

Appendix

Appendix 1. Variable definitions

Type	Name	Meaning	Measurement method	References and data sources
Dependent variable	<i>CR</i>	Corporate Resilience Scores	First, the index weight is calculated using the CRITIC method. Second, the <i>CR</i> is weighted by indicators such as “Stock price recovery rate”, “Quick ratio”, “Average return rate”, “R&D investment”, “Cash operation index”, “Total asset turnover rate”, and “Maximum withdrawal rate” .	
Independent variable	<i>CE</i>	Ratings of controversial events		
Mediating variable, Independent variable	<i>ESG</i>	ESG ratings		Wind
Mediating variable, Dependent variable	<i>VAR</i>	Value-at-risk		
	<i>Size</i>	Firm total assets	$Size = \ln(Total\ assets)$	
Control variables	<i>Lev</i>	Proportion of liabilities to assets		
	<i>ROA</i>	Net profit margin of total assets		
	<i>ATO</i>	Turnover rate of total assets		
	<i>Cashflow</i>	Cash flow to current liabilities ratio		

Control variables, Categorical variables	<i>Growth</i>	Operating income growth rate			
	<i>Board</i>	Number of board members		$Board = \ln(\text{Size of the board})$	
	<i>Indep</i>	Proportion of independent directors			
	<i>Balance2</i>	Equity balance degree		$Balance2 = \frac{\left(\begin{array}{l} \text{shareholding ratio of second} \\ \text{shareholder} + \text{third shareholder} \\ + \text{fourth shareholder} + \text{fifth} \\ \text{shareholder} \end{array} \right)}{\text{the first shareholder}}$	
	<i>TobinQ</i>	Tobin's Q value			
	<i>ListAge</i>	Listed years			
	<i>FIXED</i>	Proportion of fixed assets			
	<i>Area</i>	Location of the company		$\begin{array}{l} \text{Eastern region} = 2; \\ \text{Central region} = 1; \\ \text{Western region} = 0. \end{array}$	
	<i>SOE</i>	Corporate governance structure		$\begin{array}{l} \text{State-owned firms} = 1, \\ \text{Non-state-owned firms} = 0. \end{array}$	
	<i>Industry</i>	Industry		Assigning natural numbers to industry code in order.	CSRC Industry Classification
	<i>EventState</i>	$\text{Share Price Recovery} = \left(\begin{array}{l} \text{The date of the peak} \\ \text{stock price within} \\ \text{one year} - \text{the date} \\ \text{of the trough stock} \\ \text{price within one year} \end{array} \right)$		$\begin{array}{l} \text{The recover one} = 1, \\ \text{The unrecover one} = 0. \end{array}$	Wind

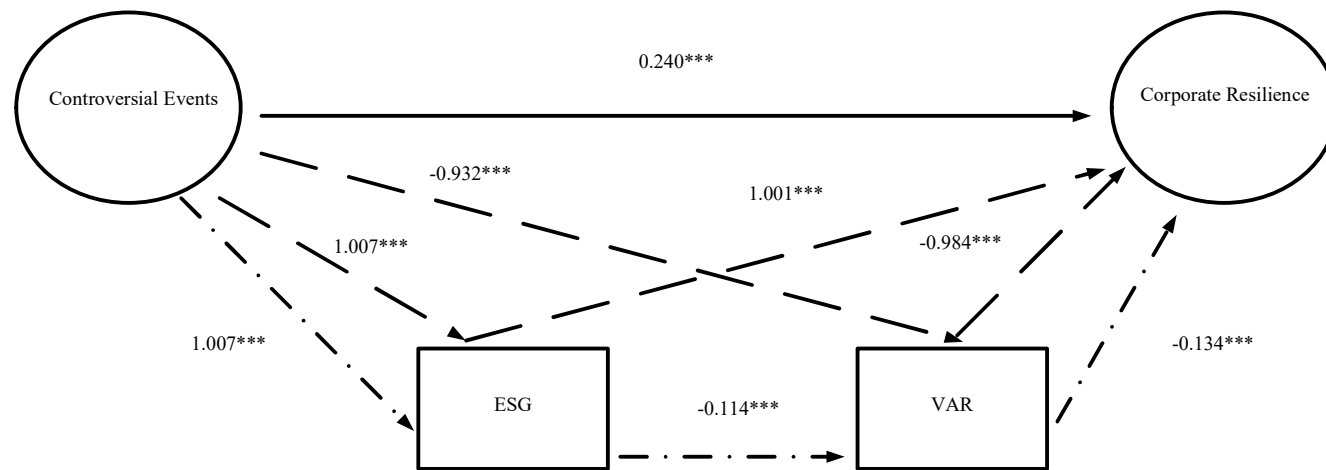
Instrumental variable	<i>CED</i>	<p>If <i>the Share Price Recovery</i> > 0 , it indicates that the stock price has recovered within one year. This is then recorded as <i>EventState</i> = 1 ; otherwise, it is recorded as <i>EventState</i> = 0 .</p> <p>There is a disparity among companies in how they score controversial events within the industry.</p>	$CED = \frac{(CE - \textit{Scoring of industry controversial events})}{\textit{Scoring of industry controversial events}}$
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Appendix 2. Descriptive statistics and bivariate correlation

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. CR	-0.027	0.503																			
2. CE	2.920	0.093	0.044 (0.000)																		
3. ESG	6.086	0.768	0.053 (0.000)	0.106 (0.000)																	
4. VAR	6.839	2.094	-0.522 (0.000)	-0.008 (0.253)	-0.081 (0.000)																
5. Size	22.298	1.299	0.137 (0.000)	-0.203 (0.000)	0.192 (0.000)	-0.287 (0.000)															
6. Lev	0.401	0.192	-0.074 (0.000)	-0.222 (0.000)	-0.046 (0.000)	-0.066 (0.000)	0.496 (0.000)														
7. ROA	0.040	0.060	0.191 (0.000)	0.140 (0.000)	0.099 (0.000)	-0.024 (0.001)	0.011 (0.117)	-0.333 (0.000)													
8. ATO	0.602	0.339	0.199 (0.000)	0.000 (0.982)	-0.009 (0.215)	-0.002 (0.745)	0.084 (0.000)	0.186 (0.000)	0.240 (0.000)												
9. Cashflow	0.053	0.063	0.151 (0.000)	0.041 (0.000)	0.071 (0.000)	-0.063 (0.000)	0.087 (0.000)	-0.133 (0.000)	0.469 (0.000)	0.194 (0.000)											
10. Growth	0.098	0.259	0.086 (0.000)	0.027 (0.000)	0.044 (0.000)	0.081 (0.000)	0.038 (0.000)	0.063 (0.000)	0.336 (0.000)	0.217 (0.000)	0.079 (0.000)										
11. Board	2.091	0.198	0.048 (0.000)	-0.033 (0.000)	0.060 (0.000)	-0.096 (0.000)	0.284 (0.000)	0.143 (0.000)	0.012 (0.095)	0.007 (0.313)	0.038 (0.000)	0.007 (0.318)									
12. Indep	37.966	5.585	-0.007 (0.310)	-0.039 (0.000)	0.033 (0.000)	0.017 (0.021)	-0.013 (0.073)	-0.008 (0.262)	-0.023 (0.002)	-0.013 (0.085)	-0.001 (0.890)	-0.004 (0.550)	-0.559 (0.000)								
13. Balance2	0.814	0.628	-0.067 (0.000)	-0.021 (0.004)	0.024 (0.001)	0.060 (0.000)	-0.102 (0.000)	-0.063 (0.000)	-0.006 (0.386)	-0.045 (0.000)	-0.028 (0.000)	0.023 (0.002)	0.025 (0.001)	-0.025 (0.001)							
14. TobinQ	1.821	0.890	-0.022 (0.003)	0.000 (0.953)	0.064 (0.000)	0.182 (0.000)	-0.334 (0.000)	-0.247 (0.000)	0.191 (0.000)	-0.023 (0.001)	0.108 (0.000)	0.125 (0.000)	-0.106 (0.000)	0.047 (0.000)	0.079 (0.000)						
15. ListAge	2.078	0.870	0.118 (0.000)	-0.173 (0.000)	0.002 (0.736)	-0.220 (0.000)	0.487 (0.000)	0.342 (0.000)	-0.206 (0.000)	0.034 (0.000)	0.013 (0.071)	-0.100 (0.000)	0.194 (0.000)	-0.009 (0.238)	-0.145 (0.000)	-0.087 (0.000)					
16. FIXED	0.198	0.142	0.013 (0.066)	-0.017 (0.020)	0.014 (0.059)	-0.099 (0.000)	0.137 (0.000)	0.111 (0.000)	-0.046 (0.000)	0.043 (0.000)	0.190 (0.000)	0.014 (0.054)	0.094 (0.000)	-0.010 (0.178)	-0.080 (0.000)	-0.122 (0.000)	0.140 (0.000)				
17. SOE	0.286	0.452	0.109 (0.000)	-0.050 (0.000)	0.029 (0.000)	-0.128 (0.000)	0.367 (0.000)	0.252 (0.000)	-0.091 (0.000)	-0.003 (0.729)	-0.029 (0.000)	-0.046 (0.000)	0.266 (0.000)	-0.043 (0.000)	-0.208 (0.000)	-0.165 (0.000)	0.428 (0.000)	0.127 (0.000)			
18. Area	1.645	0.655	0.002 (0.773)	0.021 (0.003)	0.047 (0.000)	0.023 (0.002)	-0.055 (0.000)	-0.055 (0.000)	0.003 (0.661)	0.043 (0.000)	0.004 (0.615)	0.000 (0.982)	-0.095 (0.000)	0.037 (0.000)	0.057 (0.000)	0.015 (0.038)	-0.139 (0.000)	-0.113 (0.000)	-0.168 (0.000)		
19. Industry	3.084	4.009	-0.035 (0.000)	-0.069 (0.000)	-0.026 (0.000)	0.036 (0.000)	0.099 (0.000)	0.048 (0.000)	-0.088 (0.000)	-0.149 (0.000)	-0.057 (0.000)	-0.039 (0.615)	0.037 (0.000)	0.016 (0.000)	0.006 (0.000)	0.015 (0.043)	0.056 (0.000)	-0.181 (0.000)	0.140 (0.000)	0.003 (0.713)	
20. EventState	0.449	0.497	0.342 (0.000)	-0.037 (0.000)	-0.034 (0.000)	0.112 (0.000)	-0.036 (0.000)	0.034 (0.000)	0.042 (0.000)	0.044 (0.000)	0.042 (0.000)	0.140 (0.000)	0.004 (0.626)	-0.011 (0.126)	-0.018 (0.012)	0.153 (0.000)	0.081 (0.083)	0.012 (0.000)	0.031 (0.000)	-0.018 (0.013)	-0.023 (0.001)

Appendix 3. Comparison of results between linear regression model and GAM

Model Type	R^2	AIC	BIC
linear regression model	0.233	22506.73	22655.66
GAM	0.235	22460.08	22653.84



Appendix 4. The effect of each variable (the effect value is calculated by Random Forest in DML framework)