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ESG Performance, Firm Heterogeneity, and the Speed of Dynamic Adjustment of Capital Structure: Evidence from China

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Abstract: This study aims to investigate the differences in the impact of ESG (environmental, social, and governance) performance on the speed of capital structure adjustment (SOA) across different types of A-share Chinese companies between 2018 to 2022. The research findings, obtained by using LSDVC method, suggest that among the three dimensions of ESG, an improvement in G has the most significant effect on SOA, followed by the E dimension. Furthermore, after distinguishing between different types of enterprises, it is evident that high-polluting enterprises are most affected by both E and G dimensions in terms of their influence on SOA compared to overall manufacturing and service industries.

Keywords: ESG performance, Firm heterogeneity, Capital structure, Speed of adjustment

1. Introduction

With the increasing global focus on environmental issues, an expanding number of investors are directing their attention towards the non-financial aspects of value creation by enterprises in long-term sustainable development. ESG has attracted interest from stakeholders due to its comprehensive evaluation of enterprises' long-term sustainable development across three dimensions: environment, social, and governance. It has gradually become a crucial factor in investment decisions. However, the question remains whether enterprises can secure high-quality financial resources through strong ESG performance and expedite the dynamic adjustment of their capital structure (SOA). The answer to this question hinges on the imperative need for implementing ESG management and enhancing ESG performance. Additionally, it depends on whether ESG can facilitate collaboration between real enterprises and the financial sector to collectively achieve green and sustainable development while mitigating potential climate change risks in the future.

Numerous studies have delved into the functional role of ESG performance in promoting capital structure optimization from an ESG perspective or a single-dimension perspective. In terms of the environmental (E) dimension, Wang argued that the green credit policy imposes higher threshold restrictions and financing costs on heavily polluting enterprises seeking financing [1]. Regarding the social (S) dimension, Wang et al. found that enterprises engaging in social responsibility activities

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generally reduce the speed of capital structure adjustment, with only certain types of social responsibility leading to this effect [2]; He et al. also found that companies disclosing social responsibility reports faced significantly lower financial constraints compared to those that did not disclose such reports [3]. As for the governance (G) dimension, Gyimah argued that improved governance reduces bondholders' monitoring costs, increases debt financing [4]. From a holistic perspective, Adeneyecposited that ESG participation can decrease environmental transaction costs, benefit enterprises by enhancing information transparency, and foster trust between companies and capital suppliers to improve enterprise SOA [5]. Long et al., meanwhile, believed that enhanced ESG performance could optimize the dynamic adjustment of an enterprise's capital structure; through empirical analysis using the Kink threshold model it was found that this effect is non-linear [6]. Zhang's study, on the other hand, showed how ESG performance impacts dynamic adjustment of capital structure by alleviating financing constraints for enterprises, primarily improving SOA by reducing equity capital cost [7].

The existing literature primarily focuses on examining the relationship between ESG performance and capital structure optimization from the perspective of ESG as a whole or a single dimension. However, few studies have explored whether there are differences in the contributions of the three dimensions of ESG to capital structure optimization. This paper aims to address this research gap by incorporating the three dimensions of ESG into the scope of dynamic capital structure adjustment and comparing their contributions. The potential contributions of this paper are twofold: firstly, it expands the research scope of dynamic capital structure adjustment for enterprises by including all three dimensions of ESG; secondly, it highlights the differences in the contributions of these dimensions to capital structure optimization, thereby assisting enterprises in improving their ESG performance in alignment with stakeholder preferences.

2. Theoretical analysis and hypothesis formulation

Many studies have already pointed out the pathways through which ESG enhances SOA. ESG performance can impact the speed of capital adjustment by reducing information asymmetry and agency costs. Information asymmetry is a critical factor influencing financing decisions [8] and represents one of the main risks faced by investors. It can affect investors' willingness to invest, thereby reducing enterprises' ability to obtain funds and slowing down the process of capital structure adjustment. ESG participation has been shown to decrease the level of information asymmetry between internal and external users of enterprise information [9]. Higher-quality information disclosure leads to lower financial constraints [3]. Furthermore, from a cost reduction perspective, ESG can significantly lower both equity financing costs [10] and debt financing costs [11-12], thus lowering the threshold for financing and improving SOA. As financing constraints are essentially related to financing costs, this paper argues that enhancing ESG performance can alleviate these constraints and indirectly improve SOA. Given that, Hypotheses 1 is proposed as follows:

H1: The performance of a company's ESG is directly proportional to its SOA.

Although numerous studies have explored the relationship between ESG and the dynamic adjustment of capital structure, research is scarce on whether individual dimensions of ESG make different contributions to the enhancement of SOA. Identifying which dimension of ESG holds greater significance for improving SOA can assist enterprises in selecting an ESG performance improvement path that aligns better with stakeholders' preferences and reduces costs. Therefore, it is imperative to investigate which specific dimension of ESG can more effectively promote SOA improvement.

Furthermore, due to the heterogeneity among different types of enterprises, the impact of E, S, and G on SOA improvement varies across different enterprise categories. Hence, it is significant to analyze them according to enterprises' unique characteristics. For instance, it is possible that the contribution of the E dimension to enhancing SOA in manufacturing enterprises—especially those with high pollution levels—is greater than in service enterprises where pollutant generation is minimal. This is because environmental concerns carry higher significance as signals for high-polluting firms compared to other businesses. When environmental issues arise, manufacturing industries—particularly high-polluting firms—are more likely to face policy restrictions and public scrutiny, impacting their corporate image, stock prices, and financing constraints. Conversely, high-polluting enterprises demonstrating strong environmental performance may serve as role models and receive support and encouragement.

Many literature sources have pointed out similar situations. As summarized by Liang et al., companies engaging in production activities that harm the environment present a significant challenge to climate change and are increasingly facing lawsuits [13]. Additionally, Liu et al. found that air pollution directly reduces the stock prices of polluting companies [14], while Luo et al. discovered that the quality of corporate environmental information disclosure has a significant negative impact on debt financing costs [15]. Similar patterns may also emerge in the service industry. Considering the above, Hypotheses 2 is formulated as follows:

H2: The impact of E, S, and G on the dynamic adjustment speed of capital structure varies among different types of enterprises.

H2a: The contribution of the E is more significant in polluting enterprises compared to the overall manufacturing industry and the service industry

3. Variable construction and research methods

3.1. Core Variable and Sample Selection

This paper utilizes the WindESG rating data provided by the Wind database as core variable. For this study's purposes, enterprise ESG performance scores are assigned according to the WindESG rating grade. The CCC grade is designated as 1 point with an additional point added for each subsequent level. The seven grades of CCC through AAA are marked as 1-7 points respectively.

This paper selects the listed companies with WindESG ratings from 2018 to 2022 as the sample. Subsequently, sample processing and screening are conducted based on the following criteria: (1) exclusion of enterprises in the financial industry; (2) elimination of enterprises with missing core data; (3) removal of enterprises with ST or ST* conditions during the reporting period, as these indicate operational and debt repayment difficulties; (4) elimination of enterprises with missing core data; (5) following Asimakopoulos [16], exclusion of enterprises with a debt ratio of 0 for more than one year to assess potential impact on results; (6) for the remaining samples, all continuous variables are trimmed by 1% up and down. Ultimately, a total of 9285 observation samples from 1857 enterprises spanning from 2018 to 2022 were obtained. All data is sourced from the Wind Financial Database.

3.2. Measurement of dynamic adjustment of capital structure

According to Flannery and Rangan [17], the dynamic adjustment of capital structure of an enterprise is a function combination of enterprise characteristic variables, and the standard model of dynamic adjustment of capital structure is as follows:

$$Lev_{i,t} - Lev_{i,t-1} = \gamma\left(Lev_{i,t}^{*} - Lev_{i,t-1}\right) + \xi_{i,t} \tag{1}$$

Where $Lev_{i,t}$ and $Lev_{i,t-1}$ represent the capital structure of the enterprise in year t and year t−1, calculated as the total interest-bearing liabilities divided by the total assets of the enterprise in that

year; $Lev_{i,t}^{*}$ denotes the target capital structure of the enterprise. From the foregoing, The regression coefficient γ represents SOA.
Based on the existing literature [6, 17-18], this study estimates the target capital using the following equation:

$$Lev_{i,t}^{*} = \beta X_{i,t-1} + \varsigma_{t} \tag{2}$$

Where, β is the vector of regression coefficients, and $X_{i,t-1}$ is the control variables related to the capital structure of enterprises. According to Huang et al. and Long et al. [6,18], the control variables selected in this paper are as follows: Enterprise size (Lnsize, natural logarithm of total assets), ROA (return on assets), growth ability (GI, growth rate of operating income), non-debt tax shield (Ts, depreciation and amortization divided by total assets in the current year), tangible asset ratio (TAratio, tangible assets divided by total assets) and the average Lev of the industry (meanLev). See Table 1 for a specific explanation of the variables.

As for the estimation of the parameters β from Equation (2), consistent with the methods of Faulkender et al. [19], this paper adopts the method of simultaneously estimating the target capital structure and the speed of capital structure adjustment. Substituting Equation 2 into Equation 1:

$$Lev_{i,t} = (1-\gamma)Lev_{i,t-1} + \gamma\beta X_{i,t-1} + \varepsilon_{t} \tag{3}$$

According to research by Flannery and Hankins [20], the most accurate and effective method for dealing with this type of dynamic panel is the LSDVC method. Therefore, this study employs the LSDVC method to estimate the dynamic adjustment speed of capital structure.

Table 1: Description of variables.

Variable	Proxy	Measurement/Source
Leverage	Book leverage	Total interest-bearing debt to total book value of asset
ESG performance	The score of E, S, G and ESG	From WindESG
Firm-level determinants	Lnsize: The size of company	The natural logarithm of a firm's total assets
	GI: Growth rate of revenue	(Current revenue - Prior revenue) / Prior revenue
	Tangibility: Tangible assets ratio	Tangible assets / Total assets
	MTB: Market-to-book ratio	
	ROA: Return On Assets	
	Ts: Non-debt tax shield	Amortization and depreciation / Total assets
	meanLev: The average Lev of the company's major industries	
(Predetermined variables)	Age: Firm age	
(Dummy variables)	Year	

3.3. Control variables

The control variables have been outlined in section 3.2. The variables, definitions, and calculation methods or sources utilized in this paper are presented in Table 1. The classification of sectors and major industries comes from the CRSC Industry Code.

3.4. Model Building

In order to examine the impact of ESG performance on the dynamic adjustment of enterprise capital structure, this paper constructs the following regression model by referencing existing research and combining it with equations (1)(2)(3):

$$Lev_{i,t} - Lev_{i,t-1} = (\gamma_0 + \gamma_1 ESG_{i,t})(Lev^*_{i,t} - Lev_{i,t-1}) + \gamma_2 X_{i,t-1} + \varphi_t \quad (4)$$

The coefficient represents the impact of ESG performance on the speed of dynamic adjustment of capital structure, denoted as $\gamma_1\gamma_0 - \gamma_1 ESG_{i,t}$. If ESG performance can enhance the speed of dynamic adjustment of capital structure, then γ_1 will be less than 0. When analyzing the influence of a single ESG dimension on SOA, it is sufficient to categorize ESG into E, S, and G.

4. Empirical Analysis

4.1. Descriptive statistics

Table 2 presents the results of the descriptive statistics. Rev represents the difference between the firm's capital structure in period t and that of the firm in period t−1, indicating the actual change in the firm's capital structure. Dev represents the difference between the target firm's capital structure in period t and that of the firm in period t−1, indicating the theoretically expected change in the firm's capital structure. The ESG score ranges from 1 to 7, while the score of E, S, G ranges from 0 to 10. The distribution of ESG scores and environment and society scores is skewed to the right since the mean of all three is below their respective medians.

Table 2: Summary statistics

Variables	Obs.	Mean	Std	Min	Median	Max
Lev(%)	9285	19.502	13.914	0.000	17.729	80.813
Rev(%)	9285	0.622	5.977	-42.515	0.174	39.270
Dev(%)	9285	0.000	3.744	-25.777	0.587	33.293
ESG	9285	3.504	0.837	1.000	3.000	7.000
E	9285	1.780	2.005	0.000	1.240	10.000
S	9285	4.001	1.815	0.000	3.900	10.000
G	9285	6.456	0.911	1.200	6.480	9.780
Lnsize	9285	22.634	1.234	19.618	22.484	28.607
ROA	9285	4.734	6.214	33.268	4.796	28.030
GI	9285	10.674	23.525	68.150	8.900	171.642
Tan	9285	41.226	18.143	20.420	41.454	85.165
MTB	9285	2.736	2.184	0.603	2.108	31.837
Ts	9285	24.999	13.562	0.281	23.215	76.515

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According to the categories and major industry codes provided by the China Securities Regulatory Commission (CSRC), as well as the classification criteria for high-polluting enterprises, descriptive statistics of ESG and the scores of individual dimensions of enterprises belonging to the manufacturing industry (Manu), high-polluting enterprises belonging to the manufacturing industry (Con), and service industry (Ser) are presented in Table 3.

In terms of mean and median, it is observed that the scores of ESG, E dimension, and S dimension in the manufacturing industry are higher than those in the service industry, while the scores of G dimension are lower than those in the service industry. This indicates that overall, the ESG score of the manufacturing industry is better than that of the service industry. Furthermore, it is noted that both average and median values for ESG and its three dimensions for high-polluting enterprises belonging to the manufacturing industry are higher than those for all enterprises within this sector.

Table 3: Summary statistics of the dimensions of E, S and G

Variables	Obs.	Mean	Min	P1/4	Median	Max
E(Manu)	6369	1.940	0.000	0.310	1.570	10.000
S(Manu)	6369	4.251	0.000	3.050	4.190	10.000
G(Manu)	6369	6.422	1.280	5.890	6.460	9.780
E(Con)	2368	2.199	0.000	0.930	1.860	10.000
S(Con)	2368	4.361	0.240	3.130	4.380	10.000
G(Con)	2368	6.448	1.320	5.930	6.460	9.780
E(Ser)	1835	1.353	0.000	0.000	0.000	10.000
S(Ser)	1835	3.412	0.000	1.950	3.140	10.000
G(Ser)	1835	6.584	1.260	5.980	6.600	9.650

4.2. Estimation of the Target's capital structure

The estimation results for the target capital structure are shown in Table 4. This study first employs the Two-way fixed model to estimate Equation 3, and then uses the LSDVC method to estimate Equation 4. It is found that the coefficients of Lev(-1) and control variables obtained by both methods are similar, indicating the robustness of the estimation results using the LSDVC method. As shown in row (2) of Table 4, the coefficient of the interaction term ESGcross is -0.023, which is statistically significant at the 1% level. This suggests that as ESG performance improves, the SOA of companies will also increase. Furthermore, separate regression analyses are conducted for the manufacturing industry (Manu) and high-pollution industry (Con) within row (3) and row (4). The findings reveal that the coefficients of ESGcross are -0.025 and -0.039 respectively—both lower than -0.023—indicating that within the manufacturing industry, particularly among high-pollution enterprises, an enhancement in ESG performance will lead to a greater emphasis on SOA principles.

4.3. The impact of E, S, G performance on the SOA of different types of enterprises

To investigate which dimension can best promote the improvement of SOA, this paper replaced the ESG score in Equation 4 with the scores of E, S, and G. Regression analysis was then conducted on all enterprises, manufacturing enterprises, high-polluting enterprises in the manufacturing industry, and service industry respectively. The regression results are presented in Table 5.

Table 4: Baseline regression results.

	(1) Two-way FE	(2) LSDVC	(3) LSDVC(Manu)	(4) LSDVC(Con)
Variables	Lev	Lev	Lev	Lev
Lev(-1)	0.414 (0.000)***	0.443 (0.000)***	0.414 (0.000)***	0.383 (0.000)***
ESG		-0.047 (-0.023)**	0.398 (0.147)	0.707 (0.072)*
ESGcross		-0.023 (0.000)***	-0.025 (0.001)***	-0.039 (0.000)***
Lnsize	1.958 (0.000)***	2.073 (0.000)***	2.833 (0.000)***	2.968 (0.004)***
ROA	-0.018 (0.295)	-0.019 (-0.232)	-0.038 (0.087)*	-0.038 (0.420)
GI	-0.001 (0.978)	-0.001 (0.903)	0.005 (0.324)	0.004 (0.606)
MTB	-0.047 (0.399)	-0.063 (0.318)	-0.102 (0.245)	-0.323 (0.019)**
Tan	-0.045 (0.001)***	-0.031 (0.066)*	-0.048 (0.010)**	-0.106 (0.001)***
Ts	-0.056 (0.000)***	-0.051 (0.009)***	-0.062 (0.004)***	-0.062 (0.054)*
meanLev	0.066 (0.069)*	0.013 (0.815)	-0.042 (0.611)	0.025 (0.856)
age	-0.103 (0.142)	-0.027 (0.695)	-0.139 (0.159)	-0.198 (0.202)
N_g	1857	1857	1278	478
N	9285	9285	5046	1857

*P-values are reported in brackets. ***, **, and * denote significance at 1%, 5% and 10%. The same below.

Table 5: E, S, G performance and the SOA of capital structure

	(1) E/S/G(Total)	(2) E/S/G(Manu)	(3) E/S/G(Con)	(4) E/S/G(Ser)
Variables	Lev	Lev	Lev	Lev
Lev(-1)	0.621 (0.000)***	0.595 (0.000)***	0.647 (0.000)***	0.724 (0.000)***
E	0.190 (0.020)**	0.209 (0.142)	0.421 (0.082)*	-0.065 (0.865)
Ecross	-0.009 (0.008)***	-0.010 (0.094)*	-0.017 (0.084)*	0.001 (0.921)
S	-0.015 (0.886)	-0.104 (0.538)	-0.123 (0.709)	-0.365 (0.366)
Scross	-0.002 (0.672)	0.003 (0.691)	0.011 (0.362)	0.005 (0.721)
G	1.048 (0.000)***	0.931 (0.000)***	1.026 (0.001)***	0.682 (0.039)**
Gcross	-0.038 (0.000)***	-0.034 (0.000)***	-0.046 (0.000)***	-0.019 (0.049)**
N	9375	6369	2069	769

The regression results align with expectations. Overall, the G dimension makes the most significant contribution to improving SOA. Horizontal comparison reveals that polluting enterprises receive more attention than the manufacturing industry and service industry, as evidenced by the smallest coefficients of the interaction term for both E (− 0.017) and G (− 0.046). Vertical comparison shows that corporate governance has the largest impact on improving SOA, followed by environmental dimension, whereas social responsibility dimension has minimal influence on SOA improvement. Therefore, assuming H2 and H2a hold true.

4.4. Robustness test

In addition to the LSDVC method used in this paper, the system GMM method is another common approach for measuring the target capital structure and assessing the contribution of E, S, and G performance to the SOA. Building on Gu [21], this study employs the system GMM method to evaluate the target capital structure and re-evaluate the impact of ESG on the dynamic adjustment of capital structure. The results are robust, but due to space limitations, this article will not present.

5. Conclusion

Based on a sample of Chinese A-share listed companies with WindESG ratings from 2018 to 2022, this paper empirically examines the differential impact of individual dimensions of ESG on the dynamic adjustment of corporate capital structure. The findings indicate that: (1) Improvements in ESG performance have a positive effect on the enhancement of SOA; (2) Among the individual dimensions of ESG, the G dimension has the greatest contribution to improving SOA, followed by the E dimension, while the impact of S dimension on SOA is not significant; (3) In polluting enterprises, both E and G have a greater influence on improving SOA compared to overall manufacturing and service industries.

The above conclusions have several implications: (1) Given that the G dimension and the E dimension significantly contribute to the enhancement of SOA, enterprise managers should prioritize these two dimensions' performance to increase their chances of obtaining high-quality financial resources and optimizing their capital structure; (2) In comparison to other manufacturing and service enterprises, high-pollution enterprises should place greater emphasis on ESG management and strive to optimize their capital structure by demonstrating strong ESG performance. Considering the implementation of green financial policies in China and the looming environmental crisis, high-polluting enterprises with poor ESG performance may encounter more severe financing difficulties, making ESG performance increasingly crucial for their capital structure adjustment [22]; (3) The impact of the S dimension on improving SOA is minimal. This suggests that stakeholders may not consider it important, either because the signal strength and quality of the S dimension are weak or because S dimension is considered to be in conflict with the interests of shareholders [23].

References

[1] Xin, W.and Ying, W. (2021). Research on the Green Innovation Promoted by Green Credit Policies. Journal of Management World, 37, 173-188+11.

[2] Duowen, W., Qian, W. and Qianyu, Chen. (2019). Corporate Social Responsibility and Leverage Adjustment Speed—An Empirical Analysis Based on Chinese Listed Companies. Finance Forum, 24, 67-80.

[3] Xianjie, H., Tusheng, X. and Xinyuan, C.(2012). Corporate Social Responsibility Disclosure and Financing Constraints. Journal of Finance and Economics, 38, 60-71+83.

[4] Gyimah, D., Kwansa, N. A., Kyiu, A. K., & Sikochi, A. S. (2021). Multinationality and capital structure dynamics: A corporate governance explanation. International Review of Financial Analysis, 76, 101758.

[5] Adeneye, Y. B., Kammoun, I., & Ab Wahab, S. N. A. (2023). Capital structure and speed of adjustment: the impact of environmental, social and governance (ESG) performance. Sustainability Accounting, Management and Policy Journal, 14(5), 945-977.

[6] *Haiming, L. and Jiajun, O. (2022). Impact of domestic enterprises' ESG performance on the dynamic adjustment of capital structure. South China Finance, 556, 33-44.*
[7] *Luguang, Z. (2023). The Function Mechanism and Data Test of Enterprise ESG Influencing the Dynamic Adjustment of Capital Structure. China Journal of Commerce, 4, 111-116.*
[8] *Heejin, Y., Hee-Joon A., Maria, H.K. and Doojin, R. (2017). Information asymmetry and investor trading behavior around bond rating change announcements. Emerging Markets Review, 32, 38-51.*
[9] *Gulraze, W. and Karin, A.P. (2022). Does mandatory IFRS adoption affect large and small public firms' accounting quality differently? Evidence from Canada. Advances in Accounting, 57, 100598.*
[10] *Yonghuai, C., Tao, L., Qing, Z. and Bo, Z. (2023). Effect of ESG performance on the cost of equity capital: Evidence from China. International Review of Economics & Finance, 83, 348-364.*
[11] *Gerwanski, J. (2020). Does it pay off? Integrated reporting and cost of debt: European evidence. Corporate Social Responsibility and Environmental Management, 27(5), 2299-2319.*
[12] *Malik, N., and Kashiramka, S. (2024). Impact of ESG disclosure on firm performance and cost of debt: Empirical evidence from India. Journal of Cleaner Production, 448, 141582.*
[13] *Yuchao, L., Qi, T. and Jun, P. (2024). Bless or curse, how does extreme temperature shape heavy pollution companies' ESG performance?-Evidence from China. Energy Economics, 131, 107378.*
[14] *Fengqi, L., Yuxin, K., Kun, G. and Xiaolei, S. (2021). The relationship between air pollution, investor attention and stock prices: Evidence from new energy and polluting sectors. Energy Policy, 156, 112430.*
[15] *Wenbing, L., Xiaoxin, G., Shihu, Z. and Juanzhi, W. (2019). Environmental information disclosure quality, media attention and debt financing costs: Evidence from Chinese heavy polluting listed companies. Journal of Cleaner Production, 231, 268-277.*
[16] *Asimakopoulos, P., Asimakopoulos, S., and Li, X. (2023). The role of environmental, social, and governance rating on corporate debt structure. Journal of Corporate Finance, 83, 102488.*
[17] *Flannery, M. J., & Rangan, K. P. (2006). Partial adjustment toward target capital structures. Journal of financial economics, 79(3), 469-506.*
[18] *Jicheng, H., Shuo, K., Bing, Z. and Zhigang, Z. (2016). Manager compensation incentive and capital structure dynamic adjustment. Journal of Management World, 11, 156-171.*
[19] *Faulkender, M., Flannery, M. J., Hankins, K. W., & Smith, J. M. (2012). Cash flows and leverage adjustments. Journal of Financial economics, 103(3), 632-646.*
[20] *Flannery, M. J., & Hankins, K. W. (2013). Estimating dynamic panel models in corporate finance. Journal of Corporate Finance, 19, 1-19.*
[21] *Yan, G. and Qianglong, Z (2018). Policy Uncertainty, Value of Financial Flexibility and Dynamic Adjustment of Capital Structure. The Journal of World Economy, 41, 102-126.*
[22] *Yue, D. and Haiying, P. (2024).Green Credit Policy, ESG performance and Capital Structureal Adjustment of Highly-polluting Firms. Resources & Industries, 26, 75-85.*
[23] *Hongjun, X. (2024). Research Progress on ESG Controversies. Economic Perspectives(03), 145-160.*