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RESEARCH ARTICLE

Business Strategy and the Environment

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Business strategy and environmental information disclosure from a Confucian cultural perspective: Evidence from China

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Abstract

Based on social contract theory, this study investigates the impact of business strategy on environmental information disclosure from an informal institutional perspective. Using empirical data from a panel of Chinese listed A-share firms in Shanghai and Shenzhen from 2010 to 2020, we demonstrate that firms following prospector strategies have higher levels of environmental information disclosure compared to those following defender strategies. Our findings also reveal that Confucian culture positively moderates the relationship between business strategy and environmental information disclosure. Specifically, we find that when environmental uncertainty increases, the moderating effect of Confucian culture weakens, while effective legal supervision strengthens the positive moderating effect of Confucian culture. Additionally, our results show that business strategy affects environmental information disclosure through the dual channels of economic benefits contract and social recognition contract. Overall, this research provides valuable insights for corporate sustainable development and effective government environmental governance.

KEYWORDS
business strategy, Confucian culture, environmental information disclosure, environmental uncertainty, legal supervision, sustainable development

1 | INTRODUCTION

Economic growth is usually accompanied by prominent environmental problems. China, as the world's largest emerging economy, has faced repeated ecological crises due to environmental issues. Social contract theory posits that a business is a network of contracts and its behavior is embedded in society. Companies are bound by both visible legal contracts and implicit social contracts (Donaldson & Dunfee, 1994). Thus, as the main actors in environmental governance, companies should proactively disclose environmental information as a matter of course (Xi et al., 2022). In order to incentivize enterprises to disclose environmental information to the public, the Chinese government and the Shanghai Stock Exchange took notable steps in 2008, issuing regulations such as the "Guiding Opinions on Strengthening the Supervision and Management of Environmental Protection of Listed Companies" and "Guidelines on Environmental Information Disclosure of Listed Companies." These measures aimed to enhance the transparency of environmental governance and foster environmental accountability. Subsequently, in 2021, the Chinese government issued the "Administrative Measures for the Legal Disclosure of Enterprise Environmental Information," which integrated corporate environmental information disclosure (EID) into the evaluation of corporate credit ratings. The measure also clarified penalties for disclosure violations and further mandated companies to divulge their environmental performance and related risks. However, despite these efforts, the EID index of Chinese listed companies in Shanghai and Shenzhen is still

Abbreviations: EID, environmental information disclosure; CSR, corporate social responsibility; R&D, research and development; CEO, chief executive office; 2SLS, two-stage least squares.

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relatively low at 39.89%, according to the "Assessment Report on Environmental Responsibility Disclosure of Listed Companies in China (2021)". Consequently, promoting enterprises to proactively assume responsibility for EID has become a critical area for environmental governance and a prominent research topic (Ben-Amar & Chelli, 2018; Jaggi et al., 2018).

Business strategy refers to the strategic actions formulated by an organization to effectively respond to changes in the external environment and gain a competitive advantage in the market (Magerakis & Habib, 2021). Miles and Snow (1978) proposed a continuous strategic chain consisting of prospectors, analyzers, and defenders. Prospectors are innovation-oriented and implement differentiation strategies (Bentley et al., 2013). Defenders are efficiency-oriented and adopt cost leadership strategies (Miles & Snow, 1978). Analyzers occupy both attributes of prospectors and defenders, striving to minimize risk while maximizing profit (Miles & Snow, 1978). Different business strategies result in distinct adaptations to the external environment, leading to variations in development goals, business models, organizational structures, and various behavioral activities (Yuan et al., 2020). Despite the existing literature exploring the relationship between business strategy and EID, a consistent conclusion has not been reached. Wang et al. (2023) suggested that prospectors are more inclined to engage in EID to achieve sustainable development, while Li, Li, et al. (2022) emphasized the limitations faced by prospectors due to resource scarcity, preventing them from fulfilling EID obligations. Given this open question, the impact of business strategy on EID and the channel mechanism between them warrant further investigation. To effectively reconcile the contradictions in existing research and contribute valuable insights to the literature, we aim to conduct in-depth research on the relationship between business strategy and EID.

Based on the social contract theory, firms should be responsible to the society that provides the conditions for their existence (Donaldson & Dunfee, 1994). EID can be regarded as a contract between the firm and society to fulfill public expectations (Ding et al., 2022). However, existing research has yet to develop an integrated framework of business strategy and EID from the perspective of social contract theory. Thus, there is still theoretical room for improvement in current studies. Moreover, as a country with a long history and culture, China's Confucian culture is the most prominent informal institution with distinct characteristics (Du, 2015). Due to the strong influence of Confucian culture, social contract theory in China emphasizes the social ethics of benevolence, righteousness, propriety, wisdom, and trust that companies should follow (Wang & Juslin, 2009). Fu and Tsui (2003) argued that Confucianism deeply influences the values of Chinese entrepreneurs and manifests in their business decisions. Tang et al. (2022) also discovered that the informal system represented by Confucian culture subtly promotes the level of corporate carbon information disclosure. The EID behavior of enterprises is not merely a passive response to institutional pressure but also an active compliance influenced by cultural infiltration. Hence, in this study, we aim to represent informal institutions through Confucian culture, integrate Confucian culture into the framework of social contract theory, and examine the influence of Confucian culture, on the process of disclosing environmental information in business strategies.

Regarding the practice of EID in China, a series of laws and regulations have been implemented to regulate and guide corporate behavior through formal systems. Existing literature primarily focuses on examining explicit institutional constraints and incentives faced by enterprises, while giving little attention to the impact of implicit value norms, such as Confucian culture, on corporate EID decision-making and strategic choices (Jiang et al., 2021; Pan et al., 2020). Furthermore, when the informal and formal systems coexist, Confucian culture exerts soft constraints on corporate decision-making, while the legal system employs coercive measures to enforce rigid requirements (Chao et al., 2023). These two systems exhibit strong complementarity in structure and function, effectively reinforcing the social contract of corporate environmental responsibility. Considering China's current development status, its market mechanism remains imperfect, and environmental uncertainty and contradictions persist (Zhao et al., 2018). The motivations behind corporate behavior are closely related to the prevailing environmental conditions. In a highly uncertain environment, corporate survival needs may take precedence over moral considerations, leading to a trade-off effect between Confucian culture and EID practices. However, the existing literature has not thoroughly investigated the impact of informal institutions on the relationship between business strategy and EID under different formal institutional and market environments, thus hindering a comprehensive understanding of the mechanisms underlying the influence of business strategy on EID. Therefore, it becomes imperative for us to incorporate formal institutions and market environments to unveil the complexities involved in the influence of informal institutions, represented by Confucian culture, on the relationship between business strategy and EID practices.

Our study relates to but differs from Li, Li, et al. (2022) and Wang et al. (2023). While both Li, Li, et al. (2022) and Wang et al. (2023) investigated the relationship between business strategy and EID, they arrived at contradictory conclusions. Li, Li, et al. (2022) focused on listed firms in heavily polluting industries and found that prospectors exhibited lower EID quality compared to defenders. In contrast, our study encompasses a broader concept of EID, considering a sample of 20,574 listed companies across various industries in China. Moreover, in comparison to Li, Li, et al. (2022), we go a step further by controlling for individual-fixed effects and time-fixed effects that may influence corporate behavior decisions. By doing so, we eliminate the impact of unobservable differences between individuals and time on the research results, enhancing the accuracy and reliability of our findings. Similarly, Wang et al. (2023) conducted a five-year survey of 1530 Chinese listed companies and discovered that prospectors tend to disclose more environmental information. In our study, we not only expand the temporal and sample scope but also explore the dual paths through which business strategy affects EID: the economic benefit contract and the social identity contract, from the perspective of the social contract theory. This approach allows us to provide more comprehensive insights. Additionally, we pay particular attention to the

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moderating effect of Confucian culture, as well as the joint moderating effect of the market environment and legal environment. In comparison to other studies, our research is distinctive for its focus on China's unique traditional culture and the incorporation of informal institutions, allowing us to conduct a more in-depth examination of the dynamic relationship between business strategy formulation and environmental responsibility.

In summary, this research makes several contributions. Firstly, we start from the perspective of social contract theory, deepening the theoretical analysis logic in the research on the impact of business strategy on EID. Our study not only helps to reconcile the previous differences in the relationship between business strategy and sustainable development but also provides new literature support for companies to improve the quality of EID. Secondly, we break through the traditional formal institutional research framework and take a novel approach by investigating the moderating effect of Confucian culture on business strategy and EID from the perspective of informal institutions. Our study provides empirical evidence from emerging markets, highlighting the influence of Confucian culture on corporate behavior. Thirdly, we fully take into account the current situation of the interweaving of formal and informal institutions and the intricate market environment in China's market economy. This paper introduces the market and legal environment, respectively, to reveal the influence of business strategy on EID under the joint moderating effect of the two and Confucian culture. Our study expands the literature research in the field of culture and corporate decision-making.

The remainder of this paper is organized as follows. Section 2 provides the literature review and research hypotheses. Section 3 presents the study sample, data, and methodology. Section 4 presents the empirical analysis. Section 5 further analyzes the channel mechanism. Section 6 discusses the findings of the research.

2 | LITERATURE REVIEW AND RESEARCH HYPOTHESIS

2.1 | Environmental information disclosure

EID refers to the disclosure of environmental impact and performance by businesses to the public through annual reports, social responsibility reports, and environmental reports of listed companies (Trumpp et al., 2015). Previous studies have primarily considered EID as a component of corporate social responsibility (CSR) information disclosure. Wartick and Cochran (1985) proposed the theory of social performance, emphasizing that disclosing environmental information to society is a crucial social responsibility of enterprises, as it helps maintain system stability and build reputation resources. Gray (1992) explained the motivation behind EID from the perspective of fiduciary responsibility, asserting that environmental reporting serves as a mechanism for fulfilling corporate environmental fiduciary responsibility. As EID is recognized as an effective means for achieving sustainable development (Ikram et al., 2019; Luo et al., 2019), research on EID has gradually evolved independently from CSR. Luo et al. (2019) discovered that improving the quality of EID significantly reduces debt financing costs in heavily polluting industries. Similarly, Saeed and Zamir (2021) argued that EID effectively reduces information uncertainty and agency costs between stakeholders and companies. Overall, EID has evolved into a crucial aspect of corporate governance, contributing to sustainable development and improving stakeholder relationships.

So far, research on the motivations behind EID has primarily focused on three perspectives. First, the external environmental perspective examines factors such as economic policy uncertainty (Pan et al., 2020) institutional pressure (Jiang et al., 2021), market competitiveness (Delgado-Márquez et al., 2017), environmental legitimacy (Li, Huang, et al., 2018), and environmental management (Chen et al., 2020) are found to influence EID. Second, the stakeholder perspective considers media attention (Fan et al., 2020), board diversity (Liu & Zhang, 2016), investor heterogeneity (Li, Zhang, et al., 2022), and management incentives (Li et al., 2019) also motivate firms to engage in EID. Third, the corporate governance perspective investigates how factors such as firm size (Chen et al., 2020; Gallego-Alvarez, 2018), nature of property rights (Zeng et al., 2012), and profitability (Wang et al., 2023) impact the extent of EID by companies. In sum, existing research has established a relatively comprehensive list of motivations for corporate EID, and various theoretical perspectives, such as legitimacy theory, signaling theory, and external pressure theory, have been utilized to explain the antecedents of EID (Chen et al., 2020; Li, Huang, et al., 2018). However, it is worth noting that Donaldson (1982) pioneered the use of social contract theory to explain CSR, yet EID, as a corporate behavior highly related to social responsibility, has not been studied within the framework of a social contract. Therefore, in our research, we aim to incorporate social contract theory into the category of antecedents for EID, shedding new light on this important corporate behavior.

2.2 | Business strategy

There are several ways to classify business strategy types in existing organizational literature. Porter (1980) proposed cost leadership, product differentiation, and concentration strategies. Treacy and Wiersema (1995) categorized business strategies into product leadership, efficient operations, and customer intimacy. Miles and Snow (1978) classified business strategies from conservative to aggressive as defenders, analyzers, and prospectors. Among these classification methods, the strategic typology of Miles and Snow (1978) not only considers the influence of external environmental differences on organizational behavior patterns but also places more emphasis on the subjective initiative of managers in business operations. Moreover, Bentley et al. (2013) highlighted that the strategy types proposed by Miles and Snow (1978) can be measured and analyzed using enterprise file data, representing a significant improvement compared to previous reliance on interviews or questionnaires. As a result, the strategic framework of Miles and Snow (1978) has found widespread application in the study of organizational decision-making.

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According to the research by Miles and Snow (1978), prospectors prioritize innovation and differentiation as the core elements to enhance their competitiveness. They actively respond to environmental changes, continuously engage in research and development of new products, and seek to expand their production scale and explore new markets. However, these actions also expose them to greater operational risks and performance uncertainties. On the other hand, defenders focus on gaining a competitive advantage through cost-effective production and distribution efficiencies. They tend to maintain stable organizational structures, focus on a limited range of specific products and services, and target narrow market segments. Analyzers fall somewhere in between the prospectors and defenders. Existing research has primarily focused on comparing the operating results and financial behavior differences between prospectors and defenders. For instance, Ittner et al. (1997) suggested that prospectors experience unstable cash flows and are more susceptible to financial difficulties. Bentley et al. (2013) found that prospectors are more likely to be involved in financial reporting violations. Additionally, Higgins et al. (2015) provided empirical evidence showing that prospectors pay greater attention to tax planning and adopt active tax avoidance strategies.

Related to our research, existing studies have attempted to explain the variations in corporate environmental protection and sustainable development behaviors based on different business strategies, but a consensus has not yet been reached. On one hand, some studies suggest that prospectors invest more resources in environmental protection activities to enhance corporate reputation and brand image among stakeholders (Kong et al., 2020; Magerakis & Habib, 2021; Yuan et al., 2020). Yuan et al. (2020) found that prospectors are more inclined to actively engage in CSR activities. Magerakis and Habib (2021) argued that prospectors consciously reduce the use of toxic chemicals to achieve higher environmental efficiency. On the other hand, some studies believe that prospectors only engage in superficial or symbolic expressions of environmental friendliness (Li, Li, et al., 2022; Liu & Kong, 2021; Maniora, 2018). Maniora (2018) argued that due to the rapid and sporadic growth model of prospectors, sustainable development management, including fulfilling environmental responsibilities, is not their top priority in their business models. In summary, the current research on the relationship between business strategy and environmental management yields mixed results, and EID represents the main responsibility of enterprises in fulfilling environmental protection obligations. Therefore, we aim to further investigate the relationship between business strategy and EID to reconcile existing research contradictions and enrich the literature in this domain.

2.3 | Business strategy and environmental information disclosure

The enterprise can be viewed as an amalgamation of contracts, and as such, it bears a responsibility toward the society that provides the conditions for its existence. Likewise, society has a responsibility toward the enterprise's development (Donaldson, 1982). The social contract theory advocates for the alignment of CSR with the interests of corporate stakeholders, requiring the enterprise to respond to stakeholders' interests (Donaldson & Dunfee, 1994). The EID behavior of an enterprise can be seen as meeting the reasonable interest demands of stakeholders in pursuit of sustainable development. Similarly, Enderle (2002) argued that, according to the social contract theory, enterprises are obligated to fulfill the contractual obligations to various interest groups, meaning that they must meet public expectations. It is evident that enterprises should not solely focus on pursuing economic benefits but also strive to achieve social benefits. The broad sense of the social contract encompasses the contractual relationship established between enterprises and society at every level of production activities, existing in the form of explicit social contracts at the macro level and implicit social contracts at the micro level. Enterprises serve as the carriers of explicit and implicit contracts between stakeholders (Donaldson & Dunfee, 1999). Within the framework of the social contract theory, economic benefits can be considered as the explicit economic responsibility fulfilled by enterprises toward society, while social identity can be seen as the implicit social responsibilities undertaken by enterprises. In light of this, we consider economic benefits as an explicit social contract for enterprises to pursue sustainable development, and social benefits as an implicit social contract for enterprises to foster social identity. This approach may help address the limitations of previous theoretical analyses and provide a more comprehensive understanding of the interplay between business strategy, environmental responsibility, and societal expectations.

First, we analyze from the perspective of the economic benefit contract. Defenders focus on narrow product lines and market segments, prioritizing short-term financial performance (Singh & Agarwal, 2002). Thus, defenders' excessive emphasis on EID may limit the possibility of short-term opportunism, hindering their ability to avoid risks and achieve immediate goals (Yuan et al., 2020). In contrast, prospectors pursue high-risk investment opportunities, leading to fluctuating cash flows and facing more severe financing constraints (Hambrick, 1983; Ittner et al., 1997). In this context, enterprises' EID behavior can be seen as a response to national policies, which can garner stakeholders' recognition of the enterprise's normative legitimacy and alleviate financing constraints (Li, Huang, et al., 2018). Simultaneously, higher EID levels are associated with better stakeholder engagement. With the same investment amount, investors may accept a lower rate of return on investment for enterprises actively disclosing environmental information, thus reducing enterprises' cost of capital utilization (Li, Gong, et al., 2018). Consequently, for prospectors with significant financing needs, EID can assist in establishing long-term, stable relationships with investors, improve capital recycling efficiency, and thereby alleviate financing constraints (Luo et al., 2022).

Second, we analyze from the perspective of the social identity contract. To establish a positive reputation, enterprises must provide stakeholders with sustainable environmental protection information. Whether positive or negative, EID reflects a company's active commitment to social responsibility and helps establish a good brand image (Wang et al., 2023). The EID performance of an enterprise

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signifies its long-term strategic intent, aiming to extend the green reputation achieved through EID to its business practices, thereby gaining continuous trust and support from stakeholders (Fan et al., 2020). Prospectors actively develop new products, explore new market opportunities, and face broader target groups and greater market pressure (Liu & Kong, 2021). Previous studies have confirmed that consumers tend to have a positive attitude toward products of companies with good reputations when new products enter the market (Bhattacharya & Sen, 2003; Lii & Lee, 2012). In addition to improving corporate reputation, EID can increase consumers' recognition of products and help companies explore new opportunities (Branco & Rodrigues, 2006). Therefore, prospectors are more likely to engage in EID to seek social recognition. Based on the above analysis, we propose the following research hypotheses.

> **H1.** Business strategy has a significantly positive effect on EID. Specifically, firms that follow prospector strategy are more likely to engage in EID compared to those follow defender strategy.

2.4 | The moderating effect of Confucian culture

China has been deeply influenced by Confucian culture since ancient times. The social morality of benevolence, righteousness, propriety, wisdom, and trustworthiness, inherent in Confucian culture, has gradually become internalized within the corporate social contract, emphasizing the harmonious coexistence of enterprises, society, and the environment. Sociological studies, such as those conducted by Hofstede (1980) and Schwartz (1994), have shown that cultural concepts are deeply imprinted on the cognitive behavior and value preferences of organizations and individuals. Moreover, Du (2015) discovered that Confucian culture, as a significant social norm, impacts business ethics and mitigates minority shareholder expropriation to some extent. Similarly, Yan et al. (2021) argued that Confucian culture plays a vital governance role in regulating market behavior and reducing corporate innovation risks. As evident from these findings, Confucian culture profoundly influences entrepreneurship (Chen et al., 2021; Fu & Tsui, 2003). In particular, prospectors choose to engage in EID to gain social recognition and maintain the legitimacy of their business activities (Li, Huang, et al., 2018). In this process, Confucian culture serves as an informal institution, providing moral constraints and behavioral guidance for individuals and organizations, further influencing corporate behavior (Du, 2014, 2015).

First, Confucian culture strengthens the economic benefit contract in the relationship between business strategy and EID. The wealth concept promoted by Confucian culture advocates "the right way to get money, and righteousness first". Confucianism praises the acquisition of material benefits through ability but emphasizes doing so through legitimate and ethical ways (Liu, 1998). Enterprises' active disclosure of environmental information aligns with the "righteousness" advocated by Confucian culture, while the economic benefit contract between enterprises and society aligns with the pursuit of "benefit". The principle of "righteousness before profit" implies that enterprises obtain economic benefits through EID, aligning with the business ethics of Confucian culture. As a result, the moral principles emphasized by Confucianism foster a favorable moral environment (Du, 2015). Therefore, under the influence of Confucian culture, prospectors engage in timely and effective disclosure of environmental information, leading to fewer negative environmental incidents. This not only reduces information asymmetry between enterprises and stakeholders but also lowers information transmission costs, allowing investors to better identify environmentally responsible enterprises and, in turn, generate increased cash flow.

Second, Confucian culture strengthens the social identity contract in the relationship between business strategy and EID. Confucianism upholds the Datong philosophy of "the world is the same" and seeks a harmonious and stable ideal society (Fam et al., 2009). Under the influence of Confucianism, enterprises perceive themselves as integral components of society, integrating social responsibility into their strategic planning, and actively fulfilling EID responsibilities in their management decisions. Moreover, Blackburn (2001) and Kidder (2003) argued that Confucian culture promotes the golden rule, which emphasizes the "ethics of reciprocity"—treating others as you want to be treated (Du, 2015). Driven by this ethical principle, prospectors proactively undertake EID responsibilities to gain stakeholder recognition and meet societal expectations. In essence, Confucian culture provides a cultural foundation for the establishment of economic benefit contracts and social identity contracts within enterprises. As an implicit norm and ethical guideline, Confucianism encourages enterprises to engage in EID by shaping their internal ethical values. Therefore, the following hypotheses are proposed.

> **H2.** Confucian culture will enhance the positive relationship between business strategy and EID. Specifically, prospector firms have a greater incentive to engage in EID than defender firms when Confucian culture gets stronger.

2.5 | The joint moderating effect of environmental uncertainty and legal supervision and Confucian culture

Environmental uncertainty refers to the complexity and volatility of the external environment in which firms make decisions, reflecting the dynamic competition under uncertainty theory (Ghosh & Olsen, 2009). The stronger the environmental uncertainty, the greater the value demands of stakeholders (Latan et al., 2018). On the one hand, Confucian culture discourages competition and emphasizes altruistic motives. However, stronger environmental uncertainty indicates a relative increase in the difficulty of obtaining key resources, and companies need more intense competition to achieve their survival needs (López-Gamero et al., 2011). Therefore, environmental uncertainty makes companies driven by self-interest, which is contrary to Confucianism, leading to a decline in the influence of

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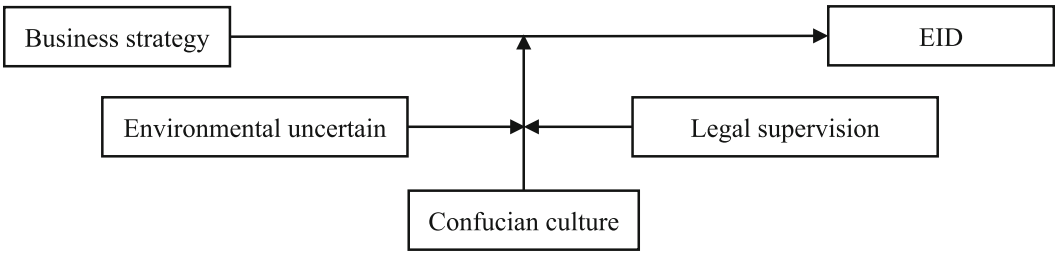

FIGURE 1 Conceptual research framework.

Confucian culture (Jin et al., 2023). On the other hand, when environmental uncertainty is stronger, the business risks faced by companies are likewise increased. Management tends to reduce environmental investment due to their inability to obtain effective information and out of risk aversion (López-Gamero et al., 2011). Prospectors implement differentiation strategies, and their competitive advantage largely depends on sufficient financial support (Li, Li, et al., 2022). When environmental uncertainty increases, the short-term economic benefits derived from EID may decrease, potentially weakening the incentive for firms to achieve social identity and create integrated value through EID. Therefore, when environmental uncertainty is strong, the guiding space for Confucian culture to play is compressed. Conversely, when environmental uncertainty is weak, the corporate social contract emphasized by Confucian culture will play a more significant guiding role. As a result, this paper proposes Hypothesis 3.

> **H3.** Environmental uncertainty will weaken the moderating effect of Confucian culture on the relationship between business strategy and EID.

Formal and informal institutions are essential components of the institutional system (North, 1990). Confucian culture represents an informal institution with implicit institutional pressure, while legal supervision represents a formal institution with explicit institutional pressure. Allen et al. (2005) confirmed that these two institutions have complementary roles. The environmental legal system is the minimum requirement imposed by the state on CSR with the help of coercive power (Jiang et al., 2021), while Confucian culture sets a higher standard for CSR from the perspective of social norms (Du, 2015). When legal supervisory is immature, the social concepts advocated by Confucian culture motivate companies to discipline themselves with higher social ethics, consciously assume social responsibility, and fulfill their EID obligations. When legal supervision is effective, an effective legal system brings enormous external environmental regulatory pressure to companies (Li et al., 2021). Under the constraints of the legal system, companies are driven by the pressure of legality and risk avoidance, they have to choose EID to enhance the effectiveness of environmental governance (Li, Huang, et al., 2018). At this time, companies are regulated by the legal system in their business decisions, while being subject to the "soft constraints" of Confucian culture to a greater extent. Confucian culture amplifies the advantages of the economic benefit contract and social identity contract, prompting prospectors to proactively consider environmental factors and fulfill their EID responsibilities more effectively. Thus, when legal supervision is effective, Confucian culture, as an invisible and complementary governance mechanism, complements the legal system and motivates prospectors' EID. Therefore, this paper proposes Hypothesis 4:

> **H4.** Legal supervision will enhance the moderating effect of Confucian culture on the relationship between business strategy and EID.

The research framework is presented in Figure 1.

3 | METHOD

3.1 | Sample selection and data sources

This paper focuses on China's Shanghai and Shenzhen A-share listed companies as the research subjects from 2010 to 2020. Several reasons justify selecting Chinese-listed companies for this study. Firstly, China holds the position of the world's second-largest economy, but rapid economic growth has also led to significant environmental challenges. Consequently, the Chinese government has introduced various ecological and environmental protection systems, including the new "Environmental Protection Law," with a specific emphasis on the level of information disclosure by enterprises. EID represents the proactive stance of companies in assuming environmental responsibilities. Therefore, our research centers on the EID performance of Chinese-listed companies. Secondly, Confucianism originated from ancient China's "ethical social political theory" during the Spring and Autumn Periods. Although countries such as South Korea, Japan, Singapore, and Vietnam are also influenced by Confucian culture, it holds particular significance as an ethical philosophy in China. Confucianism has deeply rooted itself in Chinese values, moral principles, and is considered the mainstream thought in traditional Chinese culture. Furthermore, for the calculation of business strategy and environmental uncertainty, it necessitates corporate financial data from the past 5 years. However, corporate data before 2006 often contains numerous missing values. Hence, we choose 2010 as the starting point for our research period.

Confucian culture data is obtained through manual collation from the China Confucian Temple website. Legal supervision data comes

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from the "NERI Index of Marketization of China's Provinces 2021 Report" compiled by Wang et al. (2021). Other research data are obtained from the China Security Market and Accounting Research database. After excluding the financial industry, ST, *ST, PT companies, and those with missing data, we obtain a total of 20,574 sample observations. All continuous variables in this paper are winsorized up and down by 1%.

3.2 | Measures

3.2.1 | Dependent variable

Environmental information disclosure (EID). Early studies mainly relied on the proportion of environment-related words or sentences in corporate annual reports to measure EID (Wang et al., 2023). Currently, the content analysis method has become the mainstream approach for measuring EID due to its objectivity, systematic nature, and quantitative characteristics (Beck et al., 2010). In this paper, we also adopt the content analysis method, drawing from the research methodology of Al-Tuwaijri et al. (2004) and the guidelines provided in Article 19 of the "Environmental Information Disclosure Measures (Trial)" issued by the Ministry of Environmental Protection of China. Our comprehensive assessment of EID is conducted from a quantitative perspective. For non-monetized environmental information indicators found in corporate annual reports, such as environmental management disclosure, environmental regulation and certification disclosure, and environmental information disclosure carrier, a value of 1 is assigned if disclosed, otherwise, it receives a value of 0. As for monetized environmental information indicators, such as disclosure of environmental liabilities and disclosure of environmental performance and governance, a value of 2 is assigned if quantitatively described, a value of 1 if only qualitatively described, and 0 otherwise. The EID score index system is presented in Table 1. Finally, after summing up the scores of the 30 disclosure items, the logarithm is applied to measure EID.

3.2.2 | Independent variable

Business strategy (STR). Referring to Miles and Snow (1978), Bentley et al. (2013) construct a discrete strategy scoring model. The model is widely used in business strategy research (Magerakis & Habib, 2021; Maniora, 2018). Drawing on Bentley et al. (2013), we measure business strategy using six dimensions: (a) R&D expenditure to operating revenue ratio; (b) number of employees to operating revenue ratio; (c) selling and administrative expenses as a percentage of operating revenue; (d) sales revenue growth rate; (e) employee fluctuations; and (f) capital intensity. Firstly, rolling averages over the past 5 years are calculated for each variable individually. Next, the first five variables are categorized into five groups based on their rolling average values within each "year-industry" sample. The group with the lowest value is assigned one point, and the group with the highest value is assigned five points, with a group distance of one between each group. As for the sixth variable, the grouping method is reversed: the group with the lowest value is assigned five points, the group with the highest value is assigned one point, and the group distance between each group is one. Finally, the grouping scores of the six variables are added based on the "company-year" sample to create a discrete variable that measures STR, with a total range of six to thirty points. High scores indicate prospector firms, while low scores represent defender firms (Bentley et al., 2013).

3.2.3 | Moderating variables

Confucian culture (Confu). Following Du, 2014 and Jin et al. (2023), we use geographical proximity to measure the influence of Confu. Specifically, we manually compile the names and addresses of 491 Confucian temples from the Chinese Confucian Temple Network. Next, we use internet tools such as Google Earth and Baidu Maps to count the latitude and longitude coordinates of each enterprise registration place and Confucian temples. Finally, we count the number of Confucian

TABLE 1 EID score index system.

Type of disclosure	Disclosure items	Scoring instructions
Environmental management disclosure	Environmental protection concept, environmental protection goal, environmental protection management system, environmental protection education and training, environmental protection special action, environmental event emergency mechanism, environmental protection honor or award, "three simultaneous" system	No description = 0 Disclosure = 1
Environmental regulation & certification disclosure	Key pollution monitoring unit, pollutant emission standard, sudden environmental accident, environmental violation, environmental petition case, ISO14001 certification, 1SO9001 certification	
Environmental information disclosure carrier	Annual report, CSR report, environmental report	
Environmental liability disclosure	Wastewater emission, COD emission, SO_2 emission, CO_2 emission, smoke and dust emission, industrial solid waste emission	No description = 0 Qualitative description = 1
Environmental performance & governance disclosure	Waste gas emission reduction treatment, wastewater emission reduction treatment, smoke and dust management, solid waste utilization and disposal, noise & light pollution & radiation management, implementation of cleaner production	Quantitative description = 2

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TABLE 2 Variable definitions.

Variable name	Variable symbols	Variable description
Environmental information disclosure	EID	Natural logarithm of environmental information disclosure score
Business strategy	STR	A composite measure indicating business strategy
Confucian culture	Confu	Natural logarithm of the number of Confucian temples within a 200-km radius of the enterprise's registered office
Environmental uncertainty	EU	Environmental uncertainty is calculated using literature such as Ghosh and Olsen (2009)
Legal supervision	Law	The scores of market intermediary organization development and legal system environment are taken as natural logarithm after adding 1
Firm size	Size	The natural logarithm of total assets
Debt repayment ability	Lev	Total liabilities/total assets
Profitability	ROA	Net profit/average balance of total assets
Develop ability	Growth	Operating income for the year/operating income for the previous year - 1
Operating ability	ATO	Operating income/average total assets
The largest shareholder	Top1	The largest shareholder/total number of shares
Management's shareholding ratio	Mshare	Management shareholding/total share capital
The dual roles of chairman and CEO	Dual	Dummy variable; dual equals 1 if both the chair and chief executive officer (CEO) are the same person; otherwise, 0
Years of listing	Listage	Natural logarithm of years on the market
The nature of ownership	SOE	Dummy variable, the value of state-owned holding enterprises is 1, otherwise, it is 0

temples within 200 km of the enterprise registration place and take the natural logarithm of this number as a proxy variable to measure the influence of Confu.

Environmental uncertainty (EU). Drawing on Ghosh and Olsen (2009) and Song et al. (2018), we measure EU using the ratio of the standard deviation of the company's abnormal sales revenue over the past 5 years to the mean. We then divide this ratio by the median of all enterprises in the same industry in the same year to obtain industry-adjusted EU.

Legal supervision (Law). We measure Law using the natural logarithm of the "market intermediary organization development and legal system environment" score plus 1 in the "NERI Index of Marketization of China's Provinces 2021 Report" (Wang et al., 2021). This indicator is composed of three indexes: "development of market intermediary organizations", "maintaining market legal environment" and "intellectual property protection". It provides a stable observational framework by continuously measuring changes in the legal supervisory environment across Chinese provinces, and has been widely used to measure Law (Chen et al., 2006; Yan et al., 2021). Higher scores indicate better Law.

3.2.4 | Control variables

Factors other than business strategy may also influence EID. Firstly, numerous studies have confirmed that financial factors can impact corporate EID performance (Chen et al., 2020; Delgado-Márquez et al., 2017). Therefore, we include the following variables in the model: (a) firm size (Size); (b) debt repayment ability (LEV); (c) profitability (ROA); (d) development ability (Growth); (e) operating ability (ATO). Second, corporate governance also affects corporate EID performance (Cormier & Magnan, 2015; Gerged, 2020). Thus, we incorporate the following variables in the model: (a) the largest shareholder (Top1); (b) management's shareholding ratio (Mshare); (c) the dual roles of chairman and CEO (Dual). Additionally, the number of years listed (Listage) and the nature of ownership (SOE) can also impact a company's fulfillment of EID responsibilities (Li, Huang, et al., 2018), thus we include them in the research model.

Table 2 provides specific definitions of the main variables.

3.3 | Empirical model setting

To examine the path and boundary conditions of the effect of STR on EID, we construct a two-way fixed effect mode and apply heteroscedastic robust standard errors. The model expression is presented below:

$$EID_{i,t} = \beta_0 + \beta_1 STR_{i,t} + \beta_n C_{i,t} + u_i + v_t + \varepsilon_{i,t} \quad (1)$$

$$EID_{i,t} = \beta_0 + \beta_1 STR_{i,t} + \beta_2 Confu_{i,t} + \beta_3 (STR \times Confu)_{i,t} + \beta_n C_{i,t} + u_i + v_t + \varepsilon_{i,t} \quad (2)$$

$$EID_{i,t} = \beta_0 + \beta_1 STR_{i,t} + \beta_2 Confu_{i,t} + \beta_3 Law_{i,t} + \beta_4 (STR \times Confu)_{i,t} + \beta_5 (STR \times Law)_{i,t} + \beta_5 (Confu \times Law)_{i,t} + \beta_6 (STR \times Confu \times Law)_{i,t} + \beta_n C_{i,t} + u_i + v_t + \varepsilon_{i,t} \quad (3)$$

$$EID_{i,t} = \beta_0 + \beta_1 STR_{i,t} + \beta_2 Confu_{i,t} + \beta_3 EU_{i,t} + \beta_4 (STR \times Confu)_{i,t} + \beta_5 (STR \times EU)_{i,t} + \beta_6 (Confu \times EU)_{i,t} + \beta_7 (STR \times Confu \times EU)_{i,t} + \beta_n C_{i,t} + u_i + v_t + \varepsilon_{i,t} \quad (4)$$

where Equation (1) tests the effect of STR on EID. Equation (2) examines the moderating effect of Confu. Equation (3) tests the joint

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moderating effect of Confu and EU. Equation (4) tests the joint moderating effect of Confu and Law. In the above equations, u_i and v_t represent individual and year fixed effects. $\varepsilon_{i,t}$ is the random error term.

4 | EMPIRICAL RESULTS

4.1 | Descriptive statistics

The descriptive statistics are shown in Table 3. Table 3a contains the full sample, where the mean value of EID is 1.543, the median is 1.386, and the standard deviation is 0.933. These findings suggest that over half of the sample companies have EID indicators that are lower than the mean value. The mean value of STR is 17.834, and the standard deviation is 4.152, indicating that significant differences exist in strategic choices among companies. The distributions of the other variables are within a reasonable range. Table 3b shows a separate subsample containing prospectors and defenders. According to Bentley et al. (2013), companies with a strategy score of 24–30 are defined as prospectors, while those with a strategy score of 6–12 are defined as defenders. Prospectors has a sample of 1965 companies, and defenders has a sample of 2220 companies. Overall, there are more defenders than prospectors. Moreover, the mean and median of EID for prospectors are higher than those for defenders, indicating

TABLE 3 Descriptive statistics.

(a) Full sample

Variable	Obs	Mean	Std. dev.	Min	Median	Max
EID	20,574	1.543	0.933	0	1.386	3.434
STR	20,574	17.834	4.152	8	18	27
Confu	20,574	2.647	0.805	0	2.772	4.007
EU	20,574	1.320	1.194	0.108	0.974	8.067
Law	20,574	2.349	0.594	−0.528	2.497	3.348
Size	20,574	22.404	1.278	19.368	22.246	26.607
Lev	20,574	0.463	0.204	0.057	0.462	0.944
ROA	20,574	0.032	0.069	−0.483	0.031	0.234
Growth	20,574	0.166	0.514	−0.682	0.088	5.830
ATO	20,574	0.650	0.469	0.045	0.541	3.389
Top1	20,574	0.333	0.147	0.079	0.309	0.770
Mshare	20,574	0.083	0.151	0	0.001	0.645
Dual	20,574	0.225	0.418	0	0	1
Listage	20,574	2.504	0.495	1.609	2.565	3.367
SOE	20,574	0.431	0.495	0	0	1

(b) Separate subsamples distinguishing between prospectors and defenders

	Prospectors ($N = 1965$)			Defenders ($N = 2{,}220$)		
Variable	Mean	Std. dev.	Median	Mean	Std. dev.	Median
EID	1.629	0.747	1.792	1.403	0.911	1.386
STR	25.129	1.092	25	10.801	1.145	11
Confu	2.678	0.654	2.708	2.672	0.858	2.890
EU	1.81	1.686	1.192	1.083	0.743	0.934
Law	2.416	0.567	2.576	2.334	0.565	2.463
Size	22.325	1.053	22.169	22.449	1.312	22.325
Lev	0.405	0.185	0.396	0.492	0.205	0.494
ROA	0.046	0.090	0.049	0.021	0.062	0.021
Growth	0.372	0.797	0.194	0.038	0.285	0.020
ATO	0.563	0.334	0.508	0.818	0.579	0.670
Top1	0.314	0.145	0.285	0.355	0.152	0.331
Mshare	0.159	0.188	0.063	0.042	0.111	0.000
Dual	0.336	0.472	0	0.161	0.368	0
Listage	2.303	0.503	2.197	2.644	0.457	2.772
SOE	0.227	0.419	0	0.555	0.497	1

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TABLE 4 Regression results.

Variable	(1) EID	(2) EID	(3) EID	(4) EID
STR	0.022***	0.022***	0.023***	0.020***
	(0.002)	(0.002)	(0.002)	(0.002)
Confu		0.085**	0.090***	0.067*
		(0.034)	(0.034)	(0.035)
STR × Confu		0.007***	0.009***	0.013***
		(0.002)	(0.002)	(0.003)
EU			−0.011*	
			(0.006)	
STR × EU			−0.001	
			(0.001)	
Confu × EU			−0.006	
			(0.006)	
STR × Confu × EU			−0.003**	
			(0.001)	
Law				0.086**
				(0.043)
STR × Law				−0.001
				(0.003)
Confu × Law				−0.012
				(0.016)
STR × Confu × Law				0.013***
				(0.003)
Size	0.111***	0.112***	0.113***	0.113***
	(0.012)	(0.012)	(0.012)	(0.012)
Lev	−0.139***	−0.144***	−0.143***	−0.144***
	(0.048)	(0.048)	(0.048)	(0.048)
ROA	0.050	0.051	0.030	0.054
	(0.087)	(0.087)	(0.087)	(0.087)
Growth	−0.018*	−0.017*	−0.007	−0.017*
	(0.009)	(0.009)	(0.010)	(0.009)
ATO	−0.015	−0.015	−0.018	−0.016
	(0.022)	(0.022)	(0.022)	(0.022)
Top1	0.092	0.090	0.097	0.090
	(0.078)	(0.078)	(0.078)	(0.078)
Mshare	0.065	0.070	0.061	0.071
	(0.082)	(0.082)	(0.082)	(0.082)
DUAL	−0.028*	−0.028*	−0.028*	−0.028*
	(0.015)	(0.015)	(0.015)	(0.015)
Listage	0.252***	0.257***	0.264***	0.256***
	(0.052)	(0.052)	(0.052)	(0.052)
SOE	−0.060*	−0.059*	−0.059*	−0.057*
	(0.032)	(0.032)	(0.032)	(0.032)
_cons	−2.160***	−2.412***	−2.472***	−2.512***
	(0.266)	(0.283)	(0.284)	(0.296)

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TABLE 4 (Continued)

Variable	(1) EID	(2) EID	(3) EID	(4) EID
Firm/year FE	YES	YES	YES	YES
N	20,574	20,574	20,574	20,574
Adj_R^2	0.160	0.160	0.161	0.161

Note: Standard errors are in parentheses.
*p < .1, **p < .05, and ***p < .01.

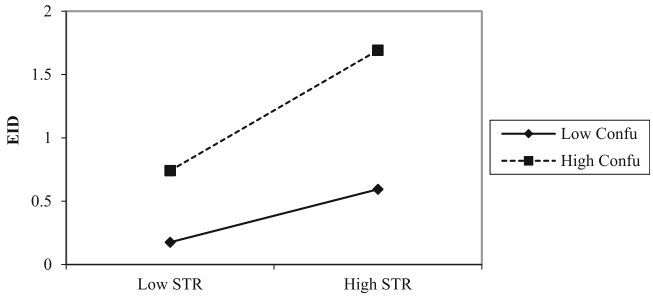

FIGURE 2 Moderating effect of Confu on the relationship between business strategy (STR) and environmental information disclosure (EID).

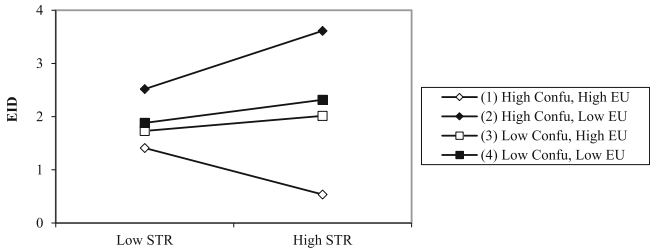

FIGURE 3 The joint moderating effect of EU and Confu on the relationship between business strategy (STR) and environmental information disclosure (EID).

that the degree of EID for prospectors is better than that for defenders, which preliminarily supports H1.

4.2 | Regression results

The regression results are shown in Table 4. In Column (1), the analysis confirms the relationship between STR and EID. The findings demonstrate a significant positive correlation between STR and EID ($\beta = .022$, $p < .01$), indicating that for each standard deviation increase in STR, the EID performance increases by 9.79% standard deviations. This outcome aligns with the research of Wang et al. (2023), confirming that prospectors exhibit higher EID levels compared to defenders, thus verifying H1. Column (2) tests the moderating effect of Confu. The coefficient of STR × Confu is significantly positive ($\beta = .007$, $p < .01$), indicating Confu positively moderates the relationship between STR and EID. Moreover, Figure 2 also shows that the effect of STR on EID is moderated by Confu. H2 is verified. Column (3) tests the joint moderating effect of EU and Confu. The coefficient of STR × Confu × EU is negatively significant ($\beta = -.003$, $p < .05$), indicating the strengthening of EU weakens the positive moderating effect of Confu on the relationship between STR and EID. Figure 3 also proves that H3 is established. Column (4) tests the joint moderating effect of Law and Confu. The coefficient of STR × Confu × Law is positively significant ($\beta = .013$, $p < .01$), indicating effective Law strengthens the positive moderating effect of Confu on the relationship between STR and EID. As shown in Figure 4, H4 is verified.

4.3 | Robustness tests

4.3.1 | Instrumental variable method

To mitigate the potential impact of endogeneity on the estimation results, we employ the instrumental variables method for 2SLS estimation. Within the existing literature, the fifth-order lag term of STR (STR t-5) has been identified as a suitable instrumental variable (Kong et al., 2020; Liu & Kong, 2021). This is based on the rationale that enterprises usually refer to their past strategic positioning while making strategic decisions, and the strategic choices made 5 years ago are unlikely to significantly impact the current EID level. The regression results are shown in Table 5. In the first stage of the regression, the variable STR_{t-5} consistently shows positive and significant effects on STR at a significance level of 1%, suggesting that enterprises tend to maintain consistent strategic positioning over time. Subsequently, in the second stage of regression, after controlling for endogeneity, the results remain consistent with our previous findings, thus passing both the unidentifiable test (Anderson canon. Corr. LM) and the weak instrumental variable test (Cragg–Donald Wald F). These outcomes further support the hypotheses posited in this paper.

4.3.2 | Advanced dependent variable

In the baseline regression, we use the current period value to measure EID. Due to temporal effects, the current STR also affects the next period's EID. Therefore, we use the one-period-ahead variable of EID ($EID_{i,t+1}$) for robustness testing. As can be seen in Table 6, the regression results again strongly support our hypothesis.

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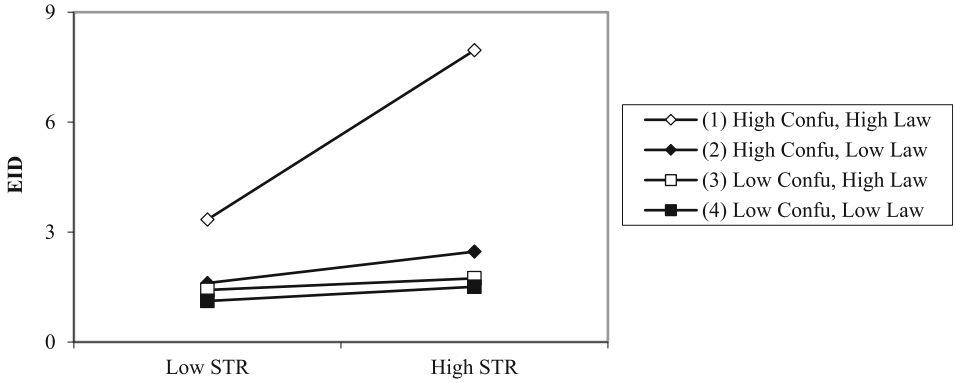

FIGURE 4 The joint moderating effect of Law and Confu on the relationship between business strategy (STR) and environmental information disclosure (EID).

4.3.3 | Substitution of independent variables

In the previous text, we use the ratio of R&D expenditure to operating revenue to measure STR. However, considering that some companies do not disclose R&D expenditures, we use the ratio of intangible assets to operating revenue and construct the variable STR_new to re-measure the propensity of new product development in STR (Kong et al., 2020). As shown in Table 7, the results are consistent with the previous regression, and the original hypothesis is verified again.

4.3.4 | Replacing Confucian culture

To proxy for the Confucian cultural distance indicator, we remeasure using the logarithm of the number of Confucian temples within 100 km (Confu100) and 300 km (Confu300) of the enterprise registration location (Du, 2014). As presented in Table 8, the regression results confirm our previous findings and the conclusions remain valid.

4.3.5 | Increase the control variables

China's vast territory results in corporate decision-making being significantly influenced by the economic development level of the region and the external governance environment. To address this concern, we conduct a robustness test by controlling for provincial characteristic variables. Specifically, we introduce four indicators—per capita gross product (GDP), industrial structure (Ind), foreign direct investment (FDI), and the degree of openness (DWKF)—as model control variables. Table 9 displays the regression results, indicating that the research findings remain robust even after accounting for the provincial characteristic variables.

5 | FURTHER ANALYSIS

Based on the above research, it is demonstrated that STR positively affects EID, although its influencing mechanism requires further investigation. Further analysis will provide answers to these questions.

5.1 | Economic benefit contract

Prospectors focus more on innovative businesses, such as technology development and product creation, and usually require more marketing activities. In terms of business models, prospectors depend on adequate financial resources to support them. Ittner et al. (1997) found that prospectors are positively associated with financial distress. Hambrick (1983) also argued that prospectors do not perform as well as defenders in terms of cash flow. EID plays a significant role in helping companies gain stakeholder recognition, reducing capital usage costs, and alleviating financing constraints (Zhou et al., 2018). Prospectors hope to manage impressions through EID to help them obtain more bank loans and business credits and effectively increase financing channels. Therefore, we aim to verify whether prospectors increase EID in pursuit of economic gain due to financing constraints. Following Kaplan and Zingales (1997), we use the KZ index to measure financing constraints. The KZ index is measured as follows.

$$\begin{aligned} KZ = &-1.001909 \times OCF/Asset + 3.139193 \times Lev - 39.678 \\ &\times Dividends/Asset - 1.314759 \times Cash/Asset + 0.2826389 \\ &\times Tobin's Q \end{aligned} \quad (7)$$

where OCF is operating cash flow, LEV is total liabilities divided by total assets, Dividends is total cash dividends paid, Cash is cash and short-term investments, Tobin's Q is market capitalization divided by total assets, and Asset is total assets at the beginning of the year. The higher the KZ index, the stronger the financing constraint of the firm.

The regression results are shown in columns (1)–(2) of Table 10. STR is significantly positively related to KZ and KZ is also significantly positively related to EID. This finding suggests that financing constraints partially mediate the relationship between STR and EID. Aggressive STR lead to greater financial constraints faced by firms, prompting them to actively increase their EID levels.

5.2 | Social identity contract

Prospectors are committed to expanding markets but often face governance problems during the expansion process, resulting in

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TABLE 5 Instrumental variable method results.

	First stage				Second stage			
Variable	(1) STR	(2) STR	(3) STR	(4) STR	(5) EID	(6) EID	(7) EID	(8) EID
STR_{t-5}	0.553***	0.552***	0.563***	0.496***				
	(0.009)	(0.009)	(0.009)	(0.009)				
STR					0.015***	0.015***	0.013***	0.013***
					(0.004)	(0.004)	(0.004)	(0.005)
Confu		0.076*	0.176***	0.002		0.025**	0.022*	0.061***
		(0.045)	(0.046)	(0.055)		(0.012)	(0.012)	(0.015)
STR × Confu		0.001	0.018	0.100***		0.009***	0.009***	0.016***
		(0.011)	(0.011)	(0.013)		(0.003)	(0.003)	(0.004)
EU			0.556***				−0.074***	
			(0.035)				(0.009)	
STR × EU			0.025***				0.000	
			(0.007)				(0.002)	
Confu × EU			0.066*				0.015*	
			(0.034)				(0.009)	
STR × Confu × EU			−0.032***				−0.006***	
			(0.008)				(0.002)	
Law				−0.126				−0.162***
				(0.203)				(0.056)
STR × Law				0.249***				−0.006
				(0.016)				(0.005)
Confu × Law				0.206***				0.007
				(0.075)				(0.021)
STR × Confu × Law				0.438***				0.016***
				(0.017)				(0.006)
_cons	5.295***	5.125***	3.399***	7.291***	−2.184***	−2.234***	−2.004***	−2.228***
	(0.809)	(0.815)	(0.805)	(0.782)	(0.218)	(0.219)	(0.218)	(0.226)
Control	YES	YES	YES	YES	YES	YES	YES	YES
Firm/year FE	YES	YES	YES	YES	YES	YES	YES	YES
N	8172	8172	8172	8172	8172	8172	8172	8172
Adj_R^2	0.397	0.398	0.422	0.460	0.133	0.134	0.143	0.141
Anderson canon. Corr. LM					2544.167***	2539.929***	2659.793***	2278.419***
Cragg–Donald Wald F					3686.620***	3676.807***	3932.120***	3150.736***

Note: Standard errors are in parentheses.
*p < .1, **p < .05, and ***p < .01.

negative news and litigation risks that can harm corporate branding (Bentley et al., 2013). Therefore, to successfully carry out their business and build long-term market competitive advantages, prospectors urgently need to accumulate public recognition. CSR represents a sustainable orientation and practice for enterprises. It helps firms better understand the inherent relationship between their strategies and the environment (Porter & Kramer, 2006). The readability of CSR reports is crucial for effective information disclosure and gaining continuous trust from stakeholders (Du & Yu, 2020). Specifically, enterprises seeking social recognition may utilize more understandable language in their social responsibility reports rather than obscure language, thereby enhancing the readability of CSR reports. To investigate whether prospectors increase EID levels by improving CSR report readability while pursuing

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TABLE 6 Advanced dependent variable results.

Variable	(1) $EID_{i,t+1}$	(2) $EID_{i,t+1}$	(3) $EID_{i,t+1}$	(4) $EID_{i,t+1}$
STR	0.015***	0.015***	0.015***	0.013***
	(0.002)	(0.002)	(0.002)	(0.002)
Confu		0.074*	0.070*	0.098**
		(0.041)	(0.042)	(0.042)
STR × Confu		0.009***	0.009***	0.015***
		(0.003)	(0.003)	(0.003)
EU			−0.000	
			(0.006)	
STR × EU			0.000	
			(0.001)	
Confu × EU			0.009	
			(0.006)	
STR × Confu × EU			−0.003**	
			(0.001)	
Law				0.069**
				(0.033)
STR × Law				−0.004
				(0.003)
Confu × Law				0.074***
				(0.019)
STR × Confu × Law				0.008**
				(0.004)
_cons	−1.022***	−1.244***	−0.946***	−1.432***
	(0.293)	(0.315)	(0.323)	(0.323)
Control	YES	YES	YES	YES
Firm/year FE	YES	YES	YES	YES
N	17,373	17,373	17,373	17,373
Adj_R^2	0.139	0.139	0.140	0.141

Note: Standard errors are in parentheses.
*p < .1, **p < .05, and ***p < .01.

social identity, we introduce the readability variable of CSR reports (Readability).

Traditional text readability measurement methods often overlook the collocation order of words and are more applicable to English texts. To address this, we draw from Shin at al. (2020) approach, adapt it to Chinese-language CSR reports, and utilize a text analysis method more suitable for the Chinese capital market. The readability metrics we employ are sourced from the WinGO database. Under the assumption of Naive Bayes, which assumes that sentences in the text are independent of each other while considering the collocation order of words in the sentence, the mean value of the log-likelihood of the product of the probability of each sentence in the text is taken as the readability value of the text. The Readability indicator is measured as follows:

$$Readability = \frac{1}{N}\sum_{s=1}^{N} logP_S \quad (8)$$

where Ps represents the probability of sentences being generated and N represents the number of sentences constituting the text. A higher Readability score indicates better readability of the CSR report, indicating the company's eagerness to gain social recognition.

The regression results are presented in columns (3)–(4) of Table 10. STR is significantly positively correlated with Readability, and Readability is also significantly positively correlated with EID. This finding suggests that Readability acts as a partial mediator between STR and EID. In pursuit of social recognition, aggressive STR tends to enhance the readability level of enterprises, thereby encouraging them to actively engage in EID.

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TABLE 7 Substitution of independent variables results.

Variable	(1) EID	(2) EID	(3) EID	(4) EID
STR_new	0.018***	0.018***	0.019***	0.016***
	(0.002)	(0.002)	(0.002)	(0.002)
Confu		0.080**	0.087**	0.082**
		(0.034)	(0.034)	(0.035)
STR_new × Confu		0.004*	0.006**	0.011***
		(0.002)	(0.003)	(0.003)
EU			−0.007	
			(0.006)	
STR_new × EU			−0.002*	
			(0.001)	
Confu × EU			0.000	
			(0.006)	
STR_new × Confu × EU			−0.004***	
			(0.001)	
Law				0.083***
				(0.030)
STR_new × Law				−0.001
				(0.003)
Confu × Law				0.038**
				(0.018)
STR_new × Confu × Law				0.011***
				(0.003)
_cons	−2.214***	−2.442***	−2.175***	−2.277***
	(0.266)	(0.283)	(0.289)	(0.293)
Control	YES	YES	YES	YES
Firm/year FE	YES	YES	YES	YES
N	20,574	20,574	20,574	20,574
Adj_R^2	0.158	0.158	0.159	0.159

Note: Standard errors are in parentheses.
*p < .1, **p < .05, and ***p < .01.

6 | DISCUSSION AND IMPLICATIONS

6.1 | Main findings

Based on Miles and Snow's organizational strategy measurement, we employ the social contract theory to investigate the relationship between enterprises and society, studying the influence of enterprise strategy on EID. First, our research confirms that prospectors exhibit higher levels of EID compared to defenders. Second, we introduce Confucian culture as a moderating variable to consider its "soft constraints" on corporate decision-making. The findings reveal that Confucian culture strengthens the relationship between business strategy and EID. Third, we introduce environmental uncertainty and legal supervision as joint moderating variables, along with Confucian culture, to examine the combined influence of the market environment, legal environment, and culture. Our study reveals that as environmental uncertainty increases, the positive regulatory effect of Confucian culture weakens, while robust legal supervision strengthens its positive impact. Lastly, our research confirms the dual-path impact of business strategy on EID through the economic benefit contract and social proof contract.

6.2 | Theoretical contributions

Our study offers several significant contributions to the literature. First, we expand the research perspective by proposing that firms have responsibilities toward the society that provides conditions for them to pursue economic benefits. We view this as a contract between firms and society (Donaldson & Dunfee, 1994) and EID as a

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TABLE 8 Replacing Confucian culture results.

	$Confu_n$ ($n = 100$)			$Confu_n$ ($n = 300$)		
Variable	(1) EID	(2) EID	(3) EID	(4) EID	(5) EID	(6) EID
STR	0.022***	0.023***	0.021***	0.022***	0.023***	0.020***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
$Confu_n$	0.073**	0.081**	0.059*	0.120***	0.123***	0.148***
	(0.032)	(0.032)	(0.033)	(0.037)	(0.037)	(0.038)
STR × $Confu_n$	0.004	0.006**	0.006*	0.009***	0.010***	0.018***
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)
EU		−0.011*			−0.010*	
		(0.006)			(0.006)	
STR × EU		−0.001			−0.001	
		(0.001)			(0.001)	
$Confu_n$ × EU		−0.011*			−0.003	
		(0.007)			(0.006)	
STR × $Confu_n$ × EU		−0.003*			−0.003**	
		(0.001)			(0.001)	
Law			0.064**			0.087***
			(0.029)			(0.030)
STR × Law			0.001			−0.001
			(0.003)			(0.003)
$Confu_n$ × Law			−0.011			0.059***
			(0.020)			(0.017)
STR × $Confu_n$ × Law			0.006*			0.013***
			(0.004)			(0.003)
_cons	−2.301***	−2.368***	−2.379***	−1.789***	−1.826***	−1.932***
	(0.272)	(0.273)	(0.279)	(0.271)	(0.272)	(0.278)
Control	YES	YES	YES	YES	YES	YES
Firm/year FE	YES	YES	YES	YES	YES	YES
N	20,574	20,574	20,574	20,574	20,574	20,574
Adj_R^2	0.160	0.161	0.160	0.161	0.161	0.162

Note: Standard errors are in parentheses.
*$p < .1$, **$p < .05$, and ***$p < .01$.

coordination method to resolve conflicts of interest. By explaining why prospectors engage in EID through social contract theory, we enrich the application of the theory and fill a gap in EID research. Our research conclusions are in line with the findings of Wang et al. (2023) and Liu & Kong (2021), who suggest that prospectors are more inclined to engage in environmental protection activities and are willing to disclose more environmental information. Overall, our study provides new evidence on the differentiation of business strategy from corporate environmental protection and sustainability behavior.

Second, we integrate informal institutions into the social contract framework. Previous research on EID has primarily focused on the moderating effect of formal institutions on corporate decision-making while ignoring the contribution of informal institutions (Jiang et al., 2021). We introduce Confucian culture as an informal institution and emphasize its subtle role in corporate decision-making. We also incorporate Confucian culture into the corporate social contract framework, highlighting how strong Confucian culture can strengthen the contractual relationship between firms and society, leading to improved EID level. Therefore, our research not only addresses Wang et al.'s (2023) suggestion to further investigate the relationship between business strategy and EID at the cultural level but also complements the existing evidence that informal institutions are integrated into corporate decision-making and play a dominant role in emerging markets.

Finally, our study focuses on the joint moderating effects of environmental uncertainty, legal supervision, and Confucian culture.

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TABLE 9 Increase the control variables' results.

Variable	(1) EID	(2) EID	(3) EID	(4) EID
STR	0.022***	0.022***	0.023***	0.020***
	(0.002)	(0.002)	(0.002)	(0.002)
Confu		0.077**	0.082**	0.061*
		(0.034)	(0.034)	(0.035)
STR × Confu		0.007***	0.009***	0.013***
		(0.002)	(0.002)	(0.003)
EU			−0.011*	
			(0.006)	
STR × EU			−0.001	
			(0.001)	
Confu × EU			−0.006	
			(0.006)	
STR × Confu × EU			−0.003**	
			(0.001)	
Law				0.076*
				(0.043)
STR × Law				−0.001
				(0.003)
Confu×Law				−0.012
				(0.016)
STR × Confu × Law				0.013***
				(0.003)
_cons	−2.165***	−2.390***	−2.449***	−2.462***
	(0.269)	(0.286)	(0.287)	(0.298)
Control	YES	YES	YES	YES
Firm/year FE	YES	YES	YES	YES
N	20,574	20,574	20,574	20,574
Adj_R^2	0.161	0.162	0.162	0.163

Note: Standard errors are in parentheses.
*p < .1, **p < .05, and ***p < .01.

In contrast, the previous literature has only focused on a single market environment (Shan & Tian, 2022) or legal environment (Allen et al., 2005). We consider the current environmental situation where formal and informal institutions are intertwined, and the market environment is complex. By examining the joint moderating effect of environmental uncertainty, legal supervision, and Confucian culture, we reveal the complexity of Confucian culture as a boundary condition. Our study thus provides new insights into the moderating effects of multiple factors on the relationship between business strategy and EID. It can be considered that our research represents a further extension of Kong et al. (2020) and Yuan et al. (2020) in the field of business strategy and CSR, offering a novel pathway to comprehend the relationship between business strategy and EID.

6.3 | Practical contributions

This study provides practical contributions for both enterprises and governments. From the perspective of business strategy, our findings suggest that enterprises should recognize the advantages of engaging in EID. Intrinsic advantages of EID include the ability to alleviate financing constraints and ensure effective implementation of business strategies. In terms of external value, enterprises' EID behavior demonstrates their active response to the national call and helps to realize the government's empowerment and efficiency of enterprises. Prospectors, facing greater competitive pressure and environmental risks, should embed environmental responsibility into their business strategies to achieve sustainable development.

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TABLE 10 Further analysis.

	Economic benefit contract		Social identity contract	
	(1)	(2)	(3)	(4)
Variable	KZ	EID	Readability	EID
STR	0.010**	0.023***	0.060*	0.030***
	(0.004)	(0.002)	(0.031)	(0.004)
KZ		0.011**		
		(0.004)		
Readability				0.005***
				(0.002)
_cons	6.947***	−2.357***	−28.810***	−0.760
	(0.524)	(0.288)	(4.836)	(0.576)
Control	YES	YES	YES	YES
Firm/year FE	YES	YES	YES	YES
N	18,779	18,779	5995	5995
Adj_R^2	0.259	0.163	0.054	0.046

Note: Standard errors are in parentheses.
*p < .1, **p < .05, and ***p < .01.

From the perspective of government regulation, our study suggests that governments should standardize the EID guidelines and evaluation standards, improve the reward and punishment mechanism, and enhance the value effect of EID. Moreover, the government should acknowledge the unique advantages of excellent traditional culture. In regions with strong Confucian culture, the government should leverage the lubricant role of Confucian culture in corporate governance and guide enterprises to assume environmental responsibility consciously. In areas where the Confucian cultural atmosphere is not strong enough, the government should promote the dissemination of Confucian culture, create a stable market environment, and strengthen government financial support to ease the tension caused by environmental uncertainty. Additionally, the government should establish an interactive mechanism in which formal and informal institutions complement each other and are rigid and flexible.

6.4 | Limitations and future research

This study also has certain limitations. First, while content analysis is a commonly used method to assess EID, it inevitably has some subjectivity. Therefore, future research should aim to explore more advanced and innovative methods for measuring EID levels. Second, this paper only examines the impact of Confucian culture within the informal institutional framework. Future research could take a country-specific approach that considers local cultural factors, which would allow for comparisons with the results of this study. Third, while we have verified the logical chain of "Business Strategy - EID" at the theoretical level, it would be valuable to include successful case studies and practical experiences at the practical level in future research. Fourth, in terms of disclosure methods, EID can be classified into voluntary and mandatory disclosure. Cultural factors may encourage companies to go beyond mandatory disclosure and voluntarily disclose more environmental information. However, the current mandatory EID mainly targets heavily polluting industries, making it challenging to differentiate between voluntary and mandatory EID for all listed companies. Therefore, future research could focus more on specific industries and explore different drivers and practices of EID within those industries. Addressing these limitations will lead to a more comprehensive understanding of the complex factors that contribute to EID and will provide valuable insights for both academic and practical purposes.

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