an inhibiting effect at low levels but a promoting effect at high levels. Heterogeneity tests further reveal that the positive impact of data assets on NQP is more pronounced in non-state-owned enterprises, high-tech industries, and firms located in regions with advanced digital infrastructure. Accordingly, enterprises should fully evaluate their development conditions and internal characteristics. Meanwhile, governments should optimize the management and regulatory systems of data assets, strengthen the construction of digital infrastructure, cultivate digital talents actively, provide a sound external environment for the development of NQP, and steadily promote high-quality development.

Keywords

Data Assets; New Quality Productivity; Nonlinear Relationship.

1. Introduction

In September 2023, General Secretary Xi Jinping first put forward the important concept of new quality productive (NQP) during an inspection tour in Heilongjiang Province. NQP refer to an advanced form of productivity led by innovation, which breaks away from traditional economic growth models and paths of productivity development. It is characterized by high technology, high efficiency, and high quality, and aligns with the new development philosophy. As important economic entities, enterprises' enhancement of NQP is crucial to boosting the overall NQP of society. Therefore, giving full play to enterprises' leading and driving role, improving development quality, building new competitive advantages, promoting industrial innovation and upgrading, and effectively advancing digital industrialization and industrial digitalization constitute a strategic decision that conforms to China's national conditions and the trend of the world.

Against the background of the digital economy, data assets have become the core strategic resources of enterprises, which can meet the needs of disruptive technological innovation, and their data technology skills can effectively empower the upgrading of productivity. The use and analysis of data assets can help enterprises integrate and restructure with traditional factors, greatly improve the efficiency of innovative factors, assist enterprises in continuously optimizing data-oriented business methods and value creation models[1], and find the "optimal solution" for the innovative allocation of production factors. Data assets can help enterprises break through the production possibility frontier. The characteristics of data, such as non-consumptiveness, non-rivalry and strong integration[2], can help enterprises break down "data silos"[3], promote the agglomeration of the digital industry, and strengthen networked collaboration between upstream and downstream of the industrial chain as well as cross-industrial chain cooperation.

However, the use and management of data assets remain in the exploratory stage, posing challenges to the cultivation of NQP. Currently, several issues remain unresolved: the ownership of data assets has yet to be clarified[4]; a standardized valuation system is still lacking; there is no consensus on pricing principles and methods; and multiple constraints impede the recognition of data assets on corporate balance sheets. These difficulties hinder the efficient allocation of corporate data resources and the sustained realization of data value. Thus, no consensus has yet been reached in the academic literature regarding the direction of the effect of data assets on NQP, leaving the underlying mechanisms to be further clarified through empirical research.

Developing NQP is a long-term task and a systemic project for China. Fully unlocking the potential of data assets provides a strong foundation for building NQP and contributes to the high-quality development of the digital economy. Therefore, this paper aims to explore the relationship between data assets and NQP, the underlying transmission mechanisms, and the influencing factors, with the goal of providing practical guidance for the management of corporate data assets.

The marginal contributions of this paper are as follows: first, this study enriches the research on the economic consequences of data assets. As a new type of strategic resource in the digital economy era, data assets have attracted considerable attention from academia. From a micro perspective, existing literature has mainly explored the impact of data assets on areas such as innovation input, productivity enhancement, and production, operation, and managerial decision-making. In contrast, this paper examines the effect of corporate data assets on NQP, thereby extending the relevant literature on the economic consequences of data assets in listed companies.

Second, this study extends the literature on the influencing factors of NQP. Existing studies have mostly explored NQP from the perspectives of conceptual connotations, underlying logic, and pathways to realization, with relatively few focusing on this concept at the firm level. Following the theoretical thread of prior research, this paper further examines the impact of data assets on NQP and provides empirical evidence that data assets do influence NQP.

Third, the findings of this paper help both firms and government agencies better understand the implications of corporate data assets. They also serve as a reference for relevant authorities to further refine the management mechanisms and regulatory frameworks surrounding data assets, thereby accelerating the development of NQP and steadily advancing high-quality development.

2. Literature Review

2.1. Related Research on Data Assets

To date, a substantial body of literature has investigated the economic consequences of data assets. From the perspective of data as a production factor, scholars have found that data, as a new type of production factor, can effectively drive economic growth [5]. However, due to the time-sensitive nature of data, the value of data elements carries certain risks, which leads to uncertainty in their monetization capacity and makes it difficult to estimate the associated economic benefits[6].

From the perspective of data assets, existing studies have found that data assets help firms increase their innovation input, improve production efficiency[7], facilitate effective production, operation, and managerial decision-making[8], and promote high-quality development[9]. However, some scholars have pointed out issues such as controversial ownership definitions of data assets[10], the inapplicability of traditional valuation methods, the lack of unified standards for data asset accounting [11], and the relatively small scale and low frequency of data asset transactions. These problems significantly increase the costs for

firms to use and manage data assets and require long-term, systematic reforms. Thus, no consensus has yet been reached in the academic literature regarding the direction of the effect of data assets, and the underlying mechanisms remain to be clarified from an empirical perspective.

2.2. Related Research on New Quality Productivity

Existing literature has largely focused on exploring the conceptual connotations[12], , pathways to realization[13] , value implications[14], and indicator systems[15] of NQP.

Most scholars have investigated the influencing factors of NQP from a qualitative research perspective. Studies have found that the digital economy [16], digital technologies[17], and data elements[14]can promote the enhancement of NQP. Other scholars have empirically tested that the agglomeration of core digital economy industries[18] and financial agglomeration[19] both exert positive effects on the development of NQP. At the firm level, research has shown that big data development[11], breakthrough innovation [3], digital and intelligent transformation[20], and ESG performance[5] all have significant impacts on the enhancement of corporate NQP.

However, the cultivation of NQP is a long-term and complex systemic undertaking. In China, challenges such as insufficient technological empowerment [4], inadequate talent reserves[21], and an unsound institutional environment[1] constrain the development of NQP. Therefore, an in-depth analysis of the driving effects on NQP in China holds significant academic value and practical implications.

3. Theoretical Analysis and Research Hypotheses

The relationship between data assets and corporate NQP is a dynamic process. In the initial stage of holding data assets, firms need to continuously invest certain resources and time to deploy corresponding equipment and technologies, thereby achieving the initial accumulation of data assets. At the same time, in the short term, data assets may encounter issues such as difficulty coordinating with existing management equipment, integrating with existing resources, and adapting to established management models. These issues can affect firms' production and operation efficiency, requiring them to continuously improve their management capabilities and adaptability. Therefore, in the initial stage of possessing data assets, the creative benefits brought to firms may hardly offset the various inputs in the short term, thereby reducing NQP.

As firms' level of data asset ownership continues to increase, data assets will exert a positive impact on the enhancement of corporate NQP. On the one hand, with the continuous accumulation of data assets, workers with digital literacy can form digital productivity by investing in, managing, and applying data assets, thereby guiding firms' production activities and assisting managers in making scientific decisions. On the other hand, with the development of digital technologies, data, as a high-quality production factor for forming NQP, can be deeply integrated with traditional production factors, bringing significant economic benefits and market advantages to firms. Furthermore, data assets possess characteristics such as shareability, exchangeability, and non-consumability [22], which can effectively alleviate geographical and other constraints, greatly improve the efficiency and quality of inter-firm cooperation, and empower the development of corporate NQP. Based on this, this paper proposes Hypothesis 1:

Hypothesis 1: There is a nonlinear dynamic relationship between data assets and corporate NQP, characterized by an inhibiting effect at low levels of data assets and a promoting effect at high levels of data assets.

4. Research Design and Variable Selection

4.1. Data Sources

This study employs data of A-share listed companies from 2009 to 2024. Following the practices of existing studies, we exclude firms in the financial industry, ST and *ST firms, and those with severe data missingness. After the above screening, this paper ultimately obtains 37,624 observations. Meanwhile, all continuous variables are winsorized at the 1% level. The data used in this paper are sourced from the CSMAR database.

4.2. Variable Definition

4.2.1. Dependent Variable

The dependent variable in this paper is corporate NQP (Nq). From the three perspectives of "high technology, high quality, and high efficiency," this paper selects 19 secondary indicators and uses the entropy method to construct an indicator system for NQP at the firm level.

Considering the high-innovation characteristic of NQP, which is essentially manifested in the emergence of a large number of disruptive innovation technologies, and drawing on existing studies [23], this paper measures the high-technology characteristic of NQP in terms of incremental innovation and breakthrough innovation.

Considering the high-quality characteristic of NQP and drawing comprehensively on existing literature[24]as well as the connotation of high-quality development of firms, this paper constructs an indicator system comprising four dimensions: shared development, open development, green development, and coordinated development.

Considering the high-efficiency characteristic of NQP and drawing on existing studies, this paper measures corporate efficiency from three dimensions: profitability, operational capability, and growth capability. The definitions and measurements of the above indicators are presented in Table 1.

Table 1. Indicator System for NQP

Level 1	Level 2	Definition
High Technology	Incremental Innovation	$\ln(\text{number of independently granted utility patents} + \text{number of independently granted design patents} + \text{number of independently granted invention patents in the current year} + 1)$
	Breakthrough Innovation	$\ln(\text{number of patent citations (CIT)} + 1)$; following the Herfindahl index (HHI) method to construct a knowledge breadth indicator to measure the degree of patent dispersion, i.e., the extent to which firms expand their innovation boundaries
High Quality	Shared Development	Number of violations of laws, regulations, and disciplines (e.g., environmental pollution, workplace safety)
		Social contribution value per share
		Growth rate of employee compensation payable
		Firm pay gap
	Open Development	Ratio of overseas operating income
	Green Development	Environmental score of HuaZheng ESG rating
	Coordinated Development	Equity concentration
		Equity balance degree
Proportion of independent directors		
Whether the chairman and CEO are the same person (Duality)		
High Efficiency	Profitability	Operating profit margin = operating profit / operating revenue
		Return on total assets = (total profit + financial expenses) / total assets
	Operational Capability	Total asset turnover = operating revenue / year-end total assets
		Inventory turnover = operating cost / year-end inventory
	Growth Capability	Growth rate of total operating revenue = (current year total operating revenue - previous year total operating revenue) / (previous year total operating revenue)
		Net profit growth rate = (current year net profit - previous year net profit) / (previous year net profit)

4.2.2. Independent Variable

The independent variable in this paper is data assets (Data). Following the approach [25], this paper measures the value of data assets as follows: $Data = \ln(\text{market value} - \text{fixed assets} - \text{financial assets} - \text{intangible assets})$. For robustness testing, this paper also adopts the text mining method used [26] to extract the frequency of characteristic word spectra and assigns weights using the entropy method.

4.2.3. Control Variables

Referring to previous studies, this paper selects firm size (Size), asset-to-liability ratio (Lev), cash level (Cash), firm age (Age), firm growth (Growth), and ownership type (SOE) as control variables. The specific definitions of these variables are presented in Table 2.

Table 2. Definitions of Main Variables

Variable Name	Variable Symbol	Measurement
NQP	Nq	Using the entropy method, an indicator system for NQP at the firm level is constructed from the three perspectives of "high technology, high quality, and high efficiency"
Data Assets	Data	$Data = \ln(\text{market value} - \text{fixed assets} - \text{financial assets} - \text{intangible assets})$
Firm Size	Size	Natural logarithm of total assets at year end
Leverage	Lev	Book value of liabilities at year end / Book value of assets at year end
Cash Level	Cash	Monetary funds / Total assets
Firm Age	Age	Natural logarithm of the number of years since the establishment of the listed firm
Firm Growth	Growth	Growth rate of operating revenue
Ownership Type	SOE	Takes the value of 1 if firm <i>i</i> is a state-owned enterprise at the end of year <i>t</i> , otherwise 0

4.3. Research Design

Referring to the study, this paper incorporates the squared term of data assets into the model and constructs the following nonlinear baseline regression model:

$$Nq_{it} = \alpha_0 + \alpha_1 Data_{it} + \alpha_2 Data_{it}^2 + \alpha_3 Controls_{it} + \mu_t + \theta_i + \varepsilon_{it} \quad (1)$$

Nq represents corporate NQP, Data represents corporate data assets, Controls represents a series of control variables, and ε_{it} represents the random error term. This paper also incorporates firm fixed effects θ_i and year fixed effects μ_t , and the standard errors of the regression results are all adjusted for clustering at the firm level.

5. Empirical Results and Analysis

5.1. Descriptive Statistics

The descriptive statistics of the main variables in this paper are presented in Table 1. As shown in Table 3, the minimum value of corporate NQP (Nq) is 0.0466, the maximum value is 1.7246, and the mean is 0.7701. The significant difference between the minimum and maximum values indicates that the level of NQP varies considerably across firms.

Table 3. Descriptive Statistics

VARIABLES	N	mean	sd	min	max
Nq	37,624	0.7701	0.3408	0.0466	1.7246
Data	37,624	22.9815	1.2311	20.7433	27.8309
size	37,624	22.3211	1.3377	18.8563	27.3125
Lev	37,624	0.4533	0.2025	0.0628	1.0670
Cash	37,624	0.1709	0.1168	0.0064	0.6099
Age	37,624	2.8539	0.3516	1.7918	3.4965
Growth	37,624	2.0382	1.3030	0.8393	8.4864
SOE	37,624	0.4041	0.4907	0.0000	1.0000

5.2. Baseline Regression Results and Analysis

Table 4 presents the regression results of data assets and NQP. As shown in the table, a nonlinear relationship exists between data assets and corporate NQP under different specifications of control variables, which is consistent with the conclusions of the theoretical analysis above. The turning point of the U-shaped curve can be derived from Equation (1). Taking column (4) as an example, when $\text{Data} = -0.1595 / (2 \times 0.0034) = 23.4559$, corporate NQP reach their minimum point. Specifically, holding other factors at their average levels, when data assets exceed 23.4559, data assets contribute to the enhancement of corporate NQP; when data assets are below 23.4559, data assets have an inhibiting effect on the enhancement of corporate NQP. Comparing the calculated turning point with the mean level of actual data assets in Table 3 (22.9815), it can be concluded that more than half of the firms have not yet entered the stage where data assets empower the enhancement of NQP. This indicates that the overall level of data asset holdings in the sample is relatively low, which is consistent with the actual situation in China. Firms should accelerate the exploration of the potential of data assets to empower the development of corporate NQP.

Table 4. Baseline Regression

VARIABLES	(1)	(2)	(3)	(4)
Data	-0.2283***	-0.1785**	-0.1581**	-0.1595**
	(-3.0967)	(-2.4182)	(-2.1306)	(-2.1463)
Data2	0.0057***	0.0037**	0.0033**	0.0034**
	(3.5815)	(2.3279)	(2.0575)	(2.0911)
size		0.0606***	0.0606***	0.0597***
		(8.7631)	(8.7565)	(4.3747)
Lev		-0.0763***	-0.0730***	-0.0738***
		(-3.9521)	(-3.7153)	(-3.5769)
Cash			-0.0070	-0.0069
			(-0.3152)	(-0.3075)
Age			-0.1089***	-0.1096***
			(-3.0286)	(-3.0547)
Growth				-0.0003
				(-0.0610)
SOE				0.0072
				(0.5664)
Constant	3.0082***	1.5777*	1.6406*	1.6655*
	(3.5098)	(1.7958)	(1.8580)	(1.8915)
Observations	37,624	37,624	37,624	37,624
Adjusted R ²	0.7048	0.7075	0.7079	0.7079
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively; t-values are reported in parentheses. The same applies to the following tables.

By identifying the level of data asset holdings corresponding to the lowest point of the U-shaped curve, it is not difficult to assess the actual effect of each firm's use of data assets in promoting the development of NQP. For firms with relatively low levels of data asset holdings (i.e., those before reaching the minimum point of NQP), they should actively respond to the Digital China initiative, place greater emphasis on enhancing their future growth capacity, and increase their investment in data assets. For firms with relatively high levels of data asset holdings (i.e., those after passing the minimum point of NQP), they may focus on how to fully leverage the advantages of "data elements ×" to maximize the value and optimize the efficiency of data assets, thereby boosting the development of corporate NQP.

5.3. Robustness Tests

5.3.1. Instrumental Variable Approach

Following the approach[27], this paper constructs instrumental variables using the cross-year and cross-industry mean of data assets (mean_Data) and its squared term (Data2) after processing. This approach is justified for two reasons. First, if the current period data assets of other firms in the same industry are at a relatively high level, this will incentivize a firm to increase its investment in digital assets to strengthen its competitive advantage, thereby satisfying the relevance condition of the instrumental variable. Second, given that the enhancing effect of data assets of competing firms on corporate innovation efficiency exhibits a significant lag, this effectively mitigates endogeneity concerns and meets the theoretical requirements of the exogeneity assumption. As shown in Table 5, in the second-stage regression results after employing the instrumental variables, the coefficient of Data² remains positive and significant at the 1% level, indicating that the nonlinear relationship still holds.

Table 5. Instrumental Variable Approach

VARIABLES	(1)Stage1	(2)Stage1	(3)Stage2
	Data	Data ²	Nq
Data			-3.2888*** (-8.3775)
Data ²			0.0692*** (5.2870)
mean_Data	0.3529*** (2.8352)	-11.2372* (-1.6735)	
mean_Data ²	-0.0072*** (-2.6793)	0.2648* (1.8311)	
Controls	YES	YES	YES
Firm FE	YES	YES	YES
Year FE	YES	YES	YES
Adjusted R ²	0.9901	0.9902	0.7108
Observations	37,252	37,252	37,252
F-value	—	—	29.51
R-squared	—	—	0.7388

5.3.2. Lagged Independent Variables

Considering that firms with higher levels of NQP may have greater demand for data assets and stronger incentives to hold them, a reverse causal relationship may exist between data assets and NQP. To mitigate this potential reverse causality, this paper employs one-period lagged values of the independent variables. The results in column (4) of Table 6 show that the nonlinear relationship between data assets and NQP still holds.

5.3.3. Replacement of the Core Independent Variable

This paper replaces the measurement of data assets (Data1). The results are shown in column (2) of Table 6, and the main conclusions of this paper remain unchanged.

5.3.4. Replacement of the Dependent Variable

This paper employs the OLS method to estimate total factor productivity (TFP_OLS) for robustness testing. As shown in column (3) of Table 6, the sign and significance of the coefficient of the squared term of data assets, the key explanatory variable, do not undergo fundamental changes, and the conclusions remain robust.

Table 6. Other Robustness Tests

VARIABLES	(1)	(2)	(3)
	Replacement of Core Independent Variable	Replacement of Dependent Variable	Lagged Variable Regress
Data		-0.3275*	-0.2352**
		(-1.6604)	(-2.5567)
Data ²		0.0096**	0.0047**
		(2.1972)	(2.3479)
Data1	-0.0646***		
	(-3.6791)		
Data1 ²	0.0177***		
	(3.3060)		
Controls	YES	YES	YES
Firm FE	YES	YES	YES
Year FE	YES	YES	YES
Observations	37,371	30,466	32,224
Adjusted R ²	0.7085	0.9361	0.7045

5.4. Heterogeneity Tests

5.4.1. Firm Ownership Type

Compared with non-state-owned enterprises, state-owned enterprises have access to more resources and policy support. However, due to their larger scale and greater resource consumption, state-owned enterprises are still in the period of accumulating investment in data assets, with relatively low levels of NQP and small variations. Moreover, because state-owned enterprises have stronger political and social objectives and are subject to stricter government supervision, their decision-making behavior is relatively prudent, which also weakens the effect of data assets on NQP. In contrast, the impact of data assets on corporate NQP exhibits a multiplier effect in non-state-owned enterprises. This is because non-state-owned enterprises have greater initiative and innovativeness in analyzing and managing data assets, and therefore have stronger incentives to explore and utilize data information to improve production efficiency. From the regression results in columns (1) and (2) of Table 7 and the results of the Utest, it is not difficult to conclude that the above predictions are supported.

5.4.2. Industry Technological Attribute

High-tech firms have a higher level of technological innovation, better basic conditions for advanced technology research, development, and application, and greater advantages in the analysis and utilization of digital technologies. They can fully exploit the potential of data assets in a short period[28]to enhance corporate NQP. At the same time, from the perspective of resource demand, high-tech firms primarily deal with high-tech products and require continuous innovation. They have a rigid demand for using data assets to improve production efficiency, whereas non-high-tech firms have a relatively lower demand for data assets.

Therefore, the level of data asset holdings in non-high-tech firms has no direct impact on their NQP, while the impact of data asset holdings on NQP in high-tech firms exhibits a multiplier effect. From the results in columns (3) and (4) of Table 7 and the results of the Utest, it can be concluded that the findings are consistent with the predictions.

5.4.3. Regional Digital Infrastructure Construction

Digital infrastructure provides a supporting platform for realizing the development of NQP[16]. This paper constructs grouping variables representing regional digital infrastructure based on the differentiated macro environments of the regions where firms are located. First, the accumulation and utilization of data assets depend on the construction of digital infrastructure, which helps firms fully integrate various production factors across all links of economic operations, enhance technological interoperability, and significantly improve production efficiency. Second, digital infrastructure construction provides a trading platform for the coordinated development of data circulation, transaction, design, and services[29], as well as a platform for the flow of various production factors among firms, promoting cooperation and mutual benefit and achieving improvements in productivity levels. Finally, digital infrastructure can effectively ensure data security by improving the compliance and transparency of business processes, thereby providing long-term safeguards for the development of corporate NQP. Therefore, for firms located in regions with a relatively low level of digital infrastructure construction, the level of data asset holdings has no direct impact on NQP. In contrast, for firms located in regions with a relatively high level of digital infrastructure construction, the impact of data asset holdings on NQP exhibits a multiplier effect. From the regression results in columns (5) and (6) of Table 7 and the results of the Utest, it can be seen that the above predictions are supported.

Table 7. Heterogeneity Analysis Results

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Non-State-Owned Enterprises	State-Owned Enterprises	Non-High-Tech	High-Tech	Low Level of Digital Infrastructure	High Level of Digital Infrastructure
Data	-0.2941***	-0.2763**	-0.0540	-0.1665	-0.1245	-0.2136*
	(-3.1690)	(-2.2529)	(-0.5357)	(-1.6319)	(-1.4304)	(-1.8808)
Data ²	0.0071***	0.0052**	0.0013	0.0039*	0.0028	0.0046*
	(3.4936)	(1.9939)	(0.5943)	(1.7636)	(1.5188)	(1.8413)
Lower bound's Slope	-0.0004	-0.0612***	-0.0004	-0.0051	-0.0067	-0.0245
Upper bound's Slope	0.0999***	0.0122	0.0179	0.0500**	0.0336	0.0401*
Controls	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	21,981	14,972	16,927	17,526	18,699	18,060
Adjusted R ²	0.6965	0.7375	0.7012	0.7351	0.6999	0.7147

6. Conclusion

As a crucial strategic resource for firms, data assets play an extremely important role in promoting their long-term development and even the sustained growth of the national economy. Based on data from Chinese A-share listed companies from 2009 to 2024, this paper examines the impact of corporate data assets on NQP. The study finds a nonlinear dynamic relationship between data assets and NQP, characterized by an inhibiting effect at low levels of data assets and a promoting effect at high levels of data assets. This conclusion remains robust under various robustness tests, including the replacement of explanatory variables and the use of lagged variables. Furthermore, the promoting effect of data assets on NQP is more

pronounced in non-state-owned enterprises, high-tech industries, and firms located in regions with a higher level of digital infrastructure.

The findings of this paper yield the following policy implications. First, firms should thoroughly assess their own development conditions and internal characteristics to fully leverage the enhancing effect of data assets on NQP. In the early stage of holding data assets, firms need to invest certain resources and time, and may encounter difficulties in coordinating with existing management models in the short term, which may affect the enhancement of NQP to some extent. Therefore, firms should carefully consider their actual circumstances, including whether they have sufficient financial and time reserves and whether they can accept the short-term decline in NQP.

Second, guidance and encouragement should be provided to firms to rationally plan and utilize data assets, thereby empowering the high-quality development of the digital economy. Governments should provide guidance and support to firms in the initial stage of data asset circulation and use, offering preferential policies such as R&D subsidies and appropriately relaxed financing conditions to help firms more quickly reap the benefits of data assets, accelerate the development of NQP, and steadily advance high-quality development. On the other hand, firms should recognize the key role of data assets in enhancing NQP and accelerate the use of data assets to analyze production, R&D, marketing, and other links, thereby effectively improving total factor productivity. At the same time, firms should focus on cultivating interdisciplinary and cross-domain digital talent, improve their management capabilities and adaptability, and build a more efficient, secure, and orderly data asset management framework to accumulate momentum and empower the development of NQP.

Third, the management mechanism and regulatory system for data assets should be optimized, relying on digital infrastructure construction and actively cultivating digital talent to provide a high-quality external environment for the development of corporate NQP. Governments should improve laws, regulations, and policies concerning data assets, clarify ownership and transaction rules, and protect data security and privacy. A regulatory mechanism for data assets should be established to strengthen supervision and management, preventing data leakage and misuse. Investment in digital infrastructure should be increased to enhance its efficiency and security. The cultivation and introduction of digital talent should be promoted to improve professional competence and practical capabilities. Through these measures, the data asset management mechanism and regulatory system can be optimized.

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