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ESG Performance of Listed Companies and Labor Cost Stickiness

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Abstract

In the context of sustainable development and the "dual carbon" goals, the impact of corporate ESG performance on cost behavior has attracted increasing attention. This study employs a sample of Chinese A-share listed companies from 2010 to 2024 to examine the impact of ESG performance on labor cost stickiness. The findings show that overall ESG performance has no significant direct impact on labor cost stickiness. However, dimension-specific analyses indicate that the social responsibility (S) dimension significantly suppresses cost stickiness, while the environmental (E) and governance (G) dimensions have no significant effect. Further analysis reveals that the moderating effects of ownership type and regional development levels on ESG are heterogeneous, and ESG practices in state-owned enterprises and enterprises in the central and western regions of China have not effectively reduced labor cost stickiness. The findings suggest that the current structural limitations of ESG ratings and differences in institutional environments are key factors affecting the cost management effectiveness of ESG practices.

Keywords

ESG performance, labor cost stickiness, corporate social responsibility, property rights heterogeneity

1. Introduction

Against the backdrop of growing global environmental awareness and the widespread adoption of sustainable development principles, China's ongoing pursuit of its "carbon peaking and carbon neutrality" goals has positioned corporate ESG performance as a critical determinant of long-term competitiveness. The government and regulators continue to strengthen ESG information disclosure requirements and push enterprises to integrate ESG into their strategic decision-making(Wang and Wu, 2024). However, there is still a lack of sufficient empirical evidence to prove whether current ESG practices truly affect the micro-level cost behavior of enterprises, especially whether they can improve resource allocation efficiency and suppress cost stickiness. As an important indicator for measuring cost adjustment asymmetry, labor cost stickiness affects not only the short-term performance of enterprises but also their adaptability and sustainability in a complex market environment (Anderson et al., 2003, Geng and Wang, 2019). While extant literature has focused on ESG's macroeconomic outcomes, such as corporate value (Yan et al., 2023) and financing costs (Mei and Zhang, 2023), its role in enhancing internal resource allocation efficiency from a cost behavior perspective, particularly regarding labor cost stickiness, has been largely overlooked.

To address this gap, this study selects Chinese A-share listed companies from 2010 to 2024 as the analysis

sample to empirically test the impact mechanism of ESG performance on labor cost stickiness. It focuses on three research questions: First, whether the ESG performance of enterprises has a significant inhibitory effect on labor cost stickiness; second, whether this mechanism exhibits heterogeneity in different ESG dimensions; and third, whether the above-mentioned impacts show structural differences under different property rights structures and regional contexts. To mitigate endogeneity concerns, this paper adopts multi-period lagged variables and fixed-effect models, and conducts robustness checks from multiple angles, such as changing the measurement method and adjusting the sample interval.

This paper makes two main contributions. First, it broadens the research on the economic consequences of ESG by introducing a micro-behavioral perspective centered on labor cost stickiness, thereby providing new evidence on ESG's management efficiency. Second, by examining the effects of the E, S, and G dimensions separately, it reveals the pivotal role of the social responsibility (S) dimension in suppressing labor cost stickiness, and thereby enriches our understanding of heterogeneity within ESG's internal mechanisms.

2. Literature Review and Theoretical Hypotheses

2.1 Research on the Economic Consequences of ESG

In recent years, the impact of ESG performance on corporate financial and non-financial performance has garnered significant attention from both academia and practitioners. Research has clearly indicated that strong ESG performance can enhance corporate value (Fatemi et al., 2018) and effectively lower the cost of capital (El Ghoul et al., 2011), thereby strengthening investors' confidence in the long-term development of enterprises. As research advances, scholarly focus has gradually expanded to examine the impact of ESG performance on specific micro-level operational behaviors, such as investment in technological innovation (HUANG, 2021), operational efficiency (Gillan et al., 2021), and risk management strategies (Albuquerque et al., 2019). However, how ESG performance actually affects corporate cost behavior remains an area requiring further in-depth exploration. As an important indicator of resource allocation efficiency, cost stickiness reflects the flexibility of enterprises in adjusting costs when business volume changes (Anderson et al., 2003). Existing research predominantly focuses on the macro-level performance outcomes of ESG and lacks a micro-level analysis of its effect on cost structure, particularly regarding labor cost stickiness.

2.2 Research on the Factors Affecting Cost Stickiness

The formation of cost stickiness is primarily attributed to adjustment costs, agency problems, and managers' optimistic expectations (Banker et al., 2013). Consequently, existing studies have predominantly analyzed its influencing factors from the perspectives of corporate governance, managers' characteristics, and the external environment. For example, high-quality internal control (Jiang et al., 2020) and a firm's digital transformation (Fan and Zheng, 2024) have both been identified as effective in curbing cost stickiness. However, the existing literature mainly focuses on traditional financial cost categories, and discussion specifically addressing labor cost stickiness remains relatively limited. Given the high specificity of human capital and the inherent rigidity of labor contracts, the formation mechanism of labor cost stickiness is typically more complex than that of general costs (Gu et al., 2012). In recent years, although some studies have begun to focus on the impact of employee protection and labor relations on cost behavior (John et al., 2020), they have not yet systematically examined the specific impact of ESG performance, particularly factors such as employee relationship management and supply chain responsibility within the social (S) dimension, on corporate labor cost adjustment behavior.

2.3 Theoretical Analysis and Research Hypotheses

Based on the resource-based view and stakeholder theory, an enterprise's outstanding performance in environmental, social, and governance aspects can improve the efficiency of internal resource allocation and the synergy with external stakeholders. At the same time, it can enhance the transparency of information disclosure, reduce the degree of information asymmetry in the capital market and the transaction friction costs between stakeholders, thereby improving the flexibility and adaptability of the enterprise's cost management system. A company's ESG performance may affect labor cost stickiness through the following channels.

The social dimension of the ESG framework focuses on two key areas: First, companies invest in employee welfare systems that cover salary guarantees, career development plans, and mental health support. Second, companies fulfill their supply chain social responsibilities, such as developing supplier codes of conduct and protecting employees' rights. Optimizing these two aspects can promote harmonious and stable labor-capital relations, ensure efficient operation of the supply chain, and reduce friction costs (Kitzmueller and Shimshack, 2012). When firms face business fluctuations, those with strong performance in the social dimension of ESG can flexibly adjust their human resource allocation and weaken the rigidity of labor costs.

In contrast, the environmental and governance dimensions have more indirect mechanisms of action. The environmental dimension improves energy efficiency and enhances carbon emissions transparency, while the governance dimension optimizes decision-making processes and strengthens long-term strategic orientation. Together, these two factors influence management resource allocation decisions (Dyck et al., 2019). However, the current ESG rating system has structural flaws. On the one hand, there is a "ceiling effect" among rating agencies, which makes it difficult to reflect the subtle differences between companies; on the other hand, the scoring structure of each dimension is unbalanced, making it difficult to fully demonstrate and evaluate the moderating role of the environmental and governance dimensions on the short-term cost behavior of enterprises. This study hypothesizes that:

H1: Good ESG performance of listed companies helps reduce labor cost stickiness.

3. Research Design

3.1 Sample Selection and Data Sources

Given that the Sino-Securities Index has been evaluating the environmental, social, and governance (ESG) performance of listed firms since 2009, this study uses A-share listed companies during 2010-2024 as the analysis sample, and uses one-period lagged ESG performance indicators to construct an empirical model that examines the impact of listed companies' ESG performance on labor cost stickiness. To ensure the validity and reliability of the research findings, the initial data were processed as follows. (1) Exclude samples of companies in the financial industry. (2) Eliminate samples of ST, *ST, and PT companies. (3) Eliminate samples with missing values for the key variables. Through these steps, a total of 12,166 valid observations were obtained. Additionally, all continuous variables are winsorized at the 1% level to mitigate the impact of extreme values. ESG rating data are obtained from the Wind Database, and other listed firm data come from the CSMAR Database.

3.2 Variable Definition

3.2.1 Dependent Variable

Labor Cost Stickiness (LCS). Following the method of Weiss (Weiss, 2010),we measure the labor cost stickiness for each sample firm in each fiscal year. Model (1) is specified as follows:

$$\mathrm{LCS}_{i,t} = \log\left(\frac{\Delta LaborCost}{\Delta Sale}\right)_{i,down} - \log\left(\frac{\Delta LaborCost}{\Delta Sale}\right)_{i,up} \quad (1)$$

Where: i denotes the firm. $LaborCost$ is the total labor cost, defined with reference to Gu et al. (2020) as "cash paid to and on behalf of employees" from the cash flow statement. $Sale$ is the firm's operating income. Considering data availability and following the approach of Sun (2023), this paper uses operating income to proxy for labor income. $\Delta LaborCost$ and $\Delta Sale$ represent the quarterly change rate of total labor cost and operating income, respectively. $down$ and up refer to the quarters in the sample company's four quarters of the year where revenue declined and increased, respectively, near the end of the period. To facilitate empirical testing of the impact of Chinese listed companies' ESG performance on labor cost stickiness, this paper takes the negative of the LCS. Therefore, a positive LCS with a higher value indicates a higher level of labor cost stickiness for the firm.

3.2.2 Independent Variables

ESG performance. Currently, ESG rating data is mainly provided by third-party professional institutions, with multiple authoritative rating systems available in the market, including Huazheng, Bloomberg, and Shangdao Ronglu. Among them, the Huazheng ESG rating system, while drawing on the international mainstream ESG assessment framework, fully combines the characteristics of China's capital market and the information disclosure characteristics of listed companies, demonstrating a high degree of local applicability. Based on its dual advantages of academic rigor and practical applicability, this study selected Huazheng ESG Ratings as the data source for the core explanatory variables. The rating results of this indicator are divided into nine levels: AAA, AA, A, BBB, BB, B, CCC, CC, and C. This study converts the ratings into continuous variables ranging from 1 to 9 (AAA=9, AA=8, …, C=1) to numerically reflect the comprehensive level of a company's ESG performance, making it easier to test its marginal impact on labor cost stickiness in the empirical model.

3.2.3 Control Variables

To mitigate the potential confounding effects of firm-specific characteristics and macroeconomic factors on labor cost stickiness, this paper controls for a set of variables. These include company size (Size), firm age (Age), profitability (ROA), leverage (Lev), company growth (Growth), ownership concentration (Top1), CEO duality (Dual), ownership type (SOE), labor intensity (APE), employee wage level (Wage), as well as year and industry fixed effects (Year; Ind). Detailed definitions of all control variables are provided in Table 1.

Table 1 Variable Definitions

Type	Name	Symbol	Definition
Dependent variable	Labor cost stickiness	LCS	The negative value of the labor cost stickiness measure calculated using the Weiss model.
Independent variables	ESG performance	ESG	A continuous variable constructed by quantifying the Huazheng ESG rating
Control Variables	Company Size	Size	The natural logarithm of the company's total assets at the end of the period
	Firm Age	Age	The natural logarithm of the company's listing years
	Profitability	ROA	Company net profit/Company total assets
	Leverage	Lev	Total company liabilities/total company assets
	Company growth	Growth	Operating income growth rate
	Ownership concentration	Top1	Shareholding ratio of the largest shareholder
	CEO duality	Dual	Dummy variables (1 if the chairman and general manager are the same person, 0 otherwise)
	Ownership type	SOE	Dummy variables (1 if the company is a state-owned enterprise, 0 otherwise)
	Labor intensity	APE	The natural logarithm of the ratio of a company's total assets to its number of employees
	Employee wage levels	Wage	The natural logarithm of the ratio of cash payments to and on behalf of employees to the number of employees
	Year	Year	Year dummy variables
	Industry	Ind	Industry dummy variables are set according to the industry classification of the China Securities Regulatory Commission

3.3 Model Building

This paper constructs an OLS regression model (2) to examine the impact of listed companies' ESG performance on labor cost stickiness:

$$\mathrm{LCS}_{i,t} = \alpha_0 + \alpha_1 ESG_{i,t} + \sum Controls + \sum Year + \sum \mathrm{Ind} + \epsilon \quad (2)$$

In the equation, i denotes the firm and t denotes the year; α_0 is the intercept term; α_1 is the core concern

coefficient, measuring the direction and magnitude of the impact of $ESG_{i,t}$ on $\mathrm{LCS}_{i,t}$; $\sum Controls$ represents the set of control variables; $\sum Year$ and $\sum \mathrm{Ind}$ respectively denote year and industry fixed effects; and ϵ is the error term.

If α_1 is significantly negative, it indicates that better ESG performance is associated with weaker labor cost stickiness; if α_1 is significantly positive, it suggests that better ESG performance is associated with stronger labor cost stickiness.

4. Analysis of Empirical Results

4.1 Descriptive Statistics

Table 2 presents the descriptive statistics for the main variables. The minimum value of labor cost stickiness (LCS) is -6.564, the maximum value is 5.874, and the standard deviation is 2.119, indicating that there are significant differences in labor cost stickiness among different listed companies; its mean is 0.207 and the median is 0.234, indicating that most listed companies have labor cost stickiness. The mean and median of ESG performance (ESG) are both around 6.000, with a small standard deviation (0.068), indicating that the ESG ratings of the vast majority of companies are highly concentrated at an upper-middle level. However, this also reflects that the rating differentiation is limited and there may be a ceiling effect.

From the perspective of control variables, the mean of enterprise size (Size) is 22.390 and the standard deviation is 1.329, indicating that there are certain differences in asset size among the sample enterprises. The mean of leverage (Lev) is 0.433 and the median is 0.428, indicating that firms are generally within a reasonable range of leverage. The average return on assets (ROA) is 0.033, suggesting generally good profitability. The mean of ownership concentration (Top1) is 0.351, indicating that the largest shareholder holds a high proportion of shares. The mean of CEO duality (Dual) is 0.275, indicating that approximately 27.5% of the sample companies have both the chairman and the general manager serving in one position. The mean of ownership type (SOE) is 0.405, indicating that state-owned enterprises account for about 40.5% of the sample. The average values of labor intensity (APE) and employee wage level (Wage) are 14.58 and 11.75, respectively, which are within a reasonable range. Overall, the values of each variable are within the expected range, consistent with existing research, and the sample is well-representative.

Table 2: Descriptive Statistics of Main Variables

Variable	N	Mean	SD	Min	50%	Max
LCS	12166	0.207	2.119	-6.564	0.234	5.874
ESG	12166	5.998	0.068	2.000	6.000	6.000
Size	12166	22.390	1.329	19.560	22.180	26.450
Age	12166	2.241	0.784	0.693	2.398	3.466
ROA	12166	0.033	0.064	-0.375	0.033	0.255
Lev	12166	0.433	0.202	0.032	0.428	0.935
Growth	12166	0.106	0.348	-0.654	0.065	3.808
Top1	12166	0.351	0.151	0.074	0.330	0.758
Dual	12166	0.275	0.447	0.000	0.000	1.000
SOE	12166	0.405	0.491	0.000	0.000	1.000
APE	12166	14.580	0.905	12.360	14.500	17.830
Wage	12166	11.750	0.573	9.360	11.720	15.990

Note: This table presents descriptive statistics for the primary variables, with variable definitions provided in Table 1. Here, N denotes the number of observations, Mean represents the mean, SD indicates the standard deviation, Min signifies the minimum value, 50% denotes the median, and Max indicates the maximum value.

4.2 Baseline Regression Results

To examine the impact of listed companies' ESG performance on corporate labor cost stickiness (LCS), this study employs a stepwise regression approach for estimation and performs company-level clustering to

control for potential agglomeration effects. The regression results are shown in Table 3. Column (1) shows the regression results that only include ESG variables. The coefficient of ESG variables is negative (-0.059) but not statistically significant. Column (2) further controls for year and industry fixed effects, and the absolute value of the ESG coefficient decreases (-0.031), but still fails to pass the significance test. Column (3) adds all control variables but does not control for fixed effects. The ESG coefficient is -0.041, which is still not significant. Column (4) includes both control variables and double fixed effects, and the ESG coefficient is -0.029, which is still not statistically significant.

The above results show that after controlling for other factors, although ESG performance has a negative impact on labor cost stickiness, the effect is not significant, and hypothesis H1 is not supported. One possible explanation is that the aggregate ESG score may mask the opposing effects of its different internal dimensions (E, S, G). Furthermore, the current ESG ratings are not differentiated enough and fail to fully capture the ESG performance differences that have a substantial impact on corporate cost behavior.

Table 3: Benchmark Regression Results

Variable	(1)	(2)	(3)	(4)
	LCS	LCS	LCS	LCS
ESG	-0.059	-0.031	-0.041	-0.029
	(-0.21)	(-0.11)	(-0.15)	(-0.10)
Constant	0.558	-0.070	1.330	0.009
	(0.33)	(-0.04)	(0.76)	(0.01)
Controls	No	No	Yes	Yes
Year	No	Yes	No	Yes
Ind	No	Yes	No	Yes
N	12166	12166	12166	12166
R^2	0.000	0.011	0.004	0.014
Adj_R^2	-0.000	0.008	0.003	0.010

*Note: The value in parentheses is the t-statistic., ***p<0.01, **p<0.05, *p<0.1, the same below.*

4.3 Robustness Check

To ensure the reliability of the benchmark regression results, this study conducts robustness checks from the following dimensions. The results are shown in Table 4.

4.3.1 Add Control Variables

To mitigate endogeneity concerns arising from omitted variables, this paper further incorporate variables such as management shareholding ratio (Mshare), number of directors (Board), proportion of independent directors (Indep), total number of employees (Employ), and asset intensity (Aintensity) into the baseline model. The results in column (1) show that the coefficient of ESG is -0.028, which is still not significant and consistent with the conclusion of the baseline regression.

4.3.2 Adjust the Sample Interval

Taking into account the possible structural impact of macroeconomic environment and policy changes, the sample period is shortened to 2015-2024 and re-run. The results in column (2) show that the ESG coefficient is -0.119, which still fails to pass the significance test, and once again supports the baseline conclusion.

4.3.3 Change the Variable Measurement Method

In order to further eliminate the interference of the variable construction method on the results, labor cost stickiness (LCS) is replaced by the overall enterprise cost stickiness (Sticky) and re-estimated. ESG coefficient in column (3) is -0.024, which is still not significant, indicating that ESG performance has no statistically significant inhibitory effect on either labor costs or overall costs.

Table 4 Robustness Check

Variable	(1)	(2)	(3)
	LCS	LCS	Sticky
ESG	-0.028	-0.119	-0.024
	(-0.10)	(-0.34)	(-0.27)
Constant	-0.135	0.270	0.464
	(-0.07)	(0.12)	(0.84)
Controls	Yes	Yes	Yes
Year	Yes	Yes	Yes
Ind	Yes	Yes	Yes
N	12166	9624	12166
R^2	0.014	0.013	0.069
Adj_R^2	0.010	0.009	0.068

5. Further Analysis

5.1 ESG Dimension-Wise Analysis

5.1.1 Descriptive Statistics of Different ESG Dimensions

Table 5 shows that the mean of the environmental dimension (E_score) is 2.045, the median is 2.000, and the standard deviation is 1.203, which is significantly lower than the social and governance dimensions. This shows that the overall environmental performance of the sample companies is poor, and there are obvious differences among companies. The mean of the social dimension (S_score) is 4.630 and the median is 5.000, indicating that the corporate social performance is at an above-average level, but the standard deviation is large (1.675), reflecting the large heterogeneity in the degree of social responsibility fulfillment among different companies. The governance dimension (G_score) has the highest mean, reaching 5.351, with a median of 6.000 and a standard deviation of 1.256, indicating that the overall governance level of the sample companies is good. Most companies are concentrated in the high score range, but there are still certain differences within them.

Combining ESG with E, S, and G dimensions, the current ESG performance of China's listed companies has the typical characteristics of "overall high scores and structural disparities," that is, the governance and social dimensions perform relatively well, while the environmental dimension lags significantly, becoming a shortcoming in the overall ESG level.

Table 5: Descriptive statistics of E, S, and G

Variable	N	Mean	SD	Min	P50	Max
E_score	12166	2.045	1.203	1.000	2.000	9.000
S_score	12166	4.630	1.675	1.000	5.000	9.000
G_score	12166	5.351	1.256	1.000	6.000	9.000

5.1.2 The Impact of Different ESG Dimensions on Labor Cost Stickiness

To further investigate the heterogeneous impact of different ESG dimensions on corporate labor cost stickiness (LCS), this paper conducted a regression analysis on the three sub-indicators of environment, society, and governance. The results are shown in Table 6.

Table 6: The Impact of E, S, And G on Labor Cost Stickiness

Variable	(1)	(2)	(3)	(4)
	LCS	LCS	LCS	LCS
E_score	0.035*	0.025	0.028	0.019
	(1.95)	(1.36)	(1.49)	(1.00)
S_score	-0.048***	-0.043***	-0.041***	-0.024*
	(-3.58)	(-3.19)	(-2.96)	(-1.67)
G_score	0.009	-0.007	-0.003	0.004

	(0.52)	(-0.39)	(-0.14)	(0.24)
Constant	0.760	1.326	0.720	0.028
	(0.45)	(0.74)	(0.40)	(0.02)
Controls	No	Yes	Yes	Yes
Year	No	No	Yes	Yes
Ind	No	No	No	Yes
N	12166	12166	12166	12166
R^2	0.001	0.005	0.008	0.014
Adj_R^2	0.001	0.004	0.005	0.010

The results in Table 6 show that the coefficient of the environmental score (E_score) is significantly positive at the 10% level in column (1), but after gradually adding control variables and fixed effects, the significance disappears, the coefficient decreases and the t-value decreases, indicating that environmental responsibility performance has a weak positive impact on labor cost stickiness, but this impact is not robust. The coefficient of the social score (S_score) is significantly negative in each column (at least at the 10% level), and the absolute value of the coefficient is relatively stable, indicating that better social responsibility performance can significantly reduce labor cost stickiness, and the results are relatively robust. The coefficient of the governance score (G_score) is insignificant under all settings, and the sign of the coefficient changes, indicating that corporate governance performance has no statistically significant impact on labor cost stickiness.

The above results reflect that different ESG dimensions have significant differences in their impact on labor cost stickiness: the social responsibility (S) dimension shows a significant and robust inhibitory effect, the environmental (E) dimension has a weak and non-robust impact, and the governance (G) dimension had no significant impact. This finding aligns with the "overall high score and structural differentiation" characteristics revealed in the descriptive statistics, indicating that the current impact of corporate ESG practices on cost behavior mainly comes from the social dimension. For example, the fulfillment of social responsibilities such as employee relations and supply chain management may improve the efficiency of human resource allocation, thereby reducing the rigidity of cost adjustments, while the environmental and governance dimensions may fail to show significant effects due to limited rating differentiation or weak correlation with corporate short-term cost decisions.

This verifies the previous analysis of how the comprehensive score of ESG may mask the opposing effects of its different internal dimensions (E, S, G).

Table 7: Property Rights Heterogeneity and Regional Heterogeneity

Variable	(1) State-owned enterprises	(2) Non-state-owned enterprises	(3) Eastern region	(4) Midwestern region
ESG	0.166	-0.110	-0.073	0.141
	(0.529)	(-0.322)	(-0.200)	(0.577)
E_score	-0.005	0.046*	0.014	0.034
	(-0.164)	(1.783)	(0.619)	(0.938)
S_score	-0.009	-0.040*	-0.034*	0.002
	(-0.405)	(-2.103)	(-1.953)	(0.078)
G_score	0.014	-0.004	0.025	-0.054*
	(0.469)	(-0.189)	(1.130)	(-1.678)
Constant	-2.250	2.453	-0.259	-0.309
	(-1.043)	(1.103)	(-0.113)	(-0.155)
Controls	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Ind	Yes	Yes	Yes	Yes
N	4929	7237	8526	3640
Adj_R^2	0.020	0.006	0.013	0.003

5.2 Heterogeneity in Ownership: The Dual Failure of Institutional Constraints and Market-Based Responses

Columns (1) and (2) of Table 7 present the subgroup regression results, which indicate that ESG

performance has no statistically significant impact on labor cost stickiness in either the state-owned enterprise (SOE) or non-SOE subsamples.

The cost behavior of state-owned enterprises is constrained by institutional characteristics such as soft budget constraints and salary rigidity, and they bear more policy burdens and social functions. Their labor adjustment decisions cannot follow market principles. Even if a company has a high ESG score, it does not readily translate into measures that reduce the rigidity of labor costs. In addition, the agency problems and lack of management incentives that are common in state-owned enterprises will weaken the synergy between ESG performance and internal efficiency management, making it more difficult for ESG to play a role in moderating labor cost stickiness.

Although non-state-owned enterprises have higher market sensitivity and cost adjustment flexibility, and are theoretically easier to integrate ESG practices into the efficiency optimization process, regression results show that the impact of ESG performance on labor cost stickiness is not significant. Current ESG ratings have not yet effectively identified or incentivized governance practices that improve the efficiency of human resource allocation, such as implementing employee care measures and applying efficiency-oriented green technologies. This situation reflects that the current ESG system has obvious limitations in terms of indicator effectiveness and market discipline.

5.3 Regional Heterogeneity: Differentiation of ESG Mechanisms Under Regional Development Imbalances

Regional heterogeneity can be seen from columns (3) and (4) of Table 7. The ESG coefficient of the eastern region is negative, while the ESG coefficient of the central and western regions is positive, but neither reaches a statistically significant level. The following will explain the difference in the direction of the coefficient.

The eastern region has a developed market economy, and external regulatory pressure, public environmental awareness, and high factor costs together constitute the external environment for enterprises to improve their overall efficiency. Corporate ESG practices are often combined with advanced technologies and management methods, pursuing efficiency improvements while fulfilling social responsibilities, and therefore show a weak negative correlation. However, this relationship is not statistically significant, suggesting that current ESG ratings may not have effectively identified advanced practices that truly balance ESG and efficiency.

Economic development in the central and western regions is relatively lagging, and enterprises generally face more severe resource constraints and financing restrictions. In this case, ESG investment is easily regarded as additional costs, which will not only fail to promote efficiency improvement in the short term, but may also increase the financial pressure on enterprises, making it more difficult for them to flexibly adjust labor costs when business demand declines. This phenomenon reflects that in areas where there is a lack of supporting policies and imperfect market mechanisms, ESG promotion may produce a “value crowding-out” effect, making it difficult to achieve a win-win situation with companies’ short-term economic performance.

6. Research Conclusions and Implications

6.1 Main Research Conclusions

Using data from A-share listed companies from 2010 to 2024, this paper empirically examines the impact of corporate ESG performance on labor cost stickiness. The study finds the following. First, although the overall ESG performance has a negative impact on labor cost stickiness, it is not statistically significant after controlling for a series of factors and fixed effects. This result may be due to the “ceiling effect” and structural imbalances in the current ESG rating system—the scores of the vast majority of companies are concentrated in the upper-middle range, resulting in insufficient rating differentiation and difficulty in effectively identifying ESG differences that truly affect cost behavior; moreover, ESG, as a comprehensive indicator, may mask the heterogeneity of its internal dimensions on cost stickiness or even offsetting effects. Second, dimension-specific analyses show that only social responsibility (S) is significantly negative under most settings, showing the effect of suppressing cost stickiness; the impact of the environmental (E) dimension is weak and non-robust,

and the governance (G) dimension is always insignificant. This finding further confirms the structural differences in the internal effects of ESG and provides a mechanistic explanation for the insignificance of the comprehensive indicators. Third, heterogeneity analysis shows that the ESG coefficients for non-state-owned enterprises and the eastern region are negative but not significant, while the coefficients for state-owned enterprises and the central and western regions are positive, indicating that ownership type and the level of regional marketization may be important moderating factors in the effects of ESG, but their influences have not formed statistical reliability.

6.2 Policy Implications and Suggestions for Enterprise Practice

Based on the research results, this paper makes the following recommendations.

Regulatory authorities should refine the ESG rating system, optimize indicator design to improve differentiation and enhance the ability to capture firm-level cost behavior, refine the disclosure requirements for information related to employment flexibility and employee allocation efficiency in the social dimension, and alleviate the rating "ceiling effect." At the same time, they should tailor support policies to firms' specific circumstances based on the actual situation of enterprises, and guidance and financing support for ESG capacity building will be strengthened for enterprises in central and western China and state-owned enterprises. Enterprises should be guided to strengthen the substantive integration of ESG management with internal operations and give full play to the role of ESG performance in driving cost optimization.

Secondly, firms should not focus solely on improving ESG ratings in the short term; instead, they should also focus on the substantial improvements that ESG practices can bring to actual operations. Specifically in terms of social responsibility, companies can build harmonious employee relations, increase investment in skills training, optimize production safety management systems, etc., so as to improve the efficiency of human resource allocation. State-owned enterprises should overcome traditional institutional constraints and deeply integrate ESG indicators with executive compensation incentives and performance appraisal systems; non-state-owned enterprises should prioritize efficiency-enhancing ESG initiatives such as digital human resource management, using intelligent means to improve human resource management efficiency, and enhance the flexibility and agility of corporate cost structure adjustments, thereby achieving coordinated development of ESG practices and cost management.

6.3 Research Limitations and Future Prospects

This study has certain limitations. The current ESG rating system remains in its nascent stages, potentially suffering from measurement errors and timeliness issues, which may not fully capture firms' actual ESG practices. Although the study controlled for multiple company characteristic variables and conducted robustness checks, omitted variables or endogeneity concerns may remain. In addition, the sample of this study only covers Chinese A-share listed companies. Whether the research conclusions are applicable to non-listed companies and whether they can be extended to other market environments needs further verification.

Future research can be further expanded in the following three aspects: Methodologically, a more comprehensive ESG indicator system or natural experiment design can be adopted, such as combining the difference-in-differences (DID) method or policy shock analysis to identify the causal mechanism of ESG's impact on labor costs. From a research perspective, future studies should integrate macro-level statistics and micro-level case studies to examine how ESG management concepts under different property rights attributes and regional backgrounds specifically affect human resource allocation strategies. In terms of content, attention should be paid to the moderating role of digital tools, such as the application of artificial intelligence in carbon emissions monitoring or blockchain in ESG information disclosure, in order to improve management accuracy and provide theoretical support and practical reference for enterprises to balance social responsibility and operational efficiency.

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Conflicts of Interest

The authors declare no conflict of interest.

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