

Corporate Governance Configurations and Corporate Social Responsibility Disclosure: Qualitative Comparative Analysis of Audit Committee and Board characteristics

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Abstract

Drawing on the complexity theory and responding to the recent calls to use such creative methods that mix between a quantitative and qualitative approach. Therefore, this study fills the literature gap, adding novelties, showing evidence from the unexplored (or underexplored) European context and, consequently, shedding light to inconclusive results in previous research concerning the effect of audit committee (AC) and board characteristics on corporate social responsibility (CSR) disclosure by applying a novel research methodology: the fuzzy set qualitative comparative analysis. The data were collected from Eikon database for a sample of the top 69 non-financial European companies (based on market capitalisation) for the period 2016–2018. The study results support the equifinality and complexity tenets of complexity theory. It also suggests that CSR disclosure relies on a complex configuration of some AC attributes, for example, independence, financial expert member, chair independence, size and activity, and other board characteristics (independence, gender, size, activity, and Chief Executive Officer (CEO) duality). These characteristics play a leading part as a recipe ingredient and, in an appropriate combination, promote achieving high CSR disclosure levels. Our empirical results offer multidimensional and valuable insights for professionals, regulators, and policymakers in establishing and revising the guidelines regarding the AC and board of directors' composition.

1 INTRODUCTION

Corporate social responsibility (CSR) is one of the critical issues that has been brought to the fore by corporate governance (CG) in the recent decade; this is mainly because of its role in showing a company's commitment towards CG and ensuring its public accountability (Jo & Harjoto, [2011](#)). As a fundamental CG feature, the board of directors has a critical function in aligning management concerns with those of stakeholders (Harjoto, Laksmana, & Lee, [2015](#)). Shareholders elect board of directors to control and manage companies' matters (Monks & Minow, [2008](#)). However, the efficiency of the board's supervisory role is measured among various board characteristics (Brick, Palmon, & Wald, [2006](#); Shahzad, Rutherford, & Sharfman, [2016](#)). Thus, board characteristics are expected to affect the CSR level.

One of the most critical CG controlling mechanisms is audit committee (AC) that its existence and characteristics would enhance board oversight, improve auditors performance, and reduce the asymmetry of information between managers and different stakeholders, hence, improve the level of companies' disclosures, such as CSR (Mangena & Pike, [2005](#)). The traditional AC role is primarily concerned with mandatory financial disclosure; however, after corporate financial scandals such as Enron in the United States, this role has expanded into non-financial disclosure including CSR (Kolk & Pinkse, [2010](#)). One of the factors that enhanced the quality and transparency of financial reporting is the adoption of the international financial reporting standards, which has also enriched the wider ACs role in monitoring both the compulsory and voluntary disclosures such as CSR (Appuhami & Tashakor, [2017](#)). A variety of authors indicate that the existence of AC enhances CSR disclosure (Barakat, Perez, & Ariza, [2015](#); Khan, Muttakin, & Siddiqui, [2013](#); Said, Zainuddin, & Haron, [2009](#)).

The literature on the connection between CG and CSR has grown expeditiously in recent years (i.e., Bear, Rahman, & Post, [2010](#); Jo & Harjoto, [2011](#); Khan et al., [2013](#); Jizi, Salama, Dixon, & Stratling, [2014](#); Fernandez-Feijoo, Romero, & Ruiz-Blanco, [2014](#); Setó-Pamies, [2015](#); Cucari, De Falco, & Orlando, [2018](#)). Nevertheless, most of these works have been dedicated to investigate the impact of firm characteristics (Muttakin, Khan, & Subramaniam, [2015](#)), board characteristics (Bear et al., [2010](#); Frias-Aceituno, Rodriguez-Ariza, & Garcia-Sanchez, [2013](#); Khan et al., [2013](#)), and ownership structure (Majeed, Aziz, & Saleem, [2015](#); Pucheta-Martínez & López-Zamora, [2018](#)) on CSR levels. However, few authors have addressed the impact of AC characteristics on CSR. Among these efforts, Appuhami and Tashakor ([2017](#)) investigate the influence of AC attributes on CSR disclosure using multiple regression. Other work conducted by Al-Shaer and Zaman ([2018](#)) examines the impact of AC characteristics on the credibility of sustainability reports. More recently, Buallay and Al-Ajmi ([2019](#)) investigate the role of AC on the extent of sustainability reporting.

Nevertheless, the majority of previous works in the line of CG and CSR indicate inconclusive results. The plausible explanation of these results is that the overwhelming majority of these works use symmetric methods (such as regression analysis) to examine hypotheses, and they assume that the effect of independent variables on the outcome is necessary and sufficient to predict the outcome (Cuadrado-Ballesteros, Martinez-Ferrero, & Garcia-Sanchez, [2017](#)). In this regard, Jain and Jamali ([2016](#)) call for the use of more creative methods; for instance, fuzzy set qualitative comparative analysis (fsQCA) that mix between quantitative and qualitative approach. Furthermore, Paniagua, Rivelles, and Sapena ([2018](#)) argue that QCA could resolve the inconclusive results and recognise the complex connections between antecedents. According to Cucari ([2019](#)), applying QCA in CG research could be crucial in determining the configurations of attributes that produce a better CG. Several scholarly articles have used fsQCA in CG field. For instance, most of these articles have been dedicated to investigating the influence of specific CG characteristics on corporate financial performance (Felicio, Rodrigues, & Samagaio, [2016](#); Garcia-Castro, Aguilera, & Ariño, [2013](#); Misangyi & Acharya, [2014](#); Paniagua et al., [2018](#); Pinto & Picoto, [2016](#)), level of company risk reporting (Carmona, Fuentes, & Ruiz, [2016](#)), and investors' reactions (Campbell & Sirmon, [2016](#)). Besides, the interest of using the QCA method in CG field is increasing; this is shown in the number of high ranked journals that have published a number of articles in recent years (Cucari, [2019](#)). Hence, this result emphasises the increasing awareness toward the relevance of using QCA in CG research.

On the other hand, as far as our knowledge goes, only Cuadrado-Ballesteros et al. ([2017](#)) and Samara, Jamali, Sierra, and Parada ([2018](#)) connect CG characteristics and CSR by using fsQCA. Cuadrado-Ballesteros et al. ([2017](#)) use fsQCA to investigate the impact of board and other firm characteristics on CSR performance for 471 non-financial U.S. companies. They conclude that CSR performance does not necessarily rely on particular board characteristic, but on certain configurations of such characteristics. More recently, Samara et al. ([2018](#)) investigate the optimal of CG antecedents (family ownership, family participation in management, and outside directors) that could influence the environmental social performance level of family companies. Other studies apply symmetrical and asymmetrical (fsQCA) approaches (i.e. Khan, Ali, Olya, Zulfqarnain, & Khan, [2018](#)), they use a CSR as a mediator for the association between transformational leadership and organisational execution.

Hence, our study aims to explore the combinations of AC and board characteristics that may attain high CSR disclosure levels, depending on the complexity theory. This goal is adopted for a sample of the top 69 non-financial European firms (based on market capitalisation) for the

period 2016–2018, depending on Eikon database. Using fsQCA, our results reveal that gaining a high CSR disclosure level relies on an integration of the net impacts of AC and board characteristics. We also found that AC and board characteristics could impact negatively or positively on a high CSR disclosure level, depending on the existence or non-existence of other characteristics simultaneously. Our results also suggest that there is more than one optimal combination from AC and board characteristics that leads to high levels of CSR disclosure score.

By doing that, our study makes different critical contributions in both practical and theoretical sides to the thrifty literature on this remarkable field. **First**, this study explores various configurations of non-financial firms that lead to the understanding of the joint dependence attributes in AC and board, which cause better CSR disclosure. **Second**, although the existing CG and CSR literature offers enormous works on board and CSR, the results are mostly contrasting, and there is still no board consent on the significance of AC characteristics. In that way, this study expands the current argument summarised above by exploring a new analytical method (fsQCA) to promote and support the systematic connection between AC and board characteristics with CSR disclosure. **Third**, the sustainable development concept refers to environmental, social and governance elements as essential parts, while, some previous research has focused only on one component. For example, Samara et al. (2018) examined only the environmental performance of the family business. Therefore, our work contributes to CSR literature by investigating the three elements disclosure (CSRSD). **Finally**, our study well-responds to the latest calls offered by Cucari (2019), Cuadrado-Ballesteros et al. (2017), and Jain and Jamali (2016) for using QCA in CSR and CG studies. Thus, this study is expected to be useful not only for researchers but also for regulators, policymakers, and professionals. It offers new directions and insights for future research by applying new methodological approach (fsQCA) and suggesting new empirical results regarding the impact of AC (size, independence, financial expert, activity, and chair independence) and board characteristics (independence, gender, size, CEO duality, and activity) on CSR disclosure. Our findings also suggest some critical attributes regarding the analysis and development of AC and board guidelines.

This article is structured as follows: in Section 1, an introduction and objective of the study are provided. Section 2 is the literature review. Section 3 is the methodology and data collection method of the study, while Section 4 provides the analyses of the results. Finally, Sections 5 and 6 provide discussion, conclusions, recommendations for future research, and limitations.

2 LITERATURE REVIEW

2.1 AC characteristics

According to Blue Ribbon Committee (BRC) recommendations, the efficiency and performance of AC are affected by different characteristics, for instance, size, independence, the existence of financial expertise, meetings, and chair independence (BRC, 1999). Few numbers of studies examine the link between CSR and different AC characteristics (Al-Shaer & Zaman, 2018; Appuhami & Tashakor, 2017; Buallay & Al-Ajmi, 2019). However, most of these efforts report mixed results. The reasonable clarification of these results is that most of these efforts use a symmetrical approach such as regression analysis and they suppose that the effect of independent variables on the outcome is necessary and sufficient to foretell the outcome (Khan et al., 2018).

Bedard, Chtourou, and Courteau (2004) and Appuhami and Tashakor (2017) argued that larger AC might be more effective since it would lead to a diversity of knowledge and experiences, which in turn leads to a better controlling mechanism that affects the CSR disclosure. Moreover, smaller AC may not have adequate resources; thus, the quality of monitoring and supervision functions would be lower (Alotaibi & Hussainey, 2016). On the other hand, larger AC would lead to poor communication and reduce the quality of the decision-making process (Lin, Xiao, & Tang, 2008). Other scholars indicate that an AC size does not affect CSR disclosure (Jizi et al., 2014) and sustainability reporting credibility (Al-Shaer & Zaman, 2018).

Concerning AC independent, Fama (1980) and Fama and Jensen (1983) suggest that AC independent members could decrease agency problem, asymmetry of information, and the possibility of collusion by management using their role of monitoring and controlling management practises effectively, thus, improve CSR reporting. Some previous works support this suggestion, and indicate that AC independence enhances the credibility of a sustainability reporting (Al-Shaer & Zaman, 2018), voluntary disclosure (Mangena & Taurigana, 2007), and CSR disclosure (Appuhami & Tashakor, 2017; Buallay & Al-Ajmi, 2019; Said, 2009). Nevertheless, Haniffa and Cooke (2005) report that AC independence affects the of level CSR disclosure negatively. According to DeFond and Francis (2005), the existence of some insiders in AC could be useful because they would have vital specific knowledge and experience about the company. While, other scholars such as Katmon, Mohamad, Norwani, and Al Farooque (2019) find an insignificant association.

Moreover, AC meetings frequency implies the number of AC meetings held through the fiscal year (Kalbers & Fogarty, 1993). More AC meetings lead to more experiences and knowledge regarding accounting, auditing, and CSR (Abbott, Parker, & Peters, 2004). Therefore, improving the responsibilities related to monitoring, supervision, reporting quality (Karamanou & Vafeas, 2005), and CSR disclosure (Appuhami & Tashakor, 2017; Buallay & Al-Ajmi, 2019; Jizi et al., 2014). Nevertheless, Othman, Ishak, Mohd Arif, and Abdul Aris (2014), among others, find no connection between the AC meetings frequency and voluntary ethics disclosure level.

Similarly, AC financial expert implies the degree of accounting, financial knowledge and experiences in the AC members. One of the main requirements of different CG codes (for example, Financial Reporting Council, 2003 in United Kingdom and SOX, 2002 in the United States) regarding AC is to consists of one member at least with relevant accounting and financial experience. The primary responsibilities of AC are supervising the integrity of companies' financial reporting and controlling risk management and internal control system (SOX, 2002). An active AC needs a financial expert member to understand different financial and reporting issues (Abbott et al., 2004). Therefore, AC members without relevant financial and accounting knowledge are less likely to deal with reporting problems (Agrawal & Chadha, 2005). Furthermore, the presence of ACs combined with financial expertise could lead to clarifies issues that would challenge the managers and external auditor to a better extent of financial disclosure. Thus, improving the transparency of corporate disclosure which would avoid agency costs associated with information flow (Bedard & Gendron, 2010). Consequently, improving CSR disclosure level (Appuhami & Tashakor, 2017; Helfaya & Moussa, 2017; Jizi et al., 2014). In contrast, Buallay and Al-Ajmi (2019) and Musallam (2018) reveal that AC financial expert affects the level of sustainability reporting negatively. They argued that the presence of a financial expert on the AC is not necessarily implying efficient monitoring, while it depends on other factors such as top management authority, or they might need specific knowledge

regarding CSR reporting. However, Appuhami and Tashakor ([2017](#)) find an insignificant connection between AC financial expert and CSR disclosure.

One more critical variable that affects the effectiveness of AC composition is the AC chair. Since he/she is accountable of planning the agenda, making the most for AC meetings, aligning AC coordinating activities with board of directors and different companies' committees, setting clear expectations for external and internal auditors, and highlight continuous enhancement for the AC (KMPG, [2018](#)). However, the efficiency of AC chairs is contributed to their independence as they would have enough time, ability, and liberty to make independent decisions and to give useful suggestions (Karamanou & Vafeas, [2005](#)), therefore, enhancing disclosures of the company, including CSRD (Appuhami & Tashakor, [2017](#)). In this vein, several CG codes (such as the United Kingdom and Australia) emphasise that companies should separate between the chair of the board and AC chair (ASX, [2019](#); FRC, [2018](#)). Consequently, Garcia-Sanchez, Frias-Aceituno, and Garcia-Rubio ([2012](#)) argue that the separation between AC chair and board chair could likewise encourage the members of AC to improve monitoring actions, CG practises and therefore enhance disclosures level such as CSR. Nevertheless, few studies explore the influence of AC chair independence on CSR. Ashfaq and Rui ([2019](#)) indicate a significant positive connection between AC chair independence and CSR disclosure level. In contrast, Appuhami and Tashakor ([2017](#)) find that AC chair independence does not affect CSR disclosure level.

2.2 Board characteristics

Board characteristics are vital attributes that could influence not only CSR disclosure but also, would associate with AC attributes, leading to various board decisions. Board size, independence, gender, meetings, and CEO duality are the most widely used characteristics to discuss the associations between board and CSR. As mentioned earlier, the nexus between the board of director's attributes and CSR is extensively investigated by prior researchers (Dwekat, Seguí-Mas, & Tormo-Carbó, [2020](#)). However, the results still mixed and ambiguous.

An agency view suggests that board independence is more capable of meeting stakeholders' interests (Zahra & Stanton, [1998](#)) as they do not have concerns about their positions in the corporation (Khan et al., [2013](#)). In this regard, the stream majority of the prior studies found that the existence of independent board member positively affects the CSR (Khan et al., [2013](#); Jo & Harjoto, [2011](#); Jizi et al., [2014](#); Cucari et al., [2018](#); Zaid, Wang, & Abuhijleh, [2019](#)). In contrast, few studies (Majeed et al., [2015](#); Sundarasan et al., [2016](#)) indicate a negative association between board independence and CSR disclosure while Liao, Lin, and Zhang ([2018](#)) and Barakat et al. ([2015](#)) find an insignificant association.

Board gender diversity is one of the most board characteristics studied by researchers. Huse and Solberg ([2006](#)) claimed that female members are more concerned in board meetings than male, they also have superior attendance registration, and are more likely to enrol in supervising committees. Therefore, they would provide the right decision and have a strong influence on the input and output of the board (Adams & Ferreira, [2009](#)). Furthermore, females are more sensitive about society, environment, and ethics (Hafsi & Turgut, [2013](#)), and they pay more attention to charitable and philanthropic activities (Angelidis & Ibrahim, [2011](#)). Setó-Pamies ([2015](#)) conclude that women talent could play a strategic position in enabling companies to dominate their environmental and social practises properly. In this vein, the crushing majority of previous studies reveal that there is a positive and statistically significant nexus between the presence of female members on the boardroom and CSR disclosure (Dah &

Jizi, [2018](#); Fernandez-Feijoo et al., [2014](#); Ferrero-Ferrero, Fernández-Izquierdo, & Muñoz-Torres, [2015](#); Kassinis, Panayiotou, Dimou, & Katsifaraki, [2016](#)). In contrast, Muttakin et al. ([2015](#)) find a negative relationship, and they conclude that women directors do not have enough education and experience to improve CSR reporting practises.

Several investigations (Adams, Almeida, & Ferreira, [2005](#); Khan et al., [2013](#); Zaid, Abuhijleh, & Pucheta-Martínez, [2020](#); Zubeltzu-Jaka, Álvarez-Etxeberria, & Ortas, [2020](#)) claim that larger boards would have a variety of knowledge and experiences, which improves the ability of board to supervise and control the company's disclosures; thus, improve CSR. However, others (Al-Dah, Dah, & Jizi, [2018](#); Yasser, Al Mamun, & Ahmed, [2017](#)) find an inverse relationship, and they argue that larger boards increase the conflict of interest (Jensen, [1993](#)), and are difficulty managed; thereby smaller board would be often more active in a role in supervising and controlling more than larger board (Jizi et al., [2014](#)). While Fuente, García-Sánchez, and Lozano ([2017](#)) find an insignificant association.

It is suggested that CEO duality leads to the concentricity of decision making and control; this, in turn, would lead to compromising the governance performance function (Haniffa & Cooke, [2002](#)); this consequently would negatively affect the disclosure policy, including CSR (Li, Fetscherin, Alon, Lattemann, & Yeh, [2010](#)). Contrarily, Jizi et al. ([2014](#)) indicate that CEO duality contribute positively to CSR disclosure level and they argue that powerful CEOs tend to use CSR as a tool to enhance their image and to be more successful. However, other authors (Khan et al., [2013](#)) do not find a relationship.

Jizi et al. ([2014](#)) point out that companies with active board would be more interested in providing information regarding CSR. On the contrary, Pucheta-Martinez and Chiva-Ortells ([2018](#)) reveal that board meeting impacts CSR negatively, and others find no relationship (Fuente et al., [2017](#); Liao et al., [2018](#)).

2.3 Complexity theory

Nowadays, applying complexity theory of CG and CSR research has encountered an increased interest among scholars. As mentioned earlier, the more logical explanation is that the overwhelming majority of previous studies results are inconclusive. For instance, Isaksson and Woodside ([2016](#)) use a complexity theory by applying a configurational approach to explore the associations between corporate financial performance and CSR performance. Besides, Cuadrado-Ballesteros et al. ([2017](#)) use complexity theory to connect between CSR performance and board with other firm characteristics. Furthermore, Jain and Jamali ([2016](#)) concluded that such reasoning and examining of complexity theory principles through asymmetric (such as fsQCA) approaches provide a novel and fruitful improvements to the field of CG and CSR. In this regard, we build our study based on the complexity theory tenants. This theory emphasises four tenets (**equifinality**, **complexity**, **asymmetry**, and **causal asymmetry**) when examining the antecedent conditions which affect a particular outcome (Isaksson & Woodside, [2016](#); Ragin, [2008](#)). In **equifinality**, the final stage could be reached with more than one optimal path, as various paths could result in the same outcome (Fiss, [2007](#); Ordanini, Parasuraman, & Rubera, [2014](#)). The **complexity** tenet indicates that different circumstances would affect the individual antecedent of a particular outcome (Isaksson & Woodside, [2016](#); Urry, [2005](#)). Woodside ([2013](#)) pointed out that the same ingredients could produce the same recipe; therefore, variables could affect a particular result either positively or negatively, relying on the existence or non-existence of other variables at the same time. The **causal asymmetry** tenet suggests that combinations related to the high value of outcomes

(dependant variable) are not the 'mirror opposite' of combinations associated with the low value of ones (Fiss, [2011](#); Isaksson & Woodside, [2016](#); Ragin, [2008](#)).

According to Woodside ([2014](#)) and Isaksson and Woodside ([2016](#)), the complex antecedent configurations can display that the high value of X condition is signal of the high value of Y (outcome) when the high value of X joins with particular other antecedent condition (for example, high L, low M, and low N). Besides, the low value of X is a signal of the high Y (outcome) also when the low X joins in different recipes (for example, low L, low R, and high S), where L, M, N, R, and S are supplementary antecedent variables. Finally, **asymmetry** tenet suggests that there is an asymmetrical association between variables; therefore, a particular variable could contribute to high levels or low levels of a specific outcome. The contrarian cases will happen as a result, which in turn represents the contrary associations presented by regression models (Woodside, [2013](#)).

Previous studies indicate inconclusive results regarding the link between AC, board attributes and CSR. The plausible explanation of these mixed results is that the most of these studies use symmetric methods (such as regression analysis) to examine hypotheses and they assume that the impacts of X (independent variables) on Y (dependent variable, or outcome) are necessary and enough to predict the outcome (Cuadrado-Ballesteros et al., [2017](#); Isaksson & Woodside, [2016](#)).

The decisions related to the CSR rely on several combinations of such AC and board attributes, but not in one AC or board characteristics (e.g., gender diversity, size, independence, meetings, experience, etc.), and there is more than one optimal attributes combination to achieve a higher level of CSR.

This study aims to identify which of the AC and board characteristics configurations are predicting a high CSR disclosure level. Consistent with Cuadrado-Ballesteros et al. ([2017](#)) and Isaksson and Woodside ([2016](#)) and based on complexity theory (specifically **equifinality** and **complexity** tents), we propose the following propositions:

Proposition 1.(equifinality): Different configurations of AC and board characteristics indicate a high CSR disclosure level.

Proposition 2.(complexity): The impact of individual AC or board characteristics on a high CSR disclosure level relies on other AC or board characteristics.

3 METHODOLOGY

3.1 Sample and data

We use a sample of the top 100 European companies based on market capitalisation for the period 2016–2018. After eliminating the missing data values and in line with prior efforts (i.e. Cuadrado-Ballesteros et al., [2017](#); La Porta, Lopez-de-Silanes, & Shleifer, [2002](#)), we exclude financial companies, because of the variety of their equity characteristics, and the lack of comparability with non-financial companies, hence, the final sample consists of 69 companies (207 observations). As shown in Table [1](#), the corporations in the sample are from different 12 European countries (France, United Kingdom, Germany, Switzerland, the Netherlands, Spain, Italy, Sweden, Denmark, Finland, Norway, and Belgium) and work in several sectors, depending on Thomson Reuters Eikon database (TRBC Economic Sector) classification. This comprises explicitly firms engaged in the sectors of industrials, basic materials, healthcare, consumer cyclicals, consumer non-cyclicals, utilities, energy, and telecommunication services (see

Table 1). To achieve study objectives, we collect the available data related to CSR disclosure data, AC characteristics (independence and financial expert), and board characteristics from Thomson Reuters Eikon database. While, other AC characteristics (size, meetings, and chair independence) were collected from companies' annual reports.

TABLE 1. Sample description

Country	Number	%	TRBC economic sector name	Number	%
France	18	26.1	Consumer cyclicals	14	20.3
United Kingdom	17	24.6	Consumer non-cyclicals	13	18.8
Germany	11	15.9	Industrials	11	15.9
Switzerland	6	8.7	Healthcare	8	11.6
Netherlands	3	4.3	Basic materials	7	10.1
Spain	3	4.3	Utilities	6	8.7
Italy	3	4.3	Energy	6	8.7
Sweden	3	4.3	Telecommunications services	4	5.8
Denmark	2	2.9			
Finland	1	1.4			
Norway	1	1.4			
Belgium	1	1.4			
Total	69	100.0		69	100.0

Our final sample includes the top 69 non-financial European companies based on market capitalisations. Table 2 indicates that most of these companies (around 81%) are with market capitalisations from 25 to 100 billion, while only 13 companies with more than 100 billion.

TABLE 2. Sample according to market capitalisation

Market capitalisation (billion)	Number	%
25–50	31	44.9
50–100	25	36.2
100–200	10	14.5
More than 200	3	4.3
	69	100.0

3.2 Variables

We use Environmental, Social, and Governance (ESG) score as a proxy to measure CSR disclosure. ESG score is collected from Thomson Reuters Eikon database, which is commonly used in the literature (Arayssi, Jizi, & Tabaja, 2020). Eikon database measures companies' ESG score based on the ESG information disclosed by companies. It also includes 178 items from three pillars (environmental, social, and governance). The first pillar is **environmental**, and it consists of 61 items distributed as follows: 19 items for resource use, 22 related to emissions, and 20 for innovation. *Resource use* measures the ability of the firm to manage using of materials, energy, and water and to use effective supply chain management to apply eco-efficient solutions. The *emissions* score measures the adherence and actions of the company to avoid the environmental emissions that result from the production process.

While *innovation* score measures the ability of the company to create new market opportunities by developing eco-designed products and new environmental technologies. The **social** pillar includes 63 items which are allocated into four categories: 29 items for the workforce, 8 related to human rights, 14 items for community involvement, and 12 items related to product responsibility. *Workforce* score reflects the company's actions toward job satisfaction and creating a diverse and equal opportunities for its workforce to assure its commitment toward creating a safe and healthy workplace. *The human rights* score reflects the company's adherence to human rights fundamental. *Community* score means the firm's adherence to be a good citizen and to protect the public health and to act ethically. *Product responsibility* score implies the capacity to make quality products or services, taking into consideration the health and safety of the customers, integrity, and honesty, and data privacy. Finally, 54 items used to measure the **governance** pillar, and it includes 34,12,8 items related to management, shareholders, and CSR strategy, respectively. *Management* score reflects the company's adherence and efficacy towards using the best CG practises. *Shareholders'* score measures the company's actions to assure the equal dealing with shareholders and the use of requisition tools. *CSR strategy* score measures the firm's adherence to use and combine the environmental, economic, and social dimensions in its daily decision.

AC characteristics are selected depending on prior CG and CSR studies, which have evidence impacts of independence, size, meetings, financial expert, and chair independence on CSR (Al-Shaer & Zaman, 2018; Appuhami & Tashakor, 2017). Board characteristics have also been chosen as the highly significant attributes that could influence not only CSR disclosure but also,

would associate with AC attributes, leading to various board decisions. According to Al-Najjar (2011), AC independence and activity affected by board attributes such as board size and independence. Board size, independence, gender, meetings, and CEO duality are the most widely used characteristics to investigate the associations between board and CSR (Dwekat, Seguí-Mas, & Tormo-Carbó, 2020). Table 3 shows the measurements of the independent variables.

TABLE 3. Measurements of the independent variables

Independent variable	Label	Operational definition
Audit committee (AC) independence	ACIND	The percentage of independent board members on the AC
AC size	ACSIZ	The total number of AC members at the end of the fiscal year
AC meeting	ACMEE	The number of AC meetings through the year
AC financial expert	ACFEX	A dummy variable, which equals one if the company has an AC with at least one ‘financial expert’ as defined in Sarbanes–Oxley or zero otherwise
AC chair independence	ACCHI	A dummy variable, and it carries the value one if the AC chair simultaneously chairs the board or any other executive position or zero otherwise
Board size	BOSIZ	The overall number of board members at the end of the fiscal year
Board independence	BOIND	The percentage of independent board members
Gender diversity	GEDIV	The percentage of females on the board
Board Meeting	BOMEET	The number of board meetings during the year
CEO duality	CEODU	A dummy variable which equals one if the CEO simultaneously chair the board, or zero otherwise

3.3 Fuzzy set qualitative comparative analysis

One of the most frequently used methods by previous literature is multiple regression analysis; however, a symmetric method indicates the net impacts of some independent variables on the dependent variable (outcome), while holding other variables constant depending on other independent variables. According to Ragin (2000, 2008), traditional statistical methods such as regression propose that the impacts found are necessary and enough to predict the outcome, while most of the actual relationships are asymmetrical. Besides, multiple regression aims to

define the significant positive or negative impact of the only particular independent variable on the outcome, not a combination of other variables (Woodside, [2013](#)). Thus, to avoid traditional statistical methods problems, and depending on complexity theory, we use fsQCA, which is one of the set-theoretic approaches suggested by Ragin ([1987](#), [2000](#), [2008](#)). This method used for complex configurational analysis; it also combines qualitative and quantitative analysis techniques. Moreover, Fiss ([2007](#)) points out that this method determine configurations that are necessary variables (conditions) to achieve a specific level of the dependent variable by using Boolean algebra rules. To achieve our study objectives, we adopt two propositions (**equifinality** and **complexity**) using fsQCA to identify the different configurations of AC and board characteristics that indicate the sufficient variables (conditions) for obtaining a high CSR disclosure level (ESG score).

When performing the fsQCA method, the first stage is mandatory, which is transforming the variables into calibrated groups (Woodside, [2013](#)). Calibration is transforming the original data into an analogous z scale. It is a way to express the degree of group membership. Thus, three breakpoints should be used: (value of 1) when there is a full membership, (value of 0) when there is full non-membership, and cross-over point where the case is not in or out of the set (value of 0.5). Depending on Dusa ([2019](#)), we analyse our data using R version 3.6.1 (QCA package version 3.5). Some authors (such as Carmona et al., [2016](#)) used the following percentile approach: 20, 50, and 80% as the breakpoints for full non-membership, the cross-over point, and full membership, respectively. While in our study, we calibrated our variable automatically (determine full membership and full non-membership using clusters “Euclidian Distance”) by using R Software (QCA package). Depending on the function (*FindTh*), we determine the three cut-off points for calibration; this task aims to locate the calibration thresholds automatically for a numerical of casual conditions to be divided into separate parties. *FindTh* uses a cluster analysis to find out which threshold value best separate the points into a specific number of groups, separating raw data into the most meaningful groups (Dusa, [2019](#)). For dummy variables, a value of (1) is given to indicate being entirely in the set and value of zero (0) when entirely out of it.

After the coding, all possible combinations of variables will be listed with their degree of consistency in a “truth table” that is created by the fsQCA method. It is essential to assess which combination might be sufficient conditions for the outcome. Coverage and consistency are helpful metrics that are identical to a symmetric test of the coefficient of determinations and correlations (Hsu, Woodside, & Marshall, [2013](#)). The consistency test measures the degree to which the cases share a condition, whether it is simple or complex to produce one particular outcome. While the sufficiency coverage examines to what extent a condition, whether it is simple or complex is considered for a specific outcome. Thus, if the degree of sufficiency consistency is high enough, then, the conditions are sufficient for the outcome (Dusa & Alrik, [2013](#)). The intuition behind is that consistency and coverage scores are identical to a Pearson's correlation coefficient r and the coefficient of determination, r^2 , in statistical analysis, respectively (Hsu et al., [2013](#)). Table [6](#) displays the results coverage indexes of the sufficient conditions and their consistency. According to Woodside ([2013](#)), the fsQCA model is useful when the coverage range is between 0.23 and 0.65, and we have obtained 0.80 as the minimum value of consistency.

4 RESULTS

4.1 Correlation and descriptive statistics

Table 4 presents the results of the correlation matrix for all variables. Various of AC and board attributes are correlated statistically. This possibly will result in multicollinearity issues in the analysis of regression, while all are less than 0.5 (excluding the correlation between AC independence (**ACIND**) and board independence (**BOIND**) with a value of 0.69), which is under the essential level (0.8) (Gujarati, 2004). According to Wu, Yeh, Huan, and Woodside (2014), this result reveals that each variable measures a single independent attribute.

TABLE 4. Correlation matrix

Variables	1	2	3	4	5	6	7	8	9	10	11
1 CSRDS	1										
2 ACIND	0.44	1									
3 ACSIZ	0.00	−0.25	1								
4 ACMEE	0.07	−0.05	−0.17	1							
5 ACFEX	0.04	0.15	0.04	0.00	1						
6 ACCHI	0.15	0.46	−0.13	0.13	0.17	1					
7 BOSIZ	−0.22	−0.38	0.42	0.10	0.00	−0.18	1				
8 BOIND	0.55	0.69	−0.23	0.11	0.06	0.38	−0.23	1			
9 GEDIV	0.13	−0.04	0.03	−0.15	−0.24	−0.15	−0.06	−0.15	1		
10 CEODU	−0.19	−0.17	−0.01	0.05	0.08	−0.10	0.27	−0.24	0.22	1	
11 BOMEE	0.16	0.00	0.00	0.30	0.03	0.02	−0.10	0.1	0.05	0.09	1

- *Note:* CSRDS represent ESG disclosure score; ACIND and ACSIZ refer to AC independence and size, respectively; while ACMEE represents the frequency of AC meetings; ACFEX refers to AC financial expert; ACCHI represent AC chair independence; BOSIZ refers to the board size; BOIND represent board independence; GEDIV refers to the percentage of female directors on the board; CEOD represents the CEO duality; and BOMEE refers to the frequency of board meetings.

Table 5 shows the descriptive statistics of all variables for the period 2016–2018. Notably, the average value of CSR disclosure score is almost 77%, in a domain between 43% and 95%. Which generally indicate that the CSR disclosure level is quite high. This might be because our

sample consists of the top European companies, and the majority of the previous studies reported that company size associates significantly with CSR level. Regarding AC characteristics, the mean values in Table 5 show that there are 4.42 AC members on average (**ACSIZ**), of whom almost 85% are independent AC members (**ACIND**), and they tend to meet around six times a year (**ACMEE**). Besides, 85% of our samples have one financial expert member at least on their AC (**ACFEX**), and around 94% of these companies have an independent AC chair (**ACCHI**). Concerning board characteristics, the descriptive results in Table 5 also display that there are almost 14 directors (**BOSIZ**), of which almost 67% are independent board members (**BOIND**), and about 33% are female members (**GEDIV**). Board members tend to meet from eight to nine times each year (**BOMEET**). Besides, 35% of our sampled companies do not separate between the chair of the board and CEO (**CEODU**).

TABLE 5. Descriptive Statistics

Variables	Mean	SD	Min	Max
CSRDS	0.77	0.11	0.43	0.95
ACIND	0.85	0.23	0.13	1.00
ACSIZ	4.42	1.16	3.00	8.00
ACMEE	6.05	2.65	2.00	15.00
ACFEX	0.85	0.36	0.00	1.00
ACCHI	0.94	0.25	0.00	1.00
BOSIZ	13.50	3.48	7.00	23.00
BOIND	0.67	0.22	0.05	1.00
GEDIV	0.33	0.11	0.05	0.64
CEODU	0.35	0.48	0.00	1.00
BOMEET	8.80	3.36	3.00	27.00

- Note: The variables are defined in Table 3.

4.2 AC and board characteristics predicting high CSR disclosure level

Table 6 displays the combinations of AC and board characteristics predicting a high CSR disclosure level for the period 2016–2018, and for each year independently (2016, 2017, and 2018).

TABLE 6. Audit committee (AC) and board characteristics that are predicting a high level of CSR score

Configuration		Consistency	Coverage
2016–2018			
1	ACIND * acsiz * BOIND * ACFEX * ACCHI * ceodu	0.941	0.301
2	ACIND * acmee * BOIND * ACFEX * ACCHI * ceodu	0.924	0.408
3	ACIND * acsiz * acmee * BOIND * GEDIV * ACFEX * ACCHI	0.969	0.214
Solution consistency: 0.929			
Solution coverage: 0.541			
2016			
1	ACIND * acsiz * BOIND * ACFEX * ACCHI * ceodu	0.906	0.285
2	ACIND * acmee * BOIND * ACFEX * ACCHI * ceodu	0.896	0.315
3	ACIND * BOSIZ * BOIND * ACFEX * ACCHI * ceodu	0.987	0.17
4	ACIND * acsiz * ACMEE * BOIND * GEDIV * ACFEX * ACCHI	0.952	0.191
Solution consistency: 0.900			
Solution coverage: 0.471			
2017			
1	ACIND * acsiz * ACMEE * BOIND * BOME * ACFEX * ACCHI * ceodu	0.932	0.133
2	ACIND * acsiz * acmee * BOIND * GEDIV * bomee * ACFEX * ACCHI * ceodu	0.936	0.167
Solution consistency: 0.934			

	Configuration	Consistency	Coverage
	Solution coverage: 0.229		
	2018		
1	ACIND * acsiz * BOIND * ACFEX * ACCHI * ceodu	0.94	0.448
	Solution consistency: 0.940		
	Solution coverage: 0.448		

- *Note:* The variables are defined on Table 3. Asterisk represents the logical ‘and’ condition, lower-case letters indicate the absence or negation of the condition, and upper-case letters indicate the presence of the condition.

Table 6 shows the configurations of AC and board characteristics that obtain a high CSR disclosure level (three for 2016–2018, four for 2016, two for 2017, and one for 2018). These configurations are necessary and sufficient conditions for a high CSR disclosure level, even though none is enough since a variety of configurations achieve high levels of CSR disclosure score. As shown from Table 6, for each period, different configurations indicate a high total consistency (more than 0.9) and sensible total coverage (0.541 for 2016–2018, 0.471 for 2016, 0.229 for 2017, and 0.448 for 2018). In each configuration, we can notice that variables with (upper-case letters) contribute positively, and variables with (lower-case letters) contribute negatively to high CSR disclosure score. For example, the first combination for predictions in the period 2016–2018 (ACIND * acsiz * BOIND * ACFEX * ACCHI * ceodu) indicates that some companies with a high percentage of independent AC members (**ACIND**), lower AC size (**acsiz**), included in their ACs at least one member with accounting and financial experience (**ACFEX**), have AC chair independent (**ACCHI**), in which there is a high percentage of independent directors (**BOIND**) and separate between CEO and the chairman of the board (**ceodu**), will have a high CSR disclosure level. This configuration indicates a high consistency index of 0.941 and a unique coverage index of 0.301.

Generally, the influence of individual characteristics are not necessarily positive or negative or always present (except for ACIND, BOIND, ACFEX, and ACCHI); such as, the AC meetings which show in 6 from 10 configurations in Table 6, and it contributes positively in some (**ACMEE**), whereas, it influences negatively in the others (**acmee**), which means that one particular AC or board characteristic would affect negatively or positively or have no effect on the CSR disclosure score, in contrast to the generalised results of prior studies. In our case, we have four variables (ACIND, BOIND, ACFEX, and ACCHI) that appear in all configurations (10 times) and contribute positively to the high levels of CSR disclosure score. This indicates that the independence of the board and AC member, AC with at least one member with accounting and financial experience and separation between AC chair and board chair or any other executive positions are necessary conditions to achieve high CSR disclosure levels. However, it is not enough, because a variable may not produce the outcome unless a set of other variables exists. Moreover, in the non-attendance of ACIND, BOIND, ACFEX, and ACCHI, obtaining a high CSR disclosure level would not be possible. This lead to a conclusion that no single AC or board characteristic leads to a high CSR disclosure level since findings reveal complex antecedent

conditions; also, the influence of an individual AC or board characteristic depends on other primary AC or board characteristics. These findings are in line with Cuadrado-Ballesteros et al. (2017) and support our Propositions 1 and 2 regarding *equifinality* and *complexity* tenets. Lastly, differences between the years are found. Configurations obtained in Table 6 are different, according to the year of analysis. Regarding other variables, **ceodu** is shown in 8 of 10 total configurations, and **acisz** is also shown in 7 of 10 configurations, both variables contribute negatively to the high CSR disclosure level. While gender diversity (**GEDIV**) appears in three configurations, and it positively affects the high CSR disclosure level. However, board meeting (**bomee**) and board size (**BOSIZ**) appear only in one configuration, **bomee** contribute negatively, and **BOSIZ** contributes positively to the high CSR disclosure level.

4.3 Robustness analysis for sufficiency

In fsQCA, a condition or a causal configuration might be in concurrence for both the outcome and its negation in an unreasonable association. This should be taken into consideration because some instances underline a situation where a variable could be sufficient for the outcome and its negation. Thus, it is crucial to implement the algorithm for the negation of the outcome (Dusa & Alrik, 2013). The results show that the three casual configurations do not have a high enough consistency score for the negation of the outcome (CSR disclosure score); thus, the paradoxical relationship is not confirmed (Table 7). On the other hand, the association of sufficiency between a casual configuration and the outcome may be as robust as the association of sufficiency between the negation of the casual configuration and the outcome, which will create a problem (Dusa & Alrik, 2013). Our results do not assert the sufficiency association for the negation of the causal variables (Table 8). Thus, the scores of the negation of the variable's combination are low enough to confirm this conflict.

TABLE 7. Analysis of sufficient conditions for the negation of the outcome (CSR score)

Configuration	Consistency	Coverage
ACIND * acsiz * BOIND * ACFEX * ACCHI * ceodu	0.256	0.243
ACIND * acmee * BOIND * ACFEX * ACCHI * ceodu	0.209	0.273
ACIND * acsiz * acmee * BOIND * GEDIV * ACFEX * ACCHI	0.391	0.256

- *Note:* The variables are defined on Table 3. Asterisk represents the logical 'and' condition, lower-case letters indicate the absence or negation of the condition, and upper-case letters indicate the presence of the condition.

TABLE 8. Analysis of sufficiency for the negation of the causal condition

Configuration	Consistency	Coverage
Negation (ACIND * acsiz * BOIND * ACFEX * ACCHI * ceodu)	0.25	0.002
Negation (ACIND * acmee * BOIND * ACFEX * ACCHI * ceodu)	0.371	0.002

Configuration	Consistency	Coverage
Negation (ACIND * acsiz * acmee * BOIND * GEDIV * ACSEX * ACCHI)	0.378	0.002

- *Note:* The variables are defined on Table 3. Asterisk represents the logical ‘and’ condition, lower-case letters indicate the absence or negation of the condition, and upper-case letters indicate the presence of the condition.

5 DISCUSSION

Our findings suggest that obtaining a high CSR disclosure level relies on a combination of the impacts of AC and board characteristics. We also found that AC and board characteristics could impact negatively or positively the high CSR disclosure level, depending on the existence or non-existence of other characteristics simultaneously. Our empirical results suggest that there is more than one optimal combination form AC and board characteristics that leads to high levels of CSR disclosure score. In line with previous studies, our findings reveal that AC independence, board independence, AC financial expert, and AC chair independence are sufficient characteristics predicting a high CSR disclosure level. For instance, Said et al. (2009) and Appuhami and Tashakor (2017) conclude that AC independence enhances CSR disclosure level. Ashfaq and Rui (2019) find that companies with independent AC chair would have a high CSR disclosure level. AC financial expert improves CSR performance (Shaukat, Qiu, & Trojanowski, 2016), and CSR disclosure level (Jizi et al., 2014). However, the final impact also relies on other characteristics, for instance, gender, size, and meetings. Although board independence has a critical role in management supervision (Fernández-Gago, Cabeza-García, & Nieto, 2018), thus, improve CSR disclosure level (Garcia-Sanchez & Martinez-Ferrero, 2017; Khan et al., 2013). Furthermore, it increases companies’ community involvement (Wang & Coffey, 1992); therefore, adding more independent members to the boardroom will enhance CSR disclosure level. However, the independent director has more characteristics than his/her independence; for example, the impact would be different if the independent member is male or female, younger or older, in a small or large board, and active or less active board. The plausible explanation is that according to Ragin (2008), several combinations of causal factors could achieve the same outcome (CSR disclosure score).

Concerning other configurations of AC and board characteristics, CEO duality, and AC size are also important. In line with our results, previous research indicates that CEO duality contributes negatively to CSR reporting (Lattemann, Fetscherin, Alon, Li, & Schneider, 2009; Muttakin & Subramaniam, 2015). However, in contrast with previous literature (Appuhami & Tashakor, 2017; Katmon et al., 2019), we found that AC size contributes negatively to CSR disclosure level. The plausible explanation is that all companies in our sample comply with BRC recommendations, and they have a minimum of three AC members (see Table 4). On the other hand, we find that AC meetings contribute negatively to CSR disclosure score and positively in others. High frequency of AC could be more active (Jizi et al., 2014), but more meetings may negatively affect the level of CSR disclosure (Pucheta-Martinez & Chiva-Ortells, 2018). Finally, Board gender diversity is one of the most common variables studied by researchers. Consistent with our results, most authors indicate that board gender diversity positively affects CSR performance (Bear et al., 2010; Cuadrado-Ballesteros et al., 2017; Yasser et al., 2017) and CSR

disclosure (Dah & Jizi, [2018](#); Fernandez-Feijoo et al., [2014](#)). However, women directors have other essential characteristics, for instance, independence, age, experience. Obtaining a high CSR disclosure level is not as easy as improving one individual AC or board characteristics; it depends on other attributes, such as we mentioned earlier, and all of them would be considered to affect the level of CSR disclosure score.

6 CONCLUSIONS

CSR disclosure is a complex phenomenon influenced by different combinations of AC and board attributes. Responding to the recent calls offered by various authors (Cuadrado-Ballesteros et al., [2017](#); Cucari, [2019](#); Jain & Jamali, [2016](#)) to use such creative methods that mix between a quantitative and qualitative approach; we apply a new approach depending on the complexity theory. Its central argument is that various combinations of casual's factors affect the same level of specific outcome (Ragin, [2008](#)). The data were collected from Eikon database for the top 69 non-financial European companies (based on market capitalisation). By using fsQCA, our results support the two key tenets of complexity theory. *First*, different configurations of AC and board characteristics indicate a high level of CSR disclosure score (***equifinality tenet***); *second*, the impact of the individual board or AC characteristics on a high CSR disclosure level relies on other board or AC characteristics (***complexity tenet***). These results have useful practical and theoretical implications, mainly for governing parties. First, our study underlines the impact of AC and boards on CSR reporting. AC independence, AC financial expert, AC chair independence, and board independence are essential characteristics of the AC and board's contribution to the CSR disclosure, even though separately they are not important. In this regard, policymakers and regulators could encourage companies to have more independent directors not only in the boardroom but also in AC. Although the overwhelming majority of CG codes around the world enforce companies to include at least one member of AC with accounting and financial expertise, our result emphasises the significance of AC financial expert member role in upgrading the level of CSR. Accordingly, regulators and policymakers may stimulate companies to include more than one financial expert on AC.

According to our findings, AC independence, board independence, AC financial expert, AC chair independence, and gender diversity, affect CSR disclosure positively (Appuhami & Tashakor, [2017](#); Jizi et al., [2014](#)). While CEO duality and AC size contribute negatively to CSR disclosure (Haniffa & Cooke, [2002](#)), but this impact is not enough because the variable alone does not achieve the outcome; it relies on a combination of other variables.

Our results are relevant to regulators, professionals, and policymakers in establishing and revising the guidelines linked to the composition of AC and board of directors. For instance, CEO duality is one of the main variables that contribute negatively to high CSR disclosure level; however, 35% of our sample does not separate between the chairman of the board and CEO. On the other hand, it would be useful to revise AC composition; for example, our results reveal that high CSR disclosure levels are achieved with a low number of AC members, together with different AC and board attributes.

This study also contributes significantly to the board and CSR field by using a new methodology that mix between qualitative and quantitative approaches. As far as our knowledge goes, this is the first study that applies fsQCA (configurational approach) on the link between AC and CSR disclosure.

This approach is not widely used in business and management studies, which could be surprising because usually, relationships and life events are mostly asymmetrical (Ragin, 2008). According to Woodside (2013), reality includes a variety of combinations of characteristics to clarify one particular outcome, which indicates the presence of asymmetrical associations rather than the symmetric ones. Thus, our results recommend researchers to study the board characteristics associated with CG using a QCA methodology.

However, our study also has its limitations. First, the few numbers of variables could be considered when using QCA since the number of the combination grows exponentially, which in turn decrease the correct reasoning. Moreover, the degree of researchers' subjectivity affects the percentage of membership in the calibration. Finally, there should be a variety of cases since limited numbers of cases may not include examples for each potential combination; thus, the analysis would be limited to cases characteristics.

On the other hand, despite the previous limitations, QCA provides considerable insights over the ones obtained from common methods, particularly regression analyses (Woodside, 2013). Furthermore, it could resolve the inconclusive findings and recognising the complex relationships between antecedents (Paniagua et al., 2018). Besides, it could also be more attractive for future research to examine other CG characteristics that may influence the association between AC, board, and the level of CSR disclosure, for instance, board ownership, board age, the role of auditor, board educational diversity, and board interlock. Future research could also repeat the study on different CSR measures, such as credibility of sustainability reporting, and disaggregate the CSR disclosure (ESG score) into three measures (governance, social and environmental), also in different institutional frameworks, by expanding the sample or use different countries.

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