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Corporate Social Responsibility Activity Combinations for Sustainability: A Fuzzy Set Analysis of Korean Firms

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Abstract: We examine how combinations of corporate social responsibility (CSR) activities yield high performance in Korean companies by addressing two related questions to expand our limited knowledge. First, what combinations of CSR activities yield high performance? Second, how do CSR activities form an interdependent system based on different corporate contexts? We draw the 2012–2018 data from the Korean Economic Justice Institute index for a fuzzy set qualitative comparative analysis. The results reveal several effective CSR activity factor combinations under the given strategies and management environments. Companies with a high performance exhibit complementarity between social contribution, environmental management, fairness, and employee satisfaction. By contrast, companies with a low corporate performance show no complementarity between relatively unrelated activity factors. For companies with a low financial performance from CSR activities, most of the causal pathways focus only on activities at the primary stakeholder level, with weak diversity of CSR activities' combinations at the primary and secondary stakeholder levels. These results indicate not only the appropriateness of CSR activity factor combinations for companies' strategy and management environment contexts, but also their effectiveness, and are expected to provide companies with significant implications for CSR activities.

Keywords: comparative analysis; complementarity; corporate social responsibility; CSR; fsQCA; fuzzy set qualitative; sustainability

1. Introduction

In recent years, managers have been required to gain profound and nuanced comprehension of strategic environments and practices to achieve increasingly complex economic, environmental, and social goals [1]. The nature of a company's strategic priorities has become imperative to securing sustainability under stiff competition. The key success factors in corporate management over the last few decades have shifted from traditional economic factors—such as low cost, high quality, and fast and reliable delivery [2–5]—to more sophisticated, comprehensive factors, such as corporate social responsibility (CSR).

Companies now consider CSR a solution to issues of corporate sustainability, and, thus, invest substantial capital and effort into CSR activities. Research on CSR as a sustainability practice has largely clarified three positions: That CSR activities contribute to increased corporate value [6–9], that the converse negatively affects corporate value [10,11], and that CSR activities do not have any

effect on corporate value [12,13]. However, these propositions have been converging toward a singular argument: Recent CSR activities have had positive effects on corporate performance.

In the extensive literature on Korean CSR activities, most scholars use an approach that distinguishes the actual effect of the relationship between CSR activities and business performance [14–18]. Though these studies have been relatively successful in identifying the relationship between CSR activities and business performance, a rigorous understanding of the choices and consequences of combinations of CSR activity factors in different entrepreneurial contexts is lacking. Furthermore, prior studies on CSR and performance are limited by the difficulty of identifying which CSR activity factors affect corporate performance when measuring a single index that sums CSR activity factors at the corporate level [19,20].

Through this study, we expand the limited knowledge in this area by answering two related questions. First, what CSR activity combinations yield high corporate performance? The implicit assumption here is that—by combining the results of independent analyses of CSR activity factors, one can understand the combination of CSR activity factors that are effective [21]. However, observing the co-existence of a combination of CSR activities does not imply interdependence among the activity factors [22]. Therefore, the second question deals with identifying how CSR activity factors form an interdependent system depending on diverse corporate situations. Since the effects of individual factors are context-dependent, a company's strategic situation possibly affects the degree of interdependence among activity factors [22]. For example, the observed CSR activity factors that play a complementary role in one strategic situation may be irrelevant or substitutes in other situations.

This study uses constructive logic and complementarity theory—these approaches assert that CSR activity factors combine in various ways that eventually lead to high corporate performance. For the first research question, we use fuzzy-set qualitative comparative analysis (fsQCA) to reveal which CSR activity factors are relevant, or redundant, to yield high performance in specific situations [23]. We demonstrate that, in such situations, companies can combine CSR activities in numerous ways, though not all combinations of CSR activity factors will improve performance.

Note that the results of the first analysis alone do not directly establish interdependence. Instead, the comparison of similarities and differences regarding specific combinations of CSR activity factors that are effective, helps us identify the factors that are mutually complementary or substitutable. Based on this comparison theory, we explain how and why certain factors in a combination of observed CSR activity factors work interdependently [22,24]. (As Grabner and Moers [22] (p. 408) argue: "The complementarity theory is suitable to address issues related to CSR activities as a system because the theory explicitly addresses how a decision-maker tries to maximize "performance" by (simultaneously) deciding on multiple-choice variables.").

The remaining article proceeds as follows. First, the combination and complementarity of CSR at the corporate level are identified and the key dimensions discussed. Then, fsQCA is used to identify the combination of causal conditions and CSR activity factors that drive good corporate financial performance within a formalized CSR model. Finally, the main findings are discussed along with their implications for comparative CSR and corporate strategic research.

2. Literature Review

2.1. CSR and Sustainability

Bowen [25] believes that entrepreneurs' social responsibility is to meet all social expectations. He stresses that social responsibility is more important in the relationship between business and society and that maximizing social welfare supersedes corporate profitability [25] (p. 6). Since then, scholars have proposed numerous definitions of CSR [26–34]. Nevertheless, all firms should prioritize CSR activities and their relationships with stakeholders (employees, customers, suppliers, local communities, government organizations, etc.). Further, they should integrate economic, social, and environmental issues in their business models to inculcate responsible citizenship

(both economically and socially). We define this as "the company's efforts to fulfill its corporate social responsibility by voluntarily participating in actions and by complying with laws to enhance social as well as company interests." This is consistent with the integration of economic, legal, ethical, and philanthropic responsibilities in corporate decision-making [28,34].

Corporate sustainability is closely related to CSR. In this regard, sustainability refers to meeting "the needs of the present without compromising the ability of future generations to meet their own needs" [35] (p. 16). However, each company's perception of sustainability varies. Some might argue that sustainability requires maintaining the output against growing demand, whereas others might emphasize maintaining a desirable way of life for the future. Still, others might focus on striking, and then preserving, an ecological balance [36]. A broader view of sustainability encompasses all of these nuances, suggesting that sustainability interacts with the environment such that future generations can circumvent the negative repercussions of heightened economic development [35–37]. Corporate sustainability constitutes both internal and external drivers. Internal drivers might include the company's strategy, organizational culture, and the appropriate use of resources, whereas external drivers include rules and regulations, social values and norms, as well as the markets represented by all stakeholders that interact with the company and respond positively or negatively to the initiatives [38].

Though CSR and corporate sustainability are distinguishable [39], they are often used interchangeably [40,41]. According to a report by Klynveld Peat Marwick Goerdeler (KPMG) [40], 14% of the world's top 100 companies use the term "corporate responsibility," 25% use "corporate social responsibility," and 43% use "sustainability." A survey by the Korean Standards Association [42] reports that 73.1% of Korean companies use "corporate sustainability" in the title of their reports on CSR activities (management, possibility, feasibility of sustainability, etc.). Additionally, 7.3% use "CSR" and 19.6% use, among other terms, "social responsibility management," "social responsibility," and "creating shared value" (CSV). (Porter and Kramer [9] (p. 6) define CSV as follows: "The concept of shared value can be defined as policies and operating practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions in the communities in which it operates." Note that the CSV concept in our study does not replace CSR, but suggests a successful approach as a type of strategic CSR. For example, Freeman's [31] stakeholder theory, Bonini and Emerson's [43] blended value, Hart's [44] sustainable value, Elkington's [45] triple bottom line, and Prahalad's [46] bottom-of-pyramid all emphasize that both corporate economic and social values must be co-created to be sustainable while also balancing stakeholder value creation. As highlighted in the bottom-of-pyramid strategy, pioneering new markets create shared value by meeting social needs through a "blue ocean." Project Shakti from Hindustan Unilever, M-Pesa from Vodafone, and Nestlé coffee farms are considered good examples of economic value creation in poor countries. They enabled corporate social value while enhancing economic sustainability. Similarly, other companies have generated shared value through CSR—for example, Denmark's Novo Nordisk or GE's Ecomagination. Finally, Porter and Kramer [8,9] should be acknowledged for their contribution to the development of the CSR concept and the corresponding strategic approach, as they reinforce the discussion of existing CSR concepts and terminology [47].) In practice, however, these names are used indiscriminately, so we avoid distinguishing between CSR and other sustainability concepts.

2.2. CSR Activities and Firm Performance

Heal [48] argues that CSR has various effects on corporate performance and value. CSR activities can reduce information risk to stakeholders and mitigate conflicts with them, thereby reducing corporate risk and lowering capital costs [48–52]. Moreover, a company's service to society and its concern for the environment enhance its reputation and help improve its relationships with regulators. Efforts to respect human rights through organizational CSR activities lead to improved productivity through better working conditions and employee satisfaction. In addition, CSR disclosures that seek to bridge communication gaps between companies and their stakeholders have a positive impact on

corporate performance. In particular, developed countries better understand the importance of CSR disclosures than developing countries do [53,54].

The perspective that favors CSR activities argues that striking a balance between both shareholder and stakeholder interests has a positive effect on corporate sustainability. Businesses can improve their performance when CSR activities meet the expectations and needs of various stakeholders. Enhancing corporate reputation through CSR activities positively affects corporate performance, whereas unsatisfied stakeholders could negatively affect corporate performance because of increased risk awareness [55]. For example, a company's CSR activity can be an opportunity to absorb new knowledge, which improves company performance [56]. At the same time, inconsistent CSR implementation cannot ensure that knowledge is fully absorbed and consumed. The latter issue also affects corporate performance adversely through unreliability, thus further impeding subsequent CSR implementation [57]. Therefore, for a company to successfully implement CSR initiatives, it should consider the individualities of various primary and secondary stakeholders as well as prioritize resource allocation and communication based on the company's contextual factors [7,57–59]. Knowledge of CSR strategies is critical to all stakeholders should the company seek positive outcomes in corporate performance through CSR activities [60].

On the contrary, excessive investment in CSR could damage corporate value, and thus hinder performance. This conventional economic perspective argues that CSR activities are a type of expense with little effect on enhancing shareholder value. These activities might then be abused to enhance private shareholders' reputations [11,61].

Contrary to these two positions, scholars argue there is no direct relationship between CSR and corporate performance [12,13,34,52,57,62]. Along these lines, Lys et al. [13] investigate whether the effect of CSR on financial performance is an investment or a signal. They argue there is no causal relationship between CSR and financial performance. The authors state that prior studies establishing a positive association have been misinterpreted.

2.3. Complementarities in a Firm's CSR Activities

Over the past two decades, a considerable amount of research has been conducted on the relationship between CSR and the financial performance of Korean companies. Most of this research has been conducted from a stakeholder- or resource-based view. These studies suggest the role of successful CSR at the individual level. Though surveys of this nature can meaningfully prove the validity of the concept, it is still challenging to pinpoint the relative effects and interactions among factors, largely because success factors are multidimensional and diverse [63–66].

The concept of complementarity is generally theorized around the internal suitability for interactions among different organizational attributes. It is defined as the relationship among factors—that is, introducing one factor increases the value of introducing another factor.

Complementarity exists among actions, or factors, when increasing the level of one activity, or factor, increases the marginal return from an increase in the level of another activity or factor [24,67] (Complementarity theory basically deals with "fit," similar to traditional organizational, contingency, or configuration theories [68]. However, unlike the contingency theory, which focuses on the one-to-one fit between two variables, complementarity theory emphasizes multiple variables holistically. It holds that improving individual variables does not improve corporate performance. Though the theory of construction focuses on finding effective archetypes by considering multiple variables, complementarity theory focuses on identifying unique interactions of individual variables and their effects on corporate performance [69].). It allows firms to achieve higher performance because multiple actions, or factors, are simultaneously incorporated. Similarly, when the level of one action, or factor, is increased, there is a substitutive effect among the actions, or factors, when the marginal return from the level of another action, or factor, is reduced [70].

Nevertheless, complementarity theory does mandate all factors to be considered for achieving higher corporate performance [69]. Rather, the conditions of the introduction of variables, or strategies,

that are not complementary can reduce corporate performance. For example, in the absence of complementarity between strategies of internal and external knowledge sourcing (Knowledge sourcing is a process of accessing and acquiring the knowledge required to improve corporate performance. It is divided into internal and external knowledge sourcing based on corporate boundaries [71,72]. Internal knowledge sourcing refers to an approach that helps create corporate value by creating new knowledge based on unique, corporate-specific knowledge within the company [73]. External knowledge sourcing, on the other hand, refers to an approach wherein new knowledge that a company does not already have is acquired from outside and spread throughout the company [74].), the choice of the strategy itself can make it difficult to secure a competitive advantage, as there is a risk that the company might lose the strengths or opportunities it possesses [74–76].

In general, the less diversity there is among activities in the same system, the better, because complementarity arises from similarities [77]. Contrary to the basic logic of complementarity, Grandori and Furnari [78] suggest there is no theoretical reason for complementarity to arise from similarities. They insist and prove that other kinds of activities might be successfully combined. Whittington et al. [69] show that the wider and more differentiated a set of practices already introduced, the higher the corporate performance. As a result, Grandori and Furnari [78] argue that marginal profits for increasing organizational homogeneity could be reduced and even become negative. In other words, given CSR activities are expensive to implement, too many redundant and closely linked activity factors can lead to excessive CSR activities, which may adversely affect financial performance [57,79].

3. Research Methods and Variable Description

3.1. Data Analysis: fcQCA

We use fsQCA to identify the causality among variables by comparing and analyzing the differences and similarities of social phenomena, or cases, in empirical studies. fsQCA focuses on a joint causal system that allows for the full effect of interactions among individual characteristics in a case, rather than considering other independent variables as constant and the effect of one on a dependent variable [23,80]. Although fsQCA was originally developed to derive inferences from a small number of cases, it has been increasingly applied to constructing and testing theories using larger datasets [23,81–86].

One of the main features of fsQCA is that it allows us to observe cases with a combination of conditions that jointly produce performance. This usefulness of the technique stands in contrast to traditional correlation studies that analyze the effects of a variable in isolation. Although interaction effects reinforce standard linear regression to assess nonlinear relationships, they assess the suitability of a single path to the results and do not explore the correspondence in detail [23,83]. Recent theoretical and empirical studies suggest that the use of fuzzy sets has many advantages over traditional regression methods when analyzing three or more interactions that drive performance [82,87–89].

In this study, we present cluster analysis (which does not present test statistics), profile deviation analysis, coverage (similar to R^2 values), and consistency (similar to p-values). Neither cluster analysis nor profile deviation analysis can determine which combination of results contributes to performance. However, fsQCA identifies the importance of CSR activity factors by identifying whether they are core, peripheral, or redundant [82,90] factors.

The fsQCA demonstration application has three main steps. (For information on this method, we refer to Ragin [23] (pp. 44–68), Schneider and Wagemann [91] (p. 126), and Bedford et al. [86] (p. 25–27).) The first step is to perform the most important calibration process. This task requires the specification of threshold values for each variable. The threshold values correspond to full membership, full non-membership, and the crossover point. Using these thresholds, the variable is readjusted from raw scores to fuzzy set configuration values between 0 (including complete ratios) and 1 (including complete ratios). (Using the specified threshold, the logistic function is used to convert the fuzzy set

score. Fiss [82] proposes adding a constant of 0.001 to the correction value of 0.5. This is necessary to prevent the loss of analysis in the crossover point [82,92].)

The second step is to convert the data into a truth table. The row of truth tables represents all possible combinations of CSR activity factors. The effect of CSR activities is expected to vary depending on whether weights are considered. In the truth table, each company is assigned a row based on the fuzzy set member scores of CSR activity factors. Once the firm is assigned, the truth table evaluates which combinations consistently lead to performance and which do not. The minimum frequency and consistency thresholds for this task need to be specified. Frequency refers to the number of businesses that must be observed in the row of truth tables. To avoid inferences from single observations, it is recommended that the frequency be in a group of at least two firms for small data and at least three firms for large data [83]. Consistency is measured by the extent to which companies sharing a given combination of CSR activity factors share the results of high CSR activity effects. Ragin [23] recommends 0.80 as the minimum threshold. In this study, the consistency threshold of the stakeholder-weighted (SW) CSR group is 0.885 and that of the equal-weighted (EW) CSR group is 0.824.

The final step is to determine the commonality among the combinations of CSR activity factors that achieve consistently high CSR activity effects by applying algorithms based on Boolean algebra. This process identifies the core, peripheral, or redundant factors of CSR activity. In theory, key factors are tightly integrated and linked to other factors. They support the core but are surrounded by loosely coupled peripheral practices. Duplicate activity factors are not important, because, whether or not they exist, they do not affect performance achievement. Based on these insights, Fiss [82] (p. 398) defines core activities as causal conditions that show strong causality with performance, and peripheral activities as elements with weak evidence of causality with outcomes. This emphasizes the relative importance of activities within the union. A core activity is a necessary part of a combination to achieve performance, but it may not be enough on its own unless it is combined with a particular surrounding activity. However, because the surrounding activities are weakly linked, companies can replace or exchange them, potentially creating various combinations with the same effect.

3.2. Variable Description

3.2.1. CSR Activities Index

One of the representative CSR activity indexes used in Korea is the Korean Economic Justice Institute (KEJI) index, developed by the KEJI and the Citizens' Coalition for Economic Justice (CCEJ) (The CCEJ is one of Korea's leading NGOs. It was established to monitor the moral management and social responsibility of Korean companies. For more information about the CCEJ and KEJI, please visit www.ccej.or.kr/eng/. Moreover, CSR index data may include socially irresponsible companies, which may reduce the quality of the data. However, Arribas et al.'s [93] survey report that the quality of data is improving due to a significant decrease in the proportion of controversial companies.) in 1991 to annually measure and report the CSR activities of listed companies using financial results. The KEJI index, which has been published for approximately 27 years, has maintained objectivity over a long period. It is the most widely used index for CSR performance in Korean CSR research.

In the beginning, the KEJI index announced only the top 200 companies, with a total score of 100 on seven items (soundness, fairness, contribution to social welfare, consumer protection, environmental protection, employee satisfaction, and contribution to the economy) and 58 indicators. Since 2012, the index has adjusted the indicators, weighting 73 indicators of 6 items (soundness, fairness, contribution to social welfare, consumer protection, environmental management, and employee satisfaction). It rates them on a 100-point scale and announces the top 200 companies after sorting them from the highest scores. This study used 1400 KEJI index data from 2012 to 2018 for the analysis. Table 1 reports the Korean Economic Justice Institute (KEJI) evaluation clauses.

Table 1. Korean Economic Justice Institute (KEJI) evaluation clauses.

Evaluation Clauses	Evaluation Index
Soundness (25%)	Governance, investment, and capital procurement
Fairness (20%)	Fairness, clarity, and relationship with others
Contribution to Social Welfare (15%)	Protection of neglected populations and supporting social welfare
Consumer protection (15%)	Protection of consumer rights, product quality, and advertisement
Environmental management (10%)	Commitment to environmental improvement, result of environmental commitment, and cases of illegal environment actions
Employee satisfaction (15%)	Investment in human resources, company benefits packages, gender equality, etc.

Source: Citizens' Coalition for Economic Justice, 2018, () refers to the weight.

The KEJI index assigns weights to six individual categories, limiting the maximum number of points that each category can have, which is somewhat arbitrary. This is because when companies allocate limited resources to CSR activities, they are influenced by their environment and strategy. Mandatory weighting of these individual categories can lead to problems that distort the company's actual intentions for CSR activities. Therefore, we converted the original scores of the individual KEJI index categories to a maximum of 100 points. For example, if the original score of health is 20, the health score is converted into 20 × (100/25) = 80 because the maximum score is 25 and the weight is 25% of the health category. This results in a maximum total score of 600 for the six individual categories.

The first proxy is defined as the sum of simple scores from the six KEJI activity categories:

$$\text{Equal} - \text{weighted(EW) CSR activity index}_{it} = \sum_{k=1}^{6} x_{ikt}, \quad (1)$$

where x_{ikt} is i-company's score for KEJI category k in year t with a maximum of 100 points, as described above. This method assumes that all firms consider CSR factors equally important. However, companies may have different interests, depending on the environment or strategy they face [19]. As a result, companies are likely to receive different scores for CSR categories by allocating resources to specific stakeholder areas of interest. As a result, the EW CSR activity index does not reflect the situation that the company finds itself in. To solve this problem, we use the CSR weighting method suggested by Akpinar et al. [94].

Akpinar et al. [94] propose CSR measures that reflect the relative importance of each stakeholder group based on the industry in which the individual company operates. To calculate the SW CSR activity index, we classify the sample companies into 15 sectors according to the Korean Standard Industry Classification (KSIC-9) (There are more sectors classified based on the KSIC-9, but this analysis used 15 sectors). The KEJI index scores for each of the six categories are added together to obtain a CSR activity composite score for a particular industry. The individual sums of each of the six categories are then divided by the total sum to calculate the weights of the six categories for each industry. After obtaining weights for all industries, we multiply the EW CSR activity index by the previously calculated weights to obtain the SW CSR activity index of all companies.

$$\text{Stakeholder} - \text{weighted(SW) CSR activity index}_{it} = \sum_{k=1}^{6} x_{ijkt} \times Weight_{jkt}. \quad (2)$$

The score of firm i in industry j in KEJI category k in year t can be calculated using x_{ijkt}. $Weight_{jkt} = \frac{Average_{jkt}}{\sum_{k=1}^{6} Average_{jkt}}$ and $Average_{jkt}$ are the average scores in industry j in KEJI category k in year t. As the equation shows, the overall CSR measures industry weights for a particular KEJI category compared with the industry's average performance. Since CSR activities are directed at the interests of key stakeholders, these weights can be interpreted as reflecting the interests of various stakeholders.

3.2.2. Corporate Financial Performance

One of the ultimate reasons that companies conduct CSR activities is to improve financial performance for sustainable business. A most commonly used financial result of a company's CSR

activities is a return on equity (ROE), which reflects its accounting performance. It is calculated as follows:

$$ROE = (Net\ Income/\ Total\ Equity) \times 100 \quad (3)$$

Should the ROE for companies with good CSR activities always achieve positive values? Even if a company performs well in CSR activities, it is possible that the ROE may be negative depending on changes in the business environment or market conditions. Thus, are the company's CSR activities ineffective in this case? The answer is in the negative. Rather, positive CSR activities result in a smaller loss than might otherwise have been incurred. However, the ROE of companies with good CSR activities should at least be larger than the industry average. Therefore, in this study, we use the adjusted ROE (AROE), which is the ROE of an individual company minus the sector average ROE, as its financial performance. The ROE adjusted to the industry average was calculated as follows:

$$AROE_{ijt} = ROE_{it} - MROE_{jt}, \quad (4)$$

where $AROE_{ijt}$ is the excess ROE of firm i in industry j in year t, ROE_{it} is the ROE of firm i in year t, and $MROE_{jt}$ is the industry average ROE of industry j in year t. A positive AROE is a high ROE and a negative AROE is a low ROE.

3.2.3. Calibration

Calibration refers to the adjustment made to conform to a reliable standard, which is a common way to standardize data in physics. One of the most important steps in fsQCA is the construction and correction of the fuzzy set. In fact, it is no exaggeration to say that the success of a fuzzy set analysis depends on this stage. The most commonly used calibration method is Ragin's direct method, which Ragin [23] (p. 85) describes as follows:

> "Fuzzy sets are calibrated using external criteria, which in turn must follow from and conform to the researcher's conceptualization, definition, and labeling of the set in question. External standards can be implemented in two different ways. Using the first, direct method, the researcher specifies the values of an interval scale that correspond to the three qualitative breakpoints that structure a fuzzy set: Full membership, full non-membership, and the crossover point. These three benchmarks are then used to transform the original interval-scale values to fuzzy membership scores. Using the second . . . The end product of both methods is the fine-grained calibration of the degree of membership of cases in sets, with scores ranging from 0.0 to 1.0."

(Breakpoints can specify 3, 5, 7, or 10 breakpoints, but most researchers use three breakpoints because the process of specifying 5, 7, or 10 breakpoints is difficult [23,80,91]. Mendel and Korjani [95], by contrast, note that the correction method may not explicitly explain the uncertainty of three or more breakpoints in the direct method.).

To calibrate the data accurately, the researcher must understand the change in the data and apply expert knowledge of what particular aspects of the change mean. We use the median values to convert to fuzzy set scores because they are free from extreme problems that might occur when using average values [96]. We calculate the calibration values according to the Ragin [23] (pp. 85–104) direct method using the fsQCA 3.0 software. Table 2 reports the thresholds for calibration.

Table 2. Anchor points for calibration (High adjusted return on equity (AROE) group).

Variable	Membership Function (Anchor Points) *	
	Stakeholder-Weighted CSR Activities Index	**Equal-Weighted CSR Activities Index**
Soundness	Calibration (15.12,12.59,10.42)	Calibration (74.70,67.94,59.36)
Fairness	Calibration (18.62,16.05,13.09)	Calibration (84.25,76.75,65.75)
Contribution to social welfare	Calibration (9.42,5.06,2.98)	Calibration (50.60,44.56,29.67)
Consumer Protection	Calibration (12.77,12.18,10.91)	Calibration (70.00,68.33,58.67)
Environmental Management	Calibration (8.27,7.11,6.00)	Calibration (61.00,51.50,45.50)
Employee satisfaction	Calibration (11.90,11.07,8.14)	Calibration (69.75,63.97,52.60)
AROE	Calibration (0.19,0.06,0.00)	Calibration (0.19,0.06,0.00)

* Anchor points are given in the following order: Fully in, point of maximum ambiguity, fully out.

4. Results

4.1. Data and Descriptive Statistics

We use the KEJI indexes from 2012 to 2018 to sample our CSR index. The KEJI index on 200 companies is published each year for their excellent CSR activities. We select all 1400 companies, which includes all 200 companies from each year (see Table 3). Most sample companies are manufacturing companies (1085), whereas 315 are from other sectors, including non-manufacturing and financial. Financial performance data for each company are obtained separately from FnGuide (FnGuide is the Korean Center for Research in Security Prices, which provides financial information, statistics, and analyses on companies registered with the Korean Stock Exchange and KOSDAQ (see, www.fnguide.com).). Common method bias is not a problem because independent and dependent variable data are collected from two different sources.

Table 3. Industry (KSIC-9).

Industry	N	%
Construction	24	1.71
Education	4	0.29
Finance and insurance	48	3.43
Agriculture, forestry, fishing, and aquaculture	5	0.36
Wholesale and retail trade	72	5.14
Real estate and rental	4	0.29
Business facilities management and business support services	7	0.50
Accommodation and food service	5	0.36
Arts, sports, and recreation-related services	1	0.07
Transportation	24	1.71
Electricity, gas, steam, and air conditioning supply	14	1.00
Professional, scientific, and technical	58	4.14
Manufacturing	1085	77.50
Publishing, electronic video, communication equipment, and information services	46	3.29
Associations and organizations, repairs and other personal services	3	0.21
Total	1400	100.00

Table 4 reports the descriptive statistics of our sample data. The average ROE of the sample companies is 6.1%, which is 4.6% higher than the industry average ROE. The company's ROE, which has a positive effect on CSR activities, is 13.2% ($AROE_{High}$) higher than the industry average ROE. However, the superior CSR activities do not mean that all companies have a high ROE, companies with poor CSR activities are found to be −7.9% ($AROE_{Low}$) lower than the industry average. This result suggests that not all CSR activities lead to higher financial performance and that an appropriate combination of CSR activities is required to achieve higher financial performance.

Table 4. Descriptive statistics (n = 1400).

	Mean	S.D	Min	Median	Max
ROE	0.061	0.26	−6.24	0.060	4.71
AROE	0.046	0.39	−5.67	0.017	6.37
$AROE_{HIGH}$	0.132	0.39	0.00	0.062	6.35
$AROE_{LOW}$	−0.079	0.36	−5.67	−0.027	0.00
SW CSR Activities Index	63.66	2.42	49.44	63.55	76.04
Soundness	12.79	2.39	7.98	12.49	36.11
Fairness	16.11	1.78	7.96	16.05	22.41
Contribution to social welfare	5.06	1.57	1.85	5.06	12.44
Consumer protection	11.94	1.04	6.26	12.18	15.75
Environmental management	7.01	1.80	0.00	7.11	12.45
Employee satisfaction	10.76	1.95	4.44	11.07	17.41
EW CSR Activities Index	366.58	18.70	278.99	367.32	424.74
Soundness	68.25	7.45	45.52	67.94	115.16
Fairness	76.78	9.89	43.75	76.75	86.75
Contribution to social welfare	42.82	9.89	18.33	44.56	81.87
Consumer protection	66.08	4.23	38.33	68.33	75.67
Environmental management	50.36	11.29	0.000	51.50	74.50
Employee satisfaction	62.61	7.72	33.40	63.97	78.72

Table 5 reports the result of calculating the weight of each CSR category by considering the CSR activities using Akpinar et al.'s [94] method. As shown in Table 5, the result reflects the characteristics of the sector well, the weights of health (weight = 25%) and consumer protection (weight = 20%) are the highest in the financial and insurance sectors, whereas environmental management is the lowest in these two sectors (weight = 2%). The KEJI index yields the highest weight (25%) to soundness, but the calculated weight of soundness is 19%, which is calculated by considering industry conditions. That is, companies place less importance on soundness than the KEJI index does. By contrast, companies are more concerned with consumer protection, environmental management, and employee satisfaction than indicated by the KEJI index.

Table 5. Mean weights by Industry (KSIC-9) and the KEJI category over 2012–2018 (n = 1400).

	Soundness	Fairness	Contribution to Social	Consumer Protection	Environment Management	Employee Satisfaction
Construction	0.18	0.21	0.13	0.18	0.14	0.16
Education	0.21	0.21	0.12	0.16	0.13	0.16
Finance and insurance	0.25	0.22	0.13	0.20	0.02	0.17
Agriculture, forestry, fishing, and aquaculture	0.18	0.22	0.14	0.18	0.14	0.14
Wholesale and retail trade	0.18	0.21	0.12	0.18	0.14	0.17
Real estate and rental	0.16	0.19	0.13	0.18	0.15	0.19
Business facilities management and business support services	0.19	0.19	0.13	0.17	0.14	0.17
Accommodation and food service	0.19	0.21	0.12	0.18	0.14	0.16
Arts, sports, and recreation related services	0.20	0.21	0.16	0.13	0.15	0.15
Transportation	0.18	0.21	0.12	0.18	0.14	0.17
Electricity, gas, steam and air conditioning supply	0.19	0.20	0.12	0.18	0.14	0.17
Professional, scientific and technical	0.18	0.21	0.13	0.18	0.14	0.18
Manufacture	0.18	0.21	0.11	0.18	0.14	0.17
Publishing, electronic video, communication equipment, and information services	0.19	0.20	0.13	0.17	0.14	0.17
Associations and organizations, repairs, and other personal services	0.20	0.19	0.14	0.15	0.16	0.15
Average	0.19	0.21	0.13	0.17	0.13	0.17
KEJI Index Weighted	0.25	0.20	0.15	0.15	0.10	0.15

As discussed above, effective CSR activities were expected to have a positive relationship with financial performance. Table 6 reports the correlation coefficients between CSR activity factors and financial performance as well as some preliminary information. Not all CSR activity factors have a significant relationship with financial performance. Additionally, whether the weight of a CSR

activity factor is considered affects the correlation among activity factors. For example, the EW CSR consumer protection activities show a significant positive correlation with ROE, but the SW CSR is not significant. In the EW CSR, soundness is not correlated with the ROE. However, in the SW CSR, it shows a significant negative correlation. Furthermore, some activity factors reveal that considering weight affects the relationship among activity factors (e.g., fairness, social contribution, and consumer protection) adversely. These findings suggest that CSR activities affect company performance differently, whether or not strategy and environmental considerations are involved.

Table 6. Pearson correlation coefficients (n = 1400).

Panel A: Equal Weighted CSR	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. Soundness	1.000	−0.249 ***	−0.108 ***	−0.354 ***	−0.213 ***	−0.270 ***	−0.032
2. Fairness		1.000	−0.067 **	−0.142 ***	0.091 ***	0.032	0.043
3. Contribution to Social Welfare			1.000	−0.171 ***	0.007	−0.278 ***	0.057 **
4. Consumer Protection				1.000	0.206 ***	0.050	0.079 ***
5. Environmental Management					1.000	0.253 ***	0.079 ***
6. Employee Satisfaction						1.000	0.007
7. AROE							1.000
Panel B: Stakeholder Weighted CSR	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. Soundness	1.000	−0.235 ***	0.228 ***	−0.302 ***	−0.416 ***	−0.352 ***	−0.056 **
2. Fairness		1.000	−0.016	0.059 **	−0.065 **	−0.123 ***	0.043
3. Contribution to Social Welfare			1.000	−0.269 **	−0.159 **	−0.510 **	0.053 **
4. Consumer Protection				1.000	−0.053 **	0.008	0.027
5. Environmental Management					1.000	0.179 **	0.075 **
6. Employee Satisfaction						1.000	−0.028
7. AROE							1.000

Note: * p < 0.10, ** p < 0.05, *** p < 0.01.

4.2. Combinations of CSR Activities for High ROE

We next perform a regression analysis to verify whether the six CSR activities have an overall effect on corporate performance before running a fuzzy set analysis. Table 7 reports the standardized regression coefficients and t-values from the ordinary least squares (OLS) regression. Of the six CSR activities in the SW (Model 1) and EW (Model 2) CSR models, employee satisfaction is found to have significant effects. However, most of the CSR activities do not have any significant effect. Since a company's CSR activities are performed in combination with a number of activity factors, adding interaction effects might produce different regression outcomes. We thus examine the potential interactions among CSR activities using fsQCA to determine whether a mixed composition of CSR activities could explain previous ambiguous and nondeterministic empirical results.

Table 7. OLS regression results for High $AROE_{High}$ firms (n = 829).

	Dependent Variable: $AROE_{High}$			
	Model 1 [a]		**Model 2** [b]	
	Coefficient	**t-Value**	**Coefficient**	**t-Value**
SOUND	0.019	0.403	0.029	0.745
FAIR	0.044	1.137	0.026	0.708
CONSOC	0.058	1.361	0.038	1.027
CONPRO	−0.010	−0.241	0.022	0.593
ENVMGT	0.047	1.218	0.038	1.067
EMPSAT	0.078	1.788 *	0.076	2.048 **
Adj. R^2	0.001		0.000	
F-value	0.907		1.054	
Sig. *F*	0.489		0.389	

Standardized coefficients reported. *SOUND* soundness, *Fair* fairness, *CONSOC* contribution to social, *CONPRO* consumer protection, *ENVMGT* environment management, *EMPSAT* employee satisfaction. a: Stakeholder weighed (SW) CSR index firms, b: Equal weighed (EW) CSR index firms. * p < 0.10, ** p < 0.05.

The fsQCA in Table 8 follows the method suggested by Ragin [23] and Ragin and Fiss [90]. The frequency threshold we use requires a threshold of at least 70–80% of the cases. Our data are large enough to capture more than 90% of cases by adopting a frequency threshold of 3. The results in Table 8 reveal that the seven CSR activities are fully linked to financial performance. We thus divide the results into two groups: SW CSR and EW CSR.

Table 8. Results of fuzzy-set qualitative comparative analysis (fsQCA) for achieving high performance (High AROE) for high corporate social responsibility (CSR) index firms (n = 829).

	High AROE (Sufficient Causal Conditions for High AROE)						
	Stakeholder-Weighed (SW) CSR Activities Index				**Equal-Weighed (EW) CSR Activities Index**		
CSR Activity	**SH1a**	**SH1b**	**SH2a**	**SH2b**	**EH1a**	**EH1b**	**EH2**
Soundness	●	⊗	⊗	●	●	●	●
Fairness	●	●			●	●	
Contribution to Social Welfare		●		●	⊗	●	●
Consumer Protection	⊗	⊗	⊗	●			⊗
Environmental Management	●		●		●	⊗	
Employee Satisfaction			●	●			●
Raw coverage	0.165	0.161	0.209	0.197	0.199	0.179	0.246
Unique coverage	0.016	0.014	0.008	0.001	0.050	0.014	0.025
Consistency	0.796	0.760	0.764	0.793	0.834	0.816	0.801
Overall solution coverage		0.594				0.511	
Overall solution consistency		0.885				0.824	

Solid circles (●) refer to the presence of CSR activities, circles with a cross (⊗) designate its absence, large circles represent core CSR activity, small circles represent peripheral CSR activities, and blank spaces indicate the CSR activities are redundant for achieving the outcome.

Overall, we find four causal pathways in the SW CSR and three causal pathways in the EW CSR (with causal pathways describing high corporate performance), each with a consistency above 0.8. The overall solution consistency is 0.885 for SW CSR and 0.824 for EW CSR. The coverage is in the acceptable range, with overall solution coverage at 0.594 and 0.511, respectively. The row coverages of the four combinations—SH1a, SH1b, SH2a, and SH2b—of the SW CSR are 0.165, 0.161, 209 and 0.197, respectively. The row coverages of the three EW CSR combinations—EH1a, EH1b, and EH2—are 0.199, 0.179, and 0.246, respectively. These results support the assertion that corporate CSR activities enhance corporate reputation, brand, and trust, attract customers and employees, and ultimately increase profitability and corporate value [8,9,57,97–99].

As Table 8 reports, the solutions we find illustrate that there are core and peripheral conditions as well as a neutral exchange of the two combinations. The existence of different solutions generally refers to the equifinality of solutions. Further, the neutral permutations in solutions SH1 (SH1a and SH1b), SH2 (SH2a and SH2b), and EH1 (EH1a and EH1b) indicate the existence of secondary equivalence in the solution type.

Regarding key conditions, solutions SH1a and SH1b indicate the presence of fairness, which carries the highest weight (21%) in CSR activity, whereas there is no consumer protection activity. The solution also shows a trade-off between social contribution and environmental management activities, which have the lowest weight (13%). Note that the solution refers to the "absence" of consumer protection activities under the causal conditions of SH1a and SH1b. Thus, when fairness is a key activity, companies can achieve high performance even without consumer protection activities. Solution SH1a suggests that implementing environmental management activities can lead to high or low social contribution activities. However, solution SH1b, by contrast, entails social contribution activities, but it is blank for environmental management. Solutions SH1a and SH1b thus indicate that high social contributions and an absence of high environmental management activities can be treated as substitutes.

Solution SH2 differs from SH1—that is, employee satisfaction is a key condition and fairness is not taken seriously. Conversely, solutions SH2a and SH2b—similar to SH1a and SH1b—indicate that high environmental management and lack of social contribution activities can be treated as substitutes. In addition, SH2a is not executed when conducting environmental management activities as core conditions, unlike SH1a, which is combined with environmental conditions.

Conversely, in contrast to SH1b, which lacks integrity as a key condition, SH2b combines the presence of soundness as a key condition. Thus, SH1 differs from SH2 because fairness and absence of consumer protection are key conditions in the former, whereas SH2 is critical in the absence of fairness and employee satisfaction. The difference in core CSR activities suggests that SH1 and SH2 are different approaches to achieving high financial performance in the SW CSR context.

By contrast, the fsQCA results of EW CSR companies show three high-performance solutions. Each CSR combination includes soundness as a key condition. EH1a and EH1b are key conditions for fairness, but they do not include consumer protection and employee satisfaction. EH2 includes social contribution and employee satisfaction as key conditions. Solutions EH1a and EH1b also show a trade-off between social contribution activities and environmental management. Specifically, solution EH1a is marked as absent from social contribution activities, but environmental management activities achieve high performance due to the presence of key activities.

By contrast, solution EH1b shows that social contribution activities exist as core activities, but environmental management is absent. Solutions EH1a and EH1b thus indicate that the absence of social contribution activities and the existence of environmental management can be treated as substitutes.

Furthermore, solution EH2 indicates that a combination of health, social contribution, and a presence of employee satisfaction, along with the absence of consumer protection, form a key condition and causal combination that does not value fairness and environmental management activities but still achieves high performance. Comparing the results of SW CSR and EW CSR reveals that the combination of CSR activity factors depends on the weight of CSR activity factors, which, in turn, depends on the strategy and situation of the company.

4.3. Combinations of CSR Activities for Low ROE

In fsQCA, the set of causal conditions that leads to performance is different from the negation of the set of conditions that leads to the absence of performance. Unlike in regression analyses, if the inverse of the performance is used, the result does not change except for the sign of the coefficient [60]. Considering the characteristics of fsQCA, we analyze the causal conditions leading to low ROE. Table 9 reports the results.

Prior studies argue that despite high CSR activities, the relationship between CSR and financial performance is negative [100] or there is no causal link at all [13]. In this regard, we define four paths to SW CSR and two paths to EW CSR, leading to low ROE.

The overall solution consistency that leads to low ROE in SW and EW CSR activities is 0.809 and 0.887, respectively. The coverage is in an acceptable range and the overall solution coverage is 0.685 and 0.393, respectively. The row coverages of the four combinations—SL1, SL2, SL3a, and SL3b—of the SW CSR are 0.255, 0.254, 0.382, and 0.381, respectively. The row coverage of the two combinations—EL1 and EL2—of the EW CSR are 0.327 and 0.324, respectively. Thus, CSR activities can lead to lower financial performance.

Regarding core conditions, solution SL1 carried out CSR activities by combining soundness and environmental management activities, but no fairness (21%) and consumer protection (17%) activities are heavily weighted by SW CSR companies. By contrast, solutions SL1 and SL2 do not consider the social contribution, which could be used as a substitute in solutions SH1a and SH1b. This is also true for employee satisfaction activities. This combination represents a causal condition that leads to low performance.

Table 9. Results of fsQCA for achieving low performance (Low AROE) for High CSR index firms (n = 571).

	High AROE (Sufficient Causal Conditions for High AROE)					
	Stakeholder-Weighed (SW) CSR Activities Index				**Stakeholder-Weighed (SW) CSR Activities Index**	
CSR activity	SL1	SL2	SL3a	SL3b	EL1	EL2
Soundness	●	⊗		●	●	●
Fairness	⊗	⊗		●		
Contribution to Social Welfare			●		●	●
Consumer Protection	⊗	⊗				
Environmental Management	●	●	⊗	⊗	•	⊗
Employee Satisfaction			⊗			
Raw coverage	0.255	0.254	0.382	0.381	0.327	0.324
Unique coverage	0.009	0.009	0.016	0.023	0.069	0.066
Consistency	0.883	0.881	0.858	0.881	0.903	0.896
Overall solution coverage			0.685		0.393	
Overall solution consistency			0.809		0.887	

Solid circles (●) refer to the presence of CSR activities, circles with a cross (⊗) designate its absence, large circles represent core CSR activity, small circles represent peripheral CSR activities, and blank spaces indicate the CSR activities are redundant for achieving the outcome.

Solution SL2 shows that CSR activities are not combined with other activities. Further, only environmental management activities are present, whereas soundness, fairness, and consumer protection activities are absent. Besides, social contribution activities and employee satisfaction activities could be high or low.

Solution SL3a is a core activity with social contribution activities, but no environmental management and employee satisfaction activities. Meanwhile, soundness, fairness, and consumer protection activities could be high or low.

However, in solution SL3b, we find a combination of soundness and fairness, a lack of environmental management activities, and that social contribution, consumer protection, and employee satisfaction activities are unimportant. For EW companies, EL1 and EL2 combine soundness and social contribution activities, indicating a combination with the absence of environmental management activities in the surrounding conditions. However, this causal condition is a powerful factor in achieving low performance, with row coverage of 0.327 and 0.324, respectively.

As shown in Table 9, there are no special combinations except for the four cases presented in the SW CSR (SL1, SL2, SL3a, and SL3b) and the two cases in the EW CSR (EL1 and EL2). Overall, our results appear to be limited in the number of firm configuration choices leading to high financial performance (Table 8) or the number of known causal combinations with respect to low financial performance.

5. Discussion and Conclusion

This study investigated combinations of CSR activities that are effective in achieving corporate sustainability. It aimed to establish a bridge between studies that do find positive results [48–52] and those that find no effect [12,13,34,52,57,62,101]. We aimed to provide empirical evidence indicating that the combination of CSR activities supports and identifies complementary constructs.

In the study, Table 8 presents seven solutions for achieving high performance. The results reveal that at least two CSR activity factors are required for SW CSR, three or more CSR activity factors are needed for EW CSR, and that these activity factors can be substituted (there is a functional equivalence between combinations SH1a, SH1b, SH2a, and SH2b and between combinations EH1a and EH1b). There is a difference in the minimum number of activity factors between SW CSR and EW CSR. Though soundness activity factors must exist in EW CSR, they may not exist or do not have to exist in SW CSR. This difference depends on whether resources are allocated according to the company's environment and strategy.

Our use of the fuzzy aggregation method in combining CSR activities enables the exploration and mapping of complementarity within the context of CSR. This new methodological approach can provide a new starting point for interpretations of phenomena that are not currently described in the combination of CSR activities. To date, many CSR studies have focused on measuring companies' CSR levels as a single index that sums the CSR activity factors, and only then focuses on the resulting corporate performance. However, this approach is limited: For instance, it is difficult to identify which CSR activity influences the performance of the company. If CSR is performed through a combination of various factors, the more ordered the combinations, the better the effect [24]. Thus, our study assumes that complementarity effects are generated among ordered combinations. For example, when conducting intensive CSR activities to enhance sustainability, all basic CSR activity factors, such as soundness, fairness, social contribution, consumer protection, environmental management, and employee satisfaction, are expected to be high. It assumed that the higher the activity level of these factors, the stronger the complementarity and, ultimately, the higher the corporate performance.

As Table 8 reports, there is a complementarity between social contribution and environmental management related to environmental activities (key factors of corporate sustainability in both SW and EW CSR activities) and between fairness and employee satisfaction. By contrast, we find no empirical basis for complementarity among relatively heterogeneous activity factors (e.g., soundness and environmental management, excluding SL3a). This result is inconsistent with Grandori and Furnari's [78] claim that complementarity can occur in both similar and discriminatory activities.

An effective approach to CSR activities is, to begin with, primary stakeholders and gradually expand to the secondary stakeholder level [57,101]. As Table 8 reports, the causal route of the solution is the combination of the key elements, which include CSR activities at the primary (health, consumer protection, environmental management, and employee satisfaction) and secondary (fairness and social contribution, etc.) stakeholder level, which lead to high financial performance. Conversely, Table 9 shows that the causal route of the solution is either mostly focused on CSR activities at the primary stakeholder level, or shows weak diversity of CSR activity combinations at the primary and secondary stakeholder levels. This is particularly true for SW CSR companies. If a company requires CSR activities based on its business environment and strategy, it is not strategic and, thus, focused on problem-solving. The company may not fully enjoy the effectiveness of CSR activities. This result is consistent with Tang et al.'s [57] argument—that is, companies are better served by generating profits through long-term, consistent coherent CSR activities at the primary to secondary stakeholder levels.

Despite our significant findings, this study has some limitations. First, we did not completely overcome causal ambiguity, even though we used QCA to analyze causal complexity. QCA is a suitable method for identifying combinations that match enough to drive results, but it does not avoid the illogical blend of combinations and results. For example, sustainability is affected by the performance of a company's CSR activities. However, in some cases, sustainability leads to CSR activities. In other words, the level of corporate sustainability may determine the level of CSR activity.

Second, QCA is suitable for the study of complex causality and multiple interactions. However, the number of theoretically possible combinations increases exponentially because it is based on a complete interaction model that considers all possible configurations. (See Marx [102] and Marx and Dusa [103] for benchmarks on the appropriate ratio of causal conditions in the cases.) Therefore, the number of cases available has to limit the number of causal conditions that can be analyzed simultaneously. The investigator must be careful to ensure that there is sufficient freedom to avoid over-determining the results.

Third, the CSR activities of companies used in our research are measured using CCEJ's measurement system. For example, the KEJI index used herein is one of the most reliable multi-dimensional CSR measures available in Korea. The status of the members' CSR awareness level, among other items, was not measured. Therefore, we could not grasp the relationship between corporate CSR activities and corporate performance in different contexts.

Compared with a long-term study of the relationship between CSR activities and financial performance, the study of the role of sub-items of CSR activities is a relatively new topic. We look forward to more active research on CSR sub-categories as well as growing academic and industry interest in this topic. To this end, we recommend the following future avenues of research. First, a study on the role of CSR sub-details must be conducted. Our study examined the role of six KEJI index categories. For a deeper analysis, we must analyze the roles of the sub-categories that constitute these six categories (In our study, data on the 73 sub-categories were not used because of limited availability).

Second, a study on the direction of CSR activities according to company context should be conducted. Resource allocation in each company depends on company environment and strategy, which, in turn, would affect corporate CSR. So far, CSR studies have mostly examined the role of CSR activities without focusing on environment or strategy. Further research in this regard could provide managers with significant implications for CSR activities, especially when combined with the first suggestion for research. We hope to continue divergent explorations in CSR research.

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