

A Study on the Impact of Computing Infrastructure Development on Corporate Resilience

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Abstract. Computing infrastructure serves as a new digital foundation driving high-quality economic development, whilst corporate resilience constitutes the line of defence for micro-entities against external shocks. This paper utilises data on A-share listed companies from 2013 to 2024, using the number of IDC licences in prefecture-level cities as a proxy for the level of computing infrastructure, and employs a fixed-effects model to empirically test its impact on corporate resilience. The study finds that the development of computing power infrastructure significantly enhances corporate resilience, a conclusion that remains valid following robustness tests. Mechanism tests indicate that digital transformation and risk-taking levels are two key pathways; heterogeneity analysis reveals that this effect is more pronounced in state-owned enterprises and firms in the eastern region; and the level of marketisation of data as a production factor plays a positive synergistic role in this process. This paper broadens the research perspective on the economic consequences of computing power infrastructure, providing micro-level empirical support for advancing the construction of a nationwide integrated computing power network and balancing development with security during the 15th Five-Year Plan period. It is recommended that the government continue to increase investment in computing power infrastructure, refine incentive mechanisms for digital transformation, accelerate reforms towards the market-based allocation of data as a production factor, and implement differentiated policies to prevent a structural ‘resilience gap’.

Keywords: Computing power infrastructure development; corporate resilience; digital transformation; risk-taking.

1. Introduction

In the digital age, computing power has become a key engine driving economic and social development. The report of the 20th National Congress of the Communist Party of China explicitly called for “accelerating the development of the digital economy and promoting the deep integration of the digital economy with the real economy,” elevating the construction of a Digital China to the level of a national strategy. In February 2023, the Central Committee of the Communist Party of China and the State Council issued the “Overall Planning for the Construction of a Digital China,” designating digital infrastructure as one of the two cornerstones of Digital China’s development. The “Outline of the 15th Five-Year Plan for National Economic and Social Development of the People’s Republic of China,” released in March 2026, further advanced the development of digital infrastructure by dedicating an entire chapter to “Enhancing the Level of Digital and Intelligent Development”; it emphasized the need to strengthen computing power infrastructure, promote the efficient supply of computing power, algorithms, and data, and build a multi-tiered computing power facility system and a nationwide integrated computing power network. General Secretary Xi Jinping has also repeatedly emphasized the need to “accelerate the construction of new infrastructure” and “unblock the information ‘arteries’ of economic and social development.” It is evident, therefore, that at the level of public governance, computing infrastructure has gradually become a new type of public good with significant positive externalities. The optimization of its layout and improvement of its quality is being given high priority, with the aim of providing solid support for the high-quality development of the Chinese economy. However, in a development environment marked by the restructuring of global industrial chains, intensifying geopolitical rivalries, and the complex interplay of various public emergencies, some enterprises have exposed resilience shortcomings—such as inefficient resource allocation, slow supply chain responses, and insufficient resilience and recovery

capabilities—in the face of external shocks. So, can the development of computing power infrastructure—on which high hopes are pinned—effectively enhance enterprises’ ability to withstand risks and resume development? A scientific assessment of this issue holds significant practical and strategic importance for modernizing the national governance system and achieving high-quality enterprise development.

Existing literature has explored the economic consequences of the digital economy and digital infrastructure development, as well as their multidimensional impacts on enterprises, from multiple perspectives; however, research focused on examining the institutional effects of computing power infrastructure—a specific public good—in responding to external risks remains in its infancy. For example, Xiong Ran and Zhang Chengcheng [1] utilized the “Broadband China” pilot policy as a quasi-natural experiment and found that digital infrastructure development significantly enhanced a city’s attractiveness to foreign investment by mitigating the withdrawal of existing foreign capital and expanding market size. Zou Ying et al. [2] provided empirical evidence that digitalization enhances corporate resilience during crises. Li Ning et al. [3], based on tests using a dual machine learning approach, found that computing power development has a significant impact on carbon reduction and efficiency gains, and that this impact exhibits heterogeneity across regions. Research by Su Zi et al. [4] indicates that the digital economy can significantly drive the transformation and upgrading of industrial structures in cities along the Yellow River basin but exhibits characteristics of uneven spatial distribution. Overall, there is still a scarcity of research that directly takes computing power infrastructure development as its entry point to systematically examine how it influences corporate resilience at the institutional and managerial levels. Based on this, this paper will utilize data from Chinese A-share listed companies from 2013 to 2024 to empirically test the impact of computing power infrastructure development on corporate resilience and its underlying institutional transmission mechanisms.

Theoretically, computing infrastructure development may have a positive impact on corporate resilience. From a public administration perspective, as a new type of public good led by the government, the ongoing development and improvement of computing infrastructure is inherently accompanied by an overall leap in local governments’ digital governance capabilities. On the one hand, the enhancement of computing infrastructure helps governments build efficient cross-regional data transfer and intelligent response platforms, significantly improving their ability to allocate resources and implement targeted policies when responding to public emergencies. This enhancement in digital governance capabilities can indirectly provide enterprises with an institutional “buffer” against external shocks by optimizing the regional business environment and reducing institutional transaction costs [5]. On the other hand, the spillover effects of computing infrastructure can accelerate enterprises’ digital transformation. Research by Yan Zhijun et al. [5] found that the development of digital infrastructure can enhance corporate resilience by strengthening firms’ dynamic capabilities (including environmental awareness, opportunity capture, and resource reconfiguration). Therefore, the deployment of computing infrastructure is, in fact, the result of the combined effects of institutional supply and technological progress; by optimizing the public governance environment and stimulating firms’ dynamic capabilities, it can positively reinforce their risk resilience and recovery capacity.

However, the development of computing infrastructure may also have a dampening effect on corporate resilience. First, from the perspective of institutional economics, large-scale computing infrastructure development often requires local governments to invest substantial public resources in the short term, which may create a crowding-out effect on existing public services and industrial support funds, thereby exacerbating financing constraints for some small and medium-sized enterprises in the short term. Li Qiang [6], using provincial panel data from 1980 to 2010, confirmed that infrastructure investment has a significant crowding-out effect on human capital accumulation. Second, policy implementation by the government in promoting computing infrastructure development may be uneven across regions—developed regions in the east have accelerated the iteration of digital governance by leveraging their first-mover advantage, while enterprises in regions

with weaker institutional environments in the central and western parts of the country may face higher adaptation costs and institutional friction due to the widening “digital divide.” Furthermore, the regulation of socioeconomic activities by computing infrastructure networks implies a significant enhancement of the government’s capacity to collect, monitor, and govern enterprise data. Without corresponding institutional checks and balances, this “digital Leviathan”-style expansion of governance may, to some extent, dampen enterprises’ willingness to experiment through trial and error in innovation activities, thereby weakening their flexibility in the face of uncertainty.

The above analysis indicates that the direction of the impact of computing infrastructure development on corporate resilience is uncertain, with both positive governance-empowering effects and negative institutional friction effects coexisting; empirical research is urgently needed to test these hypotheses. To this end, this paper uses data from Chinese A-share listed companies from 2013 to 2024. It employs the number of Internet Data Center (IDC) operating licenses held by prefecture-level cities as a proxy for the level of regional computing infrastructure development and empirically tests its impact on corporate resilience. The study finds that computing infrastructure development significantly enhances corporate resilience; specifically, the improvement of computing infrastructure effectively reduces the volatility of corporate stock returns and strengthens firms’ ability to withstand external shocks and resume growth. This conclusion remains valid after a series of robustness tests, including lagging the explanatory variable by one period, excluding samples with abnormal volatility in 2015, and controlling for high-dimensional fixed effects. Mechanism tests reveal that computing infrastructure development primarily enhances corporate resilience through two pathways: promoting digital transformation and increasing firms’ risk-taking capacity. Heterogeneity analysis indicates that these positive effects are more pronounced among state-owned enterprises and firms in the eastern region. Furthermore, by introducing the level of data factor marketization as a moderating variable, this study finds that it plays a significant positive moderating role in the process by which computing infrastructure enhances corporate resilience. Specifically, the smoother the flow of data factors and the higher the degree of marketization in a firm’s region, the more pronounced the effect of computing infrastructure development on enhancing the firm’s risk-bearing capacity. These results are consistent with the theoretical logic that computing infrastructure enhances corporate resilience through digital transformation and increased risk-taking.

The contributions of this paper are primarily reflected in the following three aspects: First, this paper broadens the research perspective on the economic consequences of computing infrastructure. Existing literature on the economic consequences of computing infrastructure primarily focuses on corporate digital transformation [7], total factor productivity [8], and market entry into future industries [9]—all dimensions related to efficiency growth. In contrast, this paper shifts the research perspective to the risk prevention dimension of corporate resilience, revealing the unique role of computing infrastructure as a tool of national governance in ensuring the secure operation of enterprises and enhancing the resilience of the economic system. Second, this paper deepens the understanding of the mechanisms through which computing power infrastructure influences the capabilities of micro-level actors. Existing research on corporate resilience has explored pathways to shaping corporate resilience from perspectives such as the assumption of social responsibility [10], the market-based allocation of data as a production factor [11], and digital transformation [11]. This paper, however, approaches the issue from the perspective of the supply of computing power infrastructure as a strategic national public good, systematically examining two mechanism pathways—corporate digital transformation and risk-bearing levels—thereby providing micro-level empirical support for the analysis of the security utility of digital public goods. Third, the findings of this study hold significant practical implications. Against the backdrop of the computing power network being incorporated into the national “Six Networks” strategic infrastructure framework—which is set to receive trillions in investment over the coming years—this study finds that the construction of computing power infrastructure has a more pronounced effect on enhancing the resilience of state-owned enterprises and firms in eastern China. This implies that, in advancing the nationwide integrated computing power network layout, attention must be paid to the differences in

capacity among enterprises with varying ownership structures and regional endowments when it comes to reaping the benefits of computing power. In particular, through the coordinated advancement of inclusive computing power supply, digital talent development in central and western regions, and market-oriented reforms of the data factor market, we should avoid the structural resilience gap that may result from the uneven distribution of computing power resources. This will ensure that computing power infrastructure is truly established as a strategic cornerstone for the nation to balance development and security and enhance the resilience of the economic system.

The structure of this paper is as follows: Part II covers the institutional background and theoretical analysis; Part III outlines the research design; Part IV presents the main empirical tests and analysis; Part V explores further mechanism tests and heterogeneity analysis; and Part VI concludes with policy recommendations.

2. Literature Review

2.1. Research on Computing Infrastructure Development

As a new type of public good in the digital age, computing infrastructure is assuming an increasingly prominent strategic role. From the perspective of policy evolution, a joint reply issued in 2022 by four ministries, including the National Development and Reform Commission, officially launched the “East Data, West Computing” initiative, marking the entry of spatial optimization of computing resources into a phase of national coordination; The 2024 and 2025 Government Work Reports both emphasized “building digital infrastructure with moderate foresight and accelerating the formation of a nationwide integrated computing power system,” highlighting the instrumental value of computing power infrastructure as a lever for stabilizing economic growth; The “15th Five-Year Plan” Outline, released in 2026, went a step further by dedicating an entire chapter to “Enhancing the Level of Digital and Intelligent Development,” explicitly calling for the construction of a multi-tiered computing infrastructure system and a nationwide integrated computing network. As a result, the strategic status of computing infrastructure has been elevated from a technical support element to the foundation of modern governance. This policy trajectory indicates that computing infrastructure is no longer confined to the technical or industrial spheres but is closely linked to the stable operation of the socio-economic system. However, existing policy discourse largely focuses on the scale expansion and spatial balance of computing power supply. There remains a lack of systematic explanation and argumentation regarding how computing power infrastructure can be integrated into the risk response and recovery processes of socioeconomic systems, and whether it can effectively enhance the ability of micro-level entities to withstand external shocks. This research gap constitutes the logical starting point of this paper.

At the academic level, the economic effects of computing infrastructure development have attracted widespread attention, with numerous studies delving deeply into this topic from the perspective of efficiency gains. Based on data from companies listed on the Shanghai and Shenzhen A-share markets from 2011 to 2022, Cui Jinghua and Li Bin [12] found that improvements in computing infrastructure development can significantly promote corporate digital transformation. The underlying mechanism is that computing infrastructure exerts resource and governance effects, driving digital transformation by enhancing corporate long-term value and altering corporate disclosure behavior. Zheng Guoqiang [13] similarly found that computing infrastructure development can effectively promote innovation in firms’ key core technologies. The mechanism behind this lies in guiding firms to increase R&D investment, raise their level of proactive risk-taking, and improve market expectations. Zhang Yingying and Mi Xuming [14], based on data on telecommunications business operating licenses from 2007 to 2024, further confirmed that the driving effect of computing infrastructure development on corporate innovation in key core technologies is more pronounced in firms characterized by lower economic policy uncertainty, superior urban innovation ecosystems, and higher levels of digital transformation; government fiscal investment in science and technology and the process of marketization play a synergistic supporting role in the innovative effects of computing

infrastructure. Wang Lei, Chen Donglin, and Wang Jiancheng [15] measured the level of computing infrastructure development across Chinese provinces from a spatial perspective, finding significant differences among regions and a trend of dynamic convergence driven by the “East Data, West Computing” strategy. Wang Hua and Tan Xinyu [7], approaching the issue from the perspective of corporate digital transformation, found that the deployment of computing infrastructure can effectively break down internal information silos within enterprises, driving them to achieve a leap in digital capabilities at both the strategic and substantive levels. Xu Nuo et al. [8], focusing on cross-regional data flow, found that intelligent computing centers can endow enterprises with “real-time responsiveness” and “value extraction capabilities,” significantly enhancing enterprises’ total factor productivity by capturing the “immediate value” and “latent value” of data elements. Meanwhile, the cross-regional data flow resulting from the geographically dispersed deployment of intelligent computing centers helps amplify this promotional effect, validating the theoretical logic that externalizing computing power for value extraction and directing data flow toward regions with lower factor acquisition costs are more conducive to improving total factor productivity. Yu Xiaoyu [16] explored the evolutionary logic from “East Data, West Computing” to “East Data, West Training” at the macro-strategic level, proposing that the optimization of computing power deployment is closely linked to the enhancement of national governance capabilities. Sun Boyue, Yu Binbin, and Hu Yajing [17], from the perspective of corporate financialization, found that the construction of computing power infrastructure can effectively curb enterprises’ tendency to “shift from the real economy to the virtual economy” and guide them back to developing their core businesses. Research by Mao Fengfu, Wei Yafei, and Gao Yuchen [18] similarly validated the role of computing power infrastructure in promoting corporate digital transformation, noting that this effect is particularly pronounced among firms with weaker digital foundations. Wang Hua and Tan Xinyu’s [7] study on computing power infrastructure and new-quality productive forces indicates that investment in computing power infrastructure significantly enhances enterprises’ levels of new-quality productive forces by improving their digital and intelligent capabilities and the quality of internal controls. The aforementioned studies reveal from various perspectives that this infrastructure—which underpins economic and social operations in the digital age—is profoundly reshaping corporate behavior through channels such as technological empowerment, cost optimization, and governance improvements. However, overall, these studies have focused more on the incremental impacts of computing infrastructure—such as its effects on corporate efficiency growth and improvements in digitalization levels—while systematic micro-level empirical tests regarding its ability to enhance corporate resilience—that is, a firm’s capacity to maintain operations and withstand risks in the face of external shocks—remain lacking.

Regarding the mechanisms through which computing infrastructure influences corporate behavior, existing research has identified several important theoretical channels. The study by Chao Xiaojing, Shen Lu, and Guo Huiling [19] found that computing infrastructure primarily promotes technological convergence in the real economy through two channels: the marketization of data as a production factor and distributed innovation; an increase in the level of data marketization is a key condition for computing infrastructure to unlock the value of information and tap into the value of knowledge. This study provides important insights into understanding the micro-level transmission mechanisms of computing power infrastructure: if the development and improvement of computing power infrastructure can create a stable and predictable business environment for enterprises by optimizing the effectiveness of government digital governance and reducing regional institutional transaction costs, then its empowering effect on corporate resilience may exhibit differentiated characteristics among enterprises with different property rights structures and regional endowments. Specifically, state-owned enterprises, leveraging their resource endowments and policy coordination advantages, may be better positioned to reap the governance dividends brought by computing power infrastructure; in the eastern regions, supported by a well-developed digital industrial ecosystem, the efficiency of computing power resource conversion may also be higher. This logic aligns closely with the theoretical framework presented in this paper—which posits that computing power infrastructure

influences corporate resilience by optimizing public governance effectiveness—and provides empirical support for the heterogeneity analysis discussed later in the paper.

2.2. Review of Research on Corporate Resilience

Corporate resilience—that is, a firm’s ability to withstand external shocks and recover and develop in the aftermath—has in recent years become a hot topic of interdisciplinary research spanning organizational management, public administration, and economics [20]. Against the backdrop of the VUCA (Volatility, Uncertainty, Complexity, Ambiguity) era, drastic fluctuations in the external environment pose severe challenges to corporate survival and development; the question of how to enhance corporate resilience is gradually replacing profit maximization as the core objective pursued by enterprises [2].

Regarding the conceptual framework and measurement methods of corporate resilience, a rich body of academic discussion has emerged. Tian Guanghui, Miao Changhong, Hu Zhiqiang, et al. [20] systematically reviewed research progress on regional economic resilience and constructed an analytical framework for resilience based on four dimensions—resistance, recovery, adaptation, and transformation—providing an important theoretical foundation for understanding corporate resilience in this paper. Rong Zhi and Gong Zixing [21], drawing on institutional, policy, and organizational dimensions, proposed an integrated theoretical framework for understanding resilience governance, providing methodological support for research on resilience issues from a public management perspective. Zhang Gongyi, Zhang Chang, and Liu Wanqing [22] conducted a systematic review and outlook on research into organizational resilience, pointing out that organizational resilience is a critical prerequisite for organizations to turn crises into opportunities, with its core components encompassing multiple dimensions at the cognitive, capability, and resource levels. At the empirical level, this paper draws on the approach of Chen Junhua, Hao Shuya, and Yi Cheng [23] by calculating stock return volatility using the intra-year standard deviation of monthly stock returns, thereby indirectly measuring a firm’s level of resilience. The theoretical rationale for this method lies in the fact that the real-time nature of market-based indicators, such as stock prices, effectively reflects a firm’s ability to recover after encountering crises or facing operational challenges; lower volatility indicates greater operational stability and higher levels of resilience.

Regarding the factors influencing corporate resilience, existing research has conducted in-depth explorations from multiple perspectives. Zou Ying, Shi Fu’an, and Wu Yubin [2] used smart city pilot projects as a pioneering exploration of “new infrastructure,” and used a multi-period difference-in-differences model to examine the relationship between New Infrastructure and corporate resilience. They found that “New Infrastructure”—centered on “information infrastructure, integrated infrastructure, and innovation infrastructure”—significantly enhances corporate resilience by improving supply chain governance through the information-empowerment effect, accelerating industrial chain integration through the resource-empowerment effect, and promoting value chain restructuring through the innovation-empowerment effect. Moreover, this effect is stronger in regions with lower levels of financial development and in companies with lower information transparency. Zhang Gongyi, Zhang Chang, and Liu Siwen [24] explored the influence pathways, mechanisms, and response strategies of organizational resilience in the context of environmental uncertainty, providing theoretical guidance for understanding how enterprises build resilience in dynamic environments. Guo Ye, Zhao Hao, and Chen Haiqiang [10], using the COVID-19 pandemic as a major sudden public health emergency, found that firms with higher levels of social responsibility demonstrated greater resilience in the face of the shock. The mechanism underlying this finding is that stakeholder support played a critical protective role in employee productivity and business relationships with customers and suppliers. Li Liangang, Zhang Pingyu, Tan Juntao, et al. [25], starting from the historical evolution of the concept of resilience, systematically reviewed research progress on regional economic resilience, providing a conceptual foundation for resilience research.

Regarding the pathways to shaping corporate resilience, digital transformation and the enhancement of innovation capabilities are widely recognized as two key channels. Chen Junhua,

Hao Shuya, and Yi Cheng [23], in their study on digital transformation, bankruptcy risk, and corporate resilience, found that digital transformation can significantly reduce corporate bankruptcy risk and enhance corporate resilience by optimizing the efficiency of resource allocation and improving organizational flexibility. Yang Tingqian, Chen Yanqing, and Zhou Jiali [26], drawing on dynamic capabilities theory, resource-based theory, and stakeholder theory, constructed a dual-mediation model examining the impact of corporate digital transformation on organizational resilience. They found that corporate digital transformation significantly enhances organizational resilience, with corporate profits and firm size exerting partial mediating effects; furthermore, this impact exhibits significant differences across firms of varying nature, geographic location, and age. Zhang Jie and Fan Yuting [27] examined the relationship between innovation investment and corporate resilience, exploring the underlying mechanisms and synergies within industrial chains. They found that innovation investment significantly enhances corporate resilience by improving firms' dynamic adaptability and resource reconfiguration capabilities, and that this effect is more pronounced among firms with close ties within industrial chains. Zhao Qingguo and Yao Yuxi [28], adopting an innovation-based perspective, found that corporate digital transformation significantly enhances resilience, with both innovation efficiency and innovation quality playing partial mediating roles in this effect. Furthermore, the market-based allocation of data as a production factor is also regarded as a key institutional factor influencing corporate resilience. Gu Cheng, Zhang Shushan, Zhang Peiwen, et al. [11], using the establishment of regional data trading platforms as a quasi-experiment, found that the market-based allocation of data as a factor of production can effectively promote the enhancement of corporate resilience through three mechanisms: improving credit availability, alleviating supply chain dependence, and incentivizing corporate innovation.

In summary, existing literature has revealed the multidimensional characteristics of computing power infrastructure from perspectives such as its public good attributes, technological spillover effects, and regional imbalances, and has confirmed its positive impact on corporate digital transformation, innovation in key core technologies, and the cultivation of new-quality productive forces. In the field of corporate resilience research, scholars have conducted extensive discussions from dimensions such as resource acquisition, dynamic capabilities, digital transformation, risk-taking, and stakeholder support. However, literature directly examining how computing infrastructure development affects corporate resilience remains relatively limited, particularly lacking studies that integrate the public governance attributes of computing infrastructure with the micro-level formation mechanisms of corporate resilience. Existing literature has neither reached a unified conclusion regarding the direction of computing infrastructure's impact on corporate resilience nor revealed its intrinsic transmission mechanisms from the dual perspectives of digital transformation and risk-taking; furthermore, it lacks an examination of the synergistic regulatory effects of the marketization of data as a production factor. Based on data from Chinese A-share listed companies from 2013 to 2024, this paper uses the number of IDC licenses in prefecture-level cities to characterize the level of computing infrastructure development, systematically examines the impact of computing infrastructure on corporate resilience and its transmission mechanisms through digital transformation and risk-taking levels. It also investigates the heterogeneous characteristics of state-owned enterprises and those in the eastern region, as well as the moderating effects of the marketization of data as a production factor, with the aim of providing new empirical evidence for understanding the microeconomic consequences of computing infrastructure and improving the digital governance system.

3. Research Hypotheses

The large-scale deployment of computing infrastructure provides enterprises with low-threshold, high-efficiency underlying data processing capabilities and serves as a key engine driving enterprises toward digital and intelligent upgrades. However, whether this technological empowerment can truly translate into enterprises' ability to withstand external risks depends on whether enterprises can

effectively absorb computing resources and embed them into their organizational operational processes. Cui Jinghua and Li Bin [12] found that computing infrastructure exerts both resource and governance effects, significantly promoting corporate digital transformation; Mao Fengfu et al. [18] also confirmed that computing infrastructure accelerates the intelligent restructuring of corporate business processes by optimizing the allocation of digital resources.

By restructuring corporate information processing workflows, digital transformation can significantly break down internal information silos, reduce information asymmetry, and enhance the efficiency of resource allocation and dynamic responsiveness. Jiang Luan et al. [29] found that digital transformation effectively enhances corporate resilience by improving levels of exploratory and exploitative innovation; Chen Junhua et al. [23] confirmed that digital transformation significantly reduces the risk of corporate bankruptcy by optimizing resource allocation efficiency; Fan Hejun et al. [30] pointed out that digital transformation significantly enhances a company's ability to recover from crises by improving its agility.

Corporate resilience is, in essence, an organization's ability to maintain operations, recover quickly, and achieve growth against adverse conditions in an uncertain environment; this relies heavily on the quality of information access and the capacity for dynamic adjustment. Zou Ying et al. [2] point out that "new infrastructure," centered on information infrastructure, improves supply chain governance and accelerates industrial chain integration through its information-empowerment effect, thereby significantly enhancing corporate resilience; Zhou Haifeng et al. [31] also provide empirical evidence that digitalization enhances corporate resilience during crises. Consequently, the development of computing infrastructure, by promoting corporate digital transformation, optimizes enterprises' information processing capabilities and resource allocation efficiency, thereby significantly enhancing corporate resilience. Based on this, this paper proposes the following hypothesis:

H1: Computing infrastructure development has a significant positive effect on corporate resilience.

4. Empirical Design

4.1. Sample Selection and Data Sources

This study uses Chinese A-share listed companies from 2013 to 2024 as the initial research sample and processed the sample as follows: First, samples from the finance and insurance sectors were excluded; second, samples with missing variable data were excluded; third, samples classified as ST, *ST, or PT were excluded; fourth, to mitigate the impact of outliers, this study truncated all continuous variables at the 1% quantile at both the upper and lower ends.

4.2. Definitions of Key Variables

4.2.1. Dependent variable: Corporate resilience (RES)

Following the approach of Chen Junhua et al. [23], Hu Haifeng et al. [31], and Albuquerque et al. [32], this study calculates stock return volatility using the intra-year standard deviation of monthly stock returns to measure the level of corporate resilience. Given that real-time market indicators such as stock prices effectively reflect a firm's ability to recover after encountering crises or facing operational challenges during the year, this study uses this volatility as a proxy for a firm's operational stability. It should be noted that this measurement method is a contrarian indicator; that is, the smaller the calculated value, the lower the firm's earnings volatility and the greater its stability, indicating a higher level of resilience.

4.2.2. Core Explanatory Variable: Computing Power Infrastructure Level (IDC)

Following the approach of Xu Nuo et al. [8], Sun Boyue et al. [17], Wang Hua and Tan Xinyu [7], and Zhang Yingying and Mi Xuming [14], this study uses the number of Internet Data Center (IDC) operating licenses held by prefecture-level cities to characterize the level of regional computing

infrastructure development. Additionally, to account for the skewed distribution of the data, this study applies a natural logarithm transformation.

4.2.3. Control Variables for

To minimize endogeneity issues and estimation biases caused by omitted variables, this paper follows the paradigm of existing relevant research and incorporates a series of control variables that may affect corporate resilience into the econometric model. Specifically, these include: firm size (Size), debt-to-equity ratio (Lev), return on assets (Roa), market value (Tbq), firm age (Age), the largest shareholder's ownership stake (Top1), board size (Board), proportion of independent directors (Indep), dual-role arrangement (Dual), and Big Four audit firm (Big4). The specific definitions and measurement methods for each variable are detailed in Table 1.

Table 1. Variable Definitions.

Type	Variable Name	Symbol	Variable Measure
Dependent Variable	Corporate Resilience	RES	Annual Volatility
Explanatory Variables	Computing Infrastructure Development	IDC	Natural logarithm of the number of IDCs in prefecture-level cities
	Enterprise Size	Size	Natural logarithm of a firm's total assets at year-end
	Debt-to-Asset Ratio	Lev	Total Liabilities at Year-End / Total Assets
	Return on Total Assets	ROA	Net Income at Year-End / Total Assets
	Market Value	TBQ	Tobin's Q
	Company Age	Age	The natural logarithm of the difference between the observation year and the year the firm went public
	Shareholding Concentration	Top 1	Shareholding ratio of the largest shareholder
Control Variables	Board Size	Board	Natural logarithm of the number of board members
	Proportion of Independent Directors	Indep	Number of independent directors / Total number of board members
	Dual Role	Dual	Is the Chairperson and the General Manager the same person?
	Big Four Audit	Big 4	Audited by a Big Four firm

4.3. Model Specification

To further examine the impact of computing infrastructure development on corporate resilience, this paper constructs the following fixed-effects regression model:

$$RES_{it} = \alpha_0 + \alpha_1 IDC_{it} + \alpha_h \sum Control_{it} + FirmFE + YearFE + \varepsilon_{it} \quad (1)$$

Where the dependent variable is firm *i*'s corporate resilience (RES) in period *t*, the key independent variable is firm *i*'s computing power infrastructure development (IDC) in period *t*, *Control_{it}* is the set of control variables, *FirmFE* is the firm-specific fixed effect, *YearFE* is the time-specific fixed effect, and ε_{it} is the random error term. Given that the firm resilience indicator in this study employs a reverse measure (i.e., the lower the volatility of stock returns, the stronger the firm resilience), if the regression coefficient is significantly negative, it indicates that computing infrastructure development can significantly enhance firm resilience; conversely, it suggests that it weakens firm resilience.

At the same time, drawing on Jiang Ting's [33] approach to mechanism testing, this study conducts a mechanism analysis using the following regression model:

$$Med_{it} = \beta_0 + \beta_1 IDC_{it} + \beta_h \sum Control_{it} + FirmFE + YearFE + \varepsilon_{it} \quad (2)$$

Where *Med_{it}* is the mechanism variable, and the other variables are the same as in the baseline regression model described above.

5. Analysis of Empirical Results

5.1. Descriptive Statistics

Table 2 presents the descriptive statistics for the main variables in this study. The dependent variable, corporate resilience (Res), has a mean of 0.1314, a median of 0.1165, and a standard deviation of 0.0677. Since this study uses stock return volatility as a reverse measure—where a smaller value indicates greater resilience—the results show that the risk-resistance capabilities of the sample firms are generally at a slightly above-average level. However, there is a significant gap between the maximum value (0.4255) and the minimum value (0.0414), reflecting the varying levels of resilience among different firms when facing uncertainty shocks. The mean value of the core explanatory variable, computing power infrastructure construction (IDC), was 3.5451, with a standard deviation of 2.0559, a minimum value of 0.0000, and a maximum value of 7.4708. This indicates significant imbalances and substantial regional disparities in the deployment of computing power infrastructure across different cities in China. Among the control variables, the mean value for firm size (Size) was 22.2672; the asset-liability ratio (Lev) had a mean of 0.4129, consistent with the capital structure characteristics of most listed companies; the “dual role” (Dual) variable had a mean of 0.3207, indicating that approximately 32.07% of firms have a chairman who also serves as general manager; and firms audited by the Big Four accounted for 6.05% of the sample. Overall, the statistical characteristics of all control variables fall within reasonable ranges and are generally consistent with the distributions reported in existing literature. Additionally, the VIF test results show that the VIF values for all variables are less than 5, indicating that the regression model does not suffer from severe multicollinearity.

Table 2. Descriptive Statistics.

Variable	Sample Size	Mean	Standard Deviation	Median	Minimum	Maximum
Res	40,178	0.1314	0.0677	0.0414	0.1165	0.4255
IDC	40,178	3.5451	2.0559	0.0000	3.5264	7.4708
Size	40,178	22.2672	1.2826	19.8713	22.0624	26.2058
Lev	40,178	0.4129	0.2043	0.0512	0.4031	0.8895
ROA	40,178	0.0318	0.0644	-0.2386	0.0344	0.1930
Tbq	40,178	2.0256	1.2715	0.8386	1.6137	8.0692
Age	40,178	2.0968	0.9122	0.0000	2.1972	3.4012
Top 1	40,178	0.3311	0.1470	0.0826	0.3073	0.7430
Board	40,178	2.2675	0.2563	1.6094	2.1972	2.8904
Indep	40,178	0.3864	0.0751	0.2500	0.3750	0.6000
Dual	40,178	0.3207	0.4668	0.0000	0.0000	1.0000
Big 4	40,178	0.0605	0.2384	0.0000	0.0000	1.0000

5.2. Benchmark Regression Results

Table 3 reports the results of the benchmark regression analyzing the impact of computing power infrastructure development on corporate resilience. In Column (1) of Table 3, this study controls only for year and firm-specific fixed effects; the results show that the regression coefficient for the core explanatory variable—computing power infrastructure development (IDC)—is -0.0048 and is significant at the 1% level. Given that the corporate resilience indicator used in this study employs a reverse measure, this result preliminarily suggests that the deployment of computing infrastructure effectively reduces operational volatility when firms face external shocks, playing a positive role in leveraging data resources and enhancing firms’ risk-resilience. To further enhance the reliability of the parameter estimates, Column (2) includes a series of control variables that may influence corporate resilience decisions, such as firm size, debt-to-asset ratio, return on total assets, and corporate governance characteristics. The results show that, after fully controlling potential confounding factors, the regression coefficient for IDC is -0.0025 and remains significantly negative at the 1% level. These regression results imply that the development of computing infrastructure

effectively translates into an enhanced ability of the real economy to withstand uncertainty risks; that is, the development of computing infrastructure can significantly enhance corporate resilience, thereby validating Hypothesis 1 of this paper.

Table 3 . Baseline Regression Results.

Variables	(1) RES	(2) RES
IDC	-0.0048*** (0.0008)	-0.0025*** (0.0008)
Size		0.0024*** (0.0009)
Lev		0.0269*** (0.0033)
Roa		-0.0123* (0.0063)
TBQ		0.0172*** (0.0004)
Age		-0.0513*** (0.0011)
Top 1		-0.0158*** (0.0055)
Board		0.0025 (0.0016)
Indep		-0.0104** (0.0048)
Dual		-0.0001 (0.0010)
Big4		-0.0019 (0.0028)
Constant	0.1486*** (0.0030)	0.1532*** (0.0192)
Firm FE	YES	YES
Year FE	YES	YES
N	40178	40178
adj. R2	0.2998	0.3688

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively; standard errors are shown in parentheses. The same applies below.

5.3. Robustness Tests

To further confirm the reliability of the conclusions from the baseline regression and to rule out potential endogeneity issues and interference from specific sample intervals, this paper conducted robustness tests from the following three dimensions; the regression results are reported in Table 4.

First, a one-period lag of the explanatory variable. Given that there may be a time lag before computing power infrastructure development translates into a firm's underlying risk-resilience, and to mitigate endogeneity biases arising from potential bidirectional causality, this study incorporates a one-period lag of the core explanatory variable—computing power infrastructure development (L.IDC)—into the model for re-estimation. The results in Column (1) of Table 4 show that the regression coefficient for L.IDC is -0.0022 and is significant at the 1% level. This not only rules out the possibility of an immediate, synchronous, and opposite effect in the current period but also indicates that the role of computing infrastructure in enhancing corporate resilience remains robust even after accounting for time lags.

Second, we excluded samples from specific years with abnormal volatility. In 2015, China's capital markets experienced significant abnormal volatility; this macro-systemic risk may have caused a strong short-term exogenous shock to the stock return volatility of listed companies during

the sample period (i.e., the proxy variable for corporate resilience in this study). To eliminate the interference of this extreme market event on the assessment of the enabling effects of computing infrastructure, this study excluded the 2015 observation samples and reran the regression analysis. As shown in Column (2) of Table 4, the coefficient for IDC is -0.0025, which remains significantly negative at the 1% level, indicating that the core conclusions of this study are not driven by extreme market volatility in a specific year.

Third, controlling for high-dimensional fixed effects. To account as much as possible for firm-level heterogeneity that does not change over time, as well as the implicit interference on firm resilience caused by differences in macroeconomic and industrial policy environments across specific regions (provinces) over time, this study further introduces firm-level fixed effects (Firm FE) and the interaction fixed effects between year and province (Year $\times$ Province FE) on top of the original model. Column (3) of Table 4 reports the results of this more rigorous high-dimensional fixed-effects control; the coefficient for IDC is -0.0032, which remains highly significant. This further reinforces the core hypothesis that the development of computing infrastructure can significantly enhance firm resilience.

Table 4. Robustness Test Results.

Variables	(1) RES	(2) RES	(3) RES
IDC		-0.0025*** (0.0008)	-0.0032*** (0.0011)
L.IDC	-0.0022*** (0.0008)		
Size	0.0037*** (0.0009)	0.0011 (0.0009)	0.0023*** (0.0009)
Lev	0.0218*** (0.0035)	0.0313*** (0.0033)	0.0278*** (0.0033)
ROA	-0.0095 (0.0063)	-0.0172*** (0.0063)	-0.0148** (0.0063)
Tbq	0.0186*** (0.0004)	0.0170*** (0.0004)	0.0170*** (0.0004)
Age	-0.0188*** (0.0017)	-0.0456*** (0.0011)	-0.0522*** (0.0011)
Top 1	-0.0015 (0.0060)	-0.0184*** (0.0057)	-0.0155*** (0.0056)
Board	0.0029* (0.0016)	0.0018 (0.0016)	0.0023 (0.0016)
Indep	-0.0070 (0.0048)	-0.0087* (0.0048)	-0.0103** (0.0048)
Dual	-0.0006 (0.0010)	-0.0008 (0.0010)	-0.0003 (0.0010)
Big 4	-0.0021 (0.0029)	-0.0030 (0.0028)	-0.0019 (0.0028)
Constant	0.0431** (0.0209)	0.1660*** (0.0197)	0.1601*** (0.0195)
Firm FE	YES	YES	YES
Year FE	YES	YES	NO
Year FE#Pro FE	NO	NO	YES
N	33410	37801	40178
adj. R2	0.3773	0.2750	0.3741

5.4. Analysis of Transmission Mechanisms

The theoretical analysis in the preceding section indicates that the development of computing infrastructure can enhance corporate resilience through two transmission channels: promoting

corporate digital transformation and increasing firms' risk-taking capacity. This paper empirically tests these two mechanisms; the regression results are presented in Table 5.

(1) Mechanism of Promoting Corporate Digital Transformation. The large-scale deployment of computing infrastructure provides enterprises with low-threshold, high-efficiency underlying data processing capabilities, serving as a key driver for enterprises to upgrade toward digitalization and intelligent transformation. This paper uses the results of text analysis on the frequency of digitalization-related terms in corporate annual reports as a proxy variable for digital transformation (DIG). The regression results in Column (1) of Table 5 show that the coefficient for computing infrastructure development (IDC) is 0.0214 and is significantly positive at the 5% level. This indicates that computing infrastructure development significantly accelerates the process of corporate digital transformation. Through digital transformation, firms can break down internal information silos and flexibly reshape business processes, thereby demonstrating greater agility and resilience when facing external shocks.

(2) Mechanism for Enhancing Risk-Taking Levels. Risk-taking levels reflect a firm's willingness and ability to engage in long-term strategic investments and innovative exploration when facing uncertainty and are a key source of long-term resilience. This study uses the rolling standard deviation of a firm's return on total assets over the past three years as a proxy variable for risk-taking levels (Risk). The results in Column (2) of Table 5 show that the coefficient for IDC is 0.0013 and is significantly positive at the 1% level. This confirms that the improvement of computing infrastructure significantly enhances a firm's risk-taking level. Since computing power enables robust data analysis and predictive capabilities, it effectively reduces information asymmetry and uncertainty in management decision-making, making management more inclined to take reasonable strategic risks to pursue cutting-edge exploration, thereby enhancing organizational resilience.

Table 5 . Results of Mechanism Analysis.

Variables	(1) DIG	(2) Risk
IDC	0.0214** (0.0094)	0.0013*** (0.0004)
Size	0.2478*** (0.0104)	-0.0089*** (0.0004)
Lev	-0.2270*** (0.0390)	0.0154*** (0.0015)
ROA	-0.1246* (0.0753)	-0.1893*** (0.0029)
Tbq	0.0155*** (0.0046)	0.0017*** (0.0002)
Age	0.1388*** (0.0133)	-0.0040*** (0.0005)
Top 1	-0.1678** (0.0662)	-0.0324*** (0.0026)
Board	0.0778*** (0.0190)	0.0043*** (0.0007)
Indep	-0.0502 (0.0574)	-0.0077*** (0.0022)
Dual	-0.0032 (0.0118)	0.0003 (0.0005)
Big4	-0.0153 (0.0333)	0.0053*** (0.0013)
Constant	-4.2215*** (0.2292)	0.2328*** (0.0089)
Firm FE	YES	YES
Year FE	YES	YES
N	40178	40178
adj. R2	0.7971	0.4393

5.5. Heterogeneity Analysis

5.5.1. Heterogeneity in Property Rights

China's economy is characterized by a distinct dual property rights structure. State-owned enterprises (SOEs) are typically large in scale, have complex organizational structures with multiple hierarchical levels, and are tasked with macroeconomic objectives such as stabilizing economic growth and ensuring employment. The rigidity of this institutional framework tends to create strong internal information barriers within state-owned enterprises, resulting in relatively limited flexibility in strategic adjustments and resource allocation when responding to sudden external shocks. By leveraging new digital infrastructure such as computing power, state-owned enterprises can effectively break down internal "data silos," significantly enhance management flatness and the scientific rigor of decision-making, thereby leading to a marked improvement in risk resilience. The results of the group-by-group tests in columns (1) and (2) of Table 6 validate the above logic: the effect of computing power infrastructure development (IDC) on enhancing corporate resilience—that is, reducing earnings volatility—is highly significant in the state-owned enterprise group (coefficient of -0.0051, significant at the 1% level), whereas it is not significant in the non-state-owned enterprise group. This indicates that computing infrastructure—a key component of "New Infrastructure"—precisely addresses the governance challenges faced by state-owned enterprises, serving as a vital driver for stimulating their vitality and enhancing their resilience.

Table 6. Results of the Analysis of Heterogeneity by Enterprise Nature.

Variables	(1) State-Owned Enterprises RES	(2) Non-state-owned enterprises RES
IDC	-0.0051*** (0.0014)	-0.0013 (0.0010)
Size	0.0020 (0.0016)	0.0022** (0.0011)
Lev	0.0420*** (0.0063)	0.0210*** (0.0040)
ROA	-0.0037 (0.0132)	-0.0113 (0.0073)
Tbq	0.0194*** (0.0008)	0.0166*** (0.0004)
Age	-0.0425*** (0.0028)	-0.0575*** (0.0014)
Top 1	-0.0038 (0.0092)	-0.0146** (0.0074)
Board	0.0009 (0.0027)	0.0049** (0.0020)
Indep	-0.0070 (0.0082)	-0.0115* (0.0060)
Dual	0.0004 (0.0020)	-0.0006 (0.0012)
Big4	0.0047 (0.0039)	-0.0090** (0.0040)
Constant	0.1510*** (0.0359)	0.1544*** (0.0240)
Firm FE	YES	YES
Year FE	YES	YES
N	11827	28,280
adj. R2	0.3184	0.3818

5.5.2. Regional Heterogeneity

The enabling effect of computing power infrastructure depends not only on the construction of the hardware itself but is also profoundly constrained by the level of regional digital economic development and the availability of supporting resources. The eastern region holds distinct advantages in terms of the digital industrialization environment, a pool of highly skilled talent, supply chain networks, and market dynamism; consequently, enterprises in the east are better able to efficiently absorb computing power resources and convert them into dynamic decision-making and risk-resilience capabilities. Meanwhile, although the central and western regions have accelerated the construction of computing infrastructure in recent years under the guidance of macro policies such as the “East Data, West Computing” initiative, bottlenecks exist in the transmission chain from computing power to enterprises’ actual risk-resilience capabilities due to the relative lag in “soft supporting factors” such as industrial ecosystems, digital application scenarios, and high-end digital talent. The results in Table 7 confirm this: in Column (1), the coefficient for IDCs of enterprises in the eastern regions is significantly negative at the 1% level, while in Columns (2) and (3), the regression coefficients for IDCs of enterprises in the central and western regions are both insignificant.

Table 7. Results of the Analysis of Regional Location Heterogeneity.

Variables	(1) Eastern Region Enterprises RES	(2) Enterprises in the Central Region RES	(3) Enterprises in the Western Region RES
IDC	-0.0032*** (0.0012)	-0.0031 (0.0023)	-0.0036 (0.0023)
Size	0.0028*** (0.0011)	-0.0014 (0.0022)	0.0027 (0.0023)
Lev	0.0257*** (0.0039)	0.0189** (0.0084)	0.0392*** (0.0089)
ROA	-0.0219*** (0.0074)	0.0194 (0.0169)	0.0031 (0.0180)
Tbq	0.0177*** (0.0005)	0.0146*** (0.0010)	0.0172*** (0.0010)
Age	-0.0522*** (0.0013)	-0.0505*** (0.0030)	-0.0504*** (0.0033)
Top 1	-0.0201*** (0.0067)	0.0015 (0.0140)	-0.0243* (0.0147)
Board	0.0012 (0.0019)	0.0071* (0.0039)	0.0018 (0.0045)
Indep	-0.0087 (0.0057)	-0.0085 (0.0122)	-0.0209 (0.0135)
Dual	-0.0001 (0.0011)	0.0018 (0.0026)	-0.0007 (0.0030)
Big 4	-0.0022 (0.0033)	0.0077 (0.0074)	-0.0074 (0.0078)
Constant	0.1493*** (0.0236)	0.2299*** (0.0489)	0.1558*** (0.0521)
Firm FE	YES	YES	YES
Year FE	YES	YES	YES
N	29385	6037	4740
adj. R2	0.3731	0.3662	0.3576

5.6. Analysis of Moderating Effects: Synergistic Empowerment in the Development of Data Element Markets

The efficient operation of computing infrastructure relies heavily on the quality of underlying data supply and the efficiency of data flow. If a region’s data element marketization level is low—with issues such as data barriers, unclear property rights, or inadequate trading mechanisms—the enabling

effect of computing power will be significantly constrained due to a lack of data support. Conversely, in an environment where the data factor is highly marketized, external data flows more smoothly, and enterprises can access multidimensional industrial data at lower search and transaction costs. In this scenario, the data processing potential of computing infrastructure is fully unleashed, not only broadening enterprises' information channels for perceiving the macroenvironment and market fluctuations but also enhancing their agility in dynamic adjustments, thereby generating a stronger positive synergistic effect on enterprise resilience. This paper introduces the level of data factor marketization (DID) as a moderating variable. Table 8 reports empirical test results for the moderating effect, with the interaction term being significant at the 5% statistical level. Since the dependent variable in this study—enterprise resilience (RES)—is measured using the inverse of earnings volatility, the coefficient of the interaction term is significantly negative, indicating that the level of data factor marketization plays a positive moderating role in the process by which computing infrastructure enhances enterprise resilience. In other words, the smoother the circulation of data elements and the higher the degree of marketization in a firm's region, the more pronounced the effect of computing infrastructure development on enhancing the firm's risk-resilience. This empirical conclusion corroborates the synergistic effects between the “computing infrastructure foundation” and the “data market,” indicating that accelerating reforms to promote the market-based allocation of data elements is a necessary institutional safeguard for fully unleashing the benefits of new digital infrastructure.

Table 8. Results of the Moderation Effect Analysis.

Variables	(1) RES
IDC	-0.0018** (0.0009)
DID	0.0046* (0.0027)
IDC*DID	-0.0012** (0.0006)
Size	0.0024*** (0.0009)
Lev	0.0268*** (0.0033)
Roa	-0.0129** (0.0063)
Tbq	0.0172*** (0.0004)
Age	-0.0513*** (0.0011)
Top 1	-0.0160*** (0.0055)
Board	0.0025 (0.0016)
Indep	-0.0102** (0.0048)
Dual	-0.0000 (0.0010)
Big4	-0.0019 (0.0028)
Constant	0.1517*** (0.0192)
Firm FE	YES
Year FE	YES
N	40178
adj. R2	0.3689

6. Conclusion

In the digital age, computing power has become a key driver of economic and social development. Through the “East Data, West Computing” initiative and the construction of a nationwide integrated computing power network, the government has continuously strengthened the supporting capacity of digital infrastructure. However, under external shocks, some enterprises have revealed resilience shortcomings, such as slow supply chain responses and insufficient stress-resilience and recovery capabilities, creating an urgent need to scientifically assess the actual impact of computing power infrastructure development on corporate resilience. Based on data from Chinese A-share listed companies from 2013 to 2024, this paper uses the number of Internet Data Center (IDC) operating licenses in prefecture-level cities as a proxy for the level of computing power infrastructure development and empirically examines its impact on corporate resilience. The study finds that computing power infrastructure development significantly enhances corporate resilience and reduces the volatility of corporate stock returns. Mechanism tests indicate that this enhancing effect is primarily achieved through two pathways: promoting corporate digital transformation and increasing firms’ risk-taking capacity. Heterogeneity analysis reveals that this effect is more pronounced among state-owned enterprises and firms in the eastern region. Overall, as a key public good deployed under government leadership, computing infrastructure exerts a positive reinforcing effect on firms’ risk resilience and recovery capacity by optimizing public governance efficiency and stimulating firms’ dynamic capabilities. This paper broadens the research perspective on the economic implications of computing infrastructure and provides micro-level empirical support for advancing the construction of a nationwide integrated computing network and balancing development with security during the 15th Five-Year Plan period.

Based on the above conclusions, this paper proposes the following policy recommendations: First, the government should continue to increase investment in computing infrastructure, particularly by deploying data centers in central and western regions with a moderate lead to narrow the regional “digital divide.” Second, the government should accelerate the improvement of incentive mechanisms for corporate digital transformation, guiding enterprises to make rational use of computing resources to enhance their risk-resilience. Third, the government should accelerate reforms to promote the market-based allocation of data as a production factor, leverage its synergistic regulatory effects with computing power infrastructure, and fully unlock the benefits of new digital infrastructure in enhancing corporate resilience. Fourth, in light of the significant effects already evident among state-owned enterprises and in the eastern regions, the government should strengthen the provision of inclusive computing power and provide policy preferences for non-state-owned enterprises to prevent the widening of a structural “resilience gap”, thereby truly establishing computing power infrastructure as a strategic cornerstone for the nation’s coordinated development and security.

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