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How to Improve the Environmental, Social and Governance Performance of Chinese Construction Enterprises Based on the Fuzzy Set Qualitative Comparative Analysis Method

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Abstract: The environmental, social and governance (ESG) performance of construction enterprises still needs to be improved. Therefore, in order to better utilize resources effectively to improve enterprise ESG performance, this paper explores the configuration paths for Chinese construction enterprises to improve their ESG performance using the (fuzzy set qualitative comparative analysis) fsQCA method. It was found that single conditions are not necessary to achieve high ESG performance. The improvement of the high ESG performance needs to be combined with synergistic effects of multiple conditions. The specific configuration paths consist of six types of conditions. They are the environmental goal and management-led improvement path, the environmental training and action-led improvement path, the environmental concept and partner protection joint-led improvement path, the environmental and social level synergistic improvement path and the two multifactorial composite improvement paths. Among them, the environmental concepts, environmental goal and management, environmental training and action, and partner protection are the core conditions. The other conditions also have a certain supporting role. This study will help the construction enterprises to effectively allocate resources and develop ESG strategies with limited resources. It will also provide a reference for the government to manage the ESG performance of enterprises.

Keywords: Chinese construction enterprises; ESG performance; fsQCA; sustainable development; configuration analysis

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1. Introduction

As construction enterprises are under pressure to improve their sustainability in the current competitive construction market [1], environmental, social and governance (ESG) performance is becoming an important system for evaluating the sustainable development of enterprises [2]. The environmental dimension refers to the management of emissions, pollutants, energy and resources, as well as environmental protection strategies [3]. The social dimension refers mainly to the protection of employees and partners [4]. The governance dimension relates to the characteristics of the enterprise board and innovative development [5].

ESG implementation involves a lot of investment. However, in the long run, ESG performance is beneficial both in terms of shareholder value and external stakeholder benefits [6]. Moreover, even if an enterprise is not volunteering, when a construction enterprise encounters a client with stringent building codes or standards, it must comply with local ESG requirements [7]. Therefore, the importance and necessity of ESG are making enterprises focus not only on profit maximization, but gradually also on social benefit maximization [8].

As an important part of supporting economy, the construction industry inevitably bears the responsibility for the sustainable development of the environment and society [9].

Although construction enterprises have been able to incorporate sustainability to a degree, the ESG performance of Chinese construction enterprises is at a medium level. There is still a gap to be bridged compared with enterprises in Europe and the United States [1]. Most Chinese enterprises are limited to understanding ESG from an environmental perspective and do not play an effective role in the social and governance dimensions for sustainable development [10]. For example, the protection of employees' health and safety is still lacking, and there are unstable relationships with customers and suppliers [11]. In addition, due to poor corporate governance, the behavior that appears to increase ESG is likely to be abused by enterprises [12]. Construction enterprises also have limited resources available for ESG. These situations ultimately lead to controversy over corporate ESG performance. Therefore, the question of how to effectively improve the ESG performance of construction enterprises in the dimensions of environment, society and corporate governance is worth considering.

Most of the current academic research on ESG has focused on (1) exploring the relationship between enterprise ESG performance and financial performance [13,14]; (2) analyzing the impact of ESG funds on enterprise ESG performance [15]; and (3) examining the relationship between ESG performance, corporate innovation and high-quality development [2,16]. Few studies have explored how enterprises can jointly improve the ESG performance of construction enterprises under multiple conditions in environmental, social and corporate governance dimensions.

As a result, the objectives of this study are as follows: (1) to analyze the factors that affect ESG performance in environmental, social and corporate governance dimensions; (2) to discuss the impact of configuration paths in different dimensions on the ESG performance; and (3) to determine the core conditions for improving the ESG performance of Chinese construction enterprises. The results are expected to help construction enterprises to deploy more effective ESG development strategies with limited resources practically. This paper also provides a reference for the government to manage the ESG performance of enterprises.

2. Literature Review

The theoretical framework of sustainable development was originally proposed by the World Commission on Environment and Development (WCED). The sustainable development theory was defined as the idea of "meeting the needs of the present generations without negatively affecting the development of future generations" [17]. It includes three main themes: economy, society and the environment. Since the sustainable development theory was proposed, it has been applied by many scholars in ESG-related research [18]. Social and environmental sustainability is highly compatible with the social and environmental pillar of ESG [19]. In addition, enterprises can formulate ESG implementation strategies through internal governance mechanisms to deal with environmental and social sustainable development issues [20]. Therefore, this paper chose the environmental, social and governance dimensions as the entry points to analyze how construction enterprises can improve ESG performance through the management of the three dimensions.

2.1. Analysis of the Conditions in the Environmental Dimension

With strict government regulations and an increase in social attention, more and more construction enterprises have begun to focus on the importance of environmental sustainability [21]. As a part of corporate culture, the environmental concept is not just a slogan, but the cornerstone of the enterprise's environmental management and environmental protection actions [22]. Research has shown that enterprises with an environmental concept are more likely to perform well in terms of ESG [23]. The conventional wisdom is that investing large amounts of resources in environmental management will occupy the costs of other business activities, which is not helpful for profit maximization. However, Porter's hypothesis suggests that appropriate environmental goals and management not only help to reduce energy and material waste, thereby improving environmental performance, but also have a positive impact on the high-quality development of enterprises [23,24]. Orga-

nizational learning is an important part of enterprise management. ESG practices often require employees to provide appropriate information or actions. Without adequate environmental training, environmental challenges may hinder the successful implementation of ESG strategies [7]. The learning and training of employees on environmental protection can familiarize them with and improve processes and knowledge. When employees realize the importance of environmental protection, their willingness to improve environmental performance in practice increases [25]. Therefore, this study selects environmental concepts, environmental goals and management, and environmental training and action as conditional variables affecting the ESG performance of construction enterprises in the environmental dimension.

2.2. Analysis of the Conditions in the Social Dimension

Society is an important stakeholder for enterprises. Consideration of the interests of employees, customers and suppliers in society makes a certain contribution to social performance in ESG [26]. First, the construction industry is one of the most dangerous industries. Many international organizations and countries have made regulations on occupational safety in construction enterprises. In order to avoid safety accidents during the construction process, enterprises will take appropriate safeguards to protect the health and safety of employees, which promotes the enhancement of social performance [27]. The partners of a construction enterprise include customers and suppliers. Enterprises that effectively protect the interests of partners can establish a stable and collaborative relationship. These relationships facilitate the consolidation of resources and allow for more sustainable development with limited resources, thereby positively impacting ESG performance [28]. In addition to employees and partners, construction enterprises are also subject to the attention of the public, which provides another level of external scrutiny that should not be ignored. For corporations, appropriate social welfare activity can respond to public concerns, build a positive corporate reputation and deliver more ESG recognition. In summary, this study selects employee protection, partner protection and social welfare as conditional variables affecting the ESG performance of construction enterprises in the social dimension.

2.3. Analysis of the Conditions in the Governance Dimension

Construction enterprises have achieved some success in ESG performance. However, there are still enterprises that see ESG as a means to disguise fraud and enable greenwashing and other behaviors [12]. Therefore, good corporate governance is needed to monitor and reduce such irresponsible behavior [29]. ESG performance is a result of corporate strategy, which depends largely on corporate board size [30]. First, a larger board provides more knowledge on sustainability, as well as controlling the quality of decisions on ESG strategies [31,32]. The supervision and management of the enterprise also becomes much more efficient. There is also a positive correlation between corporate market competitiveness and ESG performance [18]. To an extent, in order to obtain more project priority, enterprises can strengthen their competitiveness in the corporate market. For example, the environmental and social benefits of an enterprise's focus on innovative development can help to improve the ESG level [33]. The increased amount of resources invested by enterprises can advance the output of green technological innovations in terms of processes, products and management [16]. In addition, more policy support and incentives are available for effective green technology innovation, which can again contribute to the development of the ESG [34]. Thus, when exploring the impact of governance dimensions on enhancing ESG performance, it is particularly important to consider the board size, the market competitiveness of the enterprise, and R&D investment.

Ultimately, this paper analyzes nine conditions affecting the ESG performance of construction enterprises from the environmental, social and governance dimensions based on the sustainable development theory. The specific model is shown in Figure 1.

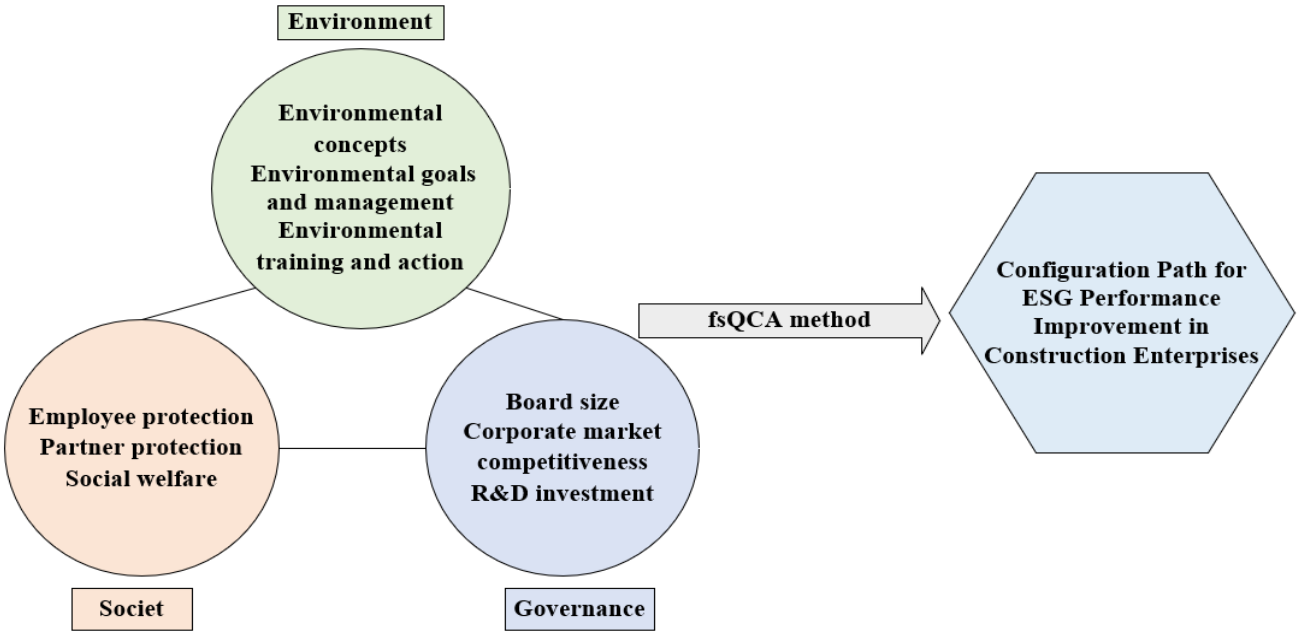

Figure 1. ESG performance improvement path model for construction enterprise.

3. Research Design

3.1. Research Method

Qualitative comparative analysis (QCA) is a method used to study a certain outcome formed by the combination of different conditions [35]. Depending on the research objectives and data, QCA can be divided into clear set qualitative comparative analysis (csQCA) and fuzzy set qualitative comparative analysis (fsQCA). The former can only deal with binary variables, while the latter can deal with continuous data [36]. Therefore, in order to better explore the ESG performance improvement path of construction enterprises, this paper selected the fsQCA method for research, mainly considering the following aspects:

1. ESG improvement in construction enterprises is subject to the synergistic effect of multiple variables. The fsQCA method is able to study the causal relationship of multiple conditions in terms of configuration perspective [36]. This helps to further explore the core role of relevant configuration conditions in enhancing the ESG performance of construction enterprises;
2. Compared with ordinary regression analysis, the fsQCA method can determine whether the conditions are core or marginal variables [37];
3. The fsQCA has a significant advantage in discussing the complementary substitution effects of different conditions. It provides an important reference for enterprises to adjust ESG improvement paths according to the characteristics of the industry [38].

3.2. Data Sources

The fsQCA method follows theoretical sampling. The selected enterprises are representative in the region or industry, which can ensure the representativeness and diversity of the data. Considering the sample size, fsQCA can be applied to both small samples (2–15 cases) and medium or large samples (more than 25) [36]. This paper took the 2022 Chinese Shanghai and Shenzhen A-share-listed construction enterprises as the initial sample. After excluding ST, *ST and enterprises with incomplete data, 101 sample cases were finally obtained. The data for the outcome variables in this paper were selected from the 2022 ESG ratings in the Wind database. Data on environmental concepts, environmental goals and management, environmental training and action, employee protection, partner protection and social welfare were derived from each enterprise's 2022 ESG report or annual report. The rest of the data were obtained from the China Stock Market and Accounting Research Database (CSMAR).

3.3. Variable Measurement

The outcome variable in this paper is ESG performance. The conditional variables include environmental concepts, environmental goals and management, environmental training and action, employee protection, partner protection, social welfare, board size, corporate market competitiveness and R&D investment. The calculation method of each variable is as follows:

1. Outcome variables: The ESG ratings in the Wind database reflect the environmental performance, social performance and corporate governance of enterprises. The indicators which incorporate the characteristics of the industry avoid the homogenization of the ratings [39]. Therefore, the behavior regarding green products, low-carbon goals or social actions of enterprises can be evaluated more accurately. This paper assigned ESG ratings (C-AAA: nine ratings in total) sequentially from 1 to 9 to represent enterprise ESG performance [40].
2. Conditional variables: At the environmental level, this paper selected three indicators: environmental concepts (ECs), environmental goals and management (EGM) and environmental training and action (ETA). For the measurement of the three indicators, this paper chose to semantically analyze the contents of the annual reports or ESG reports of enterprises [41]. If the report stated that the enterprise had an environmental concept, then it was determined that the enterprise would take a value of 1 for the EC indicator; otherwise, it would take a value of 0. If the report indicates that the enterprise has an environmental goal, environmental management system and environmental emergency response, then 1 point is awarded. The maximum number of points for EGM is 3 and the minimum is 0. Similarly, if the report shows that the enterprise has organized environmental training or environmental protection activities, it will receive 1 point. Then, the ETA indicator will show at most 2 points and at least 0 points.

At the social level, three indicators were selected: employee protection (EP), partner protection (PP) and social welfare (SW). In this paper, we also chose to semantically analyze the contents of the annual reports or ESG reports of enterprises. If the report states that the enterprise protects the interests of employees, the value EP is 1; otherwise, it is 0. If the report shows that the enterprise has protected the interests of customers or suppliers, at least 1 point is scored. The PP indicator shows at most 2 points and at least 0 points. Similarly, if the enterprise implements social welfare (such as a donation), the SW indicator is 1 point; otherwise, it is 0 [41].

At the governance level, this paper selected three indicators: board size (BS), corporate market competitiveness (Lerner) and R&D investment (RDR). Among them, board size refers to the number of corporate board members [42]. Enterprise market competitiveness is measured by the Lerner index. Since the Lerner index is inversely proportional to the level of competition, in order to maintain consistency with other variables, the "1-Lerner" value is used to measure enterprise market competitiveness [41]. In general, the higher the proportion of R&D funds in the operating income, the higher the R&D investment of the enterprise [43]. Therefore, R&D investment was measured by the ratio of the R&D funds to operating income of the enterprise [44].

4. Empirical Analysis and Results

4.1. Calibration

In fsQCA, the calibration of variables is required to ensure objectivity and credibility [45]. In this study, the 90th, 50th and 10th percentiles of all continuous variables were used as the full membership point (N1), intersection point (N2) and full non-membership point (N3) [39]. Calibration is not required for 0–1 categorical variables such as environmental concept, employee protection and social welfare [46]. In addition, to avoid the removal of sample cases with a value of 0.5 after calibration, this paper adjusts the values to 0.499 or

0.501 before proceeding to the next step of the analysis [37]. The calibration points for all variables are shown in Table 1 below:

Table 1. Variable calibration.

Type	Variable		Calibration Information		
			N1	N2	N3
Conditional variables	Environmental concepts	ECs	1	—	0
	Environmental goal and management	EGM	2.99	0.99	0.01
	Environmental training and action	ETA	1.99	0.99	0.01
	Employee protection	EP	1	—	0
	Partner protection	PP	1.99	0.99	0.01
	Social welfare	SW	1	—	0
	Board size	BS	10.99	8.99	4.99
	Corporate market competitiveness	Lerner	1.13	0.93	0.81
	R&D investment	RDR	0.054	0.029	0.003
Outcome variable		ESG	5.99	4.99	3.99

4.2. Analysis of Necessary Conditions

Before conducting a configuration analysis, it is necessary to check whether a single conditional variable is necessary for the outcome variable. A single conditional variable was determined to be necessary if its consistency was more than 0.9 and the amount (i.e., coverage) that achieved high (or low–high) ESG performance was more than 0.5 [47]. In this study, fsQCA4.0 was used to analyze the necessity of conditional variables for the high ESG performance and low–high ESG performance of construction enterprises, and the results are shown in Table 2. No variables satisfied the determination of the necessary conditions for achieving ESG performance. Therefore, there were no necessary conditions and a necessity test was not required.

Table 2. Analysis of the necessary conditional variables.

Conditional Variables	High ESG Performance		Low–High ESG Performance	
	Consistency	Coverage	Consistency	Coverage
ECs	0.728	0.482	0.581	0.518
~ECs	0.272	0.325	0.419	0.675
EP	0.733	0.517	0.508	0.483
~EP	0.267	0.288	0.492	0.713
SW	0.982	0.445	0.910	0.555
~SW	0.018	0.127	0.090	0.873
EGM	0.640	0.755	0.366	0.582
~EGM	0.645	0.430	0.845	0.760
ETA	0.463	0.828	0.207	0.499
~ETA	0.720	0.403	0.929	0.700
PP	0.849	0.576	0.631	0.577
~PP	0.377	0.431	0.536	0.827
BS	0.614	0.665	0.524	0.765
~BS	0.783	0.550	0.771	0.729
Lerner	0.615	0.549	0.685	0.823
~Lerner	0.802	0.653	0.625	0.686
RDR	0.687	0.592	0.580	0.673
~RDR	0.621	0.523	0.648	0.736

Note: The symbol "~" indicates the absence of the condition.

4.3. Configuration Analysis of Conditions

The process of configuration analysis requires a truth table analysis. Based on the sample size, the acceptable sample case number threshold was set to 1.5% of the total

sample size in this study (with a threshold of 2). The raw consistency threshold was set at 0.8 and the PRI threshold at 0.7 [47]. The analysis results of fsQCA provided three solutions: a complex solution, an intermediate solution and a simple solution. Compared to the complex and simple solution, it was easy to display the results of the intermediate solution. Therefore, the intermediate solution was chosen for the analysis in this paper [48]. The results of the configuration analysis are shown in Table 3. The blank signifies that the condition variable is not important in the configuration [49].

Table 3. Configurations for achieving high ESG performance.

Conditional Variables	Configurations					
	C1	**C2**	**C3**	**C4**	**C5**	**C6**
ECs	●	●	●	●	●	●
EGM	●	●	●		●	●
ETA	●	●		●	⊗	⊗
EP	●	●	●	●	⊗	●
PP	●	●	●	●	⊗	●
SW	●	●	●	●	●	●
BS			⊗	⊗	●	●
Lerner	⊗		⊗	⊗	⊗	●
RDR		●	Δ	⊗	●	⊗
Consistency	0.981	0.997	0.981	0.992	0.955	1.000
Raw coverage	0.242	0.237	0.228	0.196	0.060	0.124
Unique coverage	0.004	0.032	0.022	0.032	0.060	0.010
Overall solution consistency	0.960					
Overall solution coverage	0.439					

Note: "●" means that the condition exists, "⊗" means that the condition does not exist, "●" means that the condition is a core condition, "Δ" means that the condition is marginal and blank means that the condition is not important.

As can be seen from Table 3, there are six configurational conditions that improve ESG performance. The consistency results of the configurational conditions are 0.981, 0.997, 0.981, 0.992, 0.955 and 1. The overall consistency is 0.960, which is higher than the acceptable value of 0.8, indicating the adequacy of the configurational conditions. The coverage of the overall solution is 0.439. This implies that the six paths are better able to contribute to the ESG performance of construction enterprises, with an explanatory strength of 43.9%. The specific analysis is as follows:

1. C1 (EC*EP*SW*EGM*ETA*PP*~Lerner) shows that environmental goals and management play a central role. Environmental concepts, environmental training and action, employee protection, partner protection and social welfare are complementary to ESG performance. In particular, as governments continue to tighten environmental regulations, enterprises are being forced to meet government inspections [50]. The setting of environmental protection goals and management systems can be managed through the green design of products, the procurement of green materials, production and other processes [51]. By managing environmental protection in the whole process of construction, enterprises can reduce the risk of environmental pollution and environmental accidents [52].

In addition, a good environmental management system is able to improve the relationship between the enterprises and other stakeholders, such as the community [53]. The China Communications Construction Group (CCCG) is a successful example; during the construction process, the enterprise carries out the environmental protection goals strictly and constantly improves the environmental management system and standards. They are committed to building sound environmental projects by developing environmentally friendly technologies to reduce disturbance to the environment and the community [54].

Therefore, whether voluntarily or subject to governmental or external regulation, it is advantageous for enterprises to set environmental goals and management systems in order to improve environmental performance in the long term.

2. C2 (EC*EP*SW*EGM*ETA*PP*RDR) shows that environmental training and actions play a central role. Environmental concepts, environmental goals and management, employee protection, partner protection, social welfare and R&D investment are supportive to ESG performance. The agency theory suggests that corporations can make commitments to the environment, thereby reducing the gap between ownership and control [55]. For example, when enterprise incentives are rewarded for environmentally beneficial governance, the managers are more likely to develop ESG performance in operations and strategies [55]. For employees, environmental training organized by the enterprise can enhance employees' environmental awareness and motivation [56,57]. Environmental training provides employees with specialized skills and knowledge to address the complexities and challenges of environmental sustainability [57]. The efficiency of employees in practice will increase, which is favorable to improving the ESG performance [58]. Enterprises can guide employees to practice energy conservation in their work, such as by strengthening paperless office practices and purchasing green materials and products. Employees increase the possibility of green construction in practice, thus promoting excellent ESG performance.
3. C3 (EC*EP*SW*EGM*PP*~BS*~Lerner*~RDR) indicates that the core conditions are environmental concepts and partner protection. Environmental goals and management, employee protection and social welfare play a supporting role. The environmental concepts represent the attitude of construction enterprises to energy conservation and environmental protection. When environmental concepts penetrate into corporate culture, the environmental awareness of the enterprise will gradually strengthen. The long-term development strategy of an enterprise is also no longer confined to financial indicators [59]. During project construction, the promotion of green environmental concepts has not only become a new "business card" to help enterprises expand their market share, but also a means of support for enterprises to fulfill environmental protection practices in the process.

In order to maintain synergy with partners and achieve excellent ESG performance, construction enterprises can communicate with and manage partners, effectively integrating resources and resolving disputes [27]. For example, enterprises can help partners to enhance capacity. On the one hand, this behavior can contribute to the promotion of harmonious cooperation between the enterprise and the partner. On the other hand, it enables partners to produce products or services more efficiently, reducing quality defects and customer complaints [21,28].

4. C4 (EC*EP*SW*ETA*PP*~BS*~Lerner*~RDR) argues that construction enterprises can utilize the synergies of environmental concepts, environmental training and actions, the protection of employees and partners and social welfare to improve ESG performance. As a dangerous industry, it is essential to focus on protecting the rights of employees in construction [28]. There are a variety of measures protecting employees, such as health and safety protection, welfare protection, career development training and cultural communication [60]. These behaviors build a harmonious labor relationship and cohesive solidarity within the enterprise [61]. Employees gain a sense of fulfillment and happiness at work, which can have a positive effect on improving ESG performance and financial performance [62].

Construction enterprises can also use the characteristics of the industry to promote social sustainable development. For example, in the process of project construction, special industries can be developed for the project location. Enterprises can also make educational donations, provide disaster relief assistance or provide other social welfare according to local conditions [63]. Therefore, in C4, enterprises should comprehensively consider

allocating resources to these marginal conditional variables to enhance ESG performance in environmental and social dimensions.

5. C5 (EC*~EP*SW*EGM*~ETA*~PP*BS*~Lerner*RDR) reveals that construction enterprises can improve ESG performance by leveraging synergies between environmental concepts, environmental goals and management, partner protection, social welfare, board size and R&D investment. C6 (EC*EP*SW*EGM*~ETA*PP*BS*Lerner*~RDR) demonstrates that enterprises can also improve their ESG performance through the synergies of environmental concepts, environmental goals and management, employee protection, partner protection, social good, board size and corporate market competitiveness.

In the two configuration conditions, the board size has a certain promoting effect on improving the ESG performance. Specifically, the board size affects decision making in the enterprise [31]. When the board is too small, it is difficult for members to complement each other's knowledge and understanding of strategy. Corporations with larger boards are more likely to disclose more about sustainable management to stakeholders [64]. These enterprises encourage and emphasize the improvement of environmental and social sustainability issues to enhance corporate compliance [65]. However, studies have shown that enterprises operate less efficiently when the board size exceeds eight members [66]. This is because coordination difficulties between decision makers and slow decision-making are likely to occur [29]. Therefore, in order to curb greenwashing behavior more effectively, enterprises should control the number of board members to avoid coordination difficulties among members.

One of the current challenges for construction enterprises is that green technology is not complete [7]. Increased R&D investment by enterprises can provide more resources for green R&D activities. More innovations in technology can help enterprises to overcome more quality difficulties in construction activities and increase ESG performance [67]. Not only that, technological innovation enhances the core competitiveness of enterprises and enables them to obtain more development opportunities [68]. Accordingly, enterprises can have access to more resources to develop ESG performance. Therefore, enterprises of different sizes and ownerships pay different levels of attention to and devote different resources to ESG. In order to reduce the negative impact of construction activities on the outside world, enterprises should recognize the positive impact of R&D investment on ESG performance rather than focusing on short-term benefits.

4.4. Robustness Test

In QCA, robustness is tested by adjusting the anchor point of the calibration data, changing the case frequency, or increasing the consistency threshold [69]. This study chose to test the robustness of the configuration model by changing the case frequency threshold [70]. After adjusting the threshold from 2 to 3, two configurations were obtained, i.e., EC*EP*SW*EGM*ETA*PP*~Lerner and EC*EP*SW*EGM*PP*~BS*~Lerner*~RDR (Table 4). The two configurations were the original C1 and C3, respectively, and belonged to subsets of all the original configurations [71]. Therefore, the findings of this paper meet the requirements of the robustness test.

Table 4. The results of the robustness test.

Conditional Variables	Configurations	
	C1	**C2**
ECs	●	●
EGM	●	●
ETA	●	
EP	●	●
PP	●	●
SW	●	●
BS		⊗
Lerner	⊗	⊗
RDR		⊗
Consistency	0.981	0.981
Raw coverage	0.242	0.228
Unique coverage	0.076	0.063
Overall solution consistency	0.976	
Overall solution coverage	0.305	

Note: "●" means that the condition exists, "⊗" means that the condition does not exist, "●" means that the condition is a core condition, and blank means that the condition is not important.

5. Conclusions

The ESG performance of Chinese construction enterprises is at a medium level. In the long run, it is beneficial to both financial performance and external stakeholders for enterprises to actively improve ESG performance. Therefore, this paper explores how Chinese construction enterprises can improve ESG performance from the aspects of environment, society and governance by using the fsQCA method. Based on the sustainable development theory, the paper investigated environmental concepts, environmental goals and management, environmental training and action, employee protection, partner protection, social welfare, board size, market competition and R&D investment to test the configurations analysis, providing guidance for the formulation of strategies in terms of improving ESG performance.

5.1. Research Findings

(1) In Chinese construction enterprises, none of the individual conditional variables are necessary to lead to high ESG performance alone. This suggests that improving ESG performance in construction enterprises is a synergistic and complex process. It requires the collaboration of multiple conditions.

(2) The results show that the path to achieving high ESG performance consists of six types of configuration conditions. They are the environmental goals and management-led improvement path, the environmental training and action-led improvement path, the environmental concept and partner protection joint-led improvement path, the environmental and social level synergistic improvement path and the two multifactorial composite improvement paths. Among them, the environmental goals and management-led improvement path covers the largest number of enterprises. This indicates that setting feasible environmental goals and establishing a complete environmental management system play a more significant role in improving the high ESG performance for construction enterprises.

(3) Finally, environmental concepts, environmental goals and management, environmental training and action and partner protection are core conditions in C1, C2 and C3, respectively. This suggests that construction enterprises should first focus on the role of the environmental dimension and partner protection in improving ESG performance.

5.2. Research Implications

The theoretical contributions of this study include the following: (1) This study investigated the configurational role of nine conditions using sustainability theory, enriching the

theoretical research on ESG performance improvement in construction enterprises; (2) this study utilized the fsQCA method, which can effectively make up for the shortcoming of it being difficult to explore the synergies of the different conditions. The findings further expand the research related to ESG performance and enrich the application of sustainability theory in improving ESG performance for construction enterprises.

For practical implications, construction enterprise practitioners should emphasize the core roles of environmental concepts, environmental goals and management, environmental training and action and partner protection. Environmental sustainability is the main concern of the government and society. When corporations have limited resources to devote to ESG performance improvement, they can focus on the four key conditions. Construction enterprises should make a solid conceptual foundation for environmental protection, set up a reasonable environmental goal and management system and utilize the leading role of environmental training and action. Furthermore, construction enterprises should keep a focus on the partners' protection to maintain stable and friendly cooperative relationships. In addition, construction enterprises should recognize the complementary relationship between various conditions, and formulate strategies according to their own governance structures and resources. This can be combined with the enterprise's development strategy to maximize the use of limited resources to improve ESG performance. Finally, the government can set up more funds to encourage enterprises to continuously improve ESG performance. The government should also establish a rigorous oversight agency to review the ESG ratings with relevant authorities to ensure authority and reduce fraud and greenwashing.

5.3. Limitations and Future Research

This study has the following limitations. Firstly, this study only explores one industry. Future research could conduct a comparative analysis of ESG performance improvement across industries. Secondly, this study is a static analysis. In the future, the changing rules of ESG performance can be explored from a dynamic perspective.

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