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CEO's childhood poverty experience and corporate greenwashing: Evidence from China

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Authors:
Rong Xu[1,2] 🔟
Bei Lyu[3,4] 🔟

Affiliations:
[1]Urban and Happiness Research Institute, Institute of Urban Development and Strategy, Hangzhou City University, Hangzhou, China

[2]School of Public Affairs, Zhejiang University, Hangzhou, China

[3]School of Economics and Management, Huaibei Normal University, Huaibei, China

[4]International Chinese College, Panyapiwat Institute of Management, Nonthaburi, Thailand

Corresponding author:
Bei Lyu,
lyubei@pim.ac.th

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Purpose: This study aims to elucidate the effect of chief executive officers' (CEO) early-life poverty experiences on corporate greenwashing and the underlying channel mechanisms and seeks to explore the moderating effects of various factors.

Design/methodology/approach: Data were collected from Chinese A-share listed companies from 2012 to 2022. Quantitative analyses and regression models were applied to achieve the purpose.

Findings/results: We found that (1) CEO poverty experiences significantly suppress corporate greenwashing. (2) CEO poverty experience inhibits corporate greenwashing by improving information transparency and reducing agency costs. (3) CEO power, CEO green experience and CEO individualism significantly moderate the impact of the two.

Practical implications: When assessing CEOs' potential impact on greenwashing, it is crucial to consider their early-life poverty experiences. It is recommended that information transparency be improved and agency costs be mitigated. Furthermore, the moderating effect of CEO power, CEO green experience and CEO individualism should be considered.

Originality/value: Our findings not only reveal the effect of CEOs' poverty experience on corporate greenwashing and the underlying channel mechanisms but also find that their relationship can be moderated by CEO power, CEO green experience and CEO individualism.

Keywords: CEOs' poverty experience; greenwashing; information transparency; agency costs; CEO individualism.

Introduction

Environmental information disclosure is crucial for enterprises to show ecological protection responsibilities to governmental bodies, investors and the general public (Xi et al., 2022). Since 2006, China has enacted institutional documents to regulate the disclosure of environmental information by enterprises. The 2018 revised 'Code of Governance for Listed Companies' introduced new chapters on stakeholders, environmental protection and social responsibility, stipulating that listed companies should disclose environmental information. Despite the national call for 'carbon neutrality', some Chinese enterprises continue to pursue profit maximisation; and to enhance their reputation, they adopt 'greenwashing' management strategies (Ghisetti & Rennings, 2014; Wang et al., 2024). Corporate greenwashing has a detrimental impact on consumers, markets and potential stakeholders. It has been demonstrated to erode consumer trust (Martínez et al., 2020) and reduce green purchasing willingness (Rausch & Kopplin, 2021). It may also impair environmental information disclosure quality by enterprises, thereby hindering ecological civilisation construction in China (Yang et al., 2020). Greenwashing is on the rise (Kim & Lyon, 2015) and has a detrimental impact (Delmas & Burbano, 2011). It is crucial to examine its underlying factors from various standpoints.

Most studies examine corporate greenwashing's influencing factors from formal institutions. Roulet and Touboul (2015) posit that a firm's greenwashing propensity depends on size, profitability and attitudes towards risk aversion. Digital transformation of firms has been identified as a significant inhibitor of greenwashing (Wang et al., 2024), while environmental regulation has been established as an external influence (Sun & Zhang, 2019). The influence of informal institutions on corporate greenwashing has been relatively neglected in academic research. Indeed, in addition to economic benefits, institutional constraints and external regulatory pressures, corporate greenwash may also be influenced by the personal values and moral sentiments of managers. The chief executive officer (CEO) is the most powerful figure in the firm and therefore can significantly influence corporate decisions. The upper echelons

theory and imprinting theory posit that managers often incorporate their personal values, beliefs and dispositions shaped by their individual experiences into their corporate decision-making processes (Zhu & Chen, 2015). The diversity in CEOs' managerial styles is reflective of the variation in their individual life experiences (Benmelech & Frydman, 2015). In alignment with these perspectives, a substantial body of research has demonstrated that the imprint of CEOs' life experiences, such as military experience (Gao et al., 2021; Solano et al., 2024) and clan cultural background (Liu et al., 2023), shapes their decision-making styles. The term 'greenwashing' refers to the act of whitewashing corporate environmental performance through impression management strategies. Such strategies include selective reporting of environmental matters, that is, 'reporting the good news but not the bad news'. Another example is the embellishment of the company's environmental image through strategic representations, which is characterised by 'more words than deeds' or an 'inconsistency between words and deeds', meaning the company's real environmental performance and disclosed environmental performance are different. It can be observed that corporate greenwashing is likely influenced by ethical considerations. As the primary decision-makers and implementers of corporate environmental information disclosure, CEOs are likely to form their cognition of greenwashing based on moral sentiments derived from their distinctive personal experiences. Nevertheless, this topic has not been explored in existing literature. In this article, our objective is to comprehensively investigate the potential influence of values and ethical sentiments shaped by CEOs' early poverty experiences on corporate greenwashing behaviour and the underlying channel mechanisms and seek to explore the moderating effects of various factors.

This study contributes to existing literature in three significant ways: (1) It extends the influences of corporate greenwashing to the CEO's early poverty experience, adding to the existing literature studying corporate greenwashing. Existing literature mainly concentrates on formal institutional factors such as corporate governance (Wang et al., 2024) and regulatory policies (Sun & Zhang, 2019). In contrast, our study employs a novel approach by delving into the impact of CEO poverty experience from informal institutions on corporate greenwashing. (2) We dissect the channel through which the cognitive imprints of CEOs' poverty experience influence greenwashing behaviour. It analyses how poverty imprints on individuals, enhancing their integrity, empathy and long-term awareness in decision-making. Demonstrating the persistent influence of CEOs' early cognitive imprints on organisational behaviour enriches the analysis of the convergence of upper echelons theory and imprinting theory. (3) The explanations about the moderating effects of CEO power, CEO green experience and CEO individualism provide evidence that the inhibition of corporate greenwashing by CEO poverty experience can be influenced by other factors.

Theoretical analyses and hypotheses

The impact of chief executive officers' poverty experience on corporate greenwashing

Behavioural research findings indicate that individuals' formative years' experiences shape their lifelong behavioural patterns. Childhood is a critical period, and traumatic life experiences such as poverty or family misfortune can contribute to specific adult behaviours (Almond & Currie, 2011). From the perspective of positive psychology, poverty provides a distinctive and challenging environment. This suffering may also mould individuals into a more noble character, making them stronger, more honest, more empathetic and more long-term minded. Moreover, prior research has demonstrated that CEOs possess considerable influence within organisations, holding ultimate executive authority and significant social influence (Tian et al., 2023). Consequently, we investigate the potential positive impact of CEOs' poverty experience on preventing corporate greenwashing. This proposition is informed by the following arguments.

Firstly, CEOs who experienced poverty at an early age are stronger and possess longer-term strategic goals. As the saying goes, 'Poor and more resolute, do not lose the will of the blue clouds' (Preface to Tengwang Pavilion). The material and mental suffering from poverty can act as a catalyst for sharpening the mind and motivating individuals to become stronger, challenging social class limitations through sustained effort (Kang & Chen, 2006; Lin & Chen, 2011). Subsequently, CEOs who experienced poverty during their formative years show resilience in the face of adversity, including physical and capabilities to navigate enterprise management complexities effectively (Yao et al., 2020). Moreover, they are not driven by unethical profit-seeking behaviours but adhere to the bottom line of financial accountability and rarely commit fraud (Feng & Johansson, 2018). Corporate involvement in environmental protection represents a long-term business development strategy that may not yield immediate financial gains (Jang et al., 2022), rendering it a risky and challenging strategic choice for CEOs. Given the evidence, it can be posited that CEOs with poverty experiences may be more inclined to adopt and maintain environmental protection strategies when facing conflicts between environmental and economic goals. Unlike their counterparts, they are less likely to succumb to short-term financial gain and are more likely to face business challenges positively.

Secondly, CEOs who have experienced poverty tend to display greater compassion and a stronger appreciation for integrity. The adage 'I have been in the rain, so I want to hold an umbrella for others' reflects a recognition of interconnectedness. The principle 'Do unto others as you would have them do unto you' (The Analects) emphasises treating others with the same consideration and respect. The observation 'I have already realised the size of the universe,

but I pity the grass and trees' (Oral History of Kuangyi Pavilion) exemplifies empathy and compassion. The empathy effect, comprising three components (transpersonal thinking, empathic caring and personal suffering), is the source of compassion and integrity from the experience of poverty (Hayuni et al., 2019). On one hand, individuals who receive assistance while in poverty are more likely to empathise with and care about others (Lim & DeSteno, 2020; O'Sullivan et al., 2021). On the other hand, the unpredictability and risks inherent to the environment in which the poor reside compel them to recognise that their optimal strategy for maintaining their survival is to cultivate networks of interdependence, wherein they rely on the material assistance and support of others to navigate the challenges posed by their environment (Liu et al., 2024; Stephens et al., 2014; Xu & Ma, 2022). Literature suggests that those living in poverty are more inclined to share and provide mutual aid (Côté et al., 2013). This implies that CEOs who have undergone poverty may show a heightened proclivity for mutual support and empathic behaviour (Liu et al., 2024). Furthermore, those who have experienced poverty may be particularly susceptible to the negative consequences of being cheated, leading to a greater appreciation for honesty (Feng & Johansson, 2018). It may therefore be posited that the empathy of CEOs who have experienced poverty is stronger because of having witnessed first-hand suffering. Even those who have not experienced poverty may develop empathy if they have witnessed others in difficult circumstances (Cameron et al., 2019; Sharma & Morwitz, 2016). In addition, CEOs who have experienced poverty are more aware of the value of honesty, which in turn enhances their integrity. Consequently, firms led by such CEOs will promote environmental performance and disclose environmental information more truthfully, thereby deterring greenwashing behaviour because of their heightened empathy and integrity.

Thirdly, early poverty has been found to foster a greater sense of social responsibility and an inclination towards long-term, sustainable strategic decision-making among CEOs to maintain long-term reputations. As the adage states, 'A reputation can be established in 20 years, but it can be destroyed in five minutes'. On one hand, because of growing up witnessing people suffering in unfavourable circumstances, people who experienced poverty during their formative years tend to exhibit a heightened sense of social responsibility (Liu et al., 2024) and a stronger inclination to engage in altruistic behaviour for the great good. On the other hand, the stigmatisation and low self-esteem associated with poverty may foster a great concern for moral reputation (Underlid, 2005). People know that deceptive behaviour can damage their reputation, and there is a high opportunity cost of deceiving others, so they prioritise long-term objectives and ethical conduct. Greenwashing enables companies to satisfy legitimacy requirements with limited resources for environmental governance or even just verbal plans. The argument has been made that the issuance of sustainability reports by companies, even in the absence of tangible environmental improvement, can enhance corporate reputation (Philippe & Durand, 2011). Nevertheless, despite the short-term benefits of greenwashing, in the long-term, it can accumulate environmental risks. The revelation of greenwashing activities can prompt a swift consumer and market response, reducing purchasing willingness, and harm to firm's reputation and value. It can also result in regulatory penalties and other sanctions, leading to a reduction in firm value (Flammer, 2012). At the same time, firms may experience financial losses as a result of consumer backlash, boycotts and negative publicity (Walker & Wan, 2012). Furthermore, it can damage consumer confidence and the firm's socially responsible image (Jahdi & Acikdilli, 2009). Furthermore, greenwashing can result in a significant opportunity cost, as firms forego the innovation advantage brought about by the environmental Kuznets curve. It may therefore be reasonably assumed that poverty-experienced CEOs will be true to environmental responsibilities and sustain both their own and firms' long-term reputations. It is anticipated that CEOs who experienced childhood poverty will be less inclined to engage in greenwashing behaviour. In this regard, we propose the following hypothesis:

H1: There is a negative relationship between CEOs' poverty experience and corporate greenwashing.

Chief executive officer poverty experience, information transparency and greenwashing

Chief executive officer's early poverty experience enhances corporate information transparency. Firstly, CEOs who have experienced poverty are more likely to demonstrate a greater sense of integrity. Individuals in poverty are more inclined to share resources and offer mutual aid (Côté et al., 2013). This implies that such CEOs may show more mutual support and empathy (Liu et al., 2024). Moreover, those who have experienced poverty are more sensitive to the negative consequences of being deceived, leading to a greater appreciation for honesty (Feng & Johansson, 2018). An enhanced sense of inner integrity motivates CEOs to improve the quality of corporate information, which in turn increases corporate information transparency. Secondly, poverty-experienced CEOs are more concerned with their long-term reputation. Although false and embellished information disclosure may bring short-term gains, it can accumulate significant corporate risks over time, and once exposed, the company may suffer substantial economic losses and reputation damage (Hu, 1944). The capital market reacts rapidly to corporate social responsibility failures, negatively impacting shareholder wealth, and these negative outcomes are not short-term (Frooman, 1997). Consequently, CEOs are inclined to curtail corporate information concealment and fraud to protect the interests of investors and stakeholders, as well as the reputation of the firms and themselves. Poverty-experienced CEOs lead to increased corporate information transparency.

Improved corporate information transparency discourages corporate greenwashing. Information transparency enables investors and stakeholders to more accurately assess a company's environmental performance. They can exert pressure on companies through voting rights and social

participation to strengthen environmental and sustainability management practices. Firms need to adopt more practical green initiatives and optimise environmental governance to gain competitive advantages (González-Benito & González-Benito, 2005) to earn a good reputation and environmental premium compensation effect (Tang et al., 2018). To prove the truthfulness and reliability of publicly disclosed information, poverty-experienced CEOs verify the company's disclosed environmental claims and sustainability practices by engaging third-party organisations. These third parties typically conduct independent audits, thereby reducing the likelihood of false corporate claims. Thus, under the management practices of poverty-experienced CEOs, increased information transparency further compels companies to improve their environmental performance, while preventing false disclosures and reducing greenwashing to a greater extent. In this context, we propose the following hypothesis:

H2: Poverty-experienced CEO can inhibit greenwashing by improving corporate information transparency.

Chief executive officer poverty experience, agent cost and greenwashing

Poverty-experienced CEOs serve to mitigate the principal-agent problems inherent in the corporate environment. Following contemporary corporate finance theory and principal-agent theory, the fundamental causes of the principal-agent problems in enterprises are information asymmetry and the absence of adequate incentives. Jensen and Meckling (1976) defined agency cost as the sum of the principal's supervisory expenditures, the agent's warranty expenditures and the residual loss. Firstly, as previously stated, CEOs who experienced poverty in childhood are more likely to implement effective monitoring and supervision inside and outside their organisations, which in turn reduces information asymmetry (Hua & Zhang, 2021). Furthermore, poverty-experienced CEOs face greater opportunity costs when engaging in unethical behaviour, as it can result in significant reputational damage, ethical sanctions and legal and regulatory consequences (Hu, 1944). At the same time, unethical behaviours such as excessive on-the-job consumption, excessive allowances acquisition and minority shareholder expropriation will also damage the CEO's reputation, prompting them to restrain unethical behaviours and reduce corporate principal-agent conflict costs. Consequently, poverty-experienced CEOs tend to adopt visionary behaviours to safeguard their reputation, such as focusing on the interests of small and medium-sized shareholders and curbing collusion with controlling shareholders. Furthermore, reputation can motivate agents to curtail opportunistic behaviours, diminish collusion between agents and controlling shareholders and mitigate agency conflicts (Xu et al., 2023). Secondly, poverty-experienced CEOs display greater altruism and social responsibility (Hayuni et al., 2019; Liu et al., 2024). Increased ethical standards further constrain CEOs' opportunistic behaviour. Managers' philanthropy and righteousness can enhance ethical

standards, reduce minority shareholder expropriation (Du, 2015) and mitigate principal-agent conflicts (Li & Zhu, 2021). The inconsistency between CEOs' and shareholders' goal interests is a significant cause of principal-agent problems (Ang et al., 2000). It can be observed that reputation constraints and enhanced ethical standards can reconcile the contradiction between CEOs' pursuit of personal interests and the maximisation of shareholders' interests to some extent. Thus, CEOs' poverty experience can alleviate corporate principal-agent conflicts.

The mitigation of agency costs inhibits firms' greenwashing behaviour. Kasper and Streit (2000) posit that effective government monitoring and institutional design can curb the opportunistic behaviour of greenwashing. Consequently, a reduction in the efficacy of the principal-agent mechanism may encourage greenwashing as managers may prioritise their interests without effective shareholder and stakeholder voting rights on corporate environmental strategies. As previously stated, CEOs' poverty experience mitigates principal-agent conflicts within firms, thereby reducing the propensity for greenwashing. Existing literature indicates that heightened corporate finance constraints intensify greenwashing (Xia et al., 2023), and an essential rationale for this is principal-agent conflict (Chen & Zhou, 2004). Reducing minority shareholders' expropriation can effectively enhance their participation in environmental protection decision-making, which in turn inhibits greenwashing. Agency conflict provides conditions for corporate greenwashing (Li et al., 2023a). The mitigation of agency costs serves to inhibit corporate greenwashing (Ghitti et al., 2023). It can therefore be concluded that poverty-experienced CEOs are effective in mitigating principal-agent conflicts and thus in curbing corporate greenwashing. In this regard, we propose the following hypothesis:

H3: Poverty-experienced CEO reduces greenwashing by mitigating corporate agent cost.

Methodology
Sample and data collection

The initial research sample for this study covers Chinese A-share listed companies from 2012 to 2022. To minimise the potential influence of extraneous variables, the samples have been subjected to the following screening and processing procedures: (1) excluding the samples of the financial industry; (2) deleting the samples of special treatment (ST) and companies with abnormal financial data; (3) removing the samples with missing data.

The data employed in this study are derived from the following three principal sources. Firstly, CEOs' resume information and corporates' financial data are obtained from the China Stock Market and Accounting Research Database (CSMAR). Secondly, we also manually searched the CEO's birthplace information, given that this information is not mandatory to disclose. Thirdly, we referred to the studies of Hu et al. (2023), Wang et al. (2024) and Zhang (2022) to

measure firms' greenwash levels and to gain firms' environmental, social and governance (ESG) disclosure and ESG performance scores from the Bloomberg ESG database and the Huazheng database, respectively.

Variable definitions

Corporate greenwashing (Grw)

Greenwashing implies that firms try to portray a positive environmental and sustainability image through the ostensible disclosure of environmentally friendly information and green concepts, while simultaneously failing to implement environmental measures that align with the disclosed criteria, thereby failing to improve their ESG performance. Following the methodologies proposed by Hu et al. (2023), Zhang (2022) and Wang et al. (2024), Equation 1 is employed to measure a firm's greenwash level:

$$Grw_{it} = \left(ER_{dis'it} - \overline{ER}_{dis} \right) / \sigma_{dis} - \left(ER_{per'it} - \overline{ER}_{per} \right) / \sigma_{per} \qquad \text{[Eqn 1]}$$

where the first term denotes a firm's position in the disclosure score of the environment rating relative to its peers, and the second term represents a firm's position in the real performance score of the environment rating relative to its peers. Specifically, $\overline{ER}_{dis}$ and $\overline{ER}_{per}$ represent the average value of the environmental disclosure and performance scores, respectively. σ_{dis} and σ_{per} represent the standard deviation of the environment disclosure and performance scores, respectively. Here, the ER disclosure score is expressed using the Bloomberg environment rating, while the ER real performance score is expressed using the Huazheng environmental rating.

Chief executive officer poverty experience (CEO_poverty)

Referring to previous studies (Du & Ren, 2024; He et al., 2022; Xu & Ma, 2022), we defined the dummy variable CEO_poverty, which is equal to 1 if the CEO had experienced the 'three years of natural disasters' during their childhood or was born in a poverty-stricken county, and 0 otherwise. According to the three versions (1994, 2001, and 2012) of the list of Nationally Key counties for Poverty Alleviation and Development (hereinafter referred to as 'nationally poverty-stricken county'), we matched the information on the birthplace of the CEOs with these poverty-stricken counties list one by one. Furthermore, the period of 'three years of natural disasters' in China is defined as spanning from 1959 to 1961. Referring to Xu and Li (2016), the continuity of an individual's psychological development, this study selects 0–14 years old as the period of childhood. Consequently, if the CEO's birth year falls within the period between 1947 and 1961, it is considered that the CEO has experienced the 'three years of natural disasters' during their formative years; otherwise, it is postulated that the CEO did not experience this childhood phenomenon. To further support the inhibitory effect of CEOs' childhood poverty experience on corporate greenwashing, we construct the CEOs' childhood rich experience (CEO_rich) regarding Xu and Ma (2022), which is defined as 1 if the CEO did not experience the 'three years of natural disasters' in his childhood and was born in one of the top 100 counties in China, and 0 otherwise.

Information transparency (Intran) and Agency cost (Agencst)

There is a notable discrepancy in audit quality between accounting firms of varying sizes, and the international 'Big Four' accounting firms are typically of superior quality because of the constraints of their reputations and their professional competence (Lan & Xia, 2022; Lawrence et al., 2011; Wang & Chen, n.d.), which enhances the transparency of the companies being audited. Considering the aforementioned considerations, we measure the accounting information transparency based on whether the firm's annual report is audited by a Big 4 auditor (*Big4*). Big 4 auditor is a dummy variable that equals 1 if the firm is audited by a Big 4 auditor, and 0 otherwise. Referring to Ma et al. (2005) and Lin and Qiu (2020), the ratio of other receivables to total assets (*Recei*) was employed to measure the agency cost between large shareholders and small and medium shareholders. The larger this ratio, the greater the degree of the major shareholders' hollowing out of listed companies and the minority shareholder expropriation.

Control variables

To prevent the omission of their effects on firm performance and management, we control other variables at both the firm characteristic and governance level, as has been done previously in the relevant literature (Li et al., 2023b; Wang et al., 2023, 2024). The firm characteristic variables encompass firm size (*Size*), profitability (*Roa*), financial leverage (*Lev*), firm growth (*Growth*), cash flow (*Flow*), listed age (*Listage*), independent directors (*Indep*), board size (*Board*), CEO duality (*Dual*), equity concentration (*Top1*) and equity checks and balances (*Balance*). The specific definitions of these variables are provided in Table 1.

Model setting

Referring to previous studies (Liu et al., 2024; Wang et al., 2024; Zhou et al., 2024), we establish the following regression analysis to examine the impact of CEOs' childhood poverty experiences on firms' greenwashing behaviour (Equation 2):

$$Grw_{it} = \alpha_0 + \alpha_1 CEO\_poverty_{it} + \sum \alpha_k Ctrls_{it} \qquad \text{[Eqn 2]}$$
$$\sum Year + \sum Ind + \sum Prov + \varepsilon_{it}.$$

where i and t denote the firm and the year, respectively. The explanatory variable is corporate greenwashing (Grw), the core explanatory variable is CEOs' poverty experience (CEO_poverty) and Ctrls is a series of control variables. To mitigate the potential interference of unobservable factors, we include year-fixed effects ($\sum Year$), industry-fixed effects ($\sum Ind$) and province-fixed effects ($\sum Prov$), and ε is the error term.

Ethical considerations

Ethical approval to conduct this study was obtained from the Institute of Happy City, Hangzhou City University of Ethics Committee (No.20240100) in January 2024. Written informed consent was obtained for this study in accordance with national legal and institutional requirements.

Results

Descriptive statistics

Table 2 presents the descriptive statistics. It can be observed that the mean value of Grw is −0.467, the standard deviation (SD) is 1.268 and the maximum and minimum values are 5.691 and −5.546, respectively, demonstrating that there

TABLE 1: Variable description.

Variable	Symbol	Measurements
Corporate greenwashing	Grw	Difference between standardised disclosure score of environment rating and real performance score
CEO poverty	CEO_poverty	CEO_poverty equals 1 if the CEO has experienced the 'three years of natural disasters' or was born in a poverty-stricken county, otherwise equals 0
Big 4 auditor	Big4	Big4 equals 1 if the firm is audited by a Big 4 auditor, otherwise equals 0
Other receivables	Recei	The ratio of other receivables to total assets
Firm size	Size	Natural logarithm of total firm assets
Profitability	Roa	Net profit divided by the average balance of total assets
Financial leverage	Lev	Total debt divided by total assets
Firm growth	Growth	The growth rate of operating income
Cash flow	Flow	Net cash flow from operating activities divided by total assets
Listed age	Listage	The natural logarithm of the firm's listing years
Independent directors	Indep	Number of independent directors divided by the number of board of directors
Board size	Board	The natural logarithm of board members
CEO duality	Dual	Dual equals 1 if the CEO and the chair is the same person, otherwise equals 0
Equity concentration	Top1	The percentage of total shares held by the largest shareholder
Equity checks and balances	Balance	The percentage of total shares held by the second largest shareholder divided by the percentage of total shares held by the first largest shareholder

CEO, chief executive officer.

TABLE 2: Descriptive statistics.

Variable	Obs	Mean	SD	Min	Max
Grw	8303	-0.47	1.27	-5.55	5.69
CEO_poverty	8303	0.23	0.42	0.00	1.00
CEO_rich	8303	0.02	0.13	0.00	1.00
Size	8303	23.39	1.33	19.54	27.50
Roa	8303	0.05	0.06	-0.38	0.26
Lev	8303	0.48	0.19	0.04	0.94
Growth	8303	0.16	0.40	-0.68	4.81
Flow	8303	0.06	0.08	-0.21	0.27
Listage	8303	2.54	0.65	0.00	3.40
Indep	8303	0.37	0.05	0.29	0.60
Board	8303	2.18	0.20	1.61	2.71
Dual	8303	0.20	0.40	0.00	1.00
Top1	8303	0.37	0.16	0.08	0.75
Balance	8303	0.34	0.29	0.01	1.00

SD, standard deviation; CEO, chief executive officer; obs, observations; min, minimum; Max, maximum; Grw, corporate greenwashing.

is a considerable degree of variation in greenwashing behaviour among the firms in our sample. Meanwhile, the mean value of CEO_poverty is 0.233, with a SD of 0.423, indicating that there are significant differences in the CEOs' poverty experience between firms.

Multicollinearity test

Table 3 reports the matrix of Pearson's correlation coefficients between variables. Before conducting the subsequent regression analyses, we examined the variance inflation factor (VIF) to address the potential issue of multicollinearity. The results demonstrate that the correlation coefficients between the variables are all below 0.5, with the values of VIF ranging from 1.93 to 1.01, well below the cutoff of 10 (Ryan, 2008). Thus indicating that multicollinearity is not a significant concern in our empirical study.

Benchmark regression

Table 4 reports the findings of the benchmark regressions. In column (1), the estimated coefficient of CEOs' poverty experience (CEO_poverty) is significantly negative without any control variables. On this basis, we introduce control variables and re-regress the benchmark model. The results in column (2) demonstrate that the coefficient of corporate greenwashing (Grw) on CEOs' poverty experience (CEO_poverty) remains significantly negative. Considering these findings, it can be concluded that poverty-experienced CEOs will significantly inhibit corporate greenwashing. These results lend support to the reliability of H1.

This article primarily focuses on whether CEOs who have experienced poverty at an early age inhibit corporate greenwashing. However, there may be competing questions that are distinct from the poverty experience, such as whether CEOs who grew up in relatively affluent environments have an impact on corporate greenwashing. To support the uniqueness of the inhibitory effect of poverty-experienced CEOs on greenwashing, the regression of corporate greenwashing (Grw) on rich-experienced CEOs (CEO_rich) is implemented in columns (3) and (4). The results demonstrate that the coefficients of CEO_rich are not significant at the 10% level in both columns. The results indicate that CEOs who grew up in wealthier environments exhibit distinct characteristics compared to those who experienced poverty and that whether they were raised in affluent environments does not have a significant effect on corporate greenwash. This result is also consistent with the theoretical analyses presented in this article regarding the inhibitory effect of poverty-experienced CEOs on corporate greenwashing.

Endogeneity checks
Double machine learning

The above-stated benchmark regression may suffer from the curse of dimensionality and limited control variables. Double machine learning (DML), as proposed by Chernozhukov et al. (2018), employs an in- and out-of-sample cross-validation method, which can mitigate this bias. This article

TABLE 3: Correlation matrix and variance inflation factor.

Variable	Grw	CEO_poverty	CEO_rich	Size	Lev	Growth	Roa	Flow	Listage	Indep	Board	Dual	Top1	Balance	VIF
Grw	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CEO_poverty	-0.03***	1.00	-	-	-	-	-	-	-	-	-	-	-	-	1.03
CEO_rich	-0.02*	-0.03***	1.00	-	-	-	-	-	-	-	-	-	-	-	1.01
Size	0.08***	0.02**	0.02	1.00	-	-	-	-	-	-	-	-	-	-	1.62
Lev	-0.04***	0.03***	-0.01	0.49***	1.00	-	-	-	-	-	-	-	-	-	1.72
Growth	0.07***	-0.02*	-0.00	0.02**	0.00	1.00	-	-	-	-	-	-	-	-	1.36
Roa	0.06***	-0.01	0.02**	-0.07***	-0.44***	0.26***	1.00	-	-	-	-	-	-	-	1.79
Flow	0.05***	-0.02*	0.02**	0.00	-0.24***	0.08***	0.50***	1.00	-	-	-	-	-	-	1.36
Listage	-0.10***	-0.06***	0.01	0.19***	0.21***	-0.08***	-0.21***	-0.08***	1.00	-	-	-	-	-	1.22
Indep	0.01	0.02*	-0.00	0.11***	0.04***	0.01	0.00	-0.00	-0.02	1.00	-	-	-	-	1.30
Board	-0.00	0.00	0.01	0.18***	0.10***	-0.05***	-0.06***	0.00	0.08***	-0.43***	1.00	-	-	-	1.34
Dual	0.06***	0.11***	0.07***	-0.11***	-0.09***	0.07***	0.11***	0.05***	-0.19***	0.08***	-0.17***	1.00	-	-	1.12
Top1	0.03***	0.07***	0.00	0.23***	0.09***	-0.01	0.05***	0.07***	-0.07***	0.09***	0.03***	-0.11***	1.00	-	1.93
Balance	0.09***	-0.05***	-0.01	0.02	-0.05***	0.03***	0.02*	0.02*	-0.12***	-0.02**	0.03***	0.07***	-0.61***	1.00	1.80

VIF, variance inflation factor; Grw, corporate greenwashing.
*, $p < 0.1$; **, $p < 0.05$; ***, $p < 0.01$.

adopts the DML method for evaluation, sets the sample split ratio to 1:4 and selects lasso regression, gradient boosting and neural network algorithms as the estimation models, respectively. The results are shown in Table 5, where the coefficient of Grw on CEO_poverty all remain significantly negative at the 1% level in columns (1)–(3). This result suggests that CEOs' poverty experience is conducive to inhibiting corporate greenwashing, consistent with previous findings.

Propensity score matching

To address sample selection bias in benchmark regression, endogeneity tests are conducted using propensity score matching (PSM). If a firm's CEO is poverty-imprinted, these observations are designated as the treatment group, with CEO_poverty assigned a value of 1. Conversely, they are classified as the control group and assigned a value of 0. The regression results of nearest neighbour matching and radius matching are presented in columns (4) and (5) of Table 5, respectively, where the estimated coefficients on CEO_poverty are significantly negative at the 5% and 1% levels, respectively, indicating that the results remain reliable.

Instrumental variable method

To mitigate the impact of other factors that may influence corporate greenwashing on the conclusions drawn, the instrumental variable (IV) approach is employed to address this issue. In light of the existing relevant literature (Huang et al., 2023; Zhou et al., 2024), a two-stage regression is conducted utilising the mean value of CEOs' poverty experience (CEO_poverty) of companies within the same province and industry as an IV. The results are presented in Table 5. The first-stage regression in column (6) demonstrates that the estimated coefficient of the IV is significantly positive at the 1% level, indicating that the correlation between the IV and the independent variable is satisfied. The results of the second-stage regression, conducted using the IV in column (7), demonstrate that the estimated coefficient of CEO_poverty is significantly

TABLE 4: Benchmark estimation results.

Variable	(1)	(2)	(3)	(4)
	Grw	Grw	Grw	Grw
CEO_poverty	-0.09***	-0.13***	-	-
	(-2.77)	(-3.89)	-	-
CEO_rich	-	-	-0.11	-0.12
	-	-	(-1.05)	(-1.11)
Size	-	0.09***	-	0.09***
	-	(5.86)	-	(5.64)
Lev	-	-0.48***	-	-0.49***
	-	(-4.90)	-	(-4.92)
Growth	-	0.17***	-	0.17***
	-	(4.55)	-	(4.58)
Roa	-	0.01	-	0.02
	-	(0.03)	-	(0.08)
Flow	-	-0.06	-	-0.05
	-	(-0.26)	-	(-0.22)
Listage	-	-0.24***	-	-0.24***
	-	(-9.52)	-	(-9.40)
Indep	-	-0.28	-	-0.29
	-	(-0.93)	-	(-0.96)
Board	-	-0.09	-	-0.08
	-	(-1.02)	-	(-0.93)
Dual	-	0.17***	-	0.15***
	-	(4.70)	-	(4.26)
Top1	-	0.41***	-	0.40***
	-	(2.98)	-	(2.95)
Balance	-	0.50***	-	0.50***
	-	(7.56)	-	(7.66)
Constant	-0.44***	-1.78***	-0.46***	-1.76***
	(-28.02)	(-5.00)	(-33.76)	(-4.92)
Observations	8303	8303	8303	8303
R^2/pseudo R^2	0.05	0.09	0.05	0.09
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes

Note: Robust t-statistics (z-statistics) in parentheses. Column (1) introduces no control variables (with CEO_poverty as the independent variable); Column (2) introduces control variables (with CEO_poverty as the independent variable); Column (3) introduces no control variables (with CEO_rich as the independent variable); Column (4) introduces control variables (with CEO_rich as the independent variable).
FE, fixed effect; Grw, corporate greenwashing.
***, $p < 0.01$.

negative at the 1% level, indicating that the conclusion remains robust even after addressing the endogeneity concerns.

TABLE 5: Endogeneity check: Double machine learning, propensity score matching and instrumental variable-two-stage least squares (2SLS).

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Lasso regression	Gradient boosting	Neural network	Nearest neighbour matching	Radius matching	First stage	Second stage
	Grw	Grw	Grw	Grw	Grw	CEO_poverty	Grw
CEO_poverty	-0.13***	-0.12***	-0.11***	-0.08**	-0.13***		-0.13***
	(-3.88)	(-3.72)	(-3.09)	(-2.00)	(-3.89)		(-2.79)
						0.987***	
						(140.85)	
_Ctrls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.00	0.00	0.09***	-1.37***	-1.78***	-0.25***	
	(-0.03)	(0.01)	(6.90)	(-2.77)	(-5.00)	(-2.96)	
Observations	8303	8303	8303	4490	8303	8303	8303
R^2/pseudo R^2				0.11	0.09	0.58	0.04
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust t-statistics (z-statistics) in parentheses. Column (1) introduces no control variables (with CEO_poverty1 as the independent variable); Column (2) introduces control variables (with CEO_poverty1 as the independent variable); Column (3) introduces no control variables (with CEO_poverty2 as the independent variable); Column (4) introduces control variables (with CEO_poverty2 as the independent variable).

FE, fixed effect; CEO, chief executive officer; Grw, corporate greenwashing.

**, $p < 0.05$; ***, $p < 0.01$.

TABLE 6: Alternative measurements of chief executive officers' poverty experience.

Variable	(1)	(2)	(3)	(4)
	Grw	Grw	Grw	Grw
CEO_poverty1	-0.19***	-0.21***		
	(-2.64)	(-2.94)		
CEO_poverty2			-0.09**	-0.11***
			(-2.38)	(-3.03)
_Ctrls	No	Yes	No	Yes
Constant	-0.39***	-1.60**	-0.45***	-1.76***
	(-12.32)	(-2.13)	(-29.26)	(-4.93)
Observations	2299	2299	8303	8303
R^2/pseudo R^2	0.13	0.18	0.05	0.09
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes

Note: Robust t-statistics (z-statistics) in parentheses. Column (1) introduces no control variables (with CEO_poverty1 as the independent variable); Column (2) introduces control variables (with CEO_poverty1 as the independent variable); Column (3) introduces no control variables (with CEO_poverty2 as the independent variable); Column (4) introduces control variables (with CEO_poverty2 as the independent variable).

CEO, chief executive officer; FE, fixed effect; Grw, corporate greenwashing.

**, $p < 0.05$; ***, $p < 0.01$.

TABLE 7: Alternative measurement and estimation method, increased fixed effect.

Variable	(1)	(2)	(3)	(4)
	Probability of greenwashing	Probability of greenwashing	Grw	Grw
CEO_poverty	-0.09**	-0.12***	-0.10***	-0.14***
	(-2.46)	(-3.27)	(-2.69)	(-3.85)
_Ctrls	No	Yes	No	Yes
Constant	-0.52**	-2.27***	-0.44***	-1.87***
	(-2.27)	(-5.19)	(-27.22)	(-5.02)
Observations	8291	8291	8290	8290
R^2/pseudo R^2	0.03	0.05	0.08	0.12
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Industry#Year FE	-	-	Yes	Yes

Note: Robust t-statistics (z-statistics) in parentheses. Column (1) introduces no control variables (with CEO_poverty as the independent variable, and Probability of greenwashing as the dependent variable, and without Industry#Year FE); Column (2) introduces control variables (with CEO_poverty as the independent variable, and Probability of greenwashing as the dependent variable, and without Industry#Year FE); Column (3) introduces no control variables (with CEO_poverty as the independent variable, and Grw as the dependent variable, and have Industry#Year FE); Column (4) introduces control variables (, and without Industry#Year FE).

CEO, chief executive officer; FE, fixed effect; Grw, corporate greenwashing.

**, $p < 0.05$; ***, $p < 0.01$.

Robustness checks

Alternative measurements of chief executive officer poverty experience

To verify the reliability of the findings, we reconstruct the proxy variables of CEOs' poverty experience. Referring to Wei and Li (2024) and Xu and Li (2016), we use two proxy variables to assess the CEOs' poverty experience. The first proxy variable, CEO_poverty1, is based on the CEOs' childhood experience of 'three years of natural disasters'. The second proxy variable, CEO_poverty2, is derived from the 832 poverty-stricken counties in China identified by the State Council Leading Group Office of Poverty Alleviation and Development in 2014. We conduct robustness tests for each proxy variable. The regression results are presented in Table 6, where the estimated coefficients of CEO_poverty1 remain significantly negative at the 1% level in columns (1) and (2). The estimated coefficients of CEO_poverty2 are significantly negative at

the 5% and 1% levels in columns (3) and (4), respectively. This suggests that the findings of this study remain valid even when the measure of the CEOs' poverty experience is replaced.

Alternative measurement of greenwashing and estimation method

To ensure robustness, referring to Wang et al. (2024), we replace the dependent variable from the firm's greenwashing level with a dummy variable for greenwashed and non-greenwashed firms. Firms are defined as greenwashed when their greenwashing level is greater than 0 (greenwashing = 1), otherwise, they are defined as non-greenwashed (greenwashing = 0). A probit model is then used as an alternative regression method. The regression results are presented in columns (1) and (2) of Table 7. The estimated coefficients of CEO_poverty are significantly

negative at the 5% and 1% levels, respectively, indicating that CEOs' poverty experience is effective in curbing corporate greenwashing behaviour.

Increasing fixed effects

To address the endogeneity problem that may result from other unobservable variables, we introduce industry and year cross-fixed effects in the regressions to test the effect of CEO poverty experience on firms' greenwashing behaviour. The regression results in columns (3) and (4) of Table 7 demonstrate that the regression coefficients of CEO poverty experience (CEO_poverty) on corporate greenwashing are both significantly negative at the 1% level after the addition of the new fixed effect, indicating that CEOs' experience of childhood poverty can have a positive effect on curbing corporate greenwashing, and that the conclusions of the benchmark regression remain valid.

Cross-section tests

The role of information transparency

To confirm the two specific mechanisms by which CEOs' poverty experience inhibits the corporate greenwashing level, we perform cross-section tests and in-depth analyses based on the theoretical assumptions about information transparency enhancement and agency cost reduction.

In accordance with the preceding theoretical analysis, it can be posited that a CEO imbued with the trappings of poverty may exhibit a heightened sense of 'integrity' and 'reputation', among other factors. This may, in turn, enhance corporate information transparency and thus inhibit corporate greenwashing. The inhibitory effect should be more obvious when the information transparency of the enterprise is low. As previously indicated, the information transparency of firms engaging the services of international Big 4 accounting firms for their annual reports is greater than that of firms that do not employ Big 4 accounting firms. Therefore, referring to Lan and Xia (2022) and Li et al. (2021), this article regresses the sample on whether the auditor is a Big 4 firm or not, and defines a firm as a highly transparent group if it is audited by a Big 4 firm (Big4 = 1); it is then classified in the high information transparency group (High_Intran); if the auditing firm is not a 'Big 4' firm (Big4 = 0), it is classified in the low information transparency group (Low_Intran). As illustrated in Table 8, the regression coefficient for CEO poverty experience (CEO_poverty) is significantly negative at the 1% level in column (2) for the group of firms with low information transparency (Low_Intran), whereas the regression coefficient for CEO_poverty is negative but not significant in column (1) for the group of firms with high information transparency (High_Intran). The results demonstrate that under the condition of lower information transparency, the inhibitory effect of CEOs' poverty experience on corporate greenwashing behaviour is more pronounced, and CEOs' poverty experience exerts an inhibitory effect on corporate greenwashing by enhancing corporate information transparency, which in turn inhibits

corporate greenwashing. These findings align with the theoretical expectations of the first mechanism channel and provide support for the H2.

The role of agency cost

Similarly, as previously discussed in the theoretical analysis, if the sense of 'reputation' and 'social responsibility' among poverty-imprinted CEOs can reduce the minority shareholder exploitation, alleviate the agency conflict within the firm and thus inhibit greenwashing behaviour, then this inhibitory effect should be more pronounced when agency costs are higher. In accordance with the preceding analysis, the sample firms are similarly divided into two groups based on the mean value of agency costs. If the enterprise agency cost exceeds the sample mean value, it is classified as the higher agency cost group (High_Agencst); otherwise, it is designated as the lower agency cost group (Low_Agencst). The regression results are presented in Table 8. While the regression coefficients for CEO poverty experience (CEO_poverty) are significantly negative at the 1% level in both columns (3) and (4), the coefficient value for CEO_poverty is considerably larger in column (4), the higher agency costs group (High_Agencst), than in column (3), the lower agency costs group (Low_Agencst), and the empirical p-value of Fisher's portfolio test is 0.005, which exceeds the 1% level of significance, indicating that the coefficients are significantly different between the two groups. That is, the coefficient of CEO_poverty is significantly higher in the group of firms with higher agency costs (High_Agencst) than in the group of firms with lower agency costs (Low_Agencst). This indicates that when agency costs are higher, the inhibitory effect of CEO poverty experience on corporate greenwashing behaviour is more pronounced, and CEOs' poverty experience appears to inhibit corporate greenwashing by mitigating agency conflicts within the firm, which aligns with the theoretical expectations of the second mechanism channel and validates the H3.

Further analyses

The preceding analyses demonstrate that poverty-experienced CEOs inhibit corporate greenwashing behaviour. Nevertheless, it would be of interest to ascertain whether the impact of CEOs' poverty experience varies across other factors. In this context, we undertake a detailed examination of the moderating effects of CEO power, CEO green experience and CEO individualism.

Pursuing the meaning of life in 'If one reaches great heights, help the whole world' and promoting the self-redemptive spirit of helping others are the crucial elements for the poor to get rid of extreme material deprivation and help them to gradually become successful (Cotton Bronk et al., 2009). Chief executive officers who have experienced poverty at an early age have gained power through their efforts to satisfy a range of basic human needs, including those related to physiological and safety requirements, emotional belonging and respect. It is only when their higher-level motivational

needs are satisfied that they can truly realise their life aspirations and ambitions. The development of socially desirable roles based on the emotional experience of overcoming adversity and achieving success, and the active engagement in pro-social activities reminiscent of past challenges, represents a familiar and effective pathway for poverty-imprinted CEOs to actualise their values, thereby further satisfying their need for self-actualisation on a broader scale (Hofstede, 1984). It can be observed that power awakens and strengthens the emotions of poverty-experienced CEOs to achieve meaning in their lives through pro-social behaviours as they did before. Furthermore, the implementation of environmental protection as a strategic business decision requires the decision-maker to fully mobilise resources to implement it. The extant literature demonstrates that as a tool, power not only influences the behaviour and attitudes of others but also enables CEOs to more fully mobilise resources and direct strategic actions (Walls & Berrone, 2017). The question thus arises as to whether CEOs' power serves to positively moderate the relationship between their experience of poverty and corporate greenwashing. As CEO power is a composite indicator, a principal component analysis was employed to

calculate a composite indicator of CEO power (CEO_power) for the eight indicators of the four CEO power dimensions: organisational power, expert power, ownership power and reputational power, regarding the study of Quan and Wu (2010).

Chief executive officers' past professional experience is an acquired trait that not only adds to their professional knowledge and competence but also shapes their decision-

TABLE 8: The role of information transparency and agency cost.

Variable	(1)	(2)	(3)	(4)
	High_Intran	Low_Intran	Low_Agencst	High_Agencst
	Grw	Grw	Grw	Grw
CEO_poverty	-0.14	-0.13***	-0.11***	-0.16***
	(-1.43)	(-3.55)	(-2.76)	(-2.75)
Size	0.21***	0.00	0.07***	0.12***
	(4.02)	(0.16)	(3.33)	(4.83)
Lev	-0.36	-0.39***	-0.30**	-0.89***
	(-0.89)	(-3.84)	(-2.38)	(-5.20)
Growth	-0.01	0.21***	0.20***	0.11**
	(-0.10)	(5.15)	(3.75)	(2.17)
Roa	0.65	0.18	0.08	-0.26
	(0.55)	(0.63)	(0.20)	(-0.59)
Flow	0.12	-0.38	0.43	-0.79*
	(0.14)	(-1.54)	(1.44)	(-1.93)
Listage	-0.33***	-0.23***	-0.26***	-0.19***
	(-4.60)	(-8.47)	(-8.12)	(-4.16)
Indep	0.03	-0.51	-0.52	0.46
	(0.04)	(-1.61)	(-1.40)	(0.90)
Board	-0.03	-0.10	-0.03	-0.11
	(-0.14)	(-1.10)	(-0.30)	(-0.73)
Dual	0.19*	0.17***	0.14***	0.23***
	(1.85)	(4.47)	(3.09)	(3.48)
Top1	-0.18	0.29**	0.33*	0.27
	(-0.39)	(2.04)	(1.96)	(1.08)
Balance	0.39	0.40***	0.47***	0.50***
	(1.62)	(5.77)	(5.71)	(4.34)
Constant	-4.19***	0.29	-1.33***	-2.64***
	(-3.54)	(0.73)	(-2.89)	(-4.20)
Observations	1230	7070	5525	2778
R^2/pseudo R^2	0.26	0.09	0.10	0.15
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes

Note: Empirical *p*-value (0.005): The empirical *p*-value calculated from the Fischer portfolio test. Robust *t*-statistics (*z*-statistics) in parentheses.
FE, fixed effect; CEO, chief executive officer; Grw, corporate greenwashing.
*, *p* < 0.1; **, *p* < 0.05; ***, *p* < 0.01.

TABLE 9: Moderating effects of other factors.

Variable	(1)	(2)	(3)
	Grw	Grw	Grw
CEO_poverty	-0.16***	-0.13***	0.01
	(-3.85)	(-3.77)	(0.05)
CEO_power	-0.04**	-	-
	(-2.15)	-	-
CEO_poverty × CEO_power	-0.09**	-	-
	(-2.21)	-	-
CEO_green	-	0.19	-
	-	(0.78)	-
CEO_poverty × CEO_green	-	-1.25***	-
	-	(-3.62)	-
CEO_indiv	-	-	0.00
	-	-	(0.04)
CEO_poverty × CEO_indiv	-	-	0.39**
	-	-	(2.13)
Size	0.11***	0.09***	0.08**
	(5.56)	(5.79)	(2.21)
Lev	-0.64***	-0.48***	-0.20
	(-5.16)	(-4.84)	(-0.83)
Growth	0.19***	0.17***	0.25***
	(4.06)	(4.43)	(3.43)
Roa	-0.10	0.00	-0.37
	(-0.30)	(0.02)	(-0.64)
Flow	0.10	-0.07	-0.06
	(0.36)	(-0.29)	(-0.13)
Listage	-0.20***	-0.24***	-0.45***
	(-6.60)	(-9.36)	(-7.76)
Indep	-0.32	-0.31	-0.49
	(-0.92)	(-1.02)	(-0.80)
Board	-0.27***	-0.09	-0.26
	(-2.69)	(-1.09)	(-1.52)
Dual	0.23***	0.18***	0.17**
	(5.25)	(5.02)	(2.53)
Top1	0.32**	0.43***	-0.00
	(1.99)	(3.11)	(-0.60)
Balance	0.35***	0.50***	0.21
	(4.62)	(7.63)	(1.39)
Constant	-1.74***	-1.76***	-0.42
	(-4.07)	(-4.92)	(-0.52)
Observations	6114	8246	2043
R^2/pseudo R^2	0.10	0.09	0.18
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Province FE	Yes	Yes	Yes

Note: Robust *t*-statistics (*z*-statistics) in parentheses. Column (1) introduces CEO_power and the interaction term of CEO_poverty and CEO_power (with Grw as the dependent variable); Column (2) introduces CEO_green and the interaction term of CEO_poverty and CEO_green(with Grw as the dependent variable); Column (3) introduces CEO_indiv and the interaction term of CEO_poverty and CEO_indiv(with Grw as the dependent variable).
FE, fixed effect; CEO, chief executive officer; Grw, corporate greenwashing.
, *p* < 0.05; *, *p* < 0.01.

making and behavioural styles (Cho et al., 2017) and influences their cognitive and thinking patterns (Hambrick & Mason, 1984). The green experience that CEOs gain from receiving 'green'-related education (e.g. 'environmental protection'-related education) and working in 'green'-related jobs (e.g. head of the environmental protection department of a company, serving in the environmental protection department of a government) is also an acquired trait. Such acquired traits may prompt CEOs to devote greater attention to sustainability issues and enhance the green knowledge base of enterprises. The question thus arises as to whether the CEO green experience positively moderates the relationship between their poverty imprint and corporate greenwashing. In light of existing studies (Jiang & Huang, 2013; Lu & Jiang, 2022; Xu & Li, 2016), if the CEO has received a 'green'-related education or engaged in a 'green'-related job, the definition of CEO green experience (CEO_green) is 1, and otherwise 0.

The theory of rice culture posits that individuals residing in areas with a prolonged history of wheat cultivation exhibit a greater lack of interdependence and holistic thinking, that is, a greater lack of collectivism and a preference for individualism, than those in areas with a sustained tradition of rice cultivation. This is as the cultivation of rice necessitates a greater degree of functional dependence than that of wheat. The cultivation of rice necessitates a considerable input of labour and a sophisticated irrigation system that requires farmers to collaborate and exchange labour. Conversely, wheat is a relatively straightforward crop to cultivate, necessitating less extensive irrigation and less neighbourhood coordination. Consequently, the degree of individualism varies across areas in accordance with different levels of paddy fields. A CEO whose hometown is primarily engaged in wheat cultivation should exhibit a higher level of individualism than a CEO whose hometown is primarily engaged in rice cultivation (Chan et al., 2022; Xiong et al., 2020). The extant literature suggests that individualistic CEOs are more focused on personal goals and therefore have a higher motivation to take advantage of the company's interests (Jensen & Meckling, 1976). Individualistic CEOs evince a tendency towards overconfidence and optimism regarding their abilities (An et al., 2018; Chui et al., 2010; Markus & Kitayama, 2014). Such an individualistic CEO may be inclined to underestimate the probability of corporate greenwashing behaviour being detected by stakeholders. Furthermore, the individualistic CEO is more optimistic about the potential for improving the firm's performance to offset the negative impact of their greenwashing behaviour. The question thus arises as to whether CEO individualism weakens the relationship between the CEO's experience of poverty and corporate greenwashing. In line with the studies of Talhelm et al. (2014) and Zuo et al. (2022), CEO individualism is measured using a rice index, calculated as a percentage of the area under rice cultivation relative to the total cultivated area in each region. To assess the agricultural traditions of the different regions in a manner that is not influenced by data reflecting recent agricultural advances, the data in 1996

were used to calculate this index. Cultivated land includes both rice and wheat fields, and the value of the rice index ranges from 0 to 1. To facilitate analysis, the rice index is reconstructed by multiplying the rice index by –1 (CEO_Indiv), whereby a higher value of CEO_indiv indicates a greater degree of CEO individualism.

The results of the regression of the moderating effects of CEO power, CEO green experience and CEO individualism are presented in Table 9. Firstly, the coefficient of the interaction between CEOs' poverty experience and CEO power (CEO_power) in column (1) is significantly negative, indicating that CEO power positively moderates the relationship between CEOs' poverty experience and corporate greenwashing, and strengthens the inhibitory effect of CEOs' poverty experience on corporate greenwashing. Secondly, the coefficient of the interaction between CEOs' poverty experience and CEO green experience (CEO_green) in column (2) is also significantly negative, which also indicates that CEO green experience positively moderates the relationship between CEOs' poverty experience and firms' greenwashing and will strengthen the inhibitory effect of CEO's poverty experience on firms' greenwashing. Furthermore, the coefficient of the interaction between CEOs' poverty experience and CEO individualism (CEO_indiv) in column (3) is significantly positive, indicating that CEO individualism negatively moderates the relationship between CEOs' poverty experience and corporate greenwashing, and weakens the inhibitory effect of CEOs' poverty experience on corporate greenwashing. These findings indicate that the inhibitory effect of CEOs' poverty experience on corporate greenwashing may be influenced by CEO power, CEO greenwash experience and CEO individualism.

Discussion

Taking corporate environmental behaviour and information disclosure as an entry point, this article employs panel data of Chinese A-share listed companies from 2012 to 2022 to explore the H1 that poverty-imprinted CEOs are less likely to engage in greenwashing. The findings of this study also indicate that based on their notion of integrity and reputation awareness, as well as their sense of responsibility to safeguard the interests of investors and stakeholders, poverty-imprinted CEOs will reduce corporate information concealment and fraud, thereby increasing corporate information transparency, which in turn will further compel firms to improve their environmental performance while preventing false disclosure and minimising greenwashing events in H2. Furthermore, our analyses also show that based on reputation and ethical constraints, CEOs who experienced poverty during childhood can, to some extent, reconcile the conflict between maximising personal interests and maximising shareholders' interests, thus alleviating corporate agency conflicts, which the mitigation of agency costs helps to inhibit corporate greenwashing in H3.

In addition, our findings indicate that the relationship between CEOs' poverty experience and corporate greenwashing is

moderated by CEO power, CEO green experience and CEO individualism. An increase in CEO power is conducive to the mobilisation of resources by CEOs to engage in environmental behaviours. Furthermore, CEOs with green experience can accumulate environmental experience for both them and corporations, which then positively moderates the inhibitory effect of CEOs with poverty experience on corporate greenwashing. In contrast, individualistic CEOs negatively moderate the inhibitory effect of poverty-experienced CEOs on corporate greenwashing.

Conclusion

Theoretical implications

Firstly, this study contributes to the existing literature on upper echelons theory by exploring the impact of CEOs' early-age life experiences on greenwashing behaviour. On the one hand, despite the extensive research on the influence of CEOs' career experiences, the repercussions of early-age life experiences remain relatively understudied (O'Sullivan et al., 2021). On the other hand, although some scholars have also explored corporate decision-making based on the perspective of CEOs' cognitive and psychological characteristics (Chen et al., 2024; Du et al., 2024; Ren et al., 2021; Tian et al., 2023), our study further probes why CEOs' early poverty experiences would bring in downside effects on firms' greenwashing, extending beyond the conventional demographic characteristics to ponders over how early poverty experiences can affect CEOs' perceptions and decision-making preferences.

Although a few studies explore the effect of poverty-imprinted CEOs on corporate performance (Liu et al., 2024; Zhang et al., 2022). Our study focuses on how poverty experience improves CEOs' moral character and sense of responsibility, which subsequently influences their environmental decision-making preferences. This study enriches this strand of literature by elucidating the role of CEOs' cognitive preferences in conflictual decision-making situations. Moreover, we examine the underlying mechanism channels through which poverty imprinting exerts influence and the moderating effects of a series of factors.

Secondly, our results expand the knowledge regarding the imprinting work process by elaborating how the life imprints resulting from CEOs' childhood experiences of poverty can influence their decision-making preferences. Although CEOs have undergone a dramatic transition from an impoverished childhood to the present, where holding key corporate positions and earning high incomes, the ideological imprints originated from early upbringing last their entire lives and continue to exert their impacts. Our work examines how poverty-related imprints can enhance positive literacies such as moral values and a sense of responsibility, prompting CEOs to re-evaluate the priority between short-term gain and long-term sustainability. By elucidating how cognitive imprints resulting from CEOs' early poverty experiences exert a pervasive influence on the firms' behaviour, our study

contributes to the convergence of upper echelons theory and imprinting theory.

Thirdly, imprinting theory posits that the influence of early-life experiences on human behaviour may be affected by other factors. However, the reduction or enhancement of these imprints remains an important yet underexplored area of research. This article further enriches the imprints' influence process by introducing the moderating effects of relevant factors. Specifically, our study finds that CEO power and CEO green experience serve to reinforce the inhibitory effect of poverty imprint on greenwashing, whereas CEO individualism weakens this effect. The research in this article delves into the impact mechanisms of early-life imprint and enriches the literature related to imprinting theory.

Policy and managerial implications

The findings of this article have certain implications for policy and management. Firstly, the corporate governance structure requires further optimisation. The detailed examination of the mechanism channel of the relationship between poverty-experienced CEOs and greenwashing level demonstrates the part played by CEO cognitive preferences in optimising the corporate governance structure. A crucial reason for corporate greenwashing is the existence of information asymmetry, and the improvement of corporate information transparency can facilitate more effective stakeholder monitoring. It is therefore recommended that relevant institutions adopt a more active approach to supervising the disclosure of information by enterprises, to enhance transparency and reliability of corporate information through the implementation of administrative and regulatory measures. To achieve sustainable development, enterprises should also actively introduce independent third parties to participate in various assessments of enterprises, thereby facilitating the provision of independent and more credible audit opinions. The existence of agency conflict is a further significant reason for the intensification of corporate greenwashing. China's distinctive shareholding structure (where controlling shareholders hold a distinct advantage) and the minority shareholders' expropriation resulting from collusion between executives and major shareholders are prevalent (Du, 2015). It is crucial to minimise the agency cost incurred by the CEO from a cognitive perspective.

Secondly, culture and the rule of law should be continuously promoted. Our results provide evidence for the sustained promotion of culture and the rule of law, thereby accelerating the pace of ecological civilisation. On the one hand, the government can fully stimulate the awareness of self-ethical discipline among enterprise management, especially the CEO as the key decision-maker, and then bring into play the hidden power of social activities. It guides CEOs to establish appropriate values through publicity, education and other cultural activities, and brings enterprises to integrate exemplary traditional culture into the construction of corporate culture, especially internalising the character traits of truthfulness, pragmatism and foresight as part of the corporate culture, and then exerting the moderating effect of

the excellent traditional culture in corporate environmental protection decision-making, to create a positive corporate cultural atmosphere and to promote the realisation of a green and low-carbon enterprise. This, in turn, contributes to the achievement of the desired goal of ecological civilisation construction. On the other hand, it is incumbent upon the government to reinforce the supervision and constraints on the management of enterprises, establish a sound system of laws and regulations and prevent them from misusing their powers for personal gain and harming the interests of enterprises and employees. At the same time, the government may also strengthen the auditing and supervision of enterprises, promptly identifying and rectifying any inappropriate conduct within the enterprise, thereby safeguarding the normal business operations of the enterprise and the legitimate rights and interests of stakeholders.

Limitations and future research plans

Firstly, in this article, we employed secondary data from listed companies, which future research may integrate with data from questionnaires. Secondly, there was a paucity of discussion regarding the economic consequences of the reduction in greenwashing levels in this article. In the future, we can further explore the economic benefits to firms of the suppression of greenwashing by poverty-experienced CEOs. Thirdly, it is important to acknowledge that firms' environmental decision-making and disclosure is a complex issue that may involve the influence of multiple incentives and factors. Future research could examine the corporate greenwashing orientations in macro contexts.

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Data availability

The data that support the findings in this study are available from the corresponding author, B.L., upon reasonable request.

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