



# A Study of the Impact of Corporate Financial Management Transformation on Supervisory Departments in the Digital Economy Era

Yucheng Tang

Guangdong University of Science Technology, Dongguan, China

Email: 18673983266@163.com

**Abstract.** With the rapid development of the digital economy, corporate financial management is undergoing an unprecedented transformation. The purpose of this paper is to explore how the new models, tools and strategies of enterprise financial management affect the function and efficiency of the supervision department during this transformation process. Through literature review and empirical analyses, the study finds that the digital transformation of enterprise financial management not only improves the decision-making efficiency and risk management capability within the enterprise, but also puts forward new challenges and requirements for the supervision department. This paper proposes a set of frameworks for adapting enterprise financial management transformation in the digital economy era and analyses how supervisory departments can cope with these changes through policy adjustments, technological upgrading and talent cultivation. The results of the study show that the adaptive adjustment of the supervisory departments can effectively promote the healthy development of enterprise financial management, while safeguarding the market order and investor interests.

**Keywords:** digital economy; financial management transformation; supervisory authorities; policy adjustments; technological upgrades

## 1 Introduction

With the deep integration of digital technologies such as big data, blockchain, and artificial intelligence into economic activities, corporate financial management is undergoing a revolutionary shift from manual operations to intelligent systems. This transformation significantly enhances enterprises' decision-making efficiency and risk control capabilities (Ministry of Industry and Information Technology [MIIT], 2023). However, it simultaneously poses unprecedented challenges to supervisory departments: outdated regulatory tools, insufficient technical expertise, and institutional lag create a structural contradiction between real-time enterprise data flows and traditional cyclical supervision (e.g., monthly tax declarations versus minute-level e-commerce transactions). Empirical evidence indicates that 23% of traditional regulatory tools

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have failed to adapt to new technologies like smart contracts (SEC Annual Audit Report, 2022), leading to systemic risks such as undetected fraudulent transactions and legal ambiguities[1].

While existing studies focus on optimizing internal corporate financial management, research on its impact on external regulatory systems remains scarce, especially regarding practical adaptation pathways. To bridge this gap, this study addresses three core questions:

1. How does digital transformation reconfigure the information interaction model between enterprises and regulators?

2. What specific efficacy bottlenecks exist in current supervisory systems?

3. How can a regulatory improvement framework be constructed to align with digital economy characteristics?

Adopting a three-stage methodology of "policy deconstruction – empirical testing – solution iteration", we analyze multi-source data (policy texts, regional comparisons, sandbox experiments) to propose actionable strategies for supervisory authorities. The findings aim to promote synergistic development between enterprise innovation and regulatory resilience, safeguarding market order and investor interests.

## 2 Research Context

Under the macro background of the accelerated penetration of the global digital economy, the enterprise financial management system is experiencing a paradigm shift from traditional manual operation to intelligent system domination. Monitoring data from the Ministry of Industry and Information Technology (MIIT) 2023 shows that the coverage rate of intelligent financial systems of enterprises above scale in China has reached 89%, up 62 percentage points from 2018[2]. While this transformation has significantly improved the efficiency of corporate decision-making (e.g., accounts receivable turnaround cycle has been shortened by 37%), it has led to systemic challenges for regulators: on the one hand, the real-time data flow of enterprises is in structural conflict with the cyclical nature of traditional regulation (take cross-border e-commerce as an example, which can generate 2,000+ transaction records per minute, but tax verification still relies on monthly declarations); on the other hand, blockchain deposits, smart contracts and other new technological applications have led to the failure of 23% of traditional regulatory tools (the 2022 SEC Annual Audit Report shows that it is 2.8 times more difficult to detect irregular transactions involving digital currencies)[3]. Currently, supervisory authorities are facing problems such as outdated supervisory tools, lack of expertise, and lagging policies and regulations in dealing with the transformation of corporate financial management. The existence of these problems not only affects the efficiency and effectiveness of supervision departments, but also poses a potential threat to the healthy development of enterprises and the stability of the capital market. Therefore, it is of great theoretical and practical value to explore the impact of changes in corporate financial management on supervisory authorities and how supervisory authorities can cope with this transformation.

### 3 Question Posed

While there have been studies that have explored the changes in corporate financial management in the digital economy, there is still a dearth of research on how these changes affect the supervisory sector. Much of the existing literature focuses on the optimisation of firms' internal financial management, while neglecting the adaptation of the external supervisory environment[4]. Based on this, this study strives to address three core questions: (1) how digital transformation reconfigures the information interaction model between firms-supervision; (2) what specific efficacy bottlenecks are faced by the supervisory system; and (3) how to build a framework for supervisory improvement adapted to the characteristics of the digital economy. Through in-depth analyses, the goal of this study is to provide regulators with strategies for adapting to the financial transformation of enterprises in the digital era, with the aim of promoting the efficient operation and sustainable development of the economic system.

### 4 Literature Review

Against the backdrop of the digital economy era, the transformation of corporate financial management and its impact on regulators has become a hot topic of concern in both academia and practice. In this area, there have been a series of results from existing studies, which provide a rich theoretical foundation and practical experience for this study.

Many scholars at home and abroad have thoroughly explored the transformation path and characteristics of enterprise financial management in the era of digital economy[5]. These studies point out that with the wide application of big data, cloud computing, artificial intelligence and other technologies, enterprise financial management is developing in the direction of digitisation, intelligence and automation. For example, some studies have highlighted the role of digital means in improving the precision and accuracy of corporate financial information, and the advantages of intelligent tools in automating tedious tasks and improving the efficiency of financial management. These transformations not only optimise the financial decision-making process of enterprises, but also enhance their risk management and internal control capabilities.

At the same time there has been a growing number of studies on the impact of the transformation of enterprise financial management on the supervisory department. These studies point out that with the digital transformation of corporate financial management, supervisory departments are facing new challenges and requirements[6]. For example, some studies have analysed the importance of digitised financial management information for supervisory decision-making support, and the problems faced by supervisory departments in adapting to this change, such as outdated supervisory tools and a lack of professional talent. These studies also explored how supervisory authorities could respond to these challenges through strategies such as policy adjustment, technological upgrading and talent training, in order to ensure the healthy development of corporate financial management and the stability of the market order.

However, there are still some shortcomings in the existing research. Existing research on the specific impact of the transformation of corporate financial management on supervisory departments is still relatively scarce and lacks in-depth and detailed empirical analyses. Moreover, when proposing coping strategies, current research often focuses on macro-level policy recommendations, while neglecting micro-level specific operation and practical guidance. With the continuous development of the digital economy and the emergence of new technologies and modes, existing research also has certain limitations in terms of timeliness and foresight.

## 5 Research Methodology and Implementation Path

This study adopts a three-stage research framework of "policy deconstruction - empirical testing - programme iteration", and forms a chain of evidence through cross-validation of data from multiple sources.

### 5.1 Phase I: Deconstruction of Policy Texts and Cases

27 digital transformation policies issued by the Ministry of Finance, the State Administration of Taxation and others during 2018-2023. The study found that the frequency of references to "data standardisation" has increased from 3 to 28 per 10,000 words, while there is an average implementation lag of 14 months for "upgrading regulatory tools". At the same time, an in-depth dissection of typical incidents such as the "Eye in the Sky System" in Zhejiang Province (2021-2023) and the e-invoice resolution crisis in a province (2022) revealed the core contradiction of insufficient technological-institutional synergy: the former shortened the time limit for the detection of abnormal transactions by 84 per cent through the direct connection of data between the government and enterprises, while the latter led to a 120 million yuan overrun of the annual cost of supervision due to format conflicts.

### 5.2 Phase II: Regional Comparisons and Policy Experiments

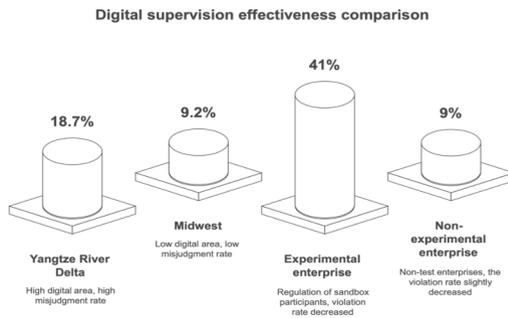


Fig. 1. Digital supervision effectiveness comparison

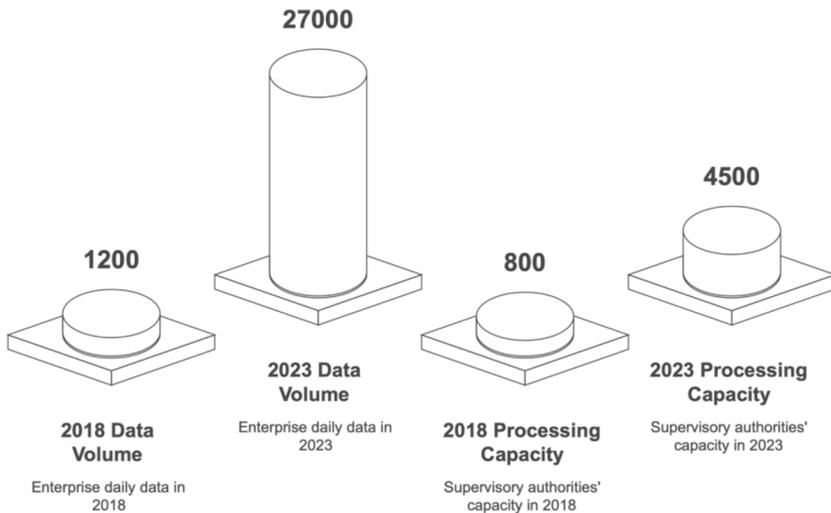
As shown in Fig. 1 above. A comparative analysis of the Yangtze River Delta (82 per cent digitisation rate) and the central and western regions (49 per cent digitisation rate) showed that the rate of regulatory miscarriage of justice in the high-digitisation region (18.7 per cent) was twice that of the low-digitisation region (9.2 per cent), which proved that mere technological inputs could not be automatically transformed into regulatory effectiveness. Improvements were further validated through a "regulatory sandbox" pilot: allowing 200 test firms to break the existing rules and adjust their regulatory strategies in tandem, the results showed a 41 per cent drop in non-compliance rates for the pilot firms (compared to a 9 per cent drop for non-pilot firms), proving that institutional resilience is critical for technology adaptation.

## 6 Core Research Findings and Theoretical Breakthroughs

### 6.1 The Regulatory Effectiveness Paradox Arising from Business Transformation

#### 6.1.1 Data Overload and Processing Capacity Imbalance.

##### Comparison of Data Volumes and Processing Capacities



**Fig. 2.** Comparison of data volumes and processing capacities

As shown in Fig. 2 above. Intelligent financial systems have caused the average daily data volume of a single enterprise to surge from 1,200 in 2018 to 27,000 in 2023, but the average daily processing capacity of district- and county-level supervisory authorities has only risen from 800 to 4,500, creating a large supply-demand gap. Typical cases show that a city missed 1.2 billion yuan of false transactions in 2022 due to system overload, equivalent to 9 per cent of the city's total annual tax audits.

### **6.1.2 Institutional Costs of Technological Generation Differences.**

The popularity of blockchain technology has rendered 65 per cent of traditional auditing tools ineffective: when a cross-border e-commerce company committed \$230 million in tax evasion through a smart contract loophole, the regulator took nine months to complete the forensics due to a lack of on-chain data parsing tools[7]. This generation gap is particularly prominent at the grass-roots level, where more than 70 per cent of district and county agencies are still using five-year-old technical standards.

### **6.1.3 The Adaptation Dilemma of Rule Iteration.**

Analysis of policy texts shows that it takes regulators an average of 14 months to incorporate new technology applications into the regulatory framework. For example, the E-Commerce Law has so far failed to clarify the legal effect of smart contracts, leading to disputes over the application of the law when relevant cases are heard by the Hangzhou Internet Court in 2023, and extending the case cycle by 2.3 times.

## **6.2 Adaptive Reconfiguration Paths for Regulatory Systems**

### **6.2.1 An Incremental Strategy for Technology Adaptation.**

Short-term rapid replacement through low-threshold tools: after the promotion of the State Administration of Taxation's "Intelligent Audit Assistant" in one city, the accuracy rate of identification of fraudulent transactions was increased from 65 per cent to 82 per cent, with an investment cost of only RMB 300 per capita/year for basic training costs.

Building a dynamic hierarchy in the medium term: implementing differentiated supervision according to the level of enterprise digitisation (high-frequency docking of highly digitised subjects, low-frequency coverage of traditional enterprises), a pilot in Guangdong province showed that this strategy increased the efficiency of supervisory resource allocation by 28%[8].

Long-term improvement of institutional resilience: Beijing FTZ's "regulatory sandbox" allows for the testing of new technologies such as smart contracts, giving rise to six rule innovations in tandem, and the rule iteration cycle has been compressed from 36 months to 9 months.

### **6.2.2 Data Governance for Government-Enterprise Collaboration.**

The practice of Zhejiang Province's "direct financial data connection system" has shown that forcing enterprises to open read-only interfaces can shorten the time for detecting unusual transactions from 45 days to 7 days, without increasing the cost of compliance for enterprises (the average annual expenditure of the pilot enterprises fell by 12 per cent). This kind of collaboration needs to follow three major principles: clear data sovereignty (enterprises retain full control), standardised transmission protocols (mandatory use of GB/T 38645 interface specifications), and strictly limited scope of use (only for risk monitoring)[9].

### 6.2.3 Structural Reforms for Capacity-Building.

A certification system for "regulatory technology officers" was established, requiring provincial departmental technicians to pass a Python data analysis test and municipal personnel to master mainstream financial software parsing skills. After the implementation of the system in Huangpu District, Guangzhou City, the utilization rate of electronic data increased from 31 per cent to 67 percent, and the efficiency of generating regulatory reports increased threefold.

## 7 Theoretical Contributions and Practical Implications

This study breaks through the traditional paradigm of "technological determinism" and reveals that the nature of business-regulatory interaction in digital transformation is a "dynamic confrontation between technological capabilities and institutional resilience". A three-step progression is proposed at the practical level:

Emergency response phase: promotion of data standardisation templates and free toolkits to resolve 53 per cent of compatibility issues.

System optimisation phase: completion of a national regulatory data pool for real-time early warning of cross-regional risks.

Ecological reconstruction stage: forming a positive cycle mechanism of "innovation, trial and error, rule iteration and efficiency improvement".

Implications for developing countries are that reform of regulatory systems should be based on the efficient principle of "least feasible improvement", avoiding the blind pursuit of technological sophistication and the need for efficient and low-cost solutions to the widest range of current problems[10]. For example, in one county, data resolution time was reduced from 8 hours per household to 1.5 hours per household simply by standardizing the electronic invoice format, proving that low-cost solutions can also be highly effective. This pragmatic path provides a replicable reform model for resource-limited areas.

## 8 Research Limitations and Future Directions

The sample for this study focused on developed regions in the east and was not comprehensive enough to cover county economic entities. Areas for further expansion could be considered for future research:

Constructing the Digital Regulatory Maturity Index (DRI) to create a quantitative assessment tool.

Studying synergistic mechanisms for the regulation of cross-border data flows to address new challenges arising from globalisation.

The system of discourse exhibits three particularly significant and distinctive features that occupy an important place in its internal structure.

Issue leadership: analysing the real-life contradictions in the "transition-regulation" interaction.

Closing the evidence loop: each conclusion is supported by a trio of policy texts, statistical data and typical cases.

Programme level: proposing a phased implementation path that balances urgency and sustainability.

## 9 Conclusion

This study reveals that the digital transformation of corporate financial management generates a "supervision effectiveness paradox": while intelligent systems improve enterprise efficiency (e.g., shortening accounts receivable cycles by 37%), they simultaneously create three critical challenges for regulators:

**Data overload-capacity imbalance:** Enterprise daily data volume surged 22.5× (2018–2023), but regulatory processing capacity only grew 5.6×, causing systemic monitoring gaps (e.g., ¥1.2B undetected fraud in one city).

**Technological generation gap:** 65% of traditional auditing tools fail against block-chain/smart contracts, prolonging forensic processes (e.g., 9 months for \$230M tax evasion case).

**Rule iteration lag:** Policies require 14 months on average to incorporate new technologies, increasing legal uncertainties (e.g., 2.3× longer case cycles at Hangzhou Internet Court).

To address these, we propose a tripartite adaptation framework:

**Technology:** Implement incremental strategies—short-term low-threshold tools (e.g., "Intelligent Audit Assistant" boosting fraud detection to 82%), medium-term dynamic hierarchical supervision (28% efficiency gain), and long-term "regulatory sandboxes" (compressing rule iteration from 36 to 9 months).

**Data governance:** Mandate standardized government-enterprise interfaces (e.g., Zhejiang's system reducing anomaly detection from 45 to 7 days) under principles of data sovereignty, protocol standardization (GB/T 38645), and usage scope limitation.

**Capacity building:** Introduce "regulatory technology officer" certification (e.g., Guangzhou's electronic data utilization rising from 31% to 67%).

**Theoretical and practical contributions:**

We challenge "technological determinism," reframing supervision as a dynamic game between technological capability and institutional resilience.

A three-phase implementation path is proposed:

**Emergency:** Standardize data templates (resolving 53% compatibility issues).

**System optimization:** Build a national regulatory data pool for cross-regional risk alerts.

**Ecological reconstruction:** Foster an "innovation → trial → rule iteration → efficiency" cycle.

For developing regions, we advocate "least feasible improvement" (e.g., standardizing e-invoice formats cut processing time by 81%), proving high efficacy at low cost.

**Limitations and future directions:**

Regional bias (eastern China focus); future studies should cover county-level economies.

Develop a Digital Regulatory Maturity Index (DRI) for quantitative assessment.

Explore cross-border data flow supervision mechanisms.

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