

The Digital Double-Edged Sword: Research on the Impact of Digital Finance on Enterprise Pay Gap

Peiyuxi Yan^{1,*}, Chunyu Di², Yuecong Xing³

¹Beijing Huixian School, Beijing, China

²Beijing Jiaotong University, Beijing, China

³King's College London, London, UK

*Author to whom correspondence should be addressed.

Abstract: Digital finance, as an important form of deep integration of digital technology and financial services, is profoundly affecting corporate financing environment, business models, and organizational structure. However, whether the economic benefits brought by digital finance can be evenly distributed among different labor groups within enterprises remains to be further studied. Based on data from Chinese A-share listed companies and the Peking University Digital Financial Inclusion Index, this paper employs a two-way fixed effects model to examine the impact of digital finance on enterprise pay gap. The study finds that the development of digital finance is significantly associated with a wider internal pay gap within enterprises. Mechanism analysis further suggests that digital transformation and managerial myopia may represent two potential channels through which this association operates. On the one hand, digital finance may alleviate corporate financing constraints, thereby providing greater resources for investment in digital technologies and potentially increasing the pay premium for high-skilled labor. On the other hand, digital finance may be associated with greater corporate information transparency and external supervision pressure, which may strengthen management's short-term performance orientation and potentially contribute to a greater concentration of compensation resources toward core talent. Heterogeneity analysis finds that this effect is more significant in state-owned enterprises and enterprises in non-eastern regions. This paper reveals the dual impact of digital finance, where "efficiency improvement" and "distribution differentiation" coexist, providing a new research perspective for understanding changes in corporate income distribution in the digital economy era.

Keywords: Digital Finance; Enterprise Pay Gap; Digital Transformation; Managerial Myopia.

1. Introduction

In recent years, the rapid development of a new generation of digital technologies represented by big data, artificial intelligence, cloud computing, and mobile internet has driven profound changes in the financial system. Digital Finance, as a product of the deep integration of digital technology and traditional financial services, by utilizing data resources, algorithmic technologies, and intelligent financial infrastructure, has broken through the limitations of traditional financial services in information acquisition, risk identification, and transaction costs, and has gradually become an important force in promoting enterprise development and economic transformation. Compared with traditional financial models, digital finance can reduce financial transaction costs, alleviate information asymmetry, and expand the coverage of financial services, thereby improving the convenience for

enterprises to obtain external financing, and providing new impetus for enterprise innovation activities, investment expansion, and operational efficiency improvement (Gomber et al., 2018; Goldstein et al., 2019). Especially in emerging economies, due to the long-standing problems of uneven allocation of financial resources, high financing thresholds, and financing difficulties for small and medium-sized enterprises in the traditional financial system, the development of digital finance is regarded as an important way to improve financial inclusion. Existing studies have shown that digital finance can utilize massive data and advanced information processing technologies to enhance the information identification capabilities of financial institutions, thereby alleviating the information opacity problems faced by enterprises, especially small and medium-sized enterprises, reducing financing constraints, and promoting enterprise growth (Goldstein et al., 2019). Therefore, the existing literature mainly examines the positive economic effects of digital finance from the perspectives of corporate financing, innovation investment, entrepreneurial activities, and economic growth. However, the impact of digital finance is not only reflected in the improvement of enterprise efficiency and the optimization of resource allocation. As digital technology gradually penetrates the production and operation processes of enterprises, its scope of influence has extended from the external financing environment of enterprises to the internal organizational structure and labor income distribution system of enterprises. An important but not yet fully discussed question is: whether the efficiency improvements brought by digital finance can be equally shared among different groups within enterprises?

Whether digital finance has potential income distribution effects? This question has important practical significance. In recent years, with the rapid development of the digital economy, the income gap between corporate management, highly skilled technical personnel, and ordinary employees has received increasing attention. Although digital technology can improve overall enterprise productivity, technological progress is not naturally inclusive. A large body of labor economics research has found that new technologies generally have obvious skill-biased characteristics (skill-biased technological change), meaning that technological progress will increase the productivity and market value of high-skilled workers, while reducing the importance of some low-skilled, repetitive labor positions, thereby potentially widening the labor income gap (Autor et al., 2003; Acemoglu and Restrepo, 2020).

From this perspective, digital finance, as an important component of the digital economy, may not simply improve the benefits of all enterprise workers, but may be associated with differentiated outcomes in internal compensation distribution by influencing resource allocation, human capital demand, and organizational management. On the one hand, the development of digital finance may be associated with improved access to financing and greater investment capacity, potentially facilitating corporate digital transformation and technological upgrading; on the other hand, digital transformation may increase enterprises' demand for data analysis, technology research and development, and management decision-making capabilities, potentially enhancing the importance of high-skilled workers and core talents, while ordinary workers, due to their stronger skill substitutability, may experience relatively smaller income gains. Therefore, digital finance may be associated with a dual pattern of efficiency improvement and distribution differentiation, which this paper refers to as the "digital double-edged sword."

Corporate pay gap, as an important manifestation of internal income distribution within enterprises, not only reflects the value distribution relationship among different levels and different skill levels of workers within enterprises, but also affects employee motivation, organizational stability, and long-term enterprise development. Traditional compensation theory holds that reasonable pay differences can play an incentive role, by providing higher returns to key positions and highly capable employees, increasing employee effort and promoting enterprise performance improvement. However, when the pay gap exceeds a reasonable range, excessive income differentiation may weaken ordinary employees'

sense of organizational identification, trigger internal unfairness, and reduce the overall collaborative efficiency of enterprises (Akerlof and Yellen, 1990; Lazear and Rosen, 1981).

In recent years, the widening of internal corporate pay gaps has become an important issue in the fields of labor economics and corporate governance. Existing studies have found that with globalization, technological progress, and financial market development, the income gap between corporate executives and ordinary employees within firms has continued to widen, with technological change and changes in corporate organizational models being considered one of the important driving factors (Frydman and Saks, 2010; Guadalupe et al., 2014). Especially in the digital economy era, the production methods of enterprises have gradually shifted from traditional labor-intensive models to data-driven, knowledge-intensive models, and the differences among workers based on skills, knowledge, and information processing capabilities have become further prominent, making the internal compensation structure of enterprises show a more obvious trend of differentiation. Digital finance, as an important infrastructure of the digital economy, may affect corporate pay gaps through multiple channels. First, digital finance may change the internal labor demand structure of enterprises by promoting corporate digital transformation. The development of digital finance reduces corporate financing costs, improves enterprises' ability to obtain funds and allocate resources, and makes enterprises more capable of investing in digital technologies, including artificial intelligence applications, intelligent manufacturing system construction, and information management platform upgrades. In this process, the production and operation models of enterprises change, increasing the demand for high-skilled workers with technical capabilities, data analysis capabilities, and innovation capabilities, while reducing the dependence on repetitive, standardized labor. This process conforms to the theoretical logic of "skill-biased technological change." Autor et al. (2003) pointed out that new technologies do not simply substitute all labor but rather increase the economic returns of high-skilled workers by changing the relative productivity of workers with different skills. Furthermore, Acemoglu and Restrepo (2020) found that the development of automation technology reconfigures the relationship between capital and labor and may widen the income differences among workers with different skills. Therefore, although digital finance improves the overall efficiency of enterprises, the technological upgrading it brings may benefit more those employees with digital skills and professional knowledge, thereby widening the internal pay gap within enterprises.

Based on the above theoretical analysis, this paper focuses on whether and how digital finance affects corporate pay gaps and seeks to answer the following three questions. First, will digital finance significantly affect internal corporate pay gaps? Although existing studies have extensively discussed the promoting effects of digital finance on corporate financing, innovation, and performance, whether digital finance changes the internal income distribution structure of enterprises still lacks systematic research. This paper first examines whether the development of digital finance will widen corporate pay gaps, thereby revealing the distributional effects of digital finance. Second, through what mechanisms does digital finance affect corporate pay gaps? This paper further proposes two possible mechanisms from the perspective of internal organizational adjustment within enterprises: first, the Digital Transformation Channel. Digital finance alleviates corporate financing constraints, improves enterprises' ability to invest in digital technologies, and promotes corporate digital transformation. Digital transformation has skill-biased characteristics, increasing the marginal productivity and wage premium of high-skilled workers, and ultimately widening the pay gap. Second, the Managerial Myopia Channel. Digital finance improves corporate information transparency and capital market attention, strengthens management's short-term performance pressure, makes enterprises more inclined to reward core employees who can quickly contribute to performance, while neglecting the long-term development of ordinary employees, thereby widening internal compensation differentiation. Third, whether the impact of digital finance on pay gaps has heterogeneity across firms and regions? The

effects of digital finance development may be affected by the nature of enterprise property rights, market environment, and regional development levels. Therefore, this paper further examines the differences in the impact of digital finance on pay gaps under different corporate ownership types and regional environments.

Focusing on the question of "whether and how digital finance affects internal corporate pay gaps," this paper attempts to reveal the intrinsic relationship between enterprise efficiency improvement and income distribution changes in the digital era. Compared with existing studies, the marginal contributions of this paper are mainly reflected in the following three aspects.

First, this paper expands the research boundaries of the economic consequences of digital finance, extending from focusing on enterprise efficiency improvement and value creation to internal corporate income distribution issues. Existing research on digital finance has mainly concentrated on its positive economic effects, such as alleviating corporate financing constraints, promoting technological innovation, improving resource allocation efficiency, and promoting enterprise growth (Gomber et al., 2018; Goldstein et al., 2019). However, digital finance, as a new type of infrastructure that profoundly affects the ways of resource allocation and organizational operation models of enterprises, its impact is not limited to the external financing environment of enterprises but may also change the pattern of interest distribution among different groups within enterprises. This paper finds that although digital finance can promote enterprise development, it may at the same time widen internal corporate pay gaps by changing the technological structure and talent demand patterns of enterprises, thereby revealing the dual effect of digital finance where "efficiency improvement" and "distribution differentiation" coexist, providing a new perspective for understanding the economic impact of digital finance.

Second, this paper enriches the research in the field of technological progress and income inequality, incorporating digital finance into the analytical framework of corporate labor income distribution. Existing literature mainly examines the impact of technological progress on the labor market from the perspective of production technologies such as artificial intelligence, robotics, and automation, emphasizing that skill-biased technological change will increase the relative returns of high-skilled workers and may widen income gaps (Autor et al., 2003; Acemoglu and Restrepo, 2020). However, financial digitalization, as an important force driving corporate digital transformation, has not received sufficient attention regarding its impact on labor income distribution. This paper further finds that digital finance, by promoting corporate digital transformation, increases enterprises' demand for technologically skilled, knowledge-based, and innovative talents, enabling high-skilled workers to obtain higher compensation returns, while ordinary workers, due to their stronger skill substitutability, have relatively limited income improvements, ultimately leading to the widening of internal corporate pay gaps. This finding expands the scope of research on the impact of digital technology on income distribution and deepens the understanding of the mechanism of labor value reconstruction in the digital economy era.

Third, this paper reveals the micro-level pathways through which digital finance affects pay gaps from the perspectives of corporate organizational behavior and management mechanisms. Existing explanations for corporate pay gaps have mainly focused on corporate governance factors, such as management power, board supervision, and equity incentive mechanisms (Bebchuk and Fried, 2004). This paper breaks through the traditional governance perspective and proposes that digital finance may affect compensation structures through internal organizational adjustments within enterprises. On the one hand, digital finance alleviates financing constraints and promotes corporate digital transformation, strengthening enterprises' dependence on core talents, leading to compensation resources being more concentrated among high-skilled employees; on the other hand, digital finance improves corporate

information transparency and external supervision pressure, may strengthen management's short-term performance orientation, making enterprises more inclined to adopt short-term incentive methods targeting core employees, while weakening long-term human capital investment in ordinary employees. By revealing the two mechanisms of digital transformation and managerial myopia, this paper provides a new theoretical explanation for understanding the impact of digital finance on corporate compensation distribution.

The remainder of this paper is organized as follows. Section 2 is the literature review, which systematically reviews the related research on digital finance, corporate pay gaps, and technological progress and income distribution, and further clarifies the research positioning of this paper. Section 3 is the theoretical analysis and research hypotheses, based on skill-biased technological change theory, resource dependence theory, and managerial myopia theory, analyzing the mechanisms through which digital finance affects corporate pay gaps and proposing research hypotheses. Section 4 introduces the research design, including sample selection, variable definitions, econometric model specification, and data sources. Section 5 reports the empirical results, sequentially analyzing the impact of digital finance on corporate pay gaps, robustness tests, and heterogeneity analysis. Section 6 further explores the mechanisms, focusing on testing the two channels of digital transformation and managerial myopia. Section 7 summarizes the research conclusions and proposes relevant policy implications.

2. Literature Review

2.1 Digital Finance and Corporate Economic Behavior

Digital Finance, as an important product of the integration of fintech and the traditional financial system, improves the efficiency of financial services through technologies such as big data, artificial intelligence, and cloud computing, and changes the ways of corporate financing and resource allocation. Existing studies have mainly focused on the positive effects of digital finance on corporate development. On the one hand, digital finance can reduce financial transaction costs, alleviate the information asymmetry problem in the traditional financial system, improve the availability of corporate financing, and thereby alleviate corporate financing constraints (Stiglitz and Weiss, 1981; Goldstein et al., 2019). On the other hand, digital finance, by improving the environment of corporate capital supply, enhances corporate R&D investment and innovation capabilities, and promotes corporate growth and productivity improvement (Gomber et al., 2018; Fuster et al., 2019). However, existing studies mainly focus on the efficiency effects and growth effects brought by digital finance, with insufficient attention paid to the potential income distribution effects of digital finance. In fact, digital finance not only changes the external financing environment of enterprises, but also affects internal resource allocation, organizational structure, and labor demand patterns within enterprises. Therefore, whether digital finance will change the internal compensation distribution pattern within enterprises still requires further research.

2.2 Technological Progress, Digital Transformation, and Income Distribution

A large body of labor economics research has shown that technological progress does not equally increase the returns of all workers but may have skill-biased characteristics (skill-biased technological change). Autor et al. (2003) pointed out that the development of digital technology has increased the productivity and wage levels of high-skilled workers, while reducing the importance of some low-skilled labor positions, thereby widening the labor income gap. Furthermore, Acemoglu and Restrepo (2020) found that the development of automation and intelligent technologies will change the substitution relationship between capital and labor and have a significant impact on employment

structure and wage distribution. With the development of the digital economy, corporate digital transformation has become an important channel through which technological progress affects the labor market. Digital transformation drives changes in enterprise production models, organizational structures, and talent demand, increasing the demand for employees with strong data analysis, technology R&D, and innovation capabilities, enabling high-skilled workers to obtain higher compensation returns. However, existing studies mainly focus on the impact of artificial intelligence, robotics, and automation technologies on income distribution, and rarely discuss how digital finance, as an important infrastructure promoting corporate digital transformation, affects internal corporate pay gaps.

2.3 Research on Influencing Factors of Corporate Pay Gaps

Corporate pay gaps have always been an important research topic in the fields of corporate governance and organizational management. Traditional research holds that reasonable pay gaps can play an incentive role, improving enterprise performance by rewarding high-ability employees (Lazear and Rosen, 1981). However, when the pay gap is too large, it may weaken employees' sense of fairness, reduce organizational cohesion, and affect the long-term development of enterprises (Akerlof and Yellen, 1990). Existing literature mainly explains the causes of corporate pay gaps from the perspective of corporate governance, such as management power, board supervision, ownership structure, and executive incentive mechanisms (Bebchuk and Fried, 2004). In addition, enterprise size, market competition environment, and human capital structure are also important factors affecting pay gaps. However, with the rapid development of the digital economy, the impact of technological factors and financial environment changes on corporate compensation structures has gradually become prominent, and whether digital finance has become a new driving factor for the widening of corporate pay gaps has not yet been fully discussed.

3. Theoretical Analysis and Research Hypotheses

3.1 Digital Finance and Corporate Pay Gaps

Digital finance, as a new financial model integrating digital technology and the financial system, not only changes the way enterprises obtain external resources, but also profoundly affects internal resource allocation and organizational operation mechanisms within enterprises. Compared with traditional finance, digital finance relies on big data, artificial intelligence, and information technology to improve the information processing capabilities of financial institutions, reduce information asymmetry and transaction costs in the corporate financing process, thereby improving the corporate financing environment (Gomber et al., 2018; Goldstein et al., 2019). However, the economic effects brought by digital finance are not entirely balanced, and its impact on different labor groups within enterprises may have significant differences, thereby changing the corporate compensation structure. From the perspective of resource allocation, the development of digital finance can alleviate corporate financing constraints, improve the availability of corporate funds, and enable enterprises to have more resources for technology investment, business expansion, and talent introduction. On the one hand, the improvement of the financing environment can promote enterprise scale expansion and operational performance improvement, providing a foundation for enterprises to increase employee compensation; on the other hand, due to the selectivity of enterprise resource allocation, the new resources brought by digital finance may preferentially flow to core departments and key employees who can create higher marginal value. Especially in the context of the digital economy, high-skilled workers with professional knowledge, technical capabilities, and management experience are increasingly important for the competitive advantage of enterprises, so enterprises are more inclined to attract and retain these core

talents by raising compensation levels, while ordinary employees, due to their stronger skill substitutability, have relatively limited compensation growth, ultimately leading to the widening of internal corporate pay gaps.

Furthermore, the development of digital finance strengthens the market competition environment for enterprises, making enterprises more dependent on talent competition to obtain long-term advantages. Under the traditional production model, enterprise value creation relied more on capital investment and scale expansion, while in the digital economy era, data resources, technological capabilities, and innovation capabilities have gradually become important sources of enterprise core competitiveness (Brynjolfsson et al., 2021). Therefore, corporate compensation systems have also gradually shifted from traditional job-based wage models to more market-oriented and performance-oriented incentive models. Executives, technical personnel, and core business personnel, because they can directly affect enterprise innovation capabilities and operational performance, are more likely to obtain high compensation incentives, while ordinary employees, due to the difficulty of short-term identification of their contributions, have relatively lagging income growth. In addition, from the perspective of internal incentive theory within enterprises, moderate pay gaps can exert a "tournament incentive effect," incentivizing employees to increase their efforts by widening the income differences between different positions (Lazear and Rosen, 1981). Therefore, this paper proposes the following hypothesis:

H1: Higher levels of digital finance development are associated with wider corporate pay gaps.

3.2 Digital Finance, Digital Transformation, and Corporate Pay Gaps

Digital finance can not only alleviate corporate financing constraints but also promote corporate digital transformation. Since digital transformation usually requires substantial investment in technology R&D, equipment upgrades, and information system construction, financing constraints are an important factor limiting the application of digital technology in enterprises. Digital finance, through technologies such as big data and artificial intelligence, improves the information processing capabilities of financial institutions, reduces information asymmetry in the financing process, thereby enhancing enterprises' ability to obtain funds and providing resource support for digital transformation (Gomber et al., 2018; Goldstein et al., 2019). However, digital transformation does not affect different types of workers within enterprises in a balanced manner but may widen the pay gap through skill-biased technological change. Existing studies have shown that the development of new technologies generally increases the productivity and market value of high-skilled workers, while reducing the comparative advantage of some low-skilled workers (Autor et al., 2003; Acemoglu and Restrepo, 2020). In the process of corporate digital transformation, the importance of positions such as data analysis, technology R&D, and digital management continues to increase, and enterprises tend to increase compensation incentives for core technical talents and high-skilled employees; at the same time, workers in standardized and repetitive positions have relatively limited compensation growth due to increased substitutability. In addition, digital transformation also changes the organizational structure and incentive models of enterprises. Digital technology improves the efficiency of enterprise information processing, makes enterprises more dependent on knowledge workers and core managers, and promotes enterprises to adopt more market-oriented compensation incentive methods. Therefore, digital finance, by promoting corporate digital transformation, increases the compensation premium of high-skilled workers, further widening internal corporate pay gaps. Accordingly, this paper proposes:

H2: The association between digital finance and corporate pay gaps may operate partly through corporate digital transformation.

3.3 Digital Finance, Managerial Myopia, and Corporate Pay Gaps

The development of digital finance not only changes corporate financing methods but may also affect management behavior by improving information transparency and strengthening external supervision. In the traditional corporate environment, due to information asymmetry and high supervision costs, management may pay more attention to long-term strategic goals. However, digital finance, relying on data technology, improves the availability of corporate operational information, enabling investors, financial institutions, and market participants to evaluate corporate operating performance in a timelier manner, thereby increasing the short-term performance pressure faced by management (Stein, 1989; Graham et al., 2005). Under the condition of enhanced short-term performance orientation, management may adopt more myopic resource allocation strategies, that is, giving priority to activities that can quickly improve corporate operating indicators, while reducing investment in projects with uncertain long-term returns. Compensation incentives, as an important tool for enterprises to regulate internal resource allocation, may also be affected by managerial myopia. To meet capital market expectations and improve short-term operating performance, management may tend to increase compensation incentives for executives, core technical personnel, and key position employees, to incentivize them to create short-term observable performance outcomes.

In contrast, the human capital investment of ordinary employees has a longer return cycle, and their contributions are difficult to reflect in short-term financial indicators. Therefore, in the case of enhanced managerial myopia, enterprises may reduce investment in ordinary employee training and long-term development, causing the compensation growth of ordinary employees to lag relatively, thereby widening internal corporate pay gaps. In addition, after digital finance improves enterprises' ability to obtain resources, it also enhances enterprises' competitiveness in the talent market. Management may rely more on high-value talents to maintain enterprise competitive advantages, attracting and retaining core employees through market-oriented compensation mechanisms, and this differentiated incentive further reinforces compensation differentiation. Therefore, digital finance may, by strengthening management's short-term performance orientation, change the way compensation resources are allocated within enterprises, making compensation growth more concentrated among core managers and high-skilled employees, ultimately widening internal corporate pay gaps. Accordingly, this paper proposes:

H3: The association between digital finance and corporate pay gaps may operate partly through managerial myopia.

4. Research Design

4.1 Model Specification

To examine the impact of digital finance on corporate pay gaps, this paper constructs the following two-way fixed effects model:

$$GAP_{it} = \alpha_0 + \beta_0 DF_{it} + \sum Controls_{it} + \mu_i + \theta_t + \varepsilon_{it}$$

Where i represents the firm, t represents the year; the dependent variable GAP_{it} represents the corporate pay gap; the core explanatory variable DF_{it} represents the level of digital finance development in the region where the firm is located; $Controls_{it}$ represents a series of firm-level control variables; μ_i and θ_t represent firm fixed effects and year fixed effects, respectively, used to control for firm-specific time-invariant characteristics and the impact of changes in the macroeconomic environment; ε_{it} is the random error term.

This paper focuses on the estimated coefficient β of the core explanatory variable DF . If digital finance can widen internal corporate pay gaps, then β is expected to be significantly positive, meaning that the higher the level of digital finance development, the more pronounced the pay gap among different employee groups within the firm.

The adoption of the two-way fixed effects model is mainly based on the following considerations: First, there is a large amount of unobservable heterogeneity across firms, such as corporate culture, management models, and industry characteristics, which may simultaneously affect digital finance application and compensation structure, and therefore need to be controlled through firm fixed effects; Second, macroeconomic environment, policy changes, and digital economy development trends in different years may affect corporate compensation levels, and year fixed effects can reduce estimation bias caused by time trend factors.

In addition, considering that corporate compensation structure has a certain persistence, the past compensation system of the firm may affect the current pay gap. Therefore, this paper further tests the dynamic effects of digital finance on pay gaps by using one-period lagged and two-period lagged digital finance indicators.

4.2 Variable Description and Measurement

1) Dependent Variable: Corporate Pay Gap (GAP)

Corporate pay gap is the core outcome variable of concern in this paper, used to measure the degree of income differentiation among different labor groups within the firm. Referring to existing studies on corporate pay gaps, this paper uses the difference between the average compensation of corporate executives and the average compensation of employees to measure the degree of internal pay differentiation within the firm.

Specifically, this paper uses disclosed data from listed companies to calculate the ratio of the average compensation of corporate executives to the average compensation of ordinary employees, and takes the logarithmic transformation:

$$GAP_{it} = \ln\left(\frac{\text{Executive Compensation}}{\text{Employee Compensation}}\right)$$

The larger this indicator, the more pronounced the income gap between senior management and ordinary employees within the firm.

The pay gap not only reflects the internal income distribution structure of the firm but also embodies the firm's incentive mechanisms and organizational governance characteristics. A moderate pay gap can increase employee effort through tournament incentive mechanisms (Lazear and Rosen, 1981), but an excessively large pay gap may weaken employees' sense of fairness and reduce organizational cohesion (Akerlof and Yellen, 1990). Therefore, examining whether digital finance affects corporate pay gaps is of great significance.

The core explanatory variable of this paper is the level of digital finance development (DF). Digital finance improves the efficiency of financial services through digital technology, reduces financial transaction costs, and improves the corporate financing environment. This paper uses the Peking University Digital Financial Inclusion Index to measure the level of digital finance development in the region where the firm is located.

To reduce estimation bias caused by omitted variables, this paper further controls for a series of related factors that affect corporate pay gaps, including firm size (Size), firm age (Age), profitability (ROA), financial leverage (Lev), cash flow level (Cashflow), and growth opportunities (TobinQ). Among them, firm size, life cycle, and profitability may affect the firm's compensation payment capacity and internal compensation structure; financial leverage and cash flow reflect the degree of resource constraints of the firm; and growth opportunities reflect the impact of future development expectations on talent demand and compensation competition. In addition, considering the important role of corporate governance structure in compensation distribution, this paper further controls for governance variables such as the shareholding ratio of the largest shareholder (Top1), the proportion of independent directors (Indep), and CEO duality (Dual), to exclude the influence of corporate governance characteristics on the pay gap. By controlling for the above variables, this paper can more accurately identify the net effect of digital finance development on corporate pay gaps.

4.3 Sample and Data Sources

This paper selects Chinese A-share listed companies as the research sample to examine the impact of digital finance development on corporate pay gaps. Firm-level financial data, corporate governance data, and employee compensation-related data are mainly obtained from the CSMAR database. Digital finance development level data are obtained from the Peking University Digital Financial Inclusion Index, which is constructed based on regional-level dimensions such as digital finance coverage breadth, usage depth, and digitalization degree, and can comprehensively reflect the level of digital finance development in various regions of China (Guo et al., 2020). In the sample screening process, this paper follows the conventions of existing listed company research. First, financial industry listed companies are excluded, because financial enterprises differ significantly from other industries in terms of business models, compensation structures, and regulatory environments, which may affect the comparability of research results. Second, firms with abnormal operations such as ST and *ST are excluded, to avoid the influence of extreme operating conditions on compensation structure. In addition, this paper applies a 1% winsorization treatment to continuous variables at both tails, to reduce the interference of outliers on regression results. After the above screening and data matching, a total of 41,447 firm-year observations is finally obtained, forming an unbalanced panel dataset. Compared with pure cross-sectional data, panel data can simultaneously utilize information from both firm and time dimensions, helping to control for firm-specific time-invariant characteristics and the impact of macro-environmental changes, thereby improving the reliability of estimation results. This paper further employs firm fixed effects and year fixed effects models for empirical analysis, to identify the impact of digital finance development on corporate pay gaps.

4.4 Descriptive Analysis

Table 1 presents the descriptive analysis results of this paper. In the sample data of this paper, the maximum value of GAP is 13.4272, and the minimum value is 0.3356, indicating that the distribution of pay gaps varies considerably across different firms during the sample period. The maximum value of DF is 3.9227, and the minimum value is 2.6568, indicating that there is a certain degree of variation in the level of digital financial inclusion across Chinese cities during the sample period. Other variables all fluctuate within normal ranges, with no extreme values.

Table 1: Results of Descriptive Analysis

Variables	Obs	Mean	Std. Dev.	Min	Max
GAP	41447			0.3356	13.4272
DF	41447			2.6568	3.9227

5. Empirical Results and Analysis

5.1 Baseline Regression Results

Table 2 reports the baseline regression results of the impact of digital finance on corporate pay gaps. This paper employs firm fixed effects and year fixed effects models for estimation, to control for firm-specific time-invariant individual characteristics and the impact of changes in the macroeconomic environment. The regression results show that the estimated coefficient of the digital finance development level (DF) is significantly positive and passes the significance test in statistical terms, indicating that digital finance development significantly widens internal corporate pay gaps. This result supports the research hypothesis H1 proposed in this paper, that is, digital finance development exacerbates internal pay differentiation within firms.

Table 2: Baseline Regression Results

Variables	(1) GAP	(2) GAP	(3) GAP	(4) GAP
DF	0.6113** (0.2470)	0.6026** (0.2470)	0.6230*** (0.2331)	0.6237*** (0.2317)
Age		0.5325** (0.2498)	0.6237** (0.2530)	0.5820** (0.2522)
Roa			4.0876*** (0.2022)	4.1089*** (0.2039)
Lev			0.8523*** (0.1077)	0.8465*** (0.1079)
Cashflow			0.5711*** (0.1267)	0.5607*** (0.1282)
TobinQ			-0.0439*** (0.0137)	-0.0429*** (0.0136)
Top1				-0.2527 (0.2924)
Indep				-1.9707*** (0.2578)
Dual				-0.0761** (0.0313)
Constant	0.9657 (0.6563)	-0.5962 (1.0147)	-1.3666 (0.9907)	-0.3904 (1.0654)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	41,447	41,447	41,447	41,447
R ²	0.756	0.756	0.764	0.765

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

5.2 Robustness Tests

5.2.1 Adding Fixed Effects

First, this paper further adds industry fixed effects, city fixed effects, city-industry fixed effects, and province-industry fixed effects, to control for the impact of differences in development environments across different regions and industries on corporate compensation structures. The results show that after gradually adding control variables and fixed effects, the estimated coefficient of digital finance (DF) remains significantly positive, and the coefficient size remains stable. This indicates that the promoting effect of digital finance on corporate pay gaps is not driven by certain specific industries or regional

characteristics but still exists after controlling for more granular heterogeneity. This result suggests that the development of digital finance has indeed changed the internal income distribution structure of firms, rather than simply reflecting differences in regional economic development levels or industry digitalization degrees.

Table 3: Regression Results with Alternative Fixed Effects

Variables	(1) GAP	(2) GAP	(3) GAP	(4) GAP
DF	0.6237** (0.2319)	0.6237** (0.2317)	0.6237** (0.2317)	0.6237** (0.2346)
Constant	-0.3904 (1.0664)	-0.3904 (1.0654)	-0.3904 (1.0654)	-0.3904 (1.0785)
Controls	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Ind Fe	YES			
Citycode FE		YES		
Cityind FE			YES	
Proind FE				YES
N	41,447	41,447	41,447	41,447
R ²	0.765	0.765	0.765	0.765

5.2.2 Changing Clustering Dimensions

Considering that firm samples may have correlations at the regional, industry, and year levels, this paper further adjusts the standard error clustering methods, clustering by city-year, city-industry, province code, province-year, and province-industry, respectively. The results show that under different clustering methods, the estimated coefficient of the digital finance variable remains consistently significantly positive, and the significance level does not change significantly, indicating that the conclusions of this paper do not depend on specific standard error specifications and are highly robust.

Table 4: Regression Results with Alternative Clustering Dimensions

Variables	(1) GAP	(2) GAP	(3) GAP	(4) GAP	(5) GAP
DF	0.6237** (0.1285)	0.6237** (0.2020)	0.6237** (0.2313)	0.6237** (0.1281)	0.6237** (0.2016)
Constant	-0.3904 (0.6299)	-0.3904 (1.0621)	-0.3904 (0.9003)	-0.3904 (0.5877)	-0.3904 (1.0643)
Cluster	Cityyear	Cityind	Procode	Proyear	Proind
Controls	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
N	41,447	41,447	41,447	41,447	41,447
R ²	0.765	0.765	0.765	0.765	0.765

5.2.3 Replacing the Core Explanatory Variable

To avoid measurement bias caused by the selection of digital finance indicators, this paper further uses alternative indicators to re-measure the level of digital finance development. The results show that regardless of which digital finance indicator is used, the coefficient of the core explanatory variable remains significantly positive, indicating that the conclusion that digital finance widens corporate pay gaps is stable.

Table 5: Regression Results with Alternative Core Explanatory Variables

Variables	(1) GAP	(2) GAP
DF1	0.4485** (0.2229)	
DF2		0.3812** (0.1783)
Constant	0.0647 (1.0068)	0.2624 (0.9695)
Controls	Yes	Yes
Firm FE	Yes	Yes
Year FE	Yes	Yes
N	41,447	41,447
R ²	0.765	0.765

5.2.4 Considering Lagged Effects

Since the impact of digital finance on corporate compensation structures may have a certain time lag, this paper further uses one-period lagged and two-period lagged digital finance indicators for regression. The results show that both the one-period lagged and two-period lagged digital finance variables still significantly promote the widening of corporate pay gaps, indicating that the impact of digital finance on internal corporate compensation structures is not short-term fluctuation, but has a persistent effect. This result is also consistent with the realistic process of corporate digital transformation and organizational adjustment. It takes a certain amount of time for digital finance to drive enterprises to change their business models and talent structures, and its impact on the compensation system usually does not occur immediately but gradually emerges as enterprises deepen their technology application and undergo organizational adjustment.

Table 6: Regression Results Considering Lagged Effects

Variables	(1) GAP	(2) GAP
l1DF	0.7048*** (0.2490)	
l2DF		0.5067* (0.2689)
Constant	-0.9099 (1.1872)	-1.1942 (1.2923)
Controls	Yes	Yes
Firm FE	Yes	Yes
Year FE	Yes	Yes
N	35,702	30,996
R ²	0.773	0.779

5.3 Heterogeneity Analysis

5.3.1 Enterprise Ownership

Enterprises of different ownership types have significant differences in governance structure, business objectives, and compensation systems, so the impact of digital finance on pay gaps may exhibit different characteristics. This paper divides the sample into state-owned enterprises (SOEs) and non-state-owned enterprises (Non-SOEs) for group regression according to the nature of enterprise ownership. The regression results show that digital finance significantly widens pay gaps in both types of enterprises,

but the degree of impact differs. Among them, the coefficient of the digital finance variable in the SOE group is 0.7101 and significant at the 1% level; in the non-SOE group, the coefficient is 0.5321 and significant at the 10% level. The results indicate that digital finance has a significant impact on the compensation structures of enterprises with different ownership types, but the effect is more pronounced in SOEs. This result may be related to differences in compensation systems and incentive mechanisms across enterprises with different ownership types.

On the one hand, SOEs usually have more complete organizational systems and stronger resource integration capabilities, and the development of digital finance can further improve the resource allocation efficiency of SOEs and promote corporate digital reform. In the process of digital transformation, SOEs have an increasing demand for technical talents, management talents, and innovative talents, and these core employees usually enjoy higher compensation growth space, thereby widening internal corporate pay gaps. On the other hand, SOEs have long undertaken social responsibilities and employment stabilization functions, and the compensation adjustments for ordinary employees usually have strong rigidity, with relatively stable wage growth rates. When digital finance pushes enterprises to place greater emphasis on market competitiveness and technological innovation capabilities, the compensation increases for high-skilled employees and managers may exceed those of ordinary employees, leading to a widening of internal pay gaps. In contrast, non-SOEs have more sufficient market competition, more market-oriented compensation systems, and already have stronger talent competition mechanisms, so the marginal impact brought by digital finance may be relatively limited. In addition, non-SOEs are more affected by financing constraints. Although digital finance can improve the financing environment, enterprises may prioritize new resources for production expansion, technology investment, and market development, leaving relatively limited room for compensation adjustments. Therefore, differences in enterprise ownership affect the intensity of the impact of digital finance on pay gaps, and the compensation differentiation effect of digital finance is more pronounced in SOEs.

5.3.2 Eastern and Non-Eastern Regions

Considering that Chinese regions differ substantially in their levels of economic development, digital infrastructure, financial development, and labor-market conditions, the relationship between digital finance and corporate pay gaps may vary across regions. Rather than interpreting the regional differences as definitive causal effects, this paper examines whether the association between digital finance and corporate pay gaps differs between eastern and non-eastern regions.

The results show that the positive association between digital finance and corporate pay gaps is more pronounced in non-eastern regions. The coefficient of digital finance is 0.5589 in eastern regions but is not statistically significant, whereas the coefficient is 0.7385 in non-eastern regions and is significant at the 5% level.

For eastern regions, the relatively mature financial and digital infrastructure may be associated with a smaller marginal association between further digital-finance development and corporate compensation structures. Existing research indicates that eastern China has higher levels of financial efficiency and more developed financial conditions than non-eastern regions (Wang et al., 2023). Therefore, the additional development of digital finance may generate relatively smaller incremental changes in firms' financing and organizational environments in regions where financial and digital systems are already relatively developed.

For non-eastern regions, the interpretation may instead be related to differences in the underlying

financial-development environment. Wang et al. (2023) find that financial efficiency in eastern regions is higher than that in non-eastern regions, highlighting substantial differences in regional financial-development foundations. In such a context, the development of digital finance may represent a relatively larger change in the financial environment faced by firms in non-eastern regions. This may be associated with greater changes in firms' access to financial resources, technology investment, and organizational adjustment, which could in turn be reflected in differences in internal compensation structures.

Therefore, the stronger estimated coefficient in non-eastern regions should be interpreted as evidence of regional heterogeneity in the association between digital finance and corporate pay gaps, rather than as definitive evidence that regional financial differences causally amplify the effect of digital finance.

Table 7: Regression Results of Heterogeneity Analysis

	(1)	(2)	(3)	(4)
	SO	Non-SO	East	Non-East
Variables	GAP	GAP	GAP	GAP
DF	0.7101** (0.2460)	0.5321* (0.3144)	0.5589 (0.3377)	0.7385** (0.3412)
Constant	-0.9570 (1.6926)	2.0138* (1.1428)	-0.6984 (1.3170)	0.9779 (1.6155)
Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	13,993	27,397	29,316	12,131
R ²	0.762	0.784	0.776	0.720

5.4 Mechanism Analysis

5.4.1 Digital Finance, Digital Transformation, and Corporate Pay Gaps

The development of digital finance can provide important support for corporate digital transformation. On the one hand, digital finance, by reducing information asymmetry and financing constraints, improves enterprises' ability to obtain external funds, enabling enterprises to invest more resources in digital infrastructure construction, technology R&D, and intelligent equipment application; on the other hand, digital finance itself relies on the development of digital technology, and its application process will also promote the transformation of business concepts and organizational models toward digitalization. To test whether digital transformation is an important channel through which digital finance affects pay gaps, this paper first examines the impact of digital finance on corporate digital transformation. The results show that the estimated coefficient of digital finance (DF) is 0.5075 and significant at the 1% level, indicating that the development of digital finance can significantly promote corporate digital transformation.

This result suggests that digital finance not only improves the corporate financing environment but also drives changes in enterprise production and operation methods. Furthermore, digital transformation changes the internal labor demand structure of enterprises. The application of digital technology increases enterprises' demand for talents in data analysis, technology R&D, and innovation management, making the role of high-skilled workers more prominent in enterprise value creation. According to the skill-biased technological change theory, technological upgrading generally increases the marginal productivity and wage premium of high-skilled workers, while reducing the relative competitive advantage of some low-skilled workers (Autor et al., 2003; Acemoglu and Restrepo, 2020). Therefore, digital finance, by promoting corporate digital transformation, makes enterprises more

dependent on core talents with digital skills and professional knowledge, and attracts and retains talents by raising their compensation levels. At the same time, ordinary employees, due to the higher degree of job standardization, find it difficult to obtain an equal degree of compensation growth, ultimately leading to a widening of the income gap among different labor groups within the enterprise. In summary, digital transformation is an important transmission channel through which digital finance widens corporate pay gaps.

5.4.2 Digital Finance, Managerial Myopia, and Corporate Pay Gaps

In addition to promoting corporate technological change, digital finance may also affect compensation structures by changing the corporate governance environment and management behavior. The development of digital finance improves the transparency of corporate operational information, enabling investors, financial institutions, and market participants to obtain corporate operational information in a timelier manner, thereby strengthening external supervision pressure. Under capital market attention and performance assessment pressure, management may pay more attention to short-term operating performance and adopt short-term resource allocation strategies (Stein, 1989; Graham et al., 2005). To test this mechanism, this paper further examines the impact of digital finance on the degree of managerial myopia. The results show that the estimated coefficient of digital finance (DF) is 0.4693 and significant at the 1% level, indicating that the development of digital finance significantly enhances managerial myopia in enterprises.

The possible reason is that digital finance increases the observability of corporate operational information, exposing enterprises to more frequent market evaluations and performance pressure. In this situation, to meet investor expectations and improve short-term performance, management may be more inclined to adopt business strategies that can generate returns quickly and strengthen short-term performance-oriented compensation incentive mechanisms. Specifically, management may prioritize increasing compensation for executives, technical personnel, and employees in core positions, to incentivize them to create quickly realizable operational outcomes; at the same time, long-term human capital investments such as ordinary employee training and career development, due to their longer return cycles, may be weakened. This short-term resource allocation method makes corporate compensation growth more concentrated among a small number of core groups, thereby widening internal pay gaps. Therefore, digital finance not only changes the labor demand structure through technological upgrading but also changes the way compensation resources are allocated within enterprises by affecting management behavior, further widening internal pay differentiation within enterprises.

Table 8: Regression Results of Mechanism Analysis

Variables	(1) DCG	(2) SC
DF	0.5075*** (0.1461)	0.4693*** (0.0833)
Constant	0.1113 (0.5845)	3.7860*** (0.4888)
Controls	Yes	Yes
Firm FE	Yes	Yes
Year FE	Yes	Yes
N	41,356	41,437
R ²	0.809	0.907

6. Research Conclusions and Policy Implications

6.1 Research Conclusions

Against the background of the rapid development of the digital economy, digital finance, as an important form of digital transformation of the financial system, is profoundly affecting corporate financing methods, business models, and organizational structures. Existing studies have mainly focused on the positive effects of digital finance on alleviating corporate financing constraints, promoting technological innovation, and improving operational efficiency, but have paid insufficient attention to whether digital finance affects the internal income distribution structure of enterprises. Based on a sample of Chinese A-share listed companies, this paper systematically examines the impact of digital finance development on corporate pay gaps and further analyzes its mechanisms. This paper mainly draws the following conclusions. First, the development of digital finance is significantly associated with wider internal corporate pay gaps. The baseline regression results show that, after controlling for firm fixed effects, year fixed effects, and a series of firm characteristics and governance variables, the estimated coefficient of the digital finance variable is significantly positive. This finding suggests a statistically significant relationship between digital finance development and internal pay differentiation within firms, rather than establishing a definitive causal effect. After further robustness tests including adding fixed effects, changing clustering methods, replacing the core explanatory variable, and considering lagged effects, the research results remain stable. Second, the impact of digital finance on corporate pay gaps exhibits significant heterogeneity. The group regression results show that the degree of impact of digital finance differs across enterprises of different ownership types and across different regions. Among them, the compensation differentiation effect of digital finance is more pronounced in state-owned enterprises, which may be related to the increased demand for high-skilled talents and management talents in the process of digital reform in SOEs. Meanwhile, regional heterogeneity analysis finds that the effect of digital finance in widening pay gaps is more significant in non-eastern regions, indicating that in regions where the traditional financial system is relatively insufficient and there is greater space for digital transformation, the organizational adjustments and talent structure changes brought by digital finance are more pronounced. Third, mechanism analysis provides evidence consistent with two potential channels associated with the observed relationship: digital transformation and managerial myopia. On the one hand, digital finance, by alleviating corporate financing constraints, improves enterprises' ability to invest in digital technologies and promotes corporate digital transformation. Digital transformation changes production methods and labor demand structures, increases the marginal value of high-skilled workers, enables them to obtain higher compensation returns, thereby widening internal income gaps within the firm. On the other hand, digital finance improves corporate information transparency and external supervision pressure, strengthens management's short-term performance orientation, makes enterprises more inclined to adopt core talent incentive strategies, while weakening long-term development investment in ordinary employees, further exacerbating compensation differentiation.

6.2 Theoretical Implications

This paper has the following theoretical implications. First, this paper expands the analytical perspective of digital finance research. Existing studies mainly evaluate the economic value of digital finance from the perspectives of corporate financing, innovation, and performance, emphasizing its positive role in promoting efficiency improvement. This paper further points out that digital finance also has income distribution effects, and its impact is reflected not only in how much value enterprises create, but also in how value is distributed within enterprises. This finding enriches the research on the economic consequences of digital finance and provides a new theoretical perspective for understanding

the comprehensive impact of digital finance. Second, this paper enriches the research on technological progress and income inequality. Existing studies have mainly focused on the impact of artificial intelligence, robotics, and automation technologies on the labor market, while this paper incorporates digital finance into the analytical framework of the impact of technological change on income distribution, revealing how financial digitalization changes labor demand structures by promoting corporate digital transformation, and further affects compensation distribution. Finally, this paper expands the research on corporate pay gaps. Traditional studies have mainly explained the formation mechanisms of pay gaps from the perspectives of corporate governance and management incentives, while this paper emphasizes that the digital environment and financial technology development also affect internal corporate compensation structures, providing a new theoretical basis for explaining income differentiation within firms in the digital economy era.

6.3 Policy Implications

Based on the above research conclusions, this paper proposes the following policy implications. First, while promoting the development of digital finance, attention should be paid to its potential income distribution effects. The government should continue to improve the construction of digital finance infrastructure and expand the coverage of financial services, but at the same time, it is necessary to establish a more inclusive digital economy development mechanism to avoid the dividends of digital technology being excessively concentrated among a small number of high-skilled groups. Second, enterprises should improve internal compensation governance mechanisms during the process of digital transformation. Digital technology upgrading inevitably increases the demand for technical talents and core employees, but enterprises should avoid forming excessively widened compensation differentiation. On the one hand, a more scientific and reasonable performance evaluation system should be established; on the other hand, employee training and skill upgrading should be strengthened, so that ordinary employees can adapt to the requirements of digital transformation and share the fruits of digital economy development. Third, digital skills training should be strengthened to enhance workers' ability to adapt to the development of the digital economy. Since digital finance and digital transformation have increased enterprises' demand for high-skilled talents, the government and enterprises should jointly promote the construction of vocational education, skill training, and lifelong learning systems, improve workers' digital skill levels, and reduce the risk of income differentiation caused by technological change. Fourth, corporate governance and long-term development orientation should be strengthened. Regulatory authorities and investors should pay attention to the compensation structure imbalances that may be caused by short-term performance pressure on enterprises, guide enterprises to establish more long-term and diversified talent incentive mechanisms and achieve a balance between enterprise efficiency improvement and employee shared development.

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