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Doctoral Thesis

The Impact of Audit Committee Characteristics on Corporate Social Responsibility Disclosure

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Abstract

This thesis fills the literature gap, adding novelties, and therefore, shedding light on inconclusive results in previous research concerning the effect of Audit Committee (AC) and board characteristics on Corporate Social Responsibility Disclosure (CSRD) in four interrelated articles. The first article (chapter 2) is the first study that presents a full picture of the board-CSR field by using a combination of two methodologies, bibliometric and social network analysis. Thus, it maps the knowledge of preceding works and suggests new avenues for future investigations to connect board characteristics, Corporate Social Responsibility Performance (CSRP), and CSRD. This article analysed 242 articles published on Web of Science database (WoS) journals (1992- 2019). Depending on the same sampled articles used in the first article, the second article (chapter 3) reviewed the previous board-CSR literature by applying a content analysis method. By doing so, this article offers a novel picture of the most critical drivers of CSRP/CSRD and provide constructive suggestions to guide future research. The first and second articles' main results suggest that little research on the board and CSR field have studied other board variables such as AC characteristics. In addition to that, CSR strategies are forming from several combinations of the board attributes and consider one dimension to be insufficient to generate an effective strategy. In this context, it must be pointed out that there is more than one best possible characteristics combination to achieve higher levels of CSRD. Therefore, building on the first and second articles, the third article (chapter 4) fills the literature gap, adding novelties, showing evidence from the European context and, consequently, shedding light on inconclusive results in preceding literature concerning the effect of AC and board characteristics on CSRD by applying a novel research methodology (fuzzy-set Qualitative Comparative Analysis (fsQCA)).

Furthermore, responding to the second article recommendations to further examine the link between board characteristics and the decisions to obtain Corporate Social Responsibility Assurance (CSRA) report, the fourth article (chapter 5) test the effect of AC attributes (namely AC financial expert, AC independence, AC meetings, and AC size) on the adoption of CSRA. The third article used a sample of the top 69 non-financial European companies (based on market capitalisation) for 2016–2018. In comparison, the fourth article used a sample of European companies listed on STOXX Europe 600 over 2011-2018. This broader sample has been selected to choose a larger number of CSRA observations during the study period. European firms were specifically chosen because they are considered leaders in obtaining CSRA reports.

Our first and second articles results indicate that board characteristics have a significant and increasing impact on CSR literature. The results also revealed that the board practices play a crucial role in managing CSRP/CSRD-related issues. The findings also identify the effect of the critical board characteristics on CSRP, CSRD quantity, and CSRD quality. Furthermore, our outcomes provide an overarching picture of the patterns and trends of the systematic nexus between board characteristics and CSRP/CSRD quality and quantity. The findings also draw potential future avenues for research in the field regarding research gaps (governance mechanisms, variables, countries, etc.). Furthermore, our results suggest some potential areas of interest for future political reforms of board of directors' guidelines.

The third article results support the equifinality and complexity tenets of complexity theory. It also suggests that CSRD 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 CEO duality). These characteristics play a leading part as a recipe ingredient and, in an appropriate combination, promote achieving high CSRD 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. In line with the complementary role of CG and AC mechanisms suggested by prior literature, our fourth article finds that AC attributes related to AC financial expert, AC independence and size of AC, and the existence of CSR committee are positively linked with the adoption of CSRA. However, our empirical analysis further indicates that AC with a higher percentage of financial expert members tends to choose higher assurance scopes.

Resumen

Esta tesis aborda un vacío significativo en la literatura sobre gobierno corporativo y reporting de sostenibilidad, centrándose en el efecto de las características de la Comisión de Auditoría y del Consejo de Administración sobre la divulgación de información sobre Responsabilidad Social Corporativa (CSRD). De este modo, la tesis aporta novedades y arroja luz sobre resultados previos no concluyentes en la literatura a través de cuatro artículos interrelacionados. El primer artículo (capítulo 2) presenta una imagen panorámica de la literatura sobre la RSC y los Consejos de administración, mediante el uso de una combinación de dos metodologías: el análisis bibliométrico y el de redes sociales. Por lo tanto, mapea el conocimiento de trabajos anteriores y sugiere nuevas vías para futuras investigaciones para conectar las características del Consejo de administración y el desempeño de la RSC y la información para su divulgación. En este artículo, se analizan 242 artículos publicados en revistas de bases de datos de Web of Science (WoS) (durante el periodo 1992-2019). A partir de la misma muestra utilizada en el capítulo anterior, el capítulo 3 revisa la literatura previa sobre RSC y los Consejos de administración mediante la aplicación la metodología del análisis de contenido. Al hacerlo, este artículo ofrece una imagen novedosa de los impulsores más críticos del desempeño de la RSC y de la información para su divulgación, proporcionando sugerencias constructivas para guiar la investigación futura. Los principales resultados del primer y segundo artículo sugieren que existe poca investigación en el campo de los Consejos de administración y la RSC, aportando nueva evidencia sobre otras variables del Consejo de administración, como son las características de la Comisión de Auditoría. Además de eso, las estrategias RSC se están formando a partir de varias combinaciones de los atributos del Consejo de administración y consideran que una dimensión es insuficiente para generar una estrategia efectiva. En este contexto, se debe señalar que existe más de una combinación de características óptimas para lograr niveles más altos de divulgación de la RSC. Por lo tanto, a partir del primer y segundo artículo, el tercer artículo (capítulo 4) lleva más allá el estado actual de la literatura, aportando novedades, mostrando evidencia del contexto europeo y, en consecuencia, arrojando luz sobre resultados no concluyentes en la literatura anterior sobre el efecto de las características del Consejo de administración y de la Comisión de Auditoría sobre la divulgación de la RSC mediante la aplicación de una metodología de investigación novedosa: la fuzzy-set Qualitative Comparative Analysis (fsQCA).

Además, respondiendo a las recomendaciones del segundo artículo para examinar más a fondo el vínculo entre las características del Consejo de administración y las decisiones para obtener la verificación de la memoria RSC, el cuarto artículo (capítulo 5) prueba el efecto de los atributos de la Comisión de Auditoría (es decir, la existencia de expertos financieros, su independencia, el número de reuniones realizadas y su tamaño) sobre la adopción de la verificación. El tercer artículo utilizó una muestra de las 69 principales empresas europeas no financieras (según la capitalización de mercado) en el periodo 2016-2018. En comparación, el cuarto artículo utilizó una muestra de empresas europeas que cotizan en STOXX Europe 600 desde 2011 a 2018. Esta muestra más amplia ha sido seleccionada para elegir un mayor número de observaciones de informes de verificación durante el período de estudio, seleccionándose las empresas europeas específicamente porque se las considera líderes en la obtención de este tipo de informes.

Los resultados de nuestro primer y segundo artículo indican que las características del Consejo de administración tienen un impacto significativo y creciente en la literatura sobre RSC. Los resultados también revelaron que las prácticas del Consejo de administración juegan un papel crucial en la gestión de problemas relacionados con el desempeño de la RSC y su divulgación. Los hallazgos también identifican el efecto de las características críticas del Consejo de administración sobre el desempeño de la RSC, la cantidad de información divulgada sobre RSC y también sobre su calidad. Además, nuestros resultados brindan una imagen general de los patrones y tendencias del vínculo sistemático entre las características del Consejo de administración y el desempeño de la RSC, la calidad y la cantidad de la información divulgada sobre RSC. Los hallazgos también trazan posibles vías futuras de investigación en el campo con respecto a las avenidas de futuro para la investigación que se intuyen (mecanismos de gobernanza, variables, países, etc.). Además, nuestros resultados sugieren algunas áreas potenciales de interés para futuras reformas políticas de los códigos y recomendaciones para a gestión de los Consejos de administración.

Los resultados del tercer artículo apoyan los principios de equifinalidad y complejidad de la teoría de la complejidad. También sugiere que la divulgación de la información RSC se basa en una configuración compleja de algunos atributos de la Comisión de Auditoría, como por ejemplo, la independencia, la existencia de miembros expertos financieros, la independencia del presidente, el tamaño y la actividad, así como otras características del consejo (independencia, género, tamaño, actividad y dualidad del CEO). Estas características juegan un papel fundamental como ingrediente de las mejores prácticas y, en una combinación adecuada, promueven el logro de altos niveles de divulgación de información RSC. Nuestros resultados empíricos ofrecen conocimientos multidimensionales y valiosos para profesionales, reguladores y responsables de la formulación de políticas en el establecimiento y revisión de las pautas con respecto a la composición del Consejo de administración y la Comisión de Auditoría. En línea con el papel complementario de los mecanismos de Gobierno corporativo y la Comisión de Auditoría sugerido por la literatura anterior, nuestro cuarto artículo encuentra que los atributos de la Comisión de Auditoría relacionados con la existencia de expertos financieros, su independencia y el tamaño la comisión, así como la existencia de un comité de RSC están positivamente vinculados con la adopción del informe de verificación de la memoria RSC. Sin embargo, nuestro análisis empírico indica además que las comisiones de Auditoría con porcentajes más altos de miembros expertos financieros tienden a elegir alcances de verificación más elevados.

Resum

Aquesta tesi aborda un buit significatiu en la literatura sobre govern corporatiu i reporting de sostenibilitat, centrant-se en l'efecte de les característiques de la Comissió d'Auditoria i del Consell d'Administració sobre la divulgació d'informació sobre Responsabilitat Social Corporativa (CSRD). D'aquesta manera, la tesi aporta novetats i dona llum sobre resultats previs no concloents en la literatura a través de quatre articles interrelacionats. El primer article (capítol 2) presenta una imatge panoràmica de la literatura sobre la RSC i els Consells d'administració, mitjançant l'ús d'una combinació de dues metodologies: l'anàlisi bibliomètrica i la de xarxes socials. Per tant, mapeja el coneixement de treballs anteriors i suggereix noves vies per a futures investigacions per a connectar les característiques del Consell d'administració i l'acompliment de la RSC i la informació per a la seua divulgació. En aquest article, s'analitzen 242 articles publicats en revistes indexades a la Web of Science (WoS) (durant el període 1992-2019). A partir de la mateixa mostra utilitzada al capítol anterior, el capítol 3 revisa la literatura prèvia sobre RSC i els Consells d'administració mitjançant l'aplicació la metodologia de l'anàlisi de contingut. En fer-ho així, aquest article ofereix una imatge nova dels impulsors més crítics de l'acompliment de la RSC i de la informació per a la seua divulgació, proporcionant suggeriments constructius per a guiar la investigació futura. Els principals resultats del primer i segon article suggereixen que existeix poca investigació en el camp dels consells d'administració i la RSC, aportant nova evidència sobre altres variables del Consell d'administració, com són les característiques de la Comissió d'Auditoria. A més d'això, les estratègies RSC s'estan formant a partir de diverses combinacions dels atributs del Consell d'administració i consideren que una dimensió és insuficient per a generar una estratègia efectiva. En aquest context, s'ha d'assenyalar que existeix més d'una combinació de característiques òptimes per a aconseguir nivells més alts de divulgació de la RSC. Per tant, a partir del primer i segon article, el tercer article (capítol 4) porta més enllà l'estat actual de la literatura, aportant novetats, mostrant evidència del context europeu i, en conseqüència, contrastant resultats no concloents en la literatura anterior sobre l'efecte de les característiques del Consell d'administració i de la Comissió d'Auditoria sobre la divulgació de la RSC mitjançant l'aplicació d'una metodologia d'investigació nova: la fuzzy-set Qualitative Comparative Analysis (fsQCA).

A més, responent a les recomanacions del segon article per a examinar més a fons el vincle entre les característiques del consell d'administració i les decisions per a obtindre la verificació de la memòria RSC, el quart article (capítol 5) prova l'efecte dels atributs de la

comissió d'auditoria sobre l'adopció de la verificació (comper exemple, l'existència d'experts financers, la seua independència, el nombre de reunions realitzades i la seua grandària). El tercer article va utilitzar una mostra de les 69 principals empreses europees no financeres (segons capitalització de mercat) en el període 2016-2018. En comparació, el quart article va utilitzar una mostra d'empreses europees que cotitzen en STOXX Europe 600 des de 2011 a 2018. Aquesta mostra més àmplia ha sigut seleccionada per a triar un major nombre d'observacions d'informes de verificació durant el període d'estudi, seleccionant-se les empreses europees específicament perquè se les considera líders en l'obtenció d'aquesta mena d'informes.

Els resultats del nostre primer i segon article indiquen que les característiques del Consell d'administració tenen un impacte significatiu i creixent en la literatura sobre RSC. Els resultats també han revelat que les pràctiques del Consell d'administració juguen un paper clau en la gestió de problemes relacionats amb l'acompliment de la RSC i la seua divulgació. Les troballes també identifiquen l'efecte de les característiques crítiques del consell d'administració sobre l'acompliment de la RSC, la quantitat d'informació divulgada sobre RSC i també sobre la seua qualitat. A més, els nostres resultats brinden una imatge general dels patrons i tendències del vincle sistemàtic entre les característiques del consell d'administració i l'acompliment de la RSC, la qualitat i la quantitat de la informació divulgada sobre RSC. Les troballes també tracen possibles vies futures d'investigació en el camp respecte a les avingudes de futur per a la investigació que s'intueixen (mecanismes de governança, variables, països, etc.). A més, els nostres resultats suggereixen algunes àrees potencials d'interés per a futures reformes polítiques dels codis i recomanacions per a la gestió dels consells d'administració.

Els resultats del tercer article donen suport als principis de equifinalitat i complexitat de la teoria de la complexitat. També suggereixen que la divulgació de la informació RSC es basa en una configuració complexa d'alguns atributs de la comissió d'auditoria, com per exemple, la independència, l'existència de membres experts financers, la independència del president, la grandària i l'activitat, així com altres característiques del consell d’administració (com la independència, el gènere, la grandària, l’activitat i la dualitat del CEO). Aquestes característiques juguen un paper fonamental com a ingredient de les millors pràctiques i, en una combinació adequada, promouen l'assoliment d'alts nivells de divulgació d'informació RSC. Els nostres resultats empírics ofereixen coneixements multidimensionals i valuosos per a professionals, reguladors i responsables de la formulació de polítiques en l'establiment i revisió de les pautes respecte a la composició del consell d'administració i la comissió d'auditoria. En línia amb el paper complementari dels mecanismes de govern corporatiu i la comissió d'auditoria suggerit per la literatura anterior, el nostre quart article troba que els atributs de la comissió d'auditoria relacionats amb l'existència d'experts financers, la seua independència i la grandària la comissió, així com l'existència d'un comité de RSC estan positivament vinculats amb l'adopció de l'informe de verificació de la memòria RSC. No obstant això, la nostra anàlisi empírica indica -a més- que les comissions d'auditoria amb percentatges més alts de membres experts financers tendeixen a triar abastos de verificació més elevats.

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"*He has not thanked Allah who has not thanked people*."

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Dedication

This thesis is dedicated.

To

my beloved parents (Muhanad and Khitam)

my precious wife (Zeena)

my beloved son (Omar)

my dearest sisters and brothers

my father and mother-in-law

For their love, support and encouragement.

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1 Introduction

1.1. General background

Corporate Social Responsibility (CSR) has become a familiar debate among researchers, organisations, and standard setters. Even stakeholders are increasingly becoming more aware of its importance, particularly concerning its role in ensuring a proper balance in the long run between the commercial viability of a firm and its loyalty to society (Harjoto & Jo, 2011; Skare & Golja, 2012; Galant & Cadez, 2017). In this regard, two modern concepts have emerged: (i) corporate sustainability and (ii) CSR. One standard definition of sustainability was suggested by Brundtland (2010) as "development that meets the needs of the present, without compromising the ability of future generations to meet their own needs". In a similar direction, CSR was defined as conducting business in a way that is economically viable, legally commendable, ethically mindful, and socially allegeable (Carroll, 1979). Furthermore, CSR is one of the significant areas that Corporate Governance (CG) has brought in the last decade; this is mainly because of its role in showing its commitment to CG and ensuring its public accountability (Harjoto & Jo, 2011). As a fundamental CG feature, the board of directors has a critical function in aligning management concerns with stakeholders (Harjoto et al., 2015).

According to Cadbury (1992), CG was defined as the way in which firms are controlled. Thus, CSR and CG help companies to obtain a balance among profitable operations and ethical practices, including social activities (Haniffa & Cooke, 2005). In the broader sense, firms must act socially and morally sensible, not merely behave in a pure financial side (Zaid et al., 2019). Considering the argument above, one of the main areas that have attracted attention during the last years is CSRD (CSRD) (Khan et al., 2013). Companies have several reasons behind their CSRD, such as enhancing their image and reputation (Siregar & Bachtiar, 2010), strengthening the relationship with clients, government and community (Williams & Pei, 1999), reducing the asymmetric of information among the company's managers and its stakeholders (Jizi et al., 2014) and legitimising their activities (Deegan et al.,2002). All these reasons ensure economic viability in the long run.

Shareholders elect board of directors to control and manage companies' matters (Monks & Minow, 2008). Hence, the board has a vital function in allying managers concerns with the stakeholders (Harjoto et al. 2015). However, the board's supervisory role's efficiency is measured among various board characteristics (Brick et al., 2006; Shahzad et al., 2016). Thus, board characteristics are expected to affect the CSR level.

The literature on the connection between CG and CSR has grown expeditiously in recent years. Besides, most of these efforts have been dedicated to examining the effect of board characteristics on CSR (i.e., Bear et al., 2010; Jo & Harjoto, 2011; Khan et al., 2013; Jizi et al., 2014; Zaid et al., 2020a; Zaid et al., 2020b). Board independence would enhance the controlling and monitoring of the management's behaviour (Fama & Jensen, 1983) and is more capable of meeting stakeholders' interests (Zahra & Stanton, 1988). Thus, the existence of an independent board would lead to more information disclosure, fewer information asymmetries and a better corporation image (Fama & Jensen, 1983). According to Barako and Brown (2008), women's participation on the board gives a broader experience and knowledge, which improves the decision-making process. Furthermore, females pay more attention to charitable and philanthropic activities (Angelidis & Ibrahim, 2011). Thus, the existence of women on the board would enhance the level of CSR. Board size affects the role of controlling and monitoring (Liao et al., 2018). Adam et al. (2005) argued that larger boards would have various knowledge and experiences, enhancing the board's ability to supervise and control the company's disclosures. It is suggested that CEO duality leads to concentration of decision making and control; this, in turn, would compromise the governance performance function (Haniffa & Cooke, 2002); this consequently reduces the disclosure policy, including CSR (Li et al., 2010). Jizi et al. (2014) point out that companies with an active board would be more interested in providing CSR information.

As noted above, over the past decade, there has been noteworthy progress in CSRD (Kolk & Perego, 2010) to show companies' commitment to sustainability issues (Kolk & Perego, 2010; Simnett et al., 2009). However, the rise in these statements' quantity has not been complemented by an improved community trust level (Martínez-Ferrero et al., 2018). CSRD completeness and credibility have been broadly criticised in the prior literature (Cheng et al., 2015; Simnett et al., 2009; Miras-Rodriguez. & Di Pietra, 2018); they argue the need for an assurance process that certifies such quality issues. In Particular, voluntary CSRD is not valuable if perceived to lack reliability and credibility (Coram et al., 2009). The assurance of CSR information by independent external third parties is considered a powerful tool to enhance transparency and bridge the credibility gap of CSRD (Cohen & Simnett, 2015; Simnett et al., 2009; Perego & Kolk, 2012; Velte, 2020).

One of the most critical board and CG controlling mechanisms is the audit committee that it is existence and characteristics would enhance board oversight, improve auditor's performance, and reduce the asymmetry of information between managers and different stakeholders, hence, improve the level of companies' disclosure, such as CSR (Mangena & Pike, 2005). The traditional Audit Committee (AC) role is primarily concerned with mandatory financial disclosure; however, after corporate financial scandals such as Enron in the US, 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 adopting the international financial reporting standards (IFRS), which has also enriched the broader ACs role in monitoring compulsory and voluntary disclosures such as CSR (Appuhami & Tashakor, 2017). A variety of authors indicate that AC's existence enhances CSRD (Said et al., 2009; Khan et al., 2013; Barakat et al., 2015). Nevertheless, few authors have been addressed the impact of AC characteristics on CSR. Among these efforts, Appuhami and Tashakor (2017) investigate the influence of AC attributes on CSRD using multiple regression. Other work conducted by Al-Shaer and Zaman (2018) examines the impact of AC characteristics on sustainability reports' credibility. More recently, Buallay and Al-Ajmi (2019) investigate the role of AC on the extent of sustainability reporting.

Given the preceding discussion, this thesis fills the literature gap, adding novelties, and therefore, shedding light on inconclusive results in previous research concerning the effect of AC and board characteristics on CSRD in four interrelated articles. The first article (chapter 2) is the first study that presents a full picture of the board-CSR field by using a combination of two methodologies, bibliometric and social network analysis. Thus, it maps the knowledge of preceding works and suggests new avenues for future investigations to connect board characteristics, CSRP, and CSRD. This article analysed 242 articles published on Web of Science database (WoS) journals (1992- 2019). Depending on the same sampled articles used in the first article, the second article (chapter 3) reviewed the previous board-CSR literature by applying a content analysis method. By doing that, this article offers a novel picture of the most critical drivers of CSRP/CSRD and provide constructive suggestions to guide future research. The first and second articles' main findings suggest that few studies on the board and CSR field have studied other board variables such as AC characteristics. Besides, CSR strategies are forming from several combinations of the board attributes and consider one dimension to be insufficient to generate an effective strategy. In this perspective, it should be stated that there is more than one best possible characteristics combination to achieve higher levels of CSRD. Therefore, building on the first and second articles, the third article (chapter 4) fills the literature gap, adding novelties, showing evidence from the European context and, consequently, shedding light on inconclusive results in preceding literature concerning the effect of AC and board characteristics on CSRD by applying a novel research methodology (fsQCA).

Furthermore, responding to the second article recommendations to further examine the link between board characteristics and the decisions to obtain CSRA report, the fourth article (chapter 5) test the effect of AC attributes (namely AC financial expert, AC independence, AC meetings, and AC size) on the adoption of CSRA. The third article used a sample of the top 69 non-financial European companies (based on market capitalisation) for 2016–2018. In comparison, the fourth article used a sample of European companies listed on STOXX Europe 600 over 2011-2018. This wider sample has been selected to choose a larger number of CSRA observations during the study period. European firms were specifically chosen because they are considered leaders in obtaining CSRA reports.

1.2. Research problem

Each article in this thesis was developed based on a particular research problem and specific research gaps. Consequently, the primary motivation behind exploring the relationship between the board and CSR using Bibliometric and Social Network Analysis in Chapter 2 is that previous bibliometric and content analysis studies have either introduced CSR (Carroll, 1999; Wood, 2010) or CG (Terjesen et al., 2009). However, to the best of our knowledge, there is no bibliometric study that analyses CG and CSR's link. Therefore, it is worthwhile to explore what was ignored by ancestors and open the black box, which, in turn, helps in supporting and enriching the current literature.

Concerning the second article in chapter 3, the crushing majority of the prior literature review and content analysis works have either introduced CSRP/CSRD (Carroll, 1999; Wood, 2010; Frynas & Yamahaki, 2016; Fernandez-Gago et al., 2020) or CG (Aguilera et al. 2015; Terjesen et al. 2009). However, comparatively scarce literature reviews studies (Rao & Tilt, 2016b; Jain and Jamali, 2016; Velte, 2017) or meta-analysis studies (Ortas et al., 2017; Byron & Post, 2016) have addressed the connection between board characteristics and CSRP/CSRD. Consequently, it is worth analysing what was neglected by scholars and opening the black box, reinforcing and enriching the existing literature. Although previous board-CSR reviews (Rao & Tilt, 2016b; Jain & Jamali, 2016; Velte, 2017) have provided excellent work, our research includes a larger sample with a broader period (242 articles, from 1992- 2019). It is worth mentioning that almost 63 % of our sample is from (2017-2019) and these recent articles have not been covered by prior studies of the ancestors. Moreover, this study primarily includes the preceding literature on the effect of board attributes on CSRP/CSRD measured by the quantity and quality indices.

Regarding the third article in chapter 4, few authors have addressed the impact of AC characteristics on CSR, as discussed above. Nevertheless, the majority of previous works in the field of CG -CSR indicate inconclusive results. The plausible explanation of these results is that the crushing majority of these efforts use symmetric methods (such as regression analysis) to examine hypotheses, and they assume that the impact of independent variables on the outcome is necessary and sufficient to predict the outcome (Cuadrado-Ballesteros et al., 2017b). In this regard, Jain and Jamali (2016) call for using more creative methods; for instance, fsQCA mixes between quantitative and qualitative approaches. Further, Paniagua et al. (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 the CG field. For instance, most of these articles have been dedicated to investigating the influence of specific CG characteristics on corporate financial performance (Garcia-Castro et al., 2013; Misangyi & Acharya 2014; Pinto & Picoto 2016; Felicio et al., 2016; Paniagua et al., 2018), level of company risk reporting (Carmona et al., 2016), and investors' reactions (Campbell & Sirmon, 2016). Besides, the interest in using the QCA method in the CG field increases; this is shown in the number of high ranked journals that have published articles in recent years (Cucari, 2019). Hence, this result emphasises the increasing awareness of the relevance of using QCA in CG research.

In terms of the fourth article, previous studies on the connection between CG characteristics (Specifically AC) and CSRA have paid little attention to its role towards the decision to obtain CSRA (Kend, 2015; Martinez-Ferrero et al., 2017; Miras-Rodriguez & Di Pietra, 2018; Laio et al., 2018; Buertey, 2021). A study by Kend (2015), for example, explores the effect of CG, including AC size and meeting, on the adoption of CSRA and CSRA providers. Al-Shaer and Zaman (2018) concentrate primarily on AC attributes and their influence on the CSRA adoption and the assurance provider selection. Both Kend (2015) and Al-Shaer and Zaman (2018), however, overlooked the link between AC attributes and the scope and level of CSRA since they could give such explanation toward the tendency of each AC attribute.

1.3. Research objectives

Based on the research problems discussed above, the aims of the ***first article*** are to maps the knowledge of preceding research, suggest new avenues for future works, and fill the literature gap by applying bibliometric and social network analysis techniques to 242 articles published on the Web of Science database (WoS) journals for the period (1992- 2019) in the board-CSR field. Depending on the same sampled articles and using a content analysis technique, the ***second article*** aims to fundamentally recapitulate and map previous literature's perspectives to assess the impact of board characteristics on CSRP and CSRD. Beyond that, this article presents a novel picture of the most critical drivers of CSRP/CSRD and provide constructive suggestions to guide future research. Building on the first and second articles recommendations regarding the literature gaps and novelties, we developed the third and fourth articles. Drawing on the complexity theory, the ***third article aims*** to explore the combinations of AC and board characteristics that achieve higher levels of CSRD by applying a novel research methodology (fsQCA). This aim is adopted for a sample of the top 69 non-financial European firms for 2016–2018, depending on the Eikon database. Finally, the ***fourth article's*** primary goal is to extend the understanding of the factors influencing the quality of CSRA reporting and companies' decisions to obtain CSRA by examining the effect of AC attributes over the adoption of CSRA reports. An additional aim is to investigate the influence of AC attributes on selecting CSRA assurer and the scope and level of CSRA. The study sample consists of non-financial European companies listed on the STOXX 600 index over 2011-2018.

1.4. Thesis contributions

This thesis makes several significant contributions to the current board-CSR literature. The first article in chapter 2 contributes to the existing literature by synthesising several new insights and deeply rooted discussions of future research avenues. More clearly, prior bibliometric studies have either introduced CSR (Carroll, 1999; Wood, 2010; Zemigala, 2015) or CG (Terjesen et al., 2009). However, as far as the authors' knowledge goes, there is no bibliometric study that examines the connection between CG and CSR. In this vein, this study contributes to the literature by presenting a comprehensive scenery of the prior board-CSR studies. More specifically, bibliometric and social network analysis techniques were applied in this article to give a clear analytical view and build substantial implications. Additionally, this article is different from it is former in several ways.

First, as we stated previously, this is the first bibliometric study that examines the link between board and CSR. Second, to provide a more in-depth view and presents a full picture of previous research, our study combines bibliometric and social network analysis techniques. Third, this scholarly article covers the prolonged period (1992- 2019); it is worth mentioning that almost 63 % of our sample is from (2017- 2019) and have not been covered by the previous literature review and bibliometric studies. Also, this article aims to cover studies related to board characteristics and different CSR measures (i.e., CSRP, CSRD quality, and quantity). Furthermore, this study is expected to be helpful and valuable not only for academicians but also for policymakers and professionals. More pointedly, it provides new directions and insights for future research by summarising the empirical results of the impact of board characteristics on CSR and offering some favourable variables that could be reflected. Moreover, it provides the most influential articles, authors, institutions, journals, and countries in the field.

The second article makes remarkable contributions to the board-CSR literature by presenting inclusive scenery and mapping the extensive knowledge of the prior research on the connection between board characteristics and CSRP/CSRD using content analysis technique. Moreover, this study primarily includes the preceding literature on the effect of board attributes on CSRP/CSRD measured by the quantity and quality indices. Furthermore, this article is anticipated to be beneficial and valuable for professionals and policymakers. More clearly, it offers novel insights and directions for future studies by presenting the empirical findings of the effect of most used board characteristics (independence, size, gender, CEO duality, CSR committee, and board activity) on CSRP/CSRD, explaining their restrictions and providing some favourable additional variables that could be considered. Also, it discussed the most used theories, methods and suggested new methodological approaches. Our study findings also suggested some critical characteristics concerning the development and analysis of the board-CSR guideline.

The third article in chapter 4 makes different significant 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 understanding the joint dependence attributes in AC and board, which cause better CSRD. Second, although the existing CG and CSR literature offers enormous works on board and CSR, the results are primarily contrasting, and there is 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 CSRD. Third, the sustainable development concept refers to environmental, social, and governance elements as critical parts, while some prior studies have concentrated 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 of disclosure (CSRD). Finally, our scholarly article well responds to the recent calls proposed by Curaci (2019), Cuadrado-Ballesteros et al. (2017b), and Jain and Jamali (2016) for employing QCA in CSR and CG studies. Consequently, this article 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 a 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 CSRD. Our findings also suggest some critical attributes concerning the analysis and development of AC and board guidelines.

In chapter 5, the fourth article makes several significant contributions to contemporary literature. First, it contributes to the prior literature by developing and expanding the investigations on the nascent CSRA field. CSRA is a relatively growing research field, and it is a gradually more popular procedure to guarantee CSRD credibility (KPMG, 2013). Second, the article further examines the connection between the strength of AC structure and the scope and level of CSRA. According to Velte (2020), few CSRA literature examinations focus on the CSRA quality proxies (such as scope and level); thus, he recommends future research to consider these proxies to distinguish between substantive and symbolic, intrinsic, and extrinsic motives of executives. Third, while most prior studies are biased for UK, Australia, and US companies (e.g., Al-Shaer & Zaman, 2018; Kend, 2015), this study implements a European level approach, including 17 European countries. Finally, prior AC and CSRA studies conduct a cross-sectional analysis (see Al-Shaer & Zaman, 2018); this article uses a panel data analysis that compares years and countries. Further, this study solves the limitations of different CG and CSRA assurance studies by using a sample that includes not only large but also intermediate and small firms and, depending on the most recent CSRA data from 2011 to 2018, using such data is expected to be more valuable, because in recent years the demand of CSRA has interestingly increased. For instance, Al-Shaer and Zaman (2018) use a sample of listed UK firms for only 2012, Martinez-Ferrero and Garcia-Sanchez (2017) use a global sample for the period 2007-2014, While Kend (2015) depends on the top 200 listed companies in 2010 from the UK and Australia.

1.5. Thesis structure

In addressing and outlining the research issues highlighted above, this thesis is structured as follows; The first chapter, the introduction, presents the main thesis problems and summarises the four articles. The second and third chapters are bibliometric and literature review articles regarding the effect of Board on CSR: Bibliometric and Social Network Analysis; and CG and CSR: Mapping the Most Critical Drivers in the Board Academic Literature. In comparison, the fourth and fifth chapters are empirical articles concerning AC and Board Characteristics predicting a high level of CSRD: QCA; and AC and CSRA: evidence from STOXX Europe 600 members. These chapters consist of an introduction, literature review and hypothesis development, research design, results and discussions, additional tests and conclusion. Chapter 6 summarises the main results of Chapters 2, 3,4 and 5 and discusses the general implications and contributions of the results.

2 The Effect of Board on Corporate Social Responsibility: Bibliometric and Social Network Analysis

Published in:

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2.1. Introduction

Corporate Social Responsibility (CSR) has become a familiar debate among researchers, organisations, and standard setters. Even stakeholders are increasingly becoming more aware of its importance, particularly concerning its role in ensuring a proper balance in the long run between the commercial viability of a firm and its loyalty to society (Harjoto & Jo, 2011; Skare & Golja, 2012; Galant & Cadez, 2017; Zemigala, 2019). Moreover, CSR is a management concept connected to quality and environmental management (Zemigala, 2017). Specifically, one of the main areas that have attracted attention during the last years is CSRD (CSRD) (Khan et al., 2013). Companies have several reasons behind their CSRD, such as enhancing their image and reputation (Siregar & Bachtiar, 2010), strengthening the relationship with clients, government and community (Williams & Pei, 1999), reducing the asymmetric of information among the company's managers and its stakeholders (Jizi et al., 2014) and legitimising their activities (Deegan et al., 2002). All these reasons ensure economic viability in the long run.

Shareholders elect board of directors to control and manage companies' matters (Monks & Minow, 2008). As a fundamental corporate governance feature, the board of directors has an essential role in aligning management concerns with stakeholders (Harjoto et al., 2015). However, the efficiency of the board supervising is measured among various board characteristics (Brick et al., 2006). Thus, board characteristics (such as independence, gender, size, CEO duality, and meetings) are expected to affect CSR.

The literature on the connection between CG and CSR has grown expeditiously in recent years. Besides, most of these efforts have been dedicated to examining the effect of board characteristics on CSR (i.e., Bear et al., 2010; Jo & Harjoto, 2011; Khan et al., 2013; Jizi et al., 2014; Zaid et al., 2020a; Zaid et al., 2020b). Board independence would enhance the controlling and monitoring of the management's behaviour (Fama & Jensen, 1983) and is more capable of meeting stakeholders' interests (Zahra & Stanton, 1988); thus, the existence of an independent board would lead to more information disclosure, fewer information asymmetries and better corporation image (Fama & Jensen, 1983). According to Barako and Brown (2008), the participation of women on the board gives a broader experience and knowledge, which improves the decision-making process. Furthermore, females pay more attention to charitable and philanthropic activities (Angelidis & Ibrahim, 2011). Thus, the existence of women on the board would enhance the level of CSR. Board size affects the role of controlling and monitoring (Liao et al., 2018). Adam et al. (2005) argued that larger boards would have a variety of knowledge and experiences, which enhances the board's ability to supervise and control the company's disclosures. It is suggested that CEO duality leads to concentration of decision making and control; this, in turn, would lead to compromising the governance performance function (Haniffa & Cooke, 2002); this consequently reduces the disclosure policy, including CSR (Li et al., 2010). Jizi et al. (2014) point out that companies with an active board would be more interested in providing CSR information.

Given the preceding discussion, this study contributes to the current literature by synthesising several new insights and offering deeply rooted discussions of avenues for further future research. More clearly, previous bibliometric studies have either introduced CSR (Carroll, 1999; Wood, 2010; Zemigala, 2015), sustainable development (Zemigala, 2019), or corporate governance (Terjesen et al., 2009). However, to the best of our knowledge, there is no bibliometric study that analyses the link between CG and CSR. Therefore, it is worthwhile to explore what was ignored by ancestors and open the black box, which, in turn, helps in supporting and enriching the current literature. In this vein, this study contributes to the literature by offering a comprehensive scenery of the previous studies regarding the link between board and CSR. More precisely, bibliometric and social network analysis techniques were applied in this study to produce a persuasive analytical view and build robust implications. Besides, depending on the Web of Science database, a prolonged period was covered in this study (1992- 2019).

Moreover, Zemigala (2015) shows different countries perspective by performing a bibliometric study on the CSR articles published in the Scopus database from 2000-2009. Feng, Zhu, and Lai (2017) studied a literature review and bibliometric analysis to evaluate CSR for the supply chain management. Moreover, Jaén et al. (2018) conducted a bibliometric study on CSR in Latin America. More recently, Zemigala (2019) analyse the tendencies of sustainable development studies in management sciences. He examines the articles published in WoS and Scopus from the period 1974-2016. On the other hand, there are also bibliometric studies of CG, such as Huang and Ho (2011), they conducted a bibliometric analysis study for all CG articles published in WoS (SSCI) from 1992-2008.

Our study is different from it is former in different ways. First, as we mentioned earlier, as far as our knowledge goes, this is the first bibliometric study that examines the link between board and CSR. Second, to provide a more in-depth view and presents a full picture of previous research, our study uses a combination of bibliometric and social network analysis techniques. Third, this study covers the prolonged period (1992- 2019); it is worth mentioning that almost 63 % of our sample is from (2017- 2019) and have not been covered by the previous literature review and bibliometric studies. Moreover, this study aims to cover studies related to board characteristics and different measures of CSR (i.e., CSRP, CSRD quality, and quantity).

Additionally, our study is expected to be valuable and beneficial not only for academicians but also for policymakers and professionals. More pointedly, it provides new directions and insights for future research by summarising the empirical results of the impact of board characteristics on CSR and offering some favourable variables that could be reflected. Moreover, it provides the most influential articles, authors, institutions, journals, and countries in the field. Our results also suggested some critical attributes concerning the analysis and progress of the Board-CSR guideline.

Given the previous discussion, the objectives of this study are to fill the literature gap by applying bibliometric and social network analysis techniques to a collection of scholarly articles in the field of board and CSR. To achieve these objectives, we explore the published articles on board-CSR from (1992–2019) and attempts to use cited references to analyse/identify:

1) The distribution patterns of papers.
2) Top players: authors, networks, institutions, and journals.
3) The core articles that influence international literature.
4) The relevant topics in the literature.
5) The main measures of dependent (CSR) and independent variables (board characteristic) used in the scientific literature (and its relations).

This chapter is structured as follows: First, an introduction and objective of the study are provided. Second, the study's methodology and data collection method, while the third section analyses the result of bibliometric and social network analysis. Finally, the last section provides discussion, conclusions, limitations, and recommendations for future research.

2.2. Methodology

2.2.1. Bibliometric and social network analysis

Bibliometric analysis is a research technique that describes patterns in literature with a specific subject and time using quantitative data (Sarkar & Searcy, 2016). In general, there are two methodological approaches to quantify the flow of information. First, using a whole publication or using its features, such as citations, keywords, author's name, etc. Second, by identifying the links among objects, their networks, and co-occurrences (Ding et al., 2001).

In general, scalar techniques are used in the first approach. In our research, such methods are based on direct counts (occurrences) of particular bibliographic items (Ding et al., 2001), provide the significant characteristics of various representatives (individual researchers, countries, fields, etc.) and research performance (Verbeek et al., 2002), as well as its evolution and trends over time. This approach is considered satisfying for scientific production, but it can only be treated as a partial indicator of contributions to knowledge.

The Social Network Analysis (SNA) is the second approach used to recognise and classify related nodes of keywords, authors or research institutions to assess associations and collaborations (DeNooy et al., 2005). Thus, these procedures identify the relations (co-occurrences) of certain items, such as the number of times that keywords (co-word), citations (co-citation), and authors (co-authorship) are mentioned together in publications in a particular research field. This approach is mainly used to understand the underlying frame of the interrelationships between articles (Ding et al., 2001).

The citation shows the relation between the investigation and the work of another author. Thus, citation analysis deals with the links among the citations (Sandison, 1989). On the other hand, Diodato (1994) identifies co-citation when two or more works (also authors or journals) are cited by another document simultaneously. The co-citation strength depends on the number of times that two earlier documents are cited together by a new article.

On the other hand, Bibliographic coupling was introduced by Kessler (1963), and it happens when two papers use a reference as a unity of coupling between those two papers. Its strength depends on the number of references the two papers have in common (Egghe & Rousseau, 1990). To achieve a global view of the effect of the boards on CSR in the literature, we have used a combination of both techniques (scalar and analytical).

2.2.2. Data collection

In line with previous bibliometric and social networks analysis studies (Franceschini et al., 2016; Zhu & Hua 2017; Seguí-Mas et al., 2018), we search the Web of Science (WoS) database, it includes different citation indices in it is core collection and we used all indexes from 1992 to 2019 because the first articles in this search appear in 1992. We use WoS because it is the world’s leading scientific citation search and analytical information platform, used in thousands of academic papers over the past decades (Li et al., 2018). WoS has covered in the last 50 years ago all the publications and corresponding citations from more than 34,000 professional journals, which constitute the core of the international scientific serial literature for many fields (Clarivate, 2020). Thus, the journals included in the WoS database are recognized as ‘top journals’ (Merigó-Lindahl, 2012).

To cover all possible related articles on (board and CSR), we developed a combined keyword that includes the board with CSR, Sustainab* and Philanthrop*. Sustainab* (to ensure that all the possible variations such as “Sustainable development,” “Sustainability Reporting,” and “Sustainability” were included in our sample). Philanthropy was previously used to refer to CSR because, in the past, companies used to focus mainly on philanthropic activities such as charitable activities and donations (Wang & Coffey, 1992). Therefore, we have used “Philanthrop*” to cover all possible variations such as “Philanthropy” and “Philanthropic activities. “The search criteria included the joint appearance of the words (“board” and (“CSR” OR “Sustainab*” OR “Philanthrop*”) in one area or jointly of the title, abstract, and keywords. After eliminating all results other than articles and English language and choosing the fields that of our interests, which are: Business, Management, Business Finance, Economics, and Environmental Studies, the result of this search showed 580 articles. We then reviewed 580 articles for their abstract and title to exclude the irrelevant articles that were not tightly focused on the relationship between board and CSR. Thus, the remaining sample included 242 articles. Afterwards, we used Bibexcel software to make a bibliometric analysis and VOSviewer to analyse the social networks and the visualisation tool for our research.

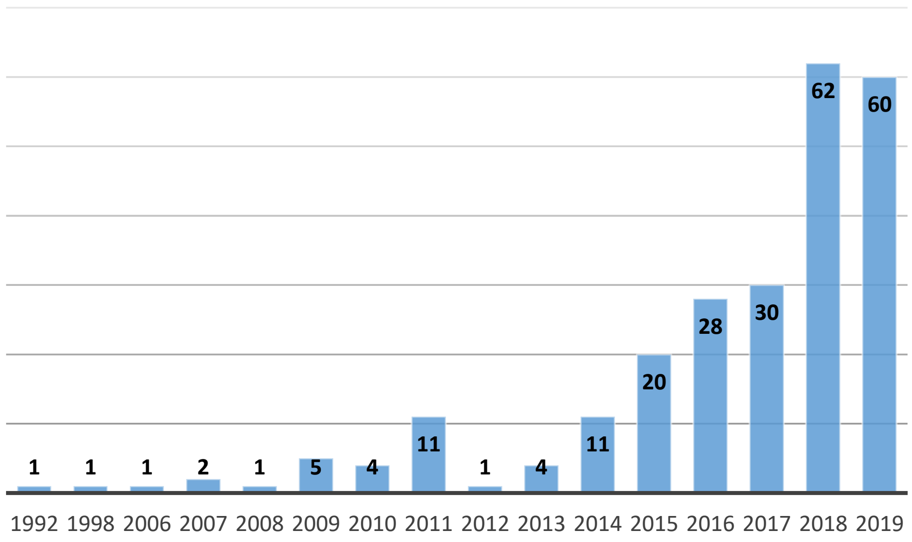
2.3. Results

First, we develop a descriptive analysis to study the literature structure in the field by counting its years of publication and contributing authors, institutions, countries, and Journals.

2.3.1. Study objective 1: Distribution pattern of the literature

We analysed the trend of publications in the periods from 1992 to 2019.

Figure 1 Publications trend



Source: Edited by author

Figure 1 shows the publications trend from 1992 to 2019. Only almost 11% (26 of 242) articles published between 1992 and 2011; the leading re-search period can be considered after 2011. Figure 1 can be split into two periods: the initial period from 1992 to 2011, and the second is the growth period from 2012 to 2019. It shows that the interest from researchers on board of directors and CSR are increasing with a rising number of published research.

Interestingly, there is a massive growth of published research in the last six years, accounting for almost 86% of the total publications in this field. This result is in line with Montiel and Delgado-Ceballos (2014), they reported that after 2012, when the studies of CSR started to increase. Moreover, some journals such as JBE have even published special issues related to CSR in 2013 (Montiel & Delgado-Ceballos, 2014). The increase in publications may be due to the 2008 financial crisis and its effect on CSR and CG. Velte (2017) reported that the international and national stander sitters initiated various amendments to improve the quality of board characteristics and CSRD after the 2008-2009 financial crisis. Besides, strengthening an institutional framework aimed to enhance the research activity and reflect scholars' recognition of field importance. The trend also shows that publications will continue to grow.

2.3.2. Study objective 2: Top players: authors, networks, institutions, countries, and journals.

Authors and Institutions

Table 1 Most Productive Country and Institution

Rank	No	Institutions	Country
1	19	University of Salamanca	Spain
2	10	Jaume I University	Spain
3	8	University of Granada	Spain
4	5	Pepperdine University	USA
5	5	Deakin University	Australia
6	5	Lebanese American University	Lebanon
7	5	Polytechnic University of Cartagena	Spain
8	5	University of Leon	Spain
9	5	American University of Beirut	Lebanon

Source: Edited by author

Table 2 Top Authors

Ranking	Number	Author	Country
1	16	Garcia-Sanchez IM	Spain
2	11	Martinez-Ferrero J	Spain
3	8	Pucheta-Martinez MC	Spain
4	6	Cuadrado-Ballesteros B	Spain
5	5	Cabeza-Garcia L	Spain
6	5	Fernandez-Gago R	Spain
7	5	Garcia-Meca E	Spain
8	5	Harjoto MA	USA
9	5	Khan I	Australia
10	5	Muttakin MB	Australia
11	5	Rodriguez-Ariza L	Spain
12	4	Jizi M	Lebanon
13	4	Jo H	USA
14	4	Khan A	Australia
15	4	Nieto M	Spain
16	4	Post C	USA

Source: Edited by author

Five hundred and forty-two different authors from three hundred and twenty-three different institutions participated in 242 articles. Table 1 shows the top nine institutions with five publications or more. The most productive institutions were from four countries (Spain, the USA, Australia, and Lebanon). The top three institutions were from Spain: University of Salamanca, Jaume I University, and the University of Granada with 19, 10, and 8, respectively. It is worth mentioning that the top two lead authors (see Table 2) are Garcia-Sanchez, with 16 publications from the University of Salamanca and Pucheta-Martinez, with eight publications from Jaume I University.

Authors Networks

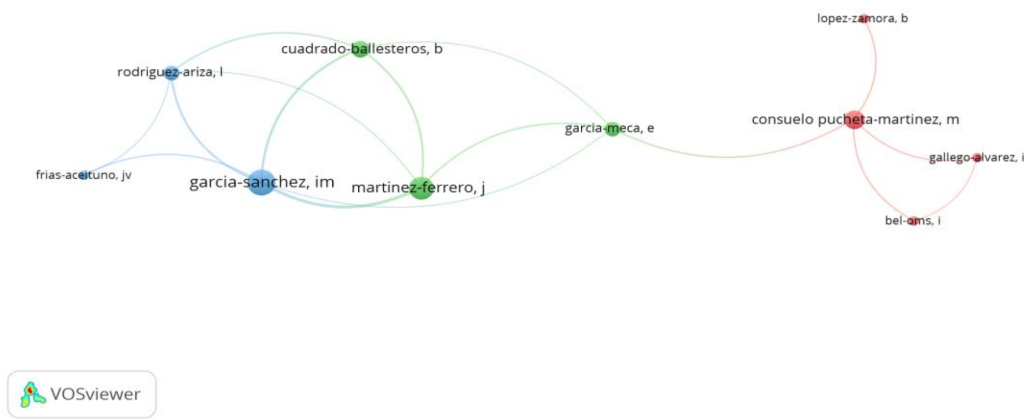
Table 3 shows the authors co-occurrence with at least three frequencies. The lead author Garcia-Sanchez have ten collaborations with Martinez-Ferrero, five collaborations with Cuadrado-Ballesteros and four with Rodríguez-Ariza. The research group of Cabeza-Garcia and Fernandez-Gago has five collaborations in common and presents three collaborations with Nieto. It is worth mentioning that most collaborations between researchers were from the same institution, the University of Salamanca. As previously mentioned in Table (1), which is the most productive institution in this field. While other researchers with four collaborations, for example, Khan and Muttakin from Australia. Figure 2 shows the main links among the authors' networks.

Table 3 Authors Co-occurrence

10	Garcia-Sanchez IM	Martinez-Ferrero J
5	Garcia-Sanchez IM	Cuadrado-Ballesteros B
5	Cabeza-Garcia L	Fernandez-Gago R
4	Khan A	Muttakin MB
4	Garcia-Sanchez IM	Rodriguez-Ariza L
3	Fernandez-Gago R	Nieto M
3	Martinez-Ferrero J	Cuadrado-Ballesteros B
3	Cabeza-Garcia L	Nieto M
3	Al-Shaer H	Zaman M
3	Chang YK	Oh WY

Source: Edited by author

Figure 2 Authors Co-occurrence



Source: Edited by author

Countries

Almost 67 % of the publications in the field of the board of directors and CSR are conducted in developed countries. Most of the publications from Spain, the USA, China, Australia, and the UK (see Table 4). Many developed countries are interestingly focusing on this topic, reflecting its importance and impact. While research in developing countries still relatively small, with a percentage of 33%. Furthermore, we noticed that Common Law countries (e.g., USA, UK, Australia, and Canada) are the top countries producers in this field. Zemigala (2015) conclude that CSR research mainly concentrated on the Common Law countries. According to Chung et al. (2012), Common Law countries pay more attention to corporate governance structure, and it focuses more on stakeholder protection than civil law countries.

Table 4 Most Productive Country

Rank	Country	Developed/Developing	Common/Civil law	No
1	Spain	Developed	Civil	55
2	USA	Developed	Common -	38
3	China	Developing	Civil	32
4	Australia	Developed	Common	30
5	UK	Developed	Common	23
6	Italy	Developed	Civil	11
7	Malaysia	Developing	Civil	10
8	Pakistan	Developing	Civil	10
9	New Zealand	Developed	Civil	9
10	Lebanon	Developing	Civil	9

Source: Edited by author

Journals

Table 5 shows the most productive journals, 242 articles published in 83 journals; this result reflects the high diversity of articles produced in this field. However, almost 56% (136 of 242) of the articles were concentrated in ten journals. As shown from the Table, the scope of the most productive journals is on CSR and corporate governance. Journal of Business Ethics is the most productive journal with 35 publications, while Corporate Social Responsibility and Environmental Management and Sustainability journals are the second and third most producer with 27 and 18 publications, respectively.

Table 5 Most Productive Journals

Journals	Record count	Scope	% Of 242	IF 2018	Q
Journal of Business Ethics (JBE)	35	Ethical issues related to business. (e.g., CSR, Social and Environmental disclosure)	14.46%	3.796	Q1
Corporate Social Responsibility and Environmental Management (CSREM)	27	Social and environmental responsibilities, sustainable development	11.15%	5.513	Q1
Sustainability	18	Challenges relating to sustainability and Socio-economic, scientific, and integrated approaches to sustainable development	7.44%	2.592	Q2
Journal of Cleaner Production (JCP)	13	Social and environmental responsibilities, sustainable development	5,37%	6.395	Q1

Source: Edited by author

On the other hand, we also developed a more evaluative assessment to study the literature in the field by using citation analysis. Thus, it can be identified that the most cited papers are the most useful, and the most co-cited papers are the most related papers.

2.3.3. Study Objective 3: Identify the Core Literature in the international literature.

Table 6 ranks the most cited articles. “The Impact of Board Diversity and Gender Composition on Corporate Social Responsibility and Firm Reputation” by Bear et al. (2010), which was published in the Journal of Business Ethics, was the most cited article (370 times) with an average of 37 citations per year. Almost 83% (201 of 242) articles were cited at least once, and nearly 42% (102 of 242) were cited more than ten times. The most cited articles are from the Journal of Business Ethics (JBE), Corporate Governance-An International Review (CGIR), Corporate Social Responsibility and Environmental Management (CSREM), and Business and Society.

Table 6 Rank of the most cited articles

Rank	Title	Authors	Journal	Publication Year	Total Citations	Average per Year
1	The Impact of Board Diversity and Gender Composition on Corporate Social Responsibility and Firm Reputation	Bear, Rahman, and Post	JBE	2010	370	37
2	Corporate Governance and Firm Value: The Impact of Corporate Social Responsibility	Jo and Harjoto	JBE	2011	278	30.89
3	Corporate Governance and Corporate Social Responsibility Synergies and Interrelationships	Jamali, Safieddine, and Rabbath	CGIR	2008	251	20.92
4	Corporate Governance and Corporate Social Responsibility Disclosures: Evidence from an Emerging Economy	Khan, Muttakin, and Siddiqui	JBE	2013	228	32.57
5	Corporate Governance and CSR Nexus	Harjoto and Jo	JBE	2011	191	21.22
6	Green Governance: Boards of Directors’ Composition and Environmental Corporate Social Responsibility	Post, Rahman, and Rubow	Busniess & Society	2011	180	20
7	The Role of the Board in the Dissemination of Integrated Corporate Social Reporting	Frias-Aceituno, Rodriguez-Ariza, and Garcia-Sanchez	CSREM	2013	154	22
8	Board Composition and Corporate Philanthropy	Wang and Coffey	JBE	1992	150	5.36
9	The Effect of Ownership Structure on Corporate Social Responsibility: Empirical Evidence from Korea	Oh, Kyun and Martynov,	JBE	2011	144	16
10	Corporate Governance and Corporate Social Responsibility (CSR): The Moderating Roles of Attainment Discrepancy and Organization Slack	Arora and Dharwadkar	CGIR	2011	130	14.44

Source: Edited by author

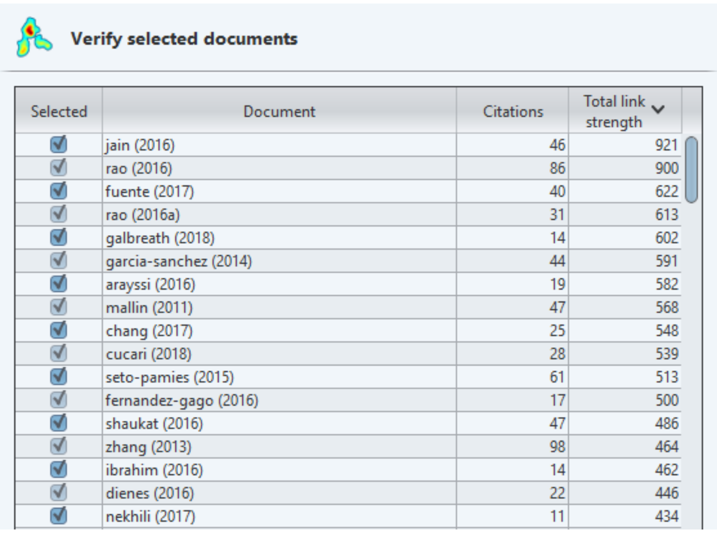
Co-citation

Figure 3 identifies two main groups of cited documents in the literature. The first cluster (the red one) is focused on stakeholders and agency theory. It is formed by five very relevant works cited frequently together in our sample (lead by Jensen, Fama, Freeman, Waddock, and Johnson). The green group comprises four articles on corporate governance, usually cited jointly (Bear, Post, Haniffa, and Khan's works).

Bibliographic coupling

To better understand the academic background of the 242 articles of the sample, we analysed the network of articles referenced, and it revealed that the largest set of connected papers contained 102 publications (i.e., 42.15% of the sample). Figure 4 presents the articles with the highest link strength of bibliographic coupling.

Figure 3 Bibliographic Coupling (Minimum of 10)


Verify selected documents

Selected	Document	Citations	Total link strength
✓	jain (2016)	46	921
✓	rao (2016)	86	900
✓	fuente (2017)	40	622
✓	rao (2016a)	31	613
✓	galbreath (2018)	14	602
✓	garcia-sanchez (2014)	44	591
✓	arayssi (2016)	19	582
✓	mallin (2011)	47	568
✓	chang (2017)	25	548
✓	cucari (2018)	28	539
✓	seto-pamies (2015)	61	513
✓	fernandez-gago (2016)	17	500
✓	shaukat (2016)	47	486
✓	zhang (2013)	98	464
✓	ibrahim (2016)	14	462
✓	dienes (2016)	22	446
✓	nekhili (2017)	11	434

Source: Edited by author

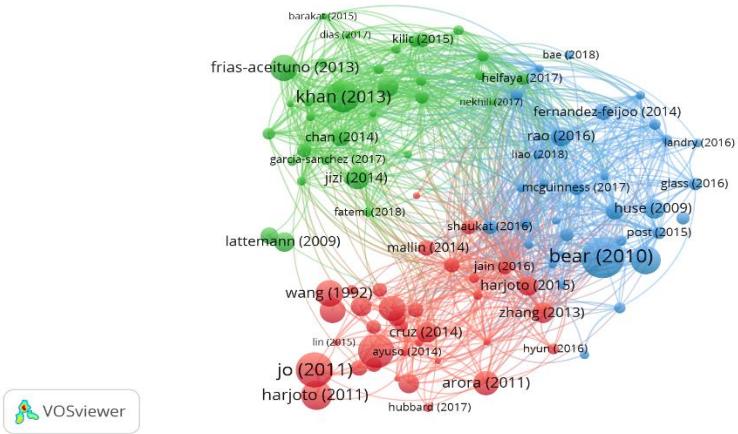
Following Figure 3, the three studies with the highest indices of bibliographic coupling are:

Jain, T., & Jamali, D. (2016). Looking inside the black box: The effect of corporate governance on corporate social responsibility. Corporate Governance: An International Review, 24(3), 253-273.

Rao, K., & Tilt, C. (2016). Board Composition and Corporate Social Responsibility: The Role of Diversity, Gender, Strategy, and Decision Making. Journal of Business Ethics, 138(2), 327-347.

Fuente, J. A., García-Sánchez, I.M., & Lozano, M.B. (2017). The role of the board of directors in the adoption of GRI guidelines for the disclosure of CSR information. Journal of Cleaner Production, 141, 737-750.

Figure 4 Bibliographic Coupling (Minimum of 10)



Source: Edited by author

Trying to complete the Bibliographic coupling analysis of articles, Figure 4 presents a network visualisation. The figure reveals three main clusters of documents that are commonly cited together. Jain et al. (2016) has the biggest link strength and belongs to the red cluster with other articles, such as Mallin et al. (2014), Zhang et al. (2013), and Shaukat et al. (2016). On the other hand, Rao et al. (2016) is close to the leader in terms of bibliographic coupling and belong to the blue cluster, like Nekhili et al. (2017). Finally, Fuente et al.(2017) lead the green cluster, where we can find documents with a relevant link strength, such as Khan et al. (2013).

Finally, after the evaluative assessment, this section will finish studying the variables used in the research in the field. Thus, it can be identified as the most used variables and the potential gaps in the field.

2.3.4. Study Objective 4: Most relevant topics in the literature.

Table 7 Keyword Frequency

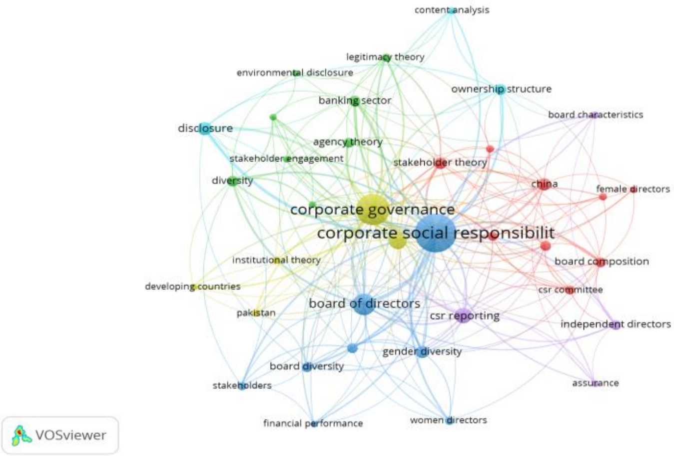
ranking	Number	Keyword
1	151	CSR/Sustainability
2	93	Corporate Governance
3	48	CSR/Sustainability disclosure

4	44	Board of directors
5	16	Disclosure
6	14	China
7	14	Gender diversity
8	13	Corporate Social Performance
9	13	stakeholder theory
10	12	ownership structure
11	11	Diversity
12	11	Women directors
13	10	Agency theory
14	10	Board diversity
15	10	Board independence
16	10	Independent directors
17	10	Banking sector

Source: Edited by author

After a homogenisation process, Table 7 shows the most frequent keywords with ten times or more in the field of board and CSR. CSR/Sustainability and Corporate Governance are the most keywords studied in the area, with 151 and 93 times, respectively. Regarding CSR, we notice that researchers in this field focused on CSRD and performance with keywords frequency 48 and 13, respectively. Consistent with our results, the keywords frequency table shows that most researchers examine board gender diversity and board independence with the frequency of 25 and 20, respectively. This result is also reflected in keywords Co-Occurrence. Thus, Table 8 indicates that most studies focus on the concept of diversity in general and specifically on gender diversity. Concerning the theoretical framework, the studies on this field mainly concentrate on stakeholder and agency theory to explain the associations between board and CSR with a frequency of 13 and 10, respectively. We can also notice that the keyword “China” appears 14 times; this indicates that China is one of the most influential countries in this field, which is consistent with our result (see Table 4). However, China appears neither in most productive authors nor in most productive institutions, reflecting that there are no clear collaborations between Chinese authors and institutions.

Figure 5 Keyword Co-occurrence



Source: Edited by author

According to the Keyword co-occurrence, Table 8 presents keywords that indicate a powerful co-occurrence, which meant that they were gist keywords in the board of directors and CSR literature

Figure 5 shows four main thematic clusters where each ball represents a keyword, and the size of each ball is proportional to the co-occurrence frequencies of keywords. The first cluster (the blue one) is devoted to the link between CSR, Board of Directors, diversity, and disclosure. The red one deals with board composition, CSR Committee, and stakeholder theory. On the other hand, the green cluster is focused on the banking sector and environmental disclosure under the lens of agency and legitimacy theories. Finally, the yellow one analyses the state of the field in developing countries, using an institutional approach.

Table 8 Keyword Co-occurrence

Number	Keyword Co-occurrence	
40	Corporate Governance	Corporate Social Responsibility
11	Board of directors	Corporate governance
11	Corporate Social Responsibility	Disclosure
10	Board of Directors	Corporate Social Responsibility
8	Corporate governance	Corporate Social Responsibility
7	Corporate governance	Disclosure
7	Corporate Social Responsibility	Ownership structure
7	Corporate Governance	CSRD
7	Board diversity	Corporate Social Responsibility

6	Corporate Social Responsibility	Gender diversity
6	China	Corporate Governance
6	Corporate Social Responsibility	Diversity
6	Corporate Social Responsibility	Stakeholder theory
6	Corporate governance	CSR
6	Corporate governance	Gender diversity
6	China	Corporate Social Responsibility

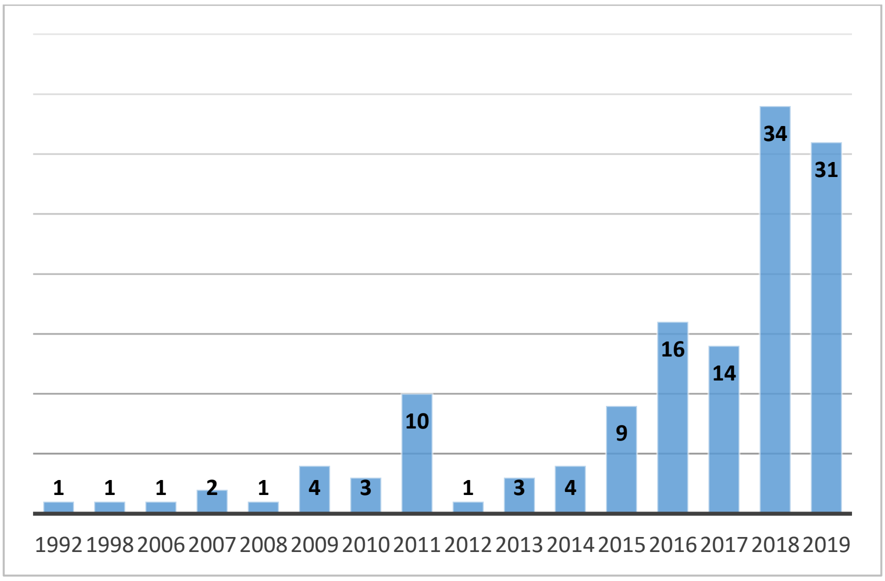
Source: Edited by author

2.3.5. Study Objective 5: Main measures of dependent (CSR) and independent variables (board characteristics) used.

Dependent Variables

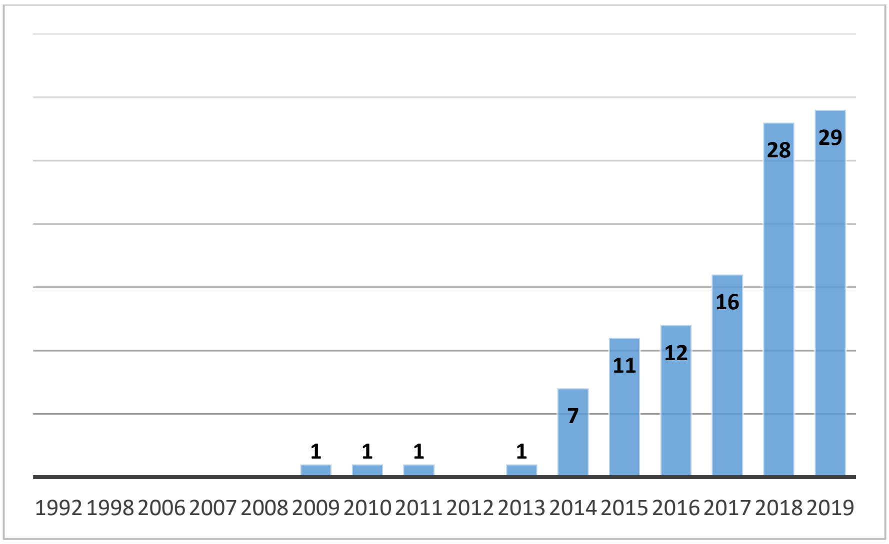
Most studies measure CSR in two ways: CSRP (CSRP) and CSRD/Reporting (CSRD). CSRP and CSRD are different, and we cannot deal with them as synonymous; CSRD is one factor affecting CSRP; it is mainly measured by the voluntary social and environmental information disclosed by companies on its annual report or CSR separate report (Velte, 2017). Also, CSRD depends on GRI (Global Reporting Initiative) guidelines, representing a set of standards that corporates use to report the impact of their operations on society, environment, and economy (Global Reporting Initiative, 2016). On the other hand, CSRP measured using a different database such as KLD and EIRIS. KLD is the most database used to measure CSRP (Chen et al., 2019; Macaulay et al., 2018; Harjoto et al., 2015; Jo & Harjoto. 2011; Ghosh & Harjoto, 2011; Harjoto & Jo, 2011; Arora & Dharwadkar, 2011; Mallin & Michelon, 2011; Bear et al., 2011). Other studies used the EIRIS database (Cuadrado-Ballesteros et al., 2017a). Moreover, some studies measure CSRP as a dummy variable (Eberhardt-Toth, 2017; Godos-Diez et al., 2018). Figure 6 shows the trend of publications based on CSRP as a dependent variable. The period of the publications is relatively broad from (1992-2019), but it is noticeable that they have started to overgrow after 2012. On the other hand, Figure 7 shows that the interest in CSRD began in 2009 and have started to grow after 2012. It is worth mentioning that in the last three years (2017-2019), the researchers in this field become more interested in CSRD than CSRP or practices.

Figure 6 CSRP Publications Trend



Source: Edited by author

Figure 7 CSRD Publications Trend



Source: Edited by author

According to Rao and Tilt (2016), CSRD will be included in companies' annual reports or individual CSR reports. Fifty-one studies depend on companies' financial statement to measure CSRD and other financial variables by analysing the content of company's annual report, website and CSR report by using a checklist, counting words and sentences (Zaid et al., 2019; Kolsi & Attayah, 2018; Appuhami & Tashakor. 2017; Barakat et al., 2015; Jizi et al., 2014; Sharif & Rashid, 2014; Khan et al., 2013). Other studies measure CSRD using ESG rating depending on the Bloomberg database (Cucari et al., 2018; Al-Dah et al., 2018;

Giannarakis et al., 2014), and by using KPMG international surveys of CSR reporting (Fernandez-Feijoo et al., 2014), using a dummy variable (Pucheta-Martinez & Chiva-Ortells, 2018; Liao et al., 2018), Dow Jones Sustainability Indices (Chang et al., 2017), and GRI database (Cabeza-Garcia et al., 2018; Fuente et al., 2017).

Almost 44 % of the sampled articles used CSRD as a dependent variable (see Table 9), while nearly 54 % used CSR (performance, practices, actions, engagement, and strategies). For example, Macaulay et al., 2018; Harjoto et al., 2015; Zhang et al., 2013, used CSRP rating to measure CSR.

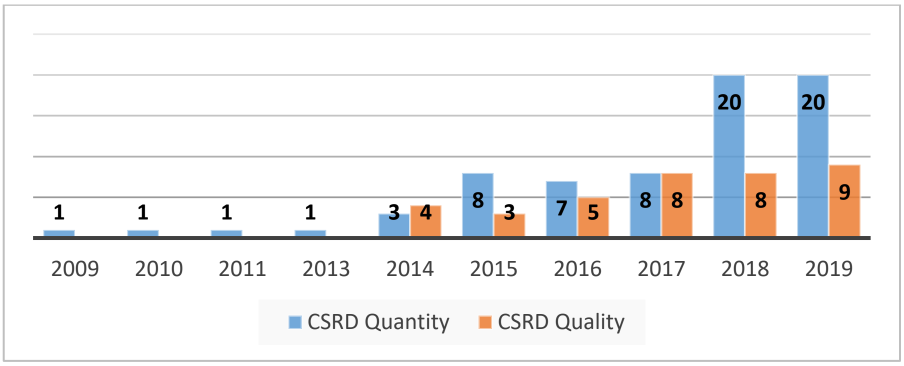
Table 9 Dependent Variable – Country Analysis

Country	CSRD	CSRP	Total
Spain	36	19	55
USA	4	34	38
China	8	24	32
Australia	14	16	30
UK	10	13	23
Other countries	37	35	72
Total	109	141	250

Source: Edited by author

Table 9 shows the dependent variable (CSR/CSRD) across different countries. Forty-eight countries studied 242 articles, and almost 67% of the studies, as mentioned earlier, conducted in developed countries. However, CSRD studies are focused on developing countries; this result is consistent with Velte (2017), while studies in developed countries mainly focused on CSRP. The USA is the second most producer country with 38 articles; 34 are focused on CSRP and mainly depend on the KLD database as the primary data source to measure CSR. Future research in developed countries such as the USA could pay more attention to study CSRD. Moreover, studies in developing countries in CSR (disclosure/performance) are relatively low; it could be more interesting for future research in these countries to consider this point.

Figure 8 CSRD quantity and quality Publications Trend



Source: Edited by author

CSRD

Almost 44 % (107 of 242) of the sampled articles used CSRD as a dependent variable, nearly 65 % (70 of 107) of these articles used CSRD quantity, while almost 35 % (37 of 107) focus on CSRD quality. According to Velte (2017), most of the studies in CSRD depend on CSRD quantity because the simplest way to measure by using a checklist, counting words and sentences, and using unweighted code to limit subjectivity and bias problem. However, few researchers used both (see, for example, Appuhami & Tashakor, 2017; Helfaya & Moussa, 2017; Alotaibi & Hussainey, 2016 & Cuadrado-Ballesteros et al., 2015). As shown in figure 8, the interest in CSRD quantity has started earlier than CSRD quality. Moreover, the trend was almost alike. However, the variation between the trend of publications has peaked in the last two years (2018-2019), and CSRD quantity research has gained much more interest from researchers. However, the quantity of disclosed CSR items is not always enough, and sometimes the quality of disclosed information could give a more accurate measurement. Future research may, therefore, give more interest to CSRD quality.

Most Used Independent Variables

Table 10 Top Six Independent Variables Used

1	Board Independence	101
2	Gender Diversity	95
3	Board Size	71
4	CEO Duality	37
5	CSR Committee	31
6	Board Meeting (activity)	21

Source: Edited by author

Table 10 shows the top independent variables used with more than 18 frequency. However, we avoid three variables from the table above (ownership concentrations, government ownership and institutional ownership with the frequency of 13, 11 and 9, respectively) because this study focuses on board characteristics, not other CG variables such as ownership structure. As shown in table (10), board independence, gender diversity, and board size are the most used variables with the frequency of 101, 95, and 71, respectively. On the other hand, few studies on the board of directors and CSR have studied other board variables such as audit committee characteristics, board age, board education and experience, board tenure, board interlocking, board compensations, CSR committee characteristics. Thus, it could be helpful for future research to focus on these variables. Table 11 shows the most used independent variables measurement.

Table 11 Measurement of Independent Variables

Variable	Operational Definition	Reference
Board independence	Percentage of (non-executive, outside, independent) directors on the board.	Jizi et al., 2014; Khan et al., 2013; Jo & Harjoto, 2011
Board Gender Diversity	Percentage of female directors on the board.	Liao et al., 2018; Giannarakis et al., 2014; Harjoto and Jo, 2011.
Board Size	Number of the board of directors	Dwekat et al., 2018; Kolsi and Attayah, 2018; Garcia-Sanchez & Martinez-Ferrero, 2017; Barakat et al., 2015
CEO Duality	A dummy variable equals one if the CEO is the chairman of the board, or 0 otherwise.	Liao et al., 2018; Giannarakis et al., 2014; Jizi et al., 2014; Khan et al., 2013.
The existence of CSR committee	A dummy variable equal one if the company exist CSR committee, or 0 otherwise.	Cucari et al., 2018; Fuente et al., 2017;
Board activity	A frequency of boards meeting	Liao et al., 2018; Cuadrado-Ballesteros et al., 2015

Source: Edited by author

2.4. Conclusions

In general, the growing literature shows how the interest in the relationship between board and CSR are increasing, especially since 2014. Besides, most of the most productive journals in the field are high-quality journals with a high scientific impact, emphasising the increasing awareness of the importance of the research on the topic. Our results also indicate the significant impact of the literature since almost 83% of articles are cited at least once, and nearly 42% are cited more than ten times. Bear et al. (2010), Jo and Harjoto (2011) and Jamali, Safieddine, and Rabbath (2008) have the essential value in the literature since they are the most cited articles in the field (with more than 250 citations).

Although the research on this field is distributed worldwide, almost 67% of the academic articles are in developed countries and concentrated mainly in Spain, the USA, China, Australia, and UK Thus, the most productive institutions and authors are primarily located in the same countries. While on the other hand, research on the field still relatively low in developing countries. Therefore, future research may consider focussing on these countries.

Regarding topics of interest in the literature, the most used keywords were "CSR" (or Sustainability), "Corporate Governance", "CSRD" (or Reporting) and "Board of directors". Besides, the keywords co-occurrence identifies "Corporate governance and corporate social responsibility," "Board of directors and corporate social responsibility," and "Corporate social responsibility and Disclosure" are the most keywords used jointly.

Social Network Analysis results also show that two or more authors study almost 93% of sampled articles; this means that researchers in this field tend to work cooperatively. Garcia-Sanchez and Martinez-Ferrero have the highest Authors co-occurrence with ten articles, noting that they both are from University of Salamanca. On the other hand, the collaborations in other countries such as Khan and Muttakin in Australia and Harjoto and Jo in the USA are relatively low with four and two collaborations. Thus, the literature structure does not identify a robust network of collaborations between authors. The study identifies only one significant network of authors, all of whom are Spanish.

The co-citation analysis indicates two main groups of cited documents in the literature. The first cluster is focused on theory (stakeholders and agency theory). The second group comprises four articles on the impact of corporate governance on CSR, usually cited jointly (Bear, Post, Haniffa, and Khan's works). The keywords and co-citation analysis results show that agency theory and stakeholder are the most popular theories used by researchers to explain the relationship between board and CSR. According to Clarkson (1995), the best way to understand CSR is to analyse how companies manage their relationship with stakeholders. Moreover, stakeholder theory has been used in most areas of CSR and has given rise to a large body of literature. Agency theory suggested that the primary function of the corporate board is to supervise the management to protect shareholders' interests, therefore, reducing conflict of interests (Jensen & Meckling 1976).

One critical contribution of this investigation has been to identify the key variables to explain the relationship between board and CSR. In this sense, literature measure CSR in two ways: CSRP and CSRD. CSRD depends on GRI guidelines, and CSRP is measured using a database such as KLD and Asset4(Eikon). They both have started to overgrow after 2012, but the researchers become more interested in CSRD than CSRP. Across countries, most of the studies were conducted in developed countries. Nevertheless, CSRD works are focused mainly on developing countries, while CSRP studies are commonly focused on developed countries. Therefore, there are different gaps for future research, for studies on CSRD in developed countries and on CSRP in developing countries. Moreover, the interest in CSRD quantity has started earlier than CSRD quality, although sometimes the quality of disclosed information could give a more accurate measurement. Therefore, future research may give more interest to CSRD quality.

On the other hand, as the independent variables, the academic literature has studied the impact of a wide range of board characteristics, highlighting the board independence, gender diversity, board size, CEO duality, board meetings, and CSR committee. While a few studies take into consideration the attributes of these variables. Thus, future research could give more consideration to some characteristics of board independence (such as gender, education, experience, age), of women on the board (independent, experience, education, age), and CSR Committee (age, gender, independent, experience, education, duality). As mentioned earlier, most of the researchers concluded that the level of CSR/CSRD would increase with a high percentage of independent directors, the presence of women in the board, the larger board size, non-CEO duality, and the existence of CSR committee. On the other hand, there are some board characteristics that studies did not draw enough attention toward their relation with CSR/CSRD, such as audit committee characteristics, board age, board education, experience diversity, and board interlocking.

Finally, this study might have some limitations in the search because of the bibliometric technique used. A significant limitation is the possibility of the non-inclusion of one or more critical vital articles in a substantial database, which was not due to a lack of methodology.

Another limitation is related to the database used (WoS). Due to its characteristics, some exceptions may be found throughout the results. On the other hand, Database characteristics will be reproduced in the measurements, and they can change (Van Raan, 2000). Thus, WoS has been working for decades and has changed over the years (the number of journals has grown notably).

3. Corporate Governance and Corporate Social Responsibility: Mapping the Most Critical Drivers in the Board Academic Literature

Dwekat, A., Seguí-Mas, E., Zaid MAA & Tormo-Carbó, G. (2020). Corporate Governance and Corporate Social Responsibility: Mapping the Most Critical Drivers in the Board Academic Literature. Invited for resubmitted to Meditari Accountancy Research.

3.1. Introduction

Over the last decades, the global economy has encountered a broader scope of societal debates on the businesses' social and ecological responsibilities. In this vein, two modern concepts have emerged: (i) corporate sustainability (CS) and (ii) Corporate Social Responsibility (CSR). One common definition of sustainability was suggested by Brundtland (2010) as "development that meets the needs of the present, without compromising the ability of future generations to meet their own needs". In the same direction, CSR was defined as conducting business in a way that is economically viable, legally commendable, ethically mindful, and socially allegeable (Carroll, 1979). Furthermore, CSR is one of the significant areas that Corporate Governance (CG) has brought in the last decade.

According to Cadbury (1992), CG was defined as the way in which firms are controlled. Thus, CSR and CG help companies to obtain a balance among profitable operations and ethical practices, including social activities (Haniffa & Cooke, 2005). In a broader sense, firms must act socially and morally sensible, not merely behave in a pure financial side (Zaid et al., 2019). Considering the argument above, corporate sustainability performance has attracted the attention of companies due to their increased interest to amplify their reputation, strengthen their relationships with clients, government, and community (Siregar & Bachtiar, 2010), and reduce the information asymmetry, which, in turn, alleviate the agency cost (Jizi et al. 2014).

Shareholders elect board to manage and control firms' matters (Monks & Minow, 2008). Hence, the board has a vital function in allying managers concerns with the stakeholders (Harjoto et al. 2015). Nevertheless, board effectiveness is assessed through several attributes (Brick et al., 2006). These attributes are expected to affect both the CSRD and CSRP levels. In this regard, this paper sheds light on the plausible nexus between the most prominent board attributes, namely (independence, size, gender diversity, CEO duality, CSR committee, and diligence) and CSRP/CSRD.

To this end, this research makes remarkable contributions to the board-CSR literature by providing several new insights and present deep-rooted discussions for further future research. More pointedly, the crushing majority of the prior review and bibliometric works have either introduced CSRP/CSRD (Carroll, 1999; Wood, 2010; Frynas & Yamahaki, 2016; Fernandez-Gago et al., 2020) or CG (Aguilera et al. 2015; Terjesen et al. 2009). However, comparatively scarce literature reviews studies (Rao & Tilt, 2016b; Jain & Jamali, 2016; Velte, 2017) or meta-analysis studies (Ortas et al., 2017; Byron & Post, 2016) have addressed the connection between board characteristics and CSRP/CSRD. Consequently, it is worth analysing what was neglected by scholars and opening the black box, reinforcing and enriching the existing literature. In this sense, our current research contributes to the literature by presenting inclusive scenery and mapping the extensive knowledge of the prior research on the connection between board characteristics and CSRP/CSRD. More specifically, a content analysis technique was employed in this research to build robust implications and generate a clear analytical view. Our study also covers a prolonged period (1992-2019), relying on the WoS database.

Although previous board-CSR reviews (Rao & Tilt, 2016b; Jain & Jamali, 2016; Velte, 2017) have provided excellent work, our research includes a larger sample with a broader period (242 articles, from 1992- 2019). It is worth mentioning that almost 63 % of our sample is from (2017- 2019) and these recent articles have not been covered by prior studies of the ancestors. Moreover, this study primarily includes the preceding literature on the effect of board attributes on CSRP/CSRD measured by the quantity and quality indices. Furthermore, our review is anticipated to be beneficial and valuable not only for academicians but also for professionals and policymakers. More clearly, it offers novel insights and directions for future studies by presenting the empirical findings of the effect of most used board characteristics (independence, size, gender, CEO duality, CSR committee, and board activity) on CSRP/CSRD, explaining their restrictions and providing some favourable additional variables that could be considered. Additionally, it discussed the most used theories, methods and suggested new methodological approaches. Our study findings also suggested some critical characteristics concerning the development and analysis of the board-CSR guideline.

In this sense, this study will help to have the intellectual structure of this research field regarding main theories, data sources and methodologies used by researchers, providing information on methodological bias and research gaps. Moreover, it will offer a 'big picture' about the critical Board characteristics to explain CSRD and Performance. Keeping this in mind, this paper's primary goal is to answer the following research questions (RQs):

RQ1: What are the main theories used by the researchers regarding the impact of Board characteristics on CSRD and Performance?

RQ2: What are the primary data sources used by the researchers in that field?

RQ3: What are the primary methodologies used by the researchers?

RQ4: What are the main variables to measure CSRD and Performance in the academic literature?

RQ5: What are the critical Board characteristics used to measure CSRD and Performance?

The rest of this chapter is arranged as follows: The subsequent section offers a brief literature review. The third section presents a comprehensive view of the study methodology and procedures regarding methods, data, and samples. The fourth section introduces the findings of the content analysis. Afterwards, a discussion of the results is presented. Conclusion, implications, and future directions are given in the last section.

3.2. Literature review

Over the last few decades, empirical research on exploring the drivers of corporate social responsibility practices has vastly burgeoned. More minutely, several scholars have articulated that the board of directors is deemed a cornerstone factor in shaping corporate social and environmental activities. For instance, Haniffa and Cooke (2005) point out that CSRD is exceedingly influenced by those involved in formulating decisions in the entity; hence, boardroom characteristics could be one of the eminent drivers that have tremendous influence in shaping the corporate social and environmental activities.

Empirically, a broad spectrum of earlier studies have been conducted to explore trends and the key factors driving CSR reporting and performance. Notwithstanding, the overwhelming majority of these studies have concentrated their efforts on investigating the vigorous linkage between board attributes and corporate social and environmental initiatives in developed countries (e.g., Zhang et al., 2013; Cuadrado-Ballesteros et al., 2017a; Yarram & Adapa, 2021; Macaulay et al., 2018; García-Sánchez & Martínez-Ferrero, 2017; Cordeiro et al., 2020). In the same context, however, there are somewhat great efforts that have been devoted in developing countries to analyse the nexus mentioned above (e.g., Alotaibi & Hussainey, 2016; Sial et al., 2018; Mahmood et al. 2018; Zaid et al. 2019; Yasser et al., 2017).

In a definitional manner, the CSR notion has received a considerable amount of attention from researchers. According to Barnett (2007), CSR is defined as “a discretionary allocation of corporate resources toward improving welfare that serves as a means of enhancing relationships with key stakeholders’’.

In the contemporary business environment, pressures exerted by different parties have been emerged on firms to take responsibility for influences on society and the environment created by their activities (Zaid et al., 2019; Dwekat et al., 2020a). Furthermore, companies will devote special attention to engage in more CSR-related activities to placate all stakeholder groups and meet their needs.

Globally, there is increasing awareness of the remarkable role that CSR can play in supporting the need to protect social and environmental rights. In this light, nowadays, different countries around the world incline to oblige firms to contribute to society's wellbeing through engaging in social and environmental activities by encouraging top management to behave in an ethically responsible manner, not solely act in a pure financial side (Zaid et al., 2020b).

From the regulatory framework, the overwhelming majority of countries worldwide have devoted remarkable efforts to CSR regulation by enacting several laws and legislations to ensure a high level of compliance with social and environmental dimensions. In this regard, Geng et al. (2010) denote that, nowadays, different countries tend to enact laws to promote cleaner production. In this context, corporate social and environmental responsibility is a significant issue for all countries, particularly great economies including, but not limited to, the U.S., China, Russia, and India, which are deemed as the largest producers of harmful emissions. However, Chao and Kumar (2010) found that some developed markets (e.g., the United States) had more holistic, transparent laws than other countries (e.g., India). More specifically, the enactment of the Sarbanes-Oxley Act (hereafter SOX) of 2002 in the USA has substantial changes in board composition, such as the increased presence of women and outside directors on the boardrooms (Dalton & Dalton, 2010), which, in turn, affects firm CSRP.

Moving to the CSR process, O'riordan and Fairbrass (2008) reveal that CSR and stakeholders dialogue process can be expressed as a phased activity. More explicitly, two distinct phases can be identified under this umbrella. These are strategy development and strategy implementation. In the strict sense of the word, the strategy development stage includes a set of factors (values, alternatives, and strategy, while the strategy implementation phase includes (implementation and control; and output).

Theoretically speaking, researchers have been paying remarkable attention to analyse the firm's social and environmental practices with the relevant theoretical framework (Zaid et al., 2019). In this vein, CSRD and CSRP concepts are congruent with a stream of theories, including, but are not limited to, agency theory, legitimacy theory, critical mass theory, institutional theory, stakeholder theories, and resource dependence theory. These theories are considered the most vastly used by ancestors.

3.3. Methodology

The content analysis technique was performed to precisely make conclusions from the data and provide new insights, knowledge, facts representation, and a fractional guide to action (Duriau et al., 2007). In the same direction, content analysis definition has been vastly used amongst the antecedent's scholars in CSRP/CSRD disclosure. According to Abbott and Monsen (1979), p.504, content analysis is "A technique for gathering data that consists of codifying qualitative information in anecdotal and literary form into categories in order to derive quantitative scales of varying levels of complexity".

Selecting the databases to be employed is most important because it must cover the study object area to validate the work (Granda-Orive et al., 2013). WoS is the current leading international academic database because it has a stronger coverage, higher impact, and not limited to recent articles (despite covering an inferior number of journals) (Aghaei et al., 2013). Consequently, we used the Web of Science (WoS) database from 1992 to 201 as the source for retrieving the sample of analysis.

We search the Web of Science database from 1992 to 2019. The logic behind choosing this interval period is a growing interest in the corporate sustainability area. Therefore, it would be possible to collect rich CS data (Fernandez-Gago et al., 2020). To include all possible related literature on the field, we include in search criteria the combined appearance of the words ("board" and "CSR" or "Sustainable" or "Philanthrop*") jointly in the title, abstract, and keywords. We used "Sustainab*" to include in our sample words like "Sustainable" and "Sustainability" and "Philanthrop*" to incorporate "Philanthropy" and "Philanthropic" (because formerly companies referred to CSR mainly to charitable activities or donations). We obtained 686 articles after eliminating all results in other languages than English and choosing the fields of our interest area (Business, Business Finance, Management, Environmental Studies, and Environmental Science). This process was followed by a screening process in which the researchers carefully read the titles and abstracts to check that all the documents matched our analysis goal. When the titles and abstracts provide unclear information for this evaluation, the complete text was analysed. After this review, we found that 242 articles coincided with the introduced search criterion: the connection between board characteristics and CSRP/CSRD. The exclusion criteria were three: 1) the articles do not analyze the relationship between Board of Directors and CSR; 2) the articles are not focused on CSRD or CSRP, and 3) the articles are focused on integrated reporting.

3.4. Results

This section has implemented a comprehensive analysis to map and recapitulate the board -CSRP/CSRD literature. Each of the following subsections analyses the research questions stated in the introduction. The first one studies the most common theories used in the sampled articles, and the second one presents the primary data sources used by the researchers. The third one displays the most prominent methodologies applied by the preceding research in the field. The fourth subsection discusses the various proxies used in measuring the dependent variable "CSRP/CSRD". Finally, the last part introduces board of directors' critical characteristics to explain the CSRP and CSRD.

3.4.1. Theories used.

A vast array of theories contributed to the literature on the association between board of directors and CSR. Table 12 shows the most used theories in clarifying the board dimensions role in the variation in CSRP/CSRD. First, agency Theory (Wang & Coffey, 1992; Mallin & Michelon, 2011; Khan et al., 2013; Sadou et al., 2017; Ghosh and Harjoto, 2011; Frias-Aceituno et al., 2014; Valls Martínez et al., 2019); Second, stakeholder theory (Godos-Díez et al., 2019; Chan et al., 2014; Lin et al., 2018; Ghosh and Harjoto, 2011); Third, legitimacy theory (Garas & ElMassah, 2018; Sadou et al., 2017; Chan et al., 2014); Fourth, resource dependency theory (Khan et al., 2019; Singh, 2007; Mahmood & Orazalin, 2017; Rao & Tilt, 2016a); Fifth, institutional theory (Baraibar-Diez et al., 2019; Shahab and Ye, 2018; Cordeiro et al., 2018; Barakat et al., 2015) and critical mass theory (Yang et al., 2019; Birindelli et al., 2018; Birindelli et al., 2019; Cook & Glass, 2018; Cabeza-García et al., 2018; Lin et al., 2018). After reviewing the previous research papers, the findings point out that the agency and stakeholder theories were the most employed theories to clarify the underlying logic of the board-CSRP/CSRD relation with a frequency of 107 and 97, respectively. According to Jain and Jamali (2016), most CG-CSR works find support for agency and stakeholder theories arguments and mainly concentrate on the impacts of board compositions on CSR. Besides, most previous literature in this field concentrates on the role of the board supervision and monitoring function in reducing the conflict of interest between owners and managers. Simultaneously, boards exemplify multiple stakeholder interests in the organisational decision-making process. The majority of our sampled articles go beyond these two aspects and suggest that board members have their social networks and can coopt external connections to manage companies' resource dependencies.

From a theoretical ideology, Gray et al. (1995) report that it is difficult to illustrate the variation in CSRP/CSRD by depending on one theory's underpinnings. For instance, Jo and

Harjoto (2012) combined agency and stakeholder theories in supporting the relationship between board and CSRP/CSRD. Agency theory suggests that controlling and monitoring functions are the most critical board responsibilities that help protect shareholders' welfares (Fama & Jensen 1983; Jensen & Meckling 1976), thereby reducing the conflict of interest between owners and manager (Berle & Means 1932).

Corporate voluntary disclosure, precisely CSR, reduces information asymmetry between managers and stakeholders (Khan et al., 2013). Wang and Coffey (1992) used agency theory to clarify the relationship between non-executive directors (board independence) and corporate philanthropy. They claimed that non-executive directors' existence in the boardroom would enhance supervision and monitoring, reduce information asymmetry, and increase companies' charitable contributions. The stakeholder theory is one of the most critical theories used to explain CSRP/CSRD/CSR (Crane et al., 2008). Clarkson (1995) argued that analysing how corporations direct their association with stakeholders is the best way to understand CSR. The stakeholder theory is utilised in most CSR areas and has given growth to an extensive literature body. Therefore, it can be considered as a dominant paradigm in CSRP/CSRD. It was suggested by Freeman (1984) and Ullmann (1985) that managers play a vital role to meet and balance the interests between stakeholders in achieving the firm's obligations and objectives.

A stakeholder's perspective ensures that there are more groups than stakeholders affected by firms' activities. Therefore, managers should consider them (Freeman, 1994). The stakeholder theory thereby links CSRD and CG to improve a company's legitimacy and better associations with stakeholders (Michelon & Parbonetti, 2012). Legitimacy theory and resource dependency theory were also from the top theories used in the literature with a frequency of 43 and 39, respectively. Most of the previous research on CSRD/CSRD has used legitimacy theory and resource dependency theory (Helfaya & Moussa, 2017; Cucari et al., 2018). The legitimacy theory postulates that firms report more CSR information to legitimise their activities and maintain or gain more social acceptance (Mallin & Michelon, 2011; Deegan et al., 2002). The resource dependency theory is well linked to the stakeholder and legitimacy theories (Helfaya & Moussa, 2017). This theory suggests that CSR reporting is a way for businesses to communicate their actions, aims, operations, and outputs. Hence, those companies can enhance their legitimacy and public image (Hillman et al.,2009). The resource dependency theory also suggests that the board is a resource to manage the surrounding environmental risks (Pfeffer & Salancik, 1978). Thus, the board would help achieve a company's strategy, build an external relationship with various shareholders, and develop its legitimacy (Hillman & Dalziel, 2003; Hillman et al., 2009).

The institutional theory helps to understand the association between society and business (Brammer et al. 2012; Adams & Zutshi 2004); it also helps to an enhanced understanding of effective CSRP/CSRD/CSR. Besides, the institutional theory could help in studying CSR, as it allows a greater understanding of the diversity of CSR and CSR dynamics as two leading firms' responsibilities aspects (Campbell, 2006). Scholars have applied the critical mass theory to explain the nexus between females' number (three or more) on the boardroom and CSR (e.g., Liao et al., 2018; Cook & Glass, 2018). Concurring to the critical mass theory, Konrad et al. (2008) argued that three females or more in the boardroom would better influence board decisions. Moreover, this theory recommended that the presence of fewer than three females is not enough to make a change (Kramer et al., 2006). Thus, three or more females in the boardroom will enhance the firm's innovation (Torchia et al., 2011) and improve financial performance (Joecks et al., 2013). In this vein, Post et al. (2011) conclude that companies with three females or more in the boardroom will have a high CSR score (KLD).

Table 12 Theories Involved.

Theory name	**Frequency**	**Proportion**
Agency Theory	107	0.44
Stakeholder Theory	97	0.40
Legitimacy Theory	43	0.18
Resource Dependency Theory	39	0.16
Institutional Theory	29	0.12
Critical Mass Theory	27	0.11

Source: Edited by author

3.4.2. Data Sources

Table 13 offers the top six data sources used by the selected 242 articles. It is apparent from Table 13 that the overwhelming majority of the scrutinised studies depended on companies' annual reports, website and CSR reports, especially the studies that focus on CSRD/CSRD with a frequency of 62 studies (see, for example, Zaid et al., 2019; Zaid et al., 2020a; Khan et al., 2019; Kolsi & Attayah, 2018; Appuhami & Tashakor, 2017; Helfaya and Moussa, 2017; Dienes, & Velte, 2016; Muttakin & Subramaniam, 2015; Amran et al., 2014; Khan et al., 2013).

Moving to the database framework, COMPUSTAT is the second commonly used database by the researchers of the selected articles. COMPUSTAT is an international database that includes financial data, for example, debt and financial performance ratios (see, for instance, Macaulay et al., 2018; Jo et al., 2016; Harjoto & Jo, 2011). The Kinder, Lydenberg, and Domini (KLD) is the third most widely used database. Further, it includes data on the 3,000 leading US firms. More importantly, it is deemed as a prosperous database concerning the CSR content (see, for example, Lu and Herremans, 2019; Macaulay et al., 2018; Cho et al., 2017; Post et al., 2011; Sun et al., 2017; Harjoto et al., 2015; Jo & Harjoto, 2011; Ghosh & Harjoto, 2011; Arora & Dharwadkar, 2011; Mallin & Michelon, 2011).

The Bloomberg database is ranked in third place and considered one of the most vital databases about social and environmental information. It contains the ESG disclosure score (ESG: Environmental, Social, and Governance), which depends on reported information in the companies' annual reports. ESG disclosure score assesses mainly the quality (effectiveness) of reported information rather than quantity (volume) (Arayssi et al., 2016).

Table 13 Data Sources Frequency

Database name	Frequency	Proportion
Companies annual report, website, and CSR report	62	0.26
COMPUSTAT	40	0.17
KLD	32	0.13
Bloomberg	26	0.11
Thomson Reuters Asset4	21	0.09
EIRIS	16	0.07
Questionnaire	10	0.04

Source: Edited by author

3.4.3. Methodology Employed

Table 14 reports the frequency of the most methodologies applied in the selected articles to study the impact of board attributes on the CSRP/CSRD. The results indicate that the predominant of the scrutinised studies used Ordinary Least Squares (OLS) estimator (see, for example, Crifo et al., 2019; Nadeem et al., 2017; Cho et al., 2017; Lin et al., 2018; Matuszak et al., 2019; Kiliç et al., 2015) with the frequency of 79 studies. Logistic regression model occupies the second place (Del Valle et al., 2019; Ghosh & Harjoto, 2011; Cho et al., 2017; García-Sánchez et al., 2019b; Hu & Loh, 2018), 2SLS (& Zaman, 2018; Oh et al., 2011), fixed-effects model (Cruz et al., 2014; Alotaibi & Hussainey, 2016), probit regression model (Harjoto & Jo, 2011), and the generalised method of moments GMM (Zaid et al., 2020a; Zaid et al., 2020b; García-Sánchez et al., 2019a; Naciti, 2019; Nekhili et al., 2017;

Cuadrado-Ballesteros et al., 2017a) with frequencies of 27, 22, 20, 19 and 17 studies respectively.

It is worth mentioning that endogeneity is a serious problem that may occur in the relationship between the board and CSRP/CSRD (Al-Dah et al., 2018). However, as shown in ***Table 14*** below, few researchers used statistical methods to solve this problem (such as 2SLS, GMM). Moreover, most studies in this field are empirical and quantitative. Few researchers combine qualitative and quantitative methods (see, for example, El-Kassar et al., 2018; Mahmood et al., 2018; and Cuadrado-Ballesteros et al., 2017b). Hence, it could be more attractive for future studies to pay more interest to qualitative studies. For instance, interviews enable them to understand the connexion between board and CSRP/CSRD.

Table 14 Methodologies

Estimator name	**Frequency**	**Proportion**
Ordinary Least Squares (OLS)	79	0.33
Logit model	27	0.11
2SLS	22	0.09
Fixes effect model	20	0.08
Probit model	19	0.08
GMM	17	0.07

Source: Edited by author

3.4.4. Dependent Variables

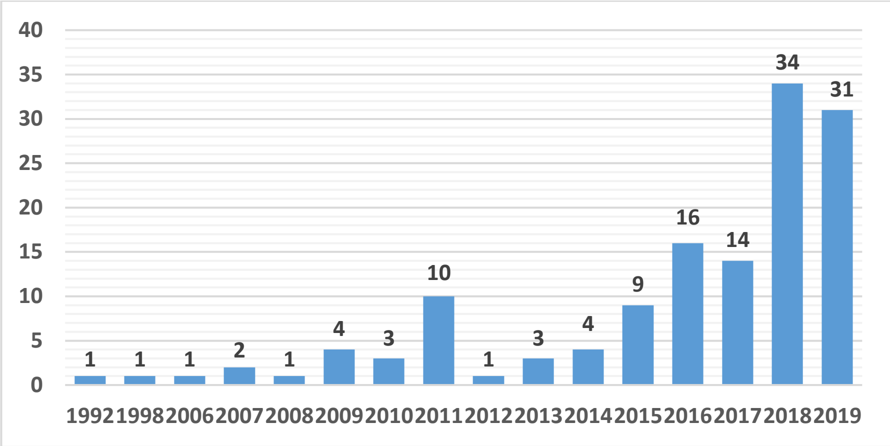
CSR is measured in two ways through the literature: CSRD and CSRP. Although both are used to measure CSR, but the two are different measures and cannot be treated as synonymous. CSRD is a primary CSR component that is primarily measured by the environmental and social information reported on firms' annual reports or CSR separate reports (Velte, 2017). Besides, there are general standards such as GRI (Global Reporting Initiative) guidelines that regulate the CSRD; it represents a set of guidelines that corporates depend on to report the outcome of their actions and operations on the environment, economy and society (Global Reporting Initiative, 2016).

On the other hand, CSRP measured using a different database such as Ethical Investment Research and Information Services (EIRIS) and the Kinder, Lydenberg, and Domini (KLD). As mentioned earlier, KLD is the primary database used to measure CSRP (Chen et al., 2019; Macaulay et al., 2018; Cho et al., 2017; Harjoto et al., 2015; Jo & Harjoto. 2011; Arora & Dharwadkar, 2011; Bear et al., 2011). The KLD database used binary scores for each company based on its assessment of the existence and non-existence of concerns and strengths for specific indicators linked to seven CSR dimensions: community, product, corporate governance, human rights, employee relations, environment, and diversity. MSCI ESG Stats Database, formerly known as the Kinder, Lydenberg, and Domini (2014) database (KLD). The database provides binary ratings (0/1) for each firm based on its evaluation of the presence and absence of strengths and concerns for particular indicators related to seven CSR dimension

Other researchers used (EIRIS) database (Cuadrado-Ballesteros et al., 2017a). EIRIS is a prominent international provider of CSRP data. It presents reliable, comparable data on over 110 different CSR areas, comprising managing environmental and climate change effects, board practice, corruption and bribery, supply chain labour standards, and human rights. Additionally, some research measure CSRP as a dummy variable (Godos-Díez et al., 2018; Eberhardt-Toth, 2017).

Figure 9 and Figure 10 illustrate the trend of literature toward using CSRP and CSRD to measure CSR. Figure 9 shows that the trend of publications that use CSRP is relatively wide (1992-2019) while, as shown in Figure 10, the interests in using CSRD as a measurement of CSR began later in 2009. However, the interest in both measurements has started to overgrow after 2012. During the last two years (2018-2019), it is interesting that the interest in CSRD is greater than CSRP.

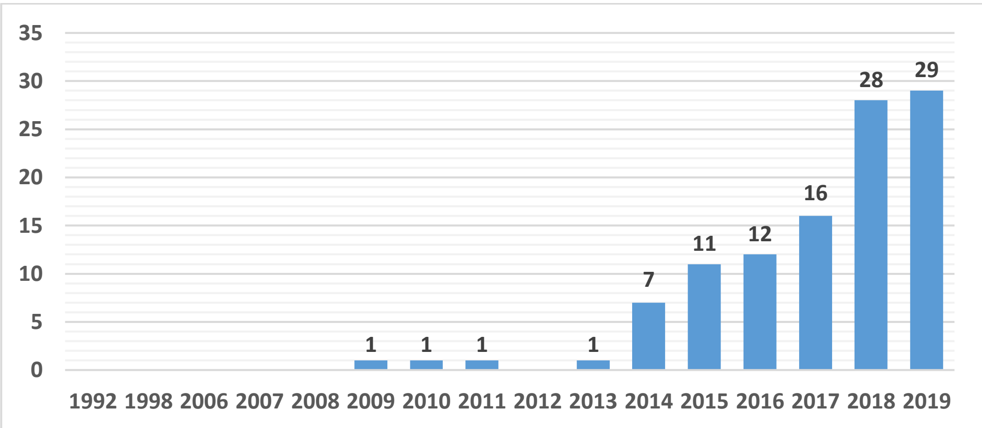
Figure 9 CSRP publications trend



Source: Edited by author

According to Rao and Tilt (2016b) and Welbeck (2017), CSRD is included in annual reports or individual CSR report of firms. As mentioned earlier, 51 of the sampled studies measure CSRD and other financial variables by analysing the firm's annual reports, CSR report and website by using a checklist, counting words and sentences (Zaid et al., 2019; Ullah et al., 2019; Kolsi & Attayah, 2018; Khan et al., 2013; Appuhami & Tashakor. 2017; Jizi et al., 2014; Barakat et al., 2015; Lone et al., 2016). some scholars measure CSRD using Bloomberg ESG score (Giannarakis et al., 2014; Al-Dah et al., 2018; Cucari et al., 2018), and by applying KPMG international questionnaires of CSRD (Fernandez-Feijoo et al., 2014), using a dummy variable (Pucheta-Martínez & Chiva-Ortells, 2018; Liao et al., 2018), Dow Jones Sustainability Indices (Chang et al., 2017), and GRI database (Fuente et al., 2017; Garcia-Torea et al., 2017; Cabeza-García et al., 2018; García-Meca et al., 2018).

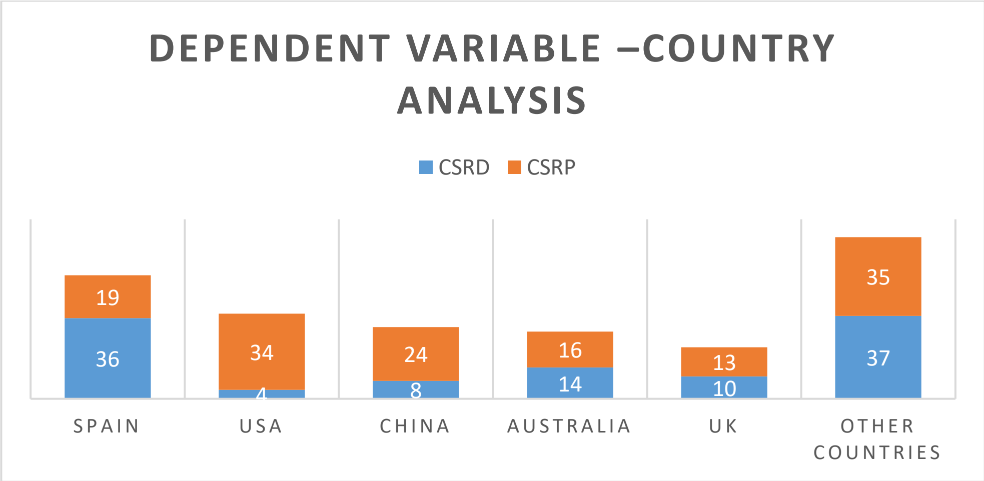
Figure 10 CSRD publications trend



Source: Edited by author

Almost 44 % of the articles in our sample used CSRD as a measure of CSR (see Figure 11), whereas approximately 56 % used CSRP (Cho et al., 2017; Hyun et al., 2016; Harjoto et al., 2015; Macaulay et al., 2018 & Zhang et al., 2013).

Figure 11 CSRP/CSRD across different countries



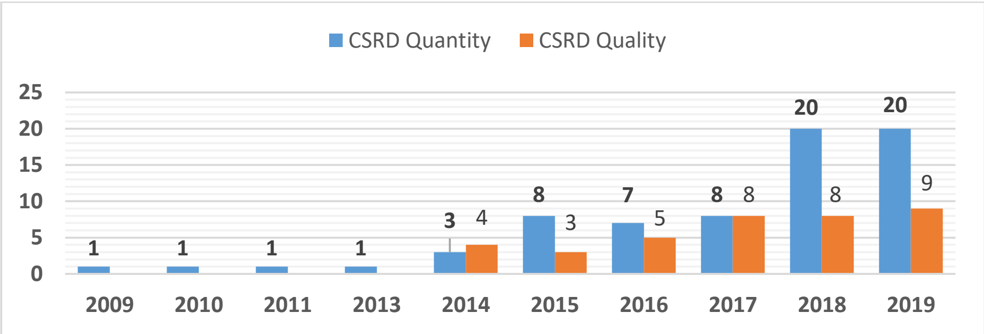
Source: Edited by author

Figure 11 displays the dependent variable across different countries. Two hundred forty-two articles have been conducted in forty-eight countries. As previously mentioned, almost 67% of the studies are performed in developed countries. However, it is notable that the interests of CSRD are focused mainly in the underdeveloped nations; this result is supported by Velte (2017), while research in the developed nations seems to concentrate on CSRP mainly. Moreover, it is worth mentioning that most of the studies in the USA, which the second most producer country, are focused on CSRP (34 out of 38) and primarily depending on the KLD database as the primary source of data to measure CSR. Thus, future investigations in developed nations such as the USA may take into consideration studying CSRD. Furthermore, research in developing nations in CSRD/CSRP is comparatively lower; it will be attractive for future studies in such nations to consider this point.

As shown in Figure 3.3, 44 % of the sampled studies used CSRD as a CSR measurement, almost 65 % of these studies used CSRD quantity. Velte (2017) previously noted that research tends to use CSRD quantity to measure CSRD. It is simpler to measure using a checklist, counting words and sentences, and using unweighted code to bound the possibility of bias. Nevertheless, few studies used both (see, for example, Cuadrado-Ballesteros et al., 2015; Appuhami & Tashakor, 2017; Helfaya & Moussa, 2017; Alotaibi & Hussainey, 2016). Figure 12 shows that the interest in CSRD quantity has begun before CSRD quality. Additionally, the trend of both types was nearly identical. Nevertheless, the variation between publications' trend has touched their highest during the last two years (2018-2019), where CSRD quantity has earned interesting attention from scholars. Nonetheless, the number of disclosed CSR items may not be sufficient.

According to Velte (2017), Empirical works on the quality of CSRD are not very common because of the expanded analysis resources and the bias problem. As there is a lack of objective quality measures for CSRD, various techniques were utilized in previous works. Some authors depend on external assessments to enhance the measure's reliability. For instance, Fernandez- Gago et al. (2016) applied the "Observatorio Score" as an independent quality score that values conformity with UN norms. Other scholars used the Bloomberg CSRD score, which rates the environmental, social and governance disclosures of public interest entities (Giannaraakis et al., 2014). Other scores are linked to personal ratings concerning several standards or guidelines, for instance, the KPMG international survey (Fernandez-Feijoo et al., 2014), IFRS framework qualitative characteristics (Alotaibi & Hussainey, 2016). The quality of revealed information could offer a more truthful measure and a clear view of firms' engagement in CSR initiatives. Therefore, future studies may give more attention to CSRD quality.

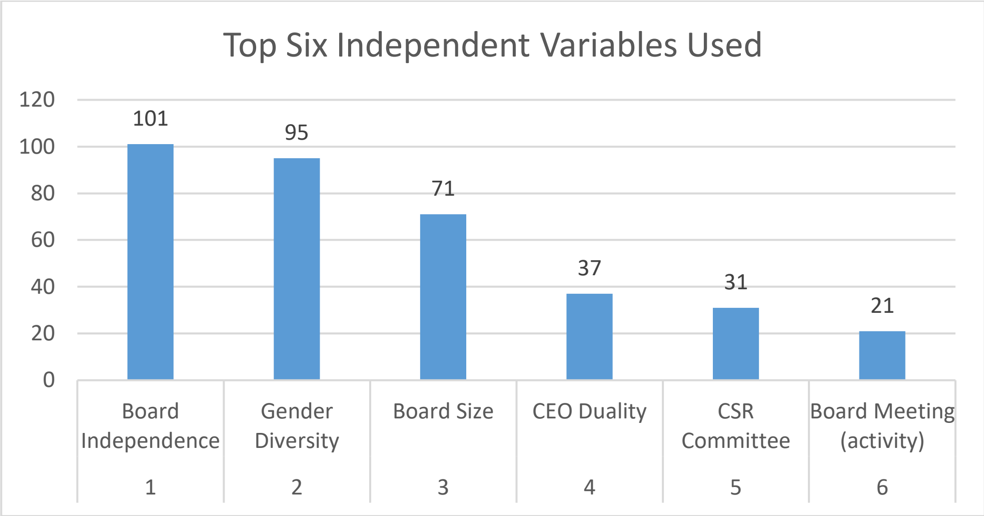
Figure 12 CSRD quantity and quality publications trend



Source: Edited by author

3.4.5. Independent Variables

Figure 13 Top Six Independent Variables Used



Source: Edited by author

Figure 13 illustrates the leading independent variables investigated through our sampled literature with a frequency of 18 and more. It is worth mentioning that we eliminate three variables (government ownership, ownership concentrations, and institutional ownership) because this study aims to focus on board attributes, not other CG variables such as ownership dimensions. Figure 5 shows that board independence, gender diversity, and board size are the most explored variables with a frequency of 102, 96, and 72, respectively. While few scholarly articles in the board-CSR field have considered other board characteristics, such as board age, audit committee characteristics, board education and experience, board tenure, CSR committee characteristics, board compensations and board interlocking.

To recapitulate the prior literature concerning board dimensions, we assort the sampled studies according to as follows:

Board Independence

Table 15 indicates the frequency of the empirical result of prior literature that examines the influence of board independence on CSRD quantity, CSRD quality, and CSRP. Board independence is one of the most discussed dimensions among the prior literature on the board-CSR relation (Cucari et al., 2018). Wang and Coffey (1992) conclude that companies with a higher number of independent directors in the boardroom will have more charitable donations. Ibrahim and Angelidis (1995) report that outside directors are more concerned about CSR's discretionary items. The presence of independent members on the board is the critical dimension of the CG mechanism (Khan et al., 2013). Some scholarly articles have even addressed the connection between board independence and CSR as their main point of interest (see, Cuadrado-Ballesteros et al., 2015; García-Sánchez et al., 2019a; Ortas et al., 2017). These articles conclude that board independence has positive consequences on the CSRP, and this nexus will be stronger in civil law countries. The plausible explanation of this result is that the civil law countries are stakeholders oriented (Frias-Aceituno et al., 2013), and they tend to disclose more CSR information (Garcia-Sanchez et al., 2015). Thus, in these countries, the independent members are expected to be more active and take the decision to promote disclosure to offset the weak investor protection law. Other scholars reveal a positive association between board independence and corporate environmental performance (de Villiers et al., 2011; Post et al., 2015). As shown in Table 3.4, most of the prior studies (almost 74%) conclude that the presence of independent board member affects CSR positively (Jizi et al., 2014; Shaukat et al., 2016; Jizi, 2017; Mallin & Michelon, 2011; Harjoto & Jo, 2011; Ibrahim & Angelidis, 1995; Wang & Coffey, 1992). An agency view explains how an independent board would be interested in showing greater transparency and accountability through better voluntary disclosures (Muttakin et al., 2015). The higher proportion of independent members in the boardroom would improve CSRD quality and quantity (Al-Dah et al., 2018; Fernandez-Gago et al., 2018; Helfaya & Moussa, 2017; Lone et al., 2016; Cuadrado-Ballesteros et al., 2015; Fernandez-Gago et al., 2016; Ibrahim & Hanefah, 2016; Khan et al., 2013; Muttakin & Subramaniam, 2015; García-Sánchez et al., 2014). According to Lattemann et al. (2009), firms with more outside directors would communicate more CSR information. This result occurs because the independent directors usually reduce the conflict of interest between different stakeholders, leading to better monitoring and controlling the environment, which increases the CSR level (Jizi et al., 2014 and Ortas et al., 2017). Contrarily, few research efforts indicate a significant negative correlation between board independence and CSRD (see Majeed et al., 2015; Alotaibi & Hussainey, 2016; Sundarasen et al., 2016) and CSRP (Yasser et al., 2017; Lin et al., 2015). One plausible justification is that independent board members are more concerned with corporate financials than CSR (Majeed et al., 2015) or may not have enough experience and knowledge to improve CSR (Sundarasen et al., 2016).

Notwithstanding, Ramón -Llorens et al. (2019) examine the impact of the human and social capital (relational background, technical and professional) of independent directors on enhancing CSR reporting, they conclude that not all independent board members are similarly effective in enhancing CSR reporting and that only some types of independent members, those categorised as support experts, help promote it. Further, other studies explore the influence of the characteristics of independent directors on CSR. Fernández-Gago et al. (2018) report that their political background increases the CSRD, and there is no relationship with educational diversity. Yu et al. (2018) assert that an independent director's reputation improves the CSR level, and this impact is more substantial in larger companies. García-Sánchez et al. (2019) conclude that an independent board affects the CSR committee's existence positively, and this will encourage companies to use GRI guidelines on their CSR reporting. Muttakin et al. (2018) find that board capital (outside directors' experience and skills) positively affects CSRD. Recently, Ongsakul et al. (2019) link between board independence and CSR inequality; they conclude that independent board members view CSR inequality unfavourably. According to the arguments above-mentioned, future researchers are expected to pay more interest to the independent directors' attributes, such as experience, age, education, and gender. Additionally, it could be interesting to consider the mediating impact of board independence on the connection between board variables (such as experience, audit committee, gender, CSR committee) and CSR.

Table 15 Board independence

Sign of the relationship	CSRD		CSRP, action, practices, engagement	Total	Percentage
	CSRD quality	CSRD quantity			
Positive (+)	10	35	30	75	74%
Negative (-)	4	4	4	12	12%
No effect	5	7	3	15	14%

Source: Edited by author

Gender Diversity

Table 16 shows the frequency of the empirical result of prior literature that examines the influence of boardroom gender diversity on CSRD quantity, CSRD quality, and CSRP. Recently, gender diversity is one of the popular variables examined by scholars. According to the keyword analysis, most of the prior studies have analysed the crucial role of board diversity on CSR activities and mainly the role of gender diversity. According to Wang and Coffey (1992), firms with a higher percentage of female directors would contribute more to charitable activities. Furthermore, as apparent from Table 16, the overwhelming majority of the previous research on this topic (nearly 90%) suggests that when the proportion of females on the board increases, the CSRP level (De Celis et al., 2015; Alazzani et al., 2017; Macaulay et al., 2018; García-Sánchez et al., 2018; Galbreath, 2018; Yasser et al., 2017; Glass et al., 2016; Shaukat et al., 2016; Post et al., 2015; Harjoto et al., 2015; Seto-Pamies, 2015; Coffey and Wang, 1998), CSR reporting quantity (Orazalin, 2019; Mahmood and Orazalin, 2017; Jizi, 2017; Sundarasen et al., 2016; Lone et al., 2016), and CSR reporting quality(Bravo & Reguera-Alvarado, 2019) will increase. Other authors indicate a positive link between female directors and corporate environmental performance (de Villiers et al., 2011; Post et al., 2015; García Martín & Herrero, 2020; Cordeiro et al., 2020). In this direction, Byron and Post (2016) conduct a meta-analysis study of 87 studies. They indicate a significant positive link between the existence of female members on the board and CSRP. Further, the authors argue that this association would be more influential in the countries where the women equality culture (i.e., evenness of the distribution of female and male) and stakeholders' protections are prevalent. In most cases, women's nature tends to be more interested in society, environment, and ethics than men (Liao et al., 2018). On the other hand, Alazzani et al. (2017) applied the upper echelon theory on the nexus between female directors and CSRP; they approve that women's role in the boardroom may differ between cultures. Besides, they indicate that woman directors may consider social issues rather than environmental ones. Board diversity would increase ethical corporate culture, decrease fraud, and reduce agency cost (Handajani et al., 2014; Rao & Tilt, 2020).

Contrariwise, a few studies (Cucari et al., 2018; Majeed et al., 2015; Muttakin et al., 2015) find a significant negative relationship between gender diversity and CSRD in some specific environments. Majeed et al. (2015) argue that the percentage of female directors in Pakistan are small. Muttakin et al. (2015) indicate that female directors do not have sufficient education and experience to enhance CSR reporting practices. On the other hand, most Bangladesh firms are family-owned, and there is a negative relationship between female directors in family companies and CSRD. Further studies in Asia unveil a significant positive correlation between gender diversity and CSR (see, for example, Liao et al., 2018 in China; Handajani et al., 2014 in Indonesia). Moreover, Jain and Jamali (2016) report a complex association between gender diversity and CSR. Women in the board have other vital attributes such as independence (executive or non-executive) and experience. Jiang and Akbar (2018) suggest that executive women on the board will enhance environmental quality. McGuinness et al. (2017) indicate that companies with a female CEO or vice CEO will have higher CSRP.

Moreover, a stream of preceding studies finds that not only gender diversity affects the CSR level but also the independence of women on the board (Pucheta-Martínez et al., 2019). In this context, Hyun et al. (2016) reveal that firms with a higher percentage of independent women on the board tend to have a higher CSR score. Additionally, it is vital to consider the existence and the number of females to analyse its effect on board. Concurring to critical mass theory, three or more women on the board would better impact board decisions (Konrad et al., 2008) and increase firm value (Gyapong et al.,2016). Also, when they are fewer than three women, they may be scared to reveal their opinion, and they will be a token (Kramer et al., 2006). Previous research (see Bear et al., 2010; Post et al., 2011; Fernandez-Feijoo et al., 2014; Liao et al., 2018; Cabeza-García et al., 2018; Cook & Glass, 2018) support this argument and they found that the presence of three women or more in the board would improve the level of CSR. Besides, Cabeza-García et al. (2018) find that the higher number of outside and independent women in the boardroom, the higher CSRD. It could be noteworthy for future investigation to study female directors' characteristics such as independence, age, experience, women executive, and education. Moreover, future studies may focus on the international sample because the economic, political, social structure (Terjesen & Singh, 2008; Cabeza-García et al., 2018), stakeholders protections, and gender equality (Byron & Post, 2016) of each country may differ and affect the proportion of women on the boardroom thus, affect the CSR level.

Table 16 Board Gender Diversity

Sign of the relationship	**CSRD**		**CSRP, action, practices, engagement**	**Total**	**Percentage**
	CSRD quality	**CSRD quantity**			
Positive (+)	18	27	41	86	90%
Negative (-)	1	2		3	3%
No effect	3	3	1	7	7%

Source: Edited by author

Board Size

Table 17 presents the frequency of the results concerning the board size's influential role in CSRD quantity, CSRD quality, and CSRP. One of the most critical characteristics of the board of directors is board size, directly influencing the monitoring and controlling role (Liao et al., 2018). A larger board would have a variety of experiences and knowledge. From a variety of stakeholder groups, which improves the board's ability to control and supervise the firm's disclosures (Khan et al., 2013), this would enhance the quality and quantity of the disclosed information, specifically CSR (Rao et al., 2012). Table 17 indicates that most of the previous studies (almost 78%) indicate that CSRP (Macaulay et al., 2018; Cook & Glass, 2018; Cuadrado-Ballesteros et al., 2017a; Jo and Harjoto, 2011; Huse et al., 2009), CSR reporting quantity (Fernández-Gago et al., 2018; Muttakin et al., 2018; McGuinness et al., 2017; Lone et al., 2016; Barakat et al., 2015; Majeed et al., 2015), and CSRD quality (Jizi et al., 2014; García-Sánchez & Martínez-Ferrero, 2017; Mahmood et al., 2018; Kolsi & Attayah, 2018) are positively and significantly linked to the firm's board size. De Villiers et al. (2011) indicate that companies with a larger board would have better corporate environmental performance. However, some studies find an inverse correlation between board size and CSRD quality (Al-Dah et al., 2018) and CSRP (Yasser et al., 2017), and they conclude that larger boards are difficult to manage and tend to increase the conflict of interest (Jensen, 1993). Therefore, a smaller board could be more effective in supervising and controlling roles (Jizi et al., 2014).

Table 17 Board Size

Sign of the relationship	CSRD		CSRP, action, practices, engagement	Total	Percentage
	CSRD quality	CSRD quantity			
Positive (+)	10	29	17	56	78%
Negative (-)	1	1	1	3	4%
No effect	6	7	-	13	18%

Source: Edited by author

CEO Duality

The duality role happens when a person holds the CEO and the chairman of the board positions in a firm in the same period. When this situation occurs, the control power and decision-making process would be concentrated, which would affect the effectiveness of governance (Haniffa & Cooke, 2002; Garcia-Sanchez et al., 2020), which, in turn, would reduce the CSR practices and disclosure (Khan et al., 2013). This argument is supported and confirmed by several researchers (see Table 18). In this regard, they reveal a significant negative association between CEO duality and CSRD quantity (see, for example, Pucheta-Martínez & Chiva-Ortells, 2018; Muttakin & Subramaniam, 2015; Sial et al., 2018; Li et al., 2010; Lattemann et al., 2009; Zaid et al., 2019), CSRD quality (Liao et al., 2018), and CSRP (Mallin & Michelon, 2011; Yasser et al., 2017). Inversely, Jizi et al. (2014), Macaulay et al. (2018), and Bear et al., 2010 found a significant positive association between CEO duality and CSR. This result may occur because powerful CEOs tend to use CSR as a tool to improve their image, be more successful, and increase their tenure or compensations (Jizi et al., 2014). However, Galbreath (2017) find an insignificant relationship.

Table 18 CEO Duality

Sign of the relationship	CSRD		CSRP, action, practices, engagement	Total	Percentage
	CSRD quality	CSRD quantity			
Positive (+)	1	1	2	4	11%
Negative (-)	3	9	6	18	49%

No effect	6	5	4	15	40%

Source: Edited by author

Existence of CSR Committee

Ullmann (1985) claims that the CSR committee's presence in the company is a clear indicator of the CSR level involvement. A variety of companies nowadays have a CSR committee responsible for monitoring CSR policies and performance, which would help the board control and adopt better sustainability patterns that would enhance CSR and CSRD (Post et al., 2011). Moreover, the majority of the prior studies (almost 81%) (see Table 19) denote that the existence of CSR committee is positively and significantly affect the degree of CSRD quality (Cucari et al., 2018; Rodríguez & Pérez, 2016; Fuente et al., 2017; Cuadrado-Ballesteros et al., 2015; Amran et al., 2014; García-Sánchez, & Martínez-Ferrero,2017; Jizi et al., 2014), CSRD quantity (Cuadrado-Ballesteros et al., 2015; Mahmood et al., 2018), and CSRP (Mallin & Michelon, 2011; Godos-Díez et al., 2018; Lin et al., 2015). García Martín and Herrero (2020) find a positive connection between the existence of CSR committee and company environmental performance. Contrariwise, other studies reveal that the CSR committee has not influenced CSR activities (Yasser et al., 2017; Rodríguez -Ariza et al., 2017; García-Sánchez et al., 2014; Cuadrado-Ballesteros et al., 2017a). Del Valle et al. (2019) conclude that knowledgeable and expert independent directors in the CSR committee will improve CSR. García-Sanchez et al. (2019) conclude that CSR committees mediate the relationship between independent directors and GRI strategies. According to Eberhardt-Toth (2017), a tiny number of articles are linked to the board CSR committee compositions and CSRD. Accordingly, the author investigates the relationship between CSR committee characteristics such as size, CEO duality, gender, independence, and CSRP. The author also finds that CSRP will increase with more women members, a higher percentage of independent members, larger age members, smaller committee size, and non-duality between CEO and committee member. Thus, future research could consider these factors and their relationship in other CSR measures such as CSRD.

Table 19 Existence of CSR committee

Sign of the relationship	**CSRD**		**CSRP, action, practices, engagement**	**Total**	**Percentage**
	CSRD quality	**CSRD quantity**			
Positive (+)	9	7	9	25	81%
Negative (-)	1			1	3%

No effect	1	1	3	5	16%

Source: Edited by author

Board Diligence (Meetings)

Most of the previous studies measures board activity as the frequency of board meetings. More board meetings would result in higher board effectiveness. Thus, a more significant board's commitment in meetings would result in a higher interest in environmental and social practices and, therefore, increase the disclosure toward it (Lipton & Lorsch, 1992). A stream of previous scholarly articles (nearly 52%) supports this result (see Table 20). More clearly, they unveil a significant positive connection between the frequency of boards meeting and CSRD quality (Cuadrado-Ballesteros et al., 2015 García-Sánchez et al., 2017; Jizi et al., 2014), CSRD quantity (Cuadrado-Ballesteros et al., 2015), and CSRP (Lin et al., 2015; Cuadrado-Ballesteros et al., 2017a.).

Table 20 Board diligence

Sign of the relationship	**CSRD**		**CSRP, action, practices, engagement**	**Total**	**Percentage**
	CSRD quality	**CSRD quantity**			
Positive (+)	5	2	4	11	52%
Negative (-)		1		1	5%
No effect	5		4	9	43%
Total	10	3	8	21	100%

Source: Edited by author

However, there are several works have suggested that there is insignificant correlation between board meeting and CSRD quality (Liao et al., 2018; Fuente et al., 2017; Dienes and Velte, 2016; García-Sánchez et al., 2014), CSRD quantity (Rodríguez & Pérez, 2016), and CSRP (Rodríguez -Ariza et al., 2017; Godos-Díez et al., 2018; Yasser et al., 2017). In contrast, Pucheta-Martínez and Chiva-Ortells (2018) indicate a significant negative relationship.

3.5. Discussion

The connection between the board characteristics and CSR is widely investigated by prior research. Nevertheless, the findings are still mixed and ambiguous. Hence, there is an urgent need to recapitulate and map the previous literature to provide a prominent sight about the nature and trends of the forgoing relationship. In this light, this current study tends to summarise and analyse the prior board-CSR literature.

While the studies on this field are globally prevailing, approximately 68% of our sample are performed in the developed economies, specifically in Spain, the USA, Australia, and the UK. Thereby, it is no surprise that the leading institutions and authors of the field are mainly located in the same countries. Contrarywise; prior research is still comparatively low in developing nations. Consequently, these countries are considered attractive future avenues of research.

According to the first research question, from a theoretical framework, the content analysis results revealed that both stakeholder theory and agency theory are the most common theories used by scholars to illuminate the association between board of directors and CSR. Agency theory suggests that the corporate board's leading role is to monitor and supervise managements' actions to safeguard the shareholders and different stakeholders' interests, thus, minimising the conflict of interests (Jensen & Meckling, 1976). Moving to the stakeholder theory, Clarkson (1997) argues that the finest way to comprehend CSR is to study how firms manage their association with stakeholders. In this direction, the stakeholder theory has been widely used in CSR-related topics. Considering the above facts, this literature review study encourages future researchers to investigate further the role of board of directors in driving the trends and patterns of CSR-related activities by using other theories such as critical mass theory, signalling theory, and resource dependency theory.

Moving to the second research question, almost 26 % of the sampled articles depend on companies' financial statement, website, and CSR standalone reports as well-organised data sources. Moreover, KLD, COMPUSTAT, EIRIS, and Bloomberg are considered informative databases for most prior research. More importantly, about our third research question, the overwhelming majority of the prior studies have used traditional statistical methods (for instance, ordinary least square regression (OLS)) (Cuadrado-Ballesteros et al., 2017b; Jain & Jamali, 2016). It should be noted that using a static model such as random-effects, fixed-effects, and pooled OLS may create biased findings because these estimators have not an adequate ability to address the potential risk stem from the endogeneity issue (Zaid et al., 2020a). As a consequence, to overcome the harmful effect of endogeneity problem, relatively few studies have used some estimators such as lagged model (Jain and Jamali, 2016), two or three-stage least squares regression analysis (2SLS, 3SLS) (see, for example, Al-Dah et al., 2018), two-stage Heckman model (Harjoto & Jo, 2011), and generalised method of moments (GMM) estimator (see, Rodríguez -Ariza et al., 2017; Fernandez-Gago et al., 2016; Cuadrado-Ballesteros et al., 2017a; Zaid et al., 2020a; Zaid et al., 2020b; Villarón-Peramato et al., 2018).

The fourth research question was concerning the CSR measurement. Regarding that, nearly 45% of our sampled articles have investigated CSRD as dependent variables, and most of these studies are concentrated in developing countries. Furthermore, many of these studies were restricted to report the extent of CSRD in the annual report. However, negligible efforts have been dedicated to measuring the quality of CSRD. According to Jizi et al. (2014), CSRD quality depends on the disclosed information's presence, richness, and inclusiveness. Therefore, this current study stimulates future researchers for further investigations to provide indicators of the qualitative analysis of CSR reporting, which, in turn, reinforce the understanding level of CSR. Moreover, this study provides the basis to examine CSRD in developed countries.

Finally, moving the board drivers of the CSR, the findings related to our last research question show that the CSR strategies are forming from several combinations of the board attributes (for instance, gender diversity, size, independence, etc.), and consider one dimension is not enough to generate an effective strategy. In this context, it should be mentioned that there is more than one best possible characteristics combination to attain higher CSR levels (Cuadrado-Ballesteros et al., 2017b; Dwekat et al., 2020b). Thus, it could be attractive for future research to use creative methods, for example, fuzzy sets that combine quantitative and qualitative approaches (Ragin, 2000).

Furthermore, the overwhelming majority of prior research has contended that CSR activities are positively correlated with board attributes, namely, board independence, board size, the CSR committee's existence, and board diligence. On the flip side, the empirical findings of the majority of preceding studies report that CSR is negatively affected by CEO duality.

3.6. Conclusion and Directions for Future Research

In the contemporary business context, social and environmental norms have experienced an increased amount of attention from a vast array of scholars in different countries worldwide. In this vein, significant pressure has been imposed on companies by various parties of stakeholders to stay aligned with such social and environmental norms. Under such circumstances, the corporate governance mechanism is deemed sufficient to assure that companies run within the framework of their environmental and social responsibilities. Therefore, this current study maps and summarises the previous literature on the board of directors' vital role in corporate sustainability patterns and trends.

Although prior research reveals somewhat mixed and paradoxical outcomes, a wide array of evidence indicates predominantly indicate that there is a positive link between board characteristics, specifically (board gender diversity, board independence, non-CEO duality, board size, CSR committee and board diligence) and CSR-related activities. However, the previous literature has unveiled a distinct focus on these attributes without diving deep into each board's various attributes. Thereby, the prior literature has not provided much convincing and solid evidence.

Given the findings preceding, this current study offers future directions for different stakeholders on the nexus between board- CSR relations. In this sense, companies, policymakers, regulators, and academicians should expand their investigations to include the attributes and peculiarities of each board dimensions. For instance, provide a comprehensive analysis of the board in-dependence-CSR relationship. More plainly, examine board independence in terms of these attributes, gender, education, experience, and age. In the same direction, females on the board and CSR committee members are highly required to assess the effect of their different attributes on CSR-related actions.

Moreover, the crushing majority of the researchers concluded that the CSR level would rise with a high proportion of independent board members, the existence of females in the board, large board size, the presence of CSR committee and the non-CEO duality. Alternatively, there are some influential characteristics of the board committees that have been neglected by prior studies. Hence, the results of this study encourage the researchers for considering the characteristics of board committees. More specifically, an audit committee is regarded as one of the essential CG structure elements, improving the firm's credibility and transparency, hence the CSRD (Appuhami & Tashakor, 2017). The audit committee's responsibility expanded after financial scandals such as Enron and WorldCom to focus on voluntary disclosure, especially CSR (Kolk & Pinkse, 2010). According to Fichtner (2010), after the Sarbanes Oxley act 2002, the audit committee became mandatory in many countries such as Spain in 2002, Turkey in 2002, Australia in 2004, France in 2008, China in 2009 and UK in 2009. Therefore, to obtain an exhaustive understanding of the CSR, examine the audit committee characteristics such as (size, independence, gender, financial experience, and diligence) is highly required.

From the diversity point of view, board diversity could help companies enhance the quality of board decision to perform a better level of CSR (Ferrero-Ferrero et al., 2015; Azam et al., 2019; Cucari et al., 2018). Board diversity can be measured through various variables such as gender diversity, board age diversity, education and experience diversity. Most of the studies focus on gender diversity and pay less attention to other variables. Age diversity is one of the vital elements to ensure various knowledge in the board (Kang et al., 2007). Age diversity would result in a combination of different generations; thus, different social and work experiences and, therefore, enhance the board's decision-making process (Cucari et al., 2018). Younger generations are usually more open to implementing modern technologies and ideas and are more flexible toward future planning and societies improvements. While on the other hand, older generations are more knowledgeable and wiser toward business decisions (Handajani et al., 2014).

Further, limited studies consider the connection between board educational diversity and CSR. Cho et al. (2017) reveal a significant positive correlation between professor on the board and CSR. Professor contributes to society by providing their teaching, research, and community (Tierney, 1997). Besides, Lau et al. (2016) examine education in a foreign country to measure board educational and experience diversity. They argue that the CSR level would increase when the board is educated in a foreign country.

CSRA has gained more interest from researchers in recent years; however, few scholars investigate the link between board attributes and CSRA. Liao et al. (2018) indicate a positive correlation between board size, female director, and CSRA. Al-Shaer and Zaman (2018) reveal that audit committee characteristics and CSR committees positively affect voluntary CSRA.

The precise impact of specific board characteristics on CSR cannot be seen in isolation. In this vein, mapping an interaction of specific board characteristics will lead to a greater or lesser degree of good governance, which, in turn, influences the company's CSR path. Thus, future investigations may pay more attention to the moderating effect of each board dimensions on CSR.

One important and interesting research avenue for future research on CSR is investigating the effect of board interlocking. This situation happens when a board member in one company holds board positions in other companies (Mizruchi, 1996; Kang, 2008). Board interlocks allow the company to benefit from other knowledge and skills (Lamb and Roundy, 2016; Rao and Tilt, 2016b), therefore improving the human capital of the board and affect the quality of board interactions (Westphal, 1999) and improving monitoring ability (Carpenter & Westphal, 2001). Thus, increasing the possibility of adopting more CSR practices (Shropshire, 2010). Few works focus on the link between board interlocks and CSR. Most of these studies indicate that board interlocks positively influence CSR (Jain & Jamali, 2016; Ortiz-de-Mandojana & Aragon-Correa, 2015). In this context, future research could expand research on these variables.

In terms of practicalities, according to the findings presented in different countries about the board critical drivers, companies could improve their CSRP and CSRD (quality and quantity) by adopting some CSR verified practices. On the other hand, regulators could implement some changes in their guidelines and CG codes to enhance CSRP and CSRD (quality and quantity) of their local companies.

Our literature review article is not free of limitations; First, this article might have a few limits in our search criteria because of its employed bibliometric technique. Second, a significant constraint is the likelihood of the non-inclusion of one or more critical studies in a substantial database, which was not anticipated to be a shortage of methodology. Third, this current study merely covers research papers published in the English language. Finally, most scholarly articles in our review have been performed in developed countries; hence the results should be interpreted cautiously with more attention to the unequal distribution of the scrutinised articles between developed and developing countries.

4. Corporate Governance Configurations and Corporate Social Responsibility Disclosure: Qualitative Comparative Analysis of Audit Committee and Board Characteristics

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4.1. Introduction

CSR is one of the critical issues that has been brought to the fore by 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 (Harjoto & Jo, 2011). As a fundamental CG feature, the board of directors has a critical function in aligning management concerns with 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 et al., 2006; Shahzad et al., 2016). Thus, board characteristics are expected to affect the CSR level.

One of the most critical CG controlling mechanisms is audit committee that it is existence and characteristics would enhance board oversight, improve auditor's performance, and reduce the asymmetry of information between managers and different stakeholders, hence, improve the level of companies' disclosure, such as CSR (Mangena & Pike, 2005). The traditional Audit Committee (AC) role is primarily concerned with mandatory financial disclosure; however, after corporate financial scandals such as Enron in the US, 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 adopting the international financial reporting standards (IFRS), which has also enriched the broader ACs role in monitoring compulsory and voluntary disclosures such as CSR (Appuhami & Tashakor, 2017). A variety of authors indicate that the existence of AC enhances CSRD (Said et al., 2009; Khan et al., 2013; Barakat et al., 2015).

The literature on the connection between CG and CSR has grown expeditiously in recent years (i.e., Bear et al., 2010; Jo & Harjoto, 2011; Khan et al., 2013; Jizi et al., 2014; Fernandez-Feijoo et al., 2014; Setó-Pamies, 2015; Cucari et al., 2018). Nevertheless, most of these works have been dedicated to investigating the impact of firm characteristics (Muttakin et al., 2015), board characteristics (Bear et al., 2010; Khan et al., 2013; Frias-Aceituno et al., 2013), and ownership structure (Majeed et al., 2015; Pucheta-Martinez & Lopez-Zamora, 2018), on CSR levels. However, few authors have been addressed the impact of AC characteristics on CSR. Among these efforts, Appuhami and Tashakor (2017) investigate the influence of AC attributes on CSRD 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 et al., 2017b). In this regard, Jain and Jamali (2016) call for using more creative methods; for instance, fsQCA that mix between quantitative and qualitative approach. Further, Paniagua et al. (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 (Garcia-Castro et al., 2013; Misangyi & Acharya 2014; Pinto & Picoto 2016; Felicio et al., 2016; Paniagua et al., 2018), level of company risk reporting (Carmona et al., 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 articles among 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 CSRP for 471 non- financial US companies. They conclude that CSRP does not necessarily rely on particular board characteristic but specific configurations of such characteristics. More recently, Samara et al. (2018) investigate the optimal CG antecedents (family ownership, family participation in management, and outside directors) that could influence family companies' environmental social performance level. Other studies apply symmetrical and asymmetrical (fsQCA) approaches (i.e., Khan et al., 2018); they use CSR as a mediator variable of the association between transformational leadership and organisational execution.

Hence, our study aims to explore the combinations of AC and board characteristics that attain high CSRD 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 2016–2018, depending on the Eikon database. Using fsQCA, our results reveal that gaining a high CSRD level relies on integrating the net impacts of AC and board characteristics. We also found that AC and board characteristics could negatively or positively impact a high

CSRD level, depending on the existence or non-existence of other characteristics simultaneously. Our results also suggest that there is more than one optimal combination of AC and board characteristics that leads to high levels of CSRD 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 understanding the joint dependence attributes in AC and board, which cause better CSRD. Second, although the existing CG and CSR literature offers enormous works on board and CSR, the results are mostly contrasting, and there is 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 CSRD. Third, the sustainable development concept refers to environmental, social, and governance elements as essential parts, while some previous research have focused only on one component. For example, Sama-ra et al. (2018) examined only the environmental performance of the family business. Therefore, our work contributes to CSR literature by investigating the three elements of disclosure (CSRD). Finally, our study well-responds to the latest calls offered by Curaci (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 a 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 CSRD. Our findings also suggest some critical attributes regarding the analysis and development of AC and board guidelines.

This paper is structured as follows: first, an introduction and objective of the study are provided. Second, the literature review. Third, the methodology and data collection method of the study, while section four analyses the result. Finally, the last section provides discussion, conclusions, recommendations for future research, and limitations.

4.2. Literature review

4.2.1. Audit committee characteristics

According to Blue Ribbon Committee (BRC) recommendations, the efficacy 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 studies examine the link between CSR and different AC characteristics (Appuhami & Tashakor, 2017; Al-Shaer & Zaman, 2018; 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. 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 con-trolling mechanism that affects the CSRD. 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 et al., 2008). Other scholars indicate that an AC size does not affect CSRD (Jizi et al., 2014) and sustain-ability reporting credibility (Al-Shaer & Zaman, 2018).

Concerning AC independence, 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 practices effectively thus, improve CSR reporting. Some previous works support this suggestion, and they indicate that AC independence enhances the credibility of sustainability reporting (Al-Shaer & Zaman, 2018), voluntary disclosure (Mangena & Tauringana, 2007), and CSRD (Said et al., 2009; Appuhami & Tashakor, 2017; Buallay & Al-Ajmi, 2019). Nevertheless, Haniffa and Cooke (2005) report that AC independence negatively affects the level of CSRD. According to DeFond and Francis (2005), the existence of some insiders in AC could be helpful because they would have vital specific knowledge and experience about the company. In contrast, other scholars such as Katmon et al. (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 et al., 2004). Therefore, improving the responsibilities related to monitoring, supervision, reporting quality (Karamanou & Vafeas, 2005), and CSRD (Jizi et al., 2014; Appuhami & Tashakor, 2017; Buallay & Al-Ajmi, 2019). Nevertheless, Othman et al. (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 UK and SOX, 2002 in the U.S) regarding AC 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 CSRD level (Jizi et al., 2014; Helfaya & Moussa, 2017; Appuhami & Tashakor, 2017). In contrast, Buallay and Al-Ajmi (2019) and Musallam (2018) reveal that the AC financial expert negatively affects the level of sustainability reporting. They argued that the presence of 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. Whereas Appuhami and Tashakor (2017) find an insignificant connection between AC financial expert and CSRD.

One more critical variable that affects the effectiveness of AC composition is the AC chair. Since he/she is accountable for 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 efficacy of AC chairs is contributed to their independence as they would have enough time, ability, and liberty to make independent decisions and to give valuable suggestions (Karamanou & Vafeas, 2005), therefore, enhancing disclosures of the company, including CSRD (Appuhami & Tashakor, 2017). In this vein, several CG codes (such as the UK and Australia) emphasize that companies should separate between the chair of the board and AC chair (FRC, 2018; ASX, 2019). Consequently, Garcia-Sanchez et al. (2012) argue that the separation between AC chair and board chair could likewise encourage AC members to improve monitoring actions and CG practices 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 CSRD level. Whereas Appuhami and Tashakor (2017) find that AC chair independence does not affect CSRD level.

4.2.2. Board characteristics

Board characteristics are vital attributes that could influence not only CSRD 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. However, the results still mixed and ambiguous.

An agency view suggests that board independence is more capable of meeting stakeholders' interests (Zahra & Stanton, 1988) 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; Sundarasen et al., 2016) indicate a negative association between board independence and CSRD, while Liao et al. (2018) and Barakat et al. (2015) find an insignificant association.

Recently, 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 they are more likely to enroll in supervising committees. Therefore, they would provide the right decision and have a strong influence on the input and output of the board (Adams & Ferriera, 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 practices 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 CSRD (Fernandez-Feijoo et al., 2014; Ferrero-Ferrero et al., 2015; Kassinis Panayiotou et al., 2016; Dah & Jizi, 2018). 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 practices.

Several investigations (Adams et al., 2005; Khan et al., 2013; Zaid et al., 2020a) claim that larger boards would have a variety of knowledge and experiences, which improves the ability of the board to supervise and control the company`s disclosures; thus, improve CSR. However, others (Yasser et al., 2017; Al-Dah et al., 2018) 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 et al., 2010). Contrarily, Jizi et al. (2014) indicate that CEO duality con-tribute positively to CSRD level, and they argue that powerful CEOs tend to use CSR as a tool to enhance their image and be more successful. In comparison, other authors (Khan et al., 2013) do not find a relationship.

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

4.2.3. Complexity theory

Nowadays, applying the 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 corporate financial performance and CSRP associations. Be-sides, Cuadrado-Ballesteros et al. (2017b) use complexity theory to connect CSRP 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 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 (Ragin, 2008; Isaksson & Woodside, 2016). 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 et al., 2014). The complexity tenet indicates that different circumstances would affect the individual antecedent of a particular outcome (Urry, 2005; Isaksson & Woodside, 2016). 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 nonexistence of other variables simultaneously. The causal asymmetry tenet suggests that combinations related to the high value of outcomes (dependent variable) are not the “mirror opposite” of combinations related to the low value of ones (Ragin, 2008; Fiss, 2011; Isaksson & Woodside, 2016).

According to Woodside (2014) and Isaksson and Woodside (2016), the complex antecedent configurations can display that the high value of X condition is a 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, the asymmetry tenet suggests an asymmetrical association between variables; therefore, a particular variable could contribute to high levels or low levels of a particular outcome. The contrarian cases will happen due to the contrary associations presented by regression models (Woodside, 2013).

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

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 predict a high CSRD level (ESG score). Consistent with Cuadrado-Ballesteros et al. (2017b) 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 CSRD level.

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

4.3. Methodology

4.3.1. Sample and data

We use a sample of the top 100 European companies based on market capitalisation for 2016–2018. After eliminating the missing data values and in line with prior efforts (i.e., Cuadrado-Ballesteros et al., 2017; La Porta et al., 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 from Table 21, the corporations in the sample are from different 12 European countries (France, UK, Germany, Switzerland, 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 21). To achieve study objectives, we collect the available data related to CSRD data, AC characteristics (independence and financial expert), and boar characteristics from the Thomson Reuters Eikon database. In comparison, other AC characteristics (size, meetings, and chair independence) were collected from companies' annual reports.

Table 21 Sample Description

Country	Numb er	%	TRBC Economic Sector Name	Number	%
France	18	26.1%	Consumer Cyclicals	14	20.3%
UK	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%

Source: Edited by author

Our final sample includes the top 69 non-financial European companies based on market capitalisations. Table 22 indicates that most of these companies (around 81%) are with market capitalisations from 25-100 billion, while only 13 companies with more than 100 billion.

Table 22 Sample according to Market Capitalization

Market Capitalization (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%

Source: Edited by author

4.3.2. Variables

We use the ESG score as a proxy to measure CSRD. ESG score is collected from Thomson Reuters Eikon database, which is commonly used in the literature (Arayssi et al., 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 firm's ability to manage using materials, energy, and water and 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, and it is allocated into four categories: 29 items for the workforce, eight related to human rights, 14 items for community involvement, and 12 items related to product responsibility. The workforce score reflects the company’s actions toward job satisfaction and creating diverse and equal opportunities for its workforce to assure its commitment to 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, protect public health, and act ethically. Product responsibility score means the capacity to make quality products or services, considering the customers' health and safety, integrity, honesty, and data privacy. Finally, 54 items used to measure the governance pillar include 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 corporate governance practices. Shareholders' score measures the company’s actions to assure 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 (Appuhami & Tashakor, 2017; Al-Shaer & Zaman, 2018). Board characteristics have also been chosen as the highly significant attributes that could influence not only CSRD 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. Table 23 shows the measurements of the independent variables.

Table 23 Measurements of the Independent Variables

Independent Variable	Label	Operational Definition
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 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 carries the value of 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	BOMEE	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

Source: Edited by author

4.3.3. FsQCA

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 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. Besides, Fiss (2007) points out that this method determined 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 CSRD 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 a group membership. Thus, three breakpoints should be used: (value of 1) when there is a full membership, (value of 0) when there are 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 Car-mona 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 nonmembership 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 automatically locate the calibration thresholds for a numerical of casual conditions divided into separate parties. FindTh uses a cluster analysis to determine which threshold value best separates the points into a specific number of groups, separating raw data into the most influential groups (Dusa, 2019). For dummy variables, a value of (1) indicates being entirely in the set and a value of zero (0) when entirely out of it.

After the coding, all possible combinations of variables will be listed with their consistency in a 'truth table' 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 simple or complex, to produce one particular outcome. While the sufficiency coverage examines to what extent a condition, whether simple or complex, is considered for a particular 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 this 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 26 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 0.23-0.65, and we have obtained 0.80 as the minimum value of consistency.

4.4. Results

4.4.1. Correlation and descriptive statistics

Table 24 presents the results of the correlation matrix for all variables. Various 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 et al. (2014), this result reveals that every variable measures a single independent attribute.

Table 24 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

Source: Edited by author

Table 25 Descriptive Statistics

Variables	Mean	S. D	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
BOMEE	8.80	3.36	3.00	27.00

Source: Edited by author

Table 25 shows the descriptive statistics of all variables for the period 2016-2018. Notably, the average value of CSRD score is almost 77%, in a domain between 43% and 95%. Which generally indicate that the CSRD 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 25 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 25 also display that there are almost 14 directors (BOSIZ), of which almost 67% tend to be independent board members (BOIND), and about 33% are female members (GEDIV). Board members meet from eight to nine times each year (BOMEE). Besides, 35% of our sampled companies do not separate between the chair of the board and CEO (CEODU).

4.4.2. AC and board characteristics predicting high CSRD level

Table 26 displays the combinations of AC and board characteristics predicting a high CSRD level for the period 2016-2018 and each year independently (2016, 2017, and 2018). Table 26 shows the configurations of AC and board characteristics that obtain a high CSRD 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 CSRD level, even though none is enough since various configurations achieve high levels of CSRD score. As shown from Table 26, 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 2o18). In each configuration, we can notice that variables with (Upper-case letters) contribute positively, and variables with (Lower-case letters) contribute negatively to high CSRD 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 CSRD level. This configuration indicates a high consistency index of 0.941 and a unique coverage index of 0.301.

Table 26 AC and board characteristics that are predicting a high level of CSRD 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*BOMEE*ACFEX*ACCHI *ceodu	0.932	0.133
2	ACIND*acsiz*acmee*BOIND*GEDIV*bomee*ACFEX*A CCHI*ceodu	0.936	0.167
	Solution consistency:0.934		
	Solution coverage:0.229		
	2018		
1	ACIND*acsiz*BOIND*ACFEX*ACCHI*ceodu	0.94	0.448
	Solution consistency:0.940		
	Solution coverage:0.448		

Source: Edited by author

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 six from ten 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 CSRD 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 (ten times) and contribute positively to the high levels of CSRD score. This indicates that the independence of 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 CSRD 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 CSRD level would not be possible. This lead to a conclusion that no single AC or board characteristic leads to a high CSRD 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 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 eight of ten total configurations, and acisz is also shown in seven of ten configurations; both variables contribute negatively to the high CSRD level. While gender diversity (GEDIV) appears in three configurations, it positively affects the high CSRD level. However, board meeting (bomee) and board size (BOSIZ) appear only in one configuration, bomee contribute negatively, and BOSIZ contributes positively to the high CSRD level.

4.4.3. Robustness analysis for sufficiency

Table 27 Analysis of sufficient conditions for the negation of the outcome (CSRD 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

Source: Edited by author

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 (CSRD score); thus, the paradoxical relationship is not confirmed (Table 27). On the other hand, the association of sufficiency between a casual configuration and the outcome may be as robust as the association of sufficiency among 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 28). Thus, the scores of the negation of the variable's combination are low enough to confirm this conflict.

Table 28 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
Negation (ACIND*acsiz*acmee*BOIND*GEDIV*ACFEX*ACCHI)	0.378	0.002

Source: Edited by author

4.4. Discussion

Our findings suggest that obtaining a high CSRD 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 CSRD level, depending on the existence or non-existence of other characteristics simultaneously. Our empirical results suggest that more than one optimal combination of AC and board characteristics leads to high CSRD score levels. 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 CSRD level. For instance, Said et al. (2009) and Appuhami and Tashakor (2017) conclude that AC independence enhances CSRD level. Ashfaq & Rui (2019) find that companies with independent AC chair would have a high CSRD level. AC financial expert improves CSRP (Shaukat et al., 2016) and CSRD 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 et al., 2018), thus, improve CSRD level (Khan et al., 2013; Garcia-Sanchez, & Martinez-Ferrero, 2017). Furthermore, it increases companies' community involvement (Wang & Coffey, 1992); therefore, adding more independent members to the boardroom will enhance the CSRD 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 (CSRD score).

Concerning other configurations of AC and board characteristics, CEO duality and AC size are also essential. In line with our results, previous research indicate that CEO duality contributes negatively to CSR reporting (Muttakin & Subramaniam, 2015; Lattemann, Fetscherin, Alon, Li, & Schneider, 2009). However, in contrast with previous literature (Appuhami & Tashakor 2017; Katmon et al. 2019), we found that AC size contributes negatively to CSRD 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 negatively impact CSRD score and positively in others. A high frequency of AC could be more active (Jizi et al., 2014), but more meetings may negatively affect the level of CSRD (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 CSRP (Bear et al., 2010; Cuadrado-Ballesteros et al., 2017b; Yasser et al., 2017) and CSRD (Fernandez-Feijoo et al., 2014; Dah & Jizi, 2018). However, women directors have other essential characteristics, for instance, independence, age, experience. Obtaining a high CSRD 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 CSRD score.

4.5. Conclusion

CSRD is a complex phenomenon influenced by different combinations of AC and board attributes. Responding to the recent calls offered by different authors (Curaci, 2019; Cuadrado-Ballesteros et al., 2017b; Jain and 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 the Eikon database for the top 69 non-financial European companies (based on market capitalisation). By using fsQCA, our results support the key two tenets of complexity theory. First, different configurations of AC and board characteristics indicate a high level of CSRD score (equifinality tenet); second, the impact of the individual board or AC characteristics on a high CSRD level relies on other board or AC characteristics (complexity tenet). These results have useful practical and theoretical im-plications, 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 CSRD, 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 CSRD. 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, gender diversity independence, gender diversity affect CSRD positively (Jizi et al.,2014; Appuhami & Tashakor 2017). While CEO duality and AC size contribute negatively to CSRD (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 CSRD level; however, 35 % of our sample do not separate between the chairman of the board and CEO. On the other hand, it will be useful to revise AC composition; for example, our results reveal that high CSRD 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 mixes qualitative and quantitative approaches. As far as our knowledge goes, this the first study that applies FsQCA (configurational approach) to the link between AC and CSRD.

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 various combinations of characteristics to clarify one particular outcome, which indicates the presence of asymmetrical associations rather than the symmetric ones. Thus, our results recommend scholars to study the board characteristics associated with corporate governance 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). Further, 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 concoction between AC, board, and the level of CSRD, 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 CSRD (ESG score) into three measures (governance, social and environmental) and different institutional frameworks by expanding the sample or use different countries.

5. Audit Committee and Corporate Social Responsibility Assurance: Evidence from STOXX Europe 600 Members

5.1. Introduction

In the past decade, there has been noteworthy progress in Corporate Social Responsibility Disclosure (CSRD) (Kolk & Perego, 2010) to show companies' commitment to sustainability issues (Kolk & Perego, 2010; Simnett et al., 2009). Nevertheless, the rise in the quantity of these statements has not been complemented by an improved community trust level (Martínez-Ferrero et al., 2018). CSRD completeness and credibility have been broadly criticised in the prior literature (Simnett et al., 2009; Cheng et al., 2015; Zorio et al., 2015; Seguí-Mas et al., 2015; Miras-Rodriguez. & Di Pietra, 2018 Seguí-Mas et al., 2018); they argue the need for an assurance process that certifies such quality issues. In Particular, voluntary CSRD is not valuable if perceived to lack reliability and credibility (Coram et al., 2009). The assurance of Corporate Social Responsibility (CSR) information by independent external third parties is considered a powerful tool to enhance transparency and bridge the credibility gap of CSRD (Cohen & Simnett, 2015; Simnett et al., 2009; Perego & Kolk, 2012; Velte, 2020).

Board members' responsibilities expand beyond monitoring and controlling management to guarantee that it implements coherent decisions with the company, aligning the agent and principal interests (Martinez-Ferrero & Garcia-Sanchez. 2017). The board members' efficiency is a method intended at decreasing agency problems, and it could determine the need to obtain a high Corporate Social Responsibility Assurance (CSRA) quality level (García-Sánchez, 2020). In this regard, the board performs a central role in defining the company's socially responsible behaviours and the accountability level of the different interest groups (Bear et al., 2010). The implementation of these tasks is influenced by the board's structure (Prado-Lorenzo & Garcia-Sanchez, 2010) in terms of independence, size, gender, activity, and committees (Rao & Tilt, 2016b).

Furthermore, one of the most vital board monitoring mechanisms is Audit Committee (AC). Its characteristics and existence would improve board supervision, enhance auditor's performance, and decrease the information asymmetry between different stakeholders and managers, thus improving firms' disclosures, such as CSR. (Mangena & Pike, 2005). According to Salleh and Stewart (2012), AC attributes could also affect CSRD credibility because they are anticipated to address matters linked to risks, sustainability and controls.

Despite the above-mentioned importance of AC, studies on the relationship between Corporate Governance (CG) and CSRA have paid little attention to its role towards the decision to obtain CSRA (Kend, 2015; Martinez-Ferrero et al., 2017; Miras-Rodriguez & Di Pietra, 2018; Laio et al., 2018; Buertey, 2021). A study by Kend (2015), for instance, investigates the impact of CG, including AC size and meeting, on the adoption of CSRA and CSRA providers. Al-Shaer and Zaman (2018) focus mainly on AC attributes and their influence on the CSRA adoption and the selection of assurance provider. Both Kend (2015) and Al-Shaer and Zaman (2018), however, overlooked the link between AC attributes and the scope and level of CSRA since they could give such explanation toward the tendency of each AC attribute.

Accordingly, this study aims to test the influence of AC attributes (namely AC financial expert, AC independence, AC meetings, and AC size) on the adoption of CSRA. The study also offers insight into the effect of AC attributes on the scope and level of CSRA and the selection of CSRA assurer. Contextually, this is attained using a sample of non-financial European companies listed on the STOXX 600 index over 2011-2018. The data were collected for 3340 firm-year observations from the GRI and ASSET4-Thomson Reuters databases. In line with the complementary role that Al-Shaer and Zaman (2018) and Martinez-Ferrero and Garcia-Sanchez (2017) find for CG and AC mechanisms, our study indicates that AC financial expert, AC independence and size of AC as well as the existence of CSR committee are positively linked with the adoption of CSRA.

In doing so, this study makes several significant contributions to the current literature. First, it contributes to the previous literature by developing and expanding the investigation on the nascent CSRA field. CSRA is a relatively growing research field, and it is a gradually more popular procedure to guarantee CSRD credibility (KPMG, 2013). Second, the study further examines the link between the strength of AC structure and the scope and level of CSRA. According to Velte (2020), few CSRA literature investigations focus on the CSRA quality proxies (such as scope and level); thus, he recommends future research to consider these proxies to distinguish between substantive and symbolic, intrinsic, and extrinsic motives of executives. Third, while the majority of previous studies are biased for UK, Australian, and US companies (e.g., Al-Shaer & Zaman, 2018; Kend, 2015; Liao et al., 2018), this study implements a European level approach, including 17 European countries.

Finally, prior AC and CSRA studies conduct a cross-sectional analysis (see Al-Shaer & Zaman, 2018); this study employs a panel data analysis that compares years and countries. Besides, our study solves the limitations of different CG and CSRA assurance studies by using a sample that includes not only large but also intermediate and small firms and, depending on the most recent CSRA data from 2011 to 2018, using such data is expected to be more valuable, because in recent years the demand of CSRA has interestingly increased. For instance, Al-Shaer and Zaman (2018) use a sample of listed UK companies for only 2012; Martinez-Ferrero and Garcia-Sanchez (2017) use an international sample for the period 2007-2014. In comparison, Kend (2015) depends on the top 200 listed firms in 2010 from the UK and Australia.

To address these issues, the rest of this research is structured as follows. The literature review section provides an empirical and theoretical overview of CSRA and its connection with AC attributes. The methodology section then discusses the sample selection, data sources, variable measurement, and empirical models. The final two sections consist of the empirical results and discussion of the outcomes, and the concluding remarks.

5.2. Literature review and development of hypothesis

5.2.1. The need for CSRA

CSR is commonly debated among academics, investors, standard setters, and consumers. Stakeholders also realise its importance and significantly how it can help maintain an appropriate balance between companies' longstanding feasibility and their commitment to society (Dwekat et al., 2020a). Several scholarly articles indicate that CSR activities positively impact financial performance in several ways, including sales, operating efficacy, financing, and litigation risk (McWilliams & Siegel, 2000). A higher CSR score can improve a company's brand value and reputation, therefore enhancing the evaluation of its products by customers and improve sales (Bear et al., 2010). Moreover, companies with a superior CSR reputation and those that concentrate on enhancing employee welfare through CSR plans can attract more talented employees and improve employee efficiency (Kim et al., 2010). Thus, according to Banker and Mashruwala (2007), greater employee satisfaction is followed by better future financial performance. Nonetheless, the credibility and completeness of CSR reporting have been widely criticised in the literature (Cho et al., 2010, Boiral & Gendron, 2011, Boiral, 2013, Chen et al., 2016, Muslu et al., 2019).

Given the crucial role that CSRD can play in shaping companies' image and reputation, managers could exploit this privilege to work as a smokescreen tool for such misconducts (Deegan, 2000; Velte, 2020). Martínez-Ferrero et al. (2016) support this direction by proving that executives who manipulate earnings for their own sake tend to protect themselves through engagement in CSR activities. Maroun (2020) argue that CSRA could be used as a symbolic action to improve companies' image, reputation, and financial performance and meet stakeholders' expectations. As a result, CSR information will become less reliable, comparable, transparent and relevant (Ball et al., 2000, Deegan et al., 2006, Bouten & Hoozée, 2015, Peters & Romi, 2015, Muslu et al., 2019). Therefore, the need to strengthen CSR information quality and to increase stakeholder confidence has become crucial.

The assurance of CSR report by independent external third parties is a powerful tool to improve transparency and bridge the credibility gap of CSRD (Simnett et al., 2009; Perego & Kolk, 2012; Cohen & Simnett, 2015; Velte, 2020). Jones and Solomon (2010) claim that assurance practices can be adopted to enhance CSR reporting credibility through assurance providers' role in evaluating companies' reporting standards, collecting evidence, and providing an independent opinion. Subsequently, the market for CSRA emerged (Blanco & Souto, 2015), as international evidence showed a continuous increase in CSRA level provided by firms (Mock et al., 2013; Kolk & Perego, 2010).

5.2.2. CSRA: Standards, scope, level, and assurer

IAASB (2013, p.7) define assurance as "an engagement in which a practitioner aims to obtain sufficient appropriate evidence in order to express a conclusion designed to enhance the degree of confidence of the intended users other than the responsible party about the subject matter information".

The first step to have assured CSRD, firms should select an external assurer. According to Ball et al. (2000) and GRI (2013), a valid CSRA provider is anticipated to be independent to evaluate and issue objective and unbiased judgments; apply various actions of quality control through the process of CSRA and be knowledgeable in CSRA practices. CSRA providers are commonly categorised into accountancy companies (mainly the Big four) and sustainability experts (Simnett et al., 2009; O'Dwyer, 2011). Arguably, accountancy companies, precisely the Big four, could offer a higher quality of CSRA services than the non-accountancy companies because accountancy companies are more independent, and they have advance experience, skills, and knowledge in performing analytical procedures and tests to guarantee the integrity of reported information (Simnett et al., 2009; Hodge et al., 2009; Ballou et al., 2018; Farooq and de Villiers, 2017; Velte & Stawinoga, 2017). Martinez-Ferrero and Garcia-Sanchez (2018) and Zorio et al. (2013) support this direction and indicate a significant positive association between hiring a Big four auditing company as a CSRA assuror and the quality of CSRA. Clarkson et al. (2019) argue that companies with higher CSR commitment tend to adopt higher CSRA scope from a Big four auditing company. Cuadrado-Ballesteros et al. (2017a) examine the impact that CSR achieves in the asymmetry of information. They prove that there are differences in reducing these asymmetries according to the type of CSRA. Nevertheless, in shareholder-oriented nations, CSRA only operates to decrease information asymmetry when offered by the accountancy firm and with a high level of assurance (reasonable). On the other hand, sustainability experts might have appropriate industry skills and experience in detecting particular CSR risk issues, and they may also have a better understanding of the prospects of leading groups of stakeholders (Velte, 2020). Therefore, companies with a higher CSRD may prefer to hire sustainability specialists to guarantee their CSR reports.

After choosing the assurer of CSRA, both the reporting firm and the assurer need to agree on several crucial issues before beginning the CSRA process. This consists of the level of CSRA provided by assurers, the CSRD scope to be covered in the process, and the standards and methodology (GRI, 2013). When the CSRA process is complete, the assurer issues the opinion or conclusion of the CSR information in a statement or report; this statement commonly comprises the level, scope, methodologies and the CSRA standards used by the reporting firm when preparing the CSR report, assurer activities, limitations faced throughout the CSRA process, recommendations and conclusion (GRI, 2013; Manetti & Becatti, 2009; Simnett et al., 2009).

Concerning CSRA standards, ISAE 3000 (ISAE, 2013) and the AccountAbility 1000 Assurance Standard (AA1000, 2011) are the most referred to standards internationally. International Standard on Assurance Engagement 3000 (ISAE 3000) guides assurance engagement requirements other than the audit and historical financial information review. This standard was established by the International Auditing and Assurance Standards Board (IAASB), an auditing and assurance services body of the International Federation of Accounting (IFAC). While the AccountAbility 1000 is under the control of the not-for-profit organisation “AccountAbility” (Farooq and de Villiers, 2019; Clarkson et al., 2019). Both assurance standards have similar requirements concerning the content of the CSR report, and both present two assurance levels: Limited or Reasonable for ISAE 3000 and moderate or high for AccountAbility 1000. Companies should identify the assurance services level in their assurance engagement with their assurors.

5.2.3. Board, Audit Committee and CSRA

The legitimacy theory view indicates that a firm has an implied social contract with the community in which it works (Cho and Patten, 2007). According to Dowling and Pfeffer (1975), these contracts must encourage the board members to be consistent with community particular norms, boundaries and values by employing sufficient sustainability processes and structures. Companies must ensure a decision-useful non-financial and financial disclosure strategy to be aligned with stakeholders’ information needs. CSRD as a supplement to financial disclosure could be the first step to achieve legitimacy. To reduce information overload and greenwash policy risks (Simnett et al., 2009), stakeholders anticipate credible and objective CSRD (Velte, 2020). Board members’ responsibilities expand beyond monitoring and controlling management to guarantee that it implements coherent decisions with the company, aligning the interest of the agent and principal (Martinez-Ferrero & Garcia-Sanchez, 2017). The efficiency of the board members is a method intended at decreasing agency problems, and it may determine the necessity to obtain a higher level of CSRA quality (García-Sánchez, 2020). In this regard, the board performs a central role in determining the company's socially responsible behaviours and the accountability level of the different interest groups (Bear et al., 2010). The implementation of these tasks is influenced by the board's structure (Prado-Lorenzo & Garcia-Sanchez. 2010) in terms of independence, size, gender, activity, and committees (Rao & Tilt, 2016).

An enormous stream of empirical research highlights the board of directors' significant role in enhancing CSRP and disclosure (Bear et al., 2010; Jo &Harjoto, 2011 Khan et al., 2013; Frias-Aceituno et al., 2013; Jizi et al., 2014). However, little attention has been paid to the association between the board and CSRA (Martinez-Ferrero & Garcia-Sanchez. 2017; Martinez-Ferrero et al., 2017; Liao et al., 2018; Miras-Rodriguez & Di Pietra, 2018). Martinez-Ferrero and Garcia-Sanchez. (2017) and Martinez-Ferrero et al. (2017) indicate that board size and board independence increases the adoption of CSRA. Besides, Miras-Rodriguez and Di Pietra (2018) found that a lower percentage of board executives positively impact CSRA decisions. This direction was supported by Liao et al. (2018), who indicate that non-CEO duality leads to more CSRA implementation. In line with board independence, according to Laio et al. (2018), board gender diversity, board size, and board meetings increase the implementation of sustainability assurance. More recently, Buertey (2021) examine the association between board gender diversity and the CSRA. His results reveal that a higher percentage of female board members leads to better CSRA implementation. Besides, in line with critical mass theory, he found that the association is more significant for companies with two or more females on boards.

Moreover, one of the most vital board monitoring mechanisms is AC. Its characteristics and existence would improve board supervision, enhance auditor's performance, and decrease the asymmetric information between different stakeholders and managers, therefore improving firms' disclosures level, such as CSR. (Mangena & Pike, 2005). AC attributes could also affect CSRD credibility because they are anticipated to address matters linked to risks, sustainability and controls (Salleh & Stewart, 2012). Little research shed light on the connection between AC characteristics on CSRA. Al-Shaer and Zaman (2018) indicate that AC attributes (independence, meetings, and expertise) and the boards of directors more generally lead to more CSR implementation and play a critical role in engaging the CSRA assurer.

5.2.4. Development of hypothesis

Audit Committee Financial expert

Financial expert member indicates the level of financial and accounting experiences and knowledge of the AC members. Most corporate governance codes worldwide require an AC to include one member with appropriate accounting and financial expertise. AC's primary responsibilities oversee firms' financial reporting integrity and internal control system and control risk management (SOX, 2002). An effective AC requires member with financial experience to understand various reporting and financial matters (Abbott et al., 2004). Besides, AC members without appropriate accounting and financial skills are unlikely to deal with reporting and financial problems (Agrawal & Chadha 2005). The existence of ACs combined with financial expertise could clarify matters that would challenge the auditor and managers to a better degree of financial disclosure, thus improving corporate disclosure transparency, which would reduce agency costs related to the flow of information (Bedard & Gendron, 2010). Moreover, audit committee members' financial experience may attract human resources, leading to better sustainability reporting (Helfaya & Moussa, 2017). AC with financial expertise could also enhance and determine the level of CSRD using their capital market knowledge (Appuhami & Tashakor, 2017).

Kelton and Yang (2008) suggest that AC financial experts would enhance internet financial disclosure. Different studies (Bedard et al. 2004; Karamanou & Vafeas 2005) on voluntary disclosure and disclosure quality indicate a significant positive association between AC with financial expert members and corporate disclosure reliability. Jizi et al. (2014) support their results using a sample of US banks, and they find a significant positive association between AC with financial expert and CSRD. Shaukat et al. (2016) indicate that ACs with financial expert members are correlated with a more comprehensive CSR strategy and higher social and environmental execution. Regarding CSRA, Al-Shaer and Zaman (2018) imply a positive association between AC financial expert and sustainability assurance credibility. Lately, Mohammadi et al. (2020) and Dwekat et al. (2020b) argue that the existence of financial expert on AC would improve CSR reporting. However, Appuhami and Tashakor (2017) find no association between CSRD and AC financial expert.

Contrarily, Buallay and Al-Ajmi (2019) reveal an inverse relationship between the AC financial expert and the banks' CSR reporting. They claimed that the AC financial expert's presence is not essentially implying effective monitoring, but it depends on other considerations such as top management power. According to the prior discussion, our first hypothesis will be as follow:

***H1a**: There is a significant positive relationship between AC financial expert and CSRA.*

***H1b**: There is a significant positive relationship between AC financial expert and CSRA level.*

***H1c**: There is a significant positive relationship between AC financial expert and CSRA scope.*

***H1d**: There is a significant positive relationship between AC financial expert and CSRA assurer.*

Audit committee independence

The most commonly used definition of AC independent is the percentage of outside directors on the AC (Beasley, 1996; Klein, 2002). The BRC issued several suggestions to develop the effectiveness of ACs. It recommended that ACs of listed firms control and monitor all economic relations between the management and external auditor and that ACs stay fully independent of management (BRC, 1999). Based on BRC recommendations, ACs with independent members could objectively evaluate management actions, internal control, and disclosure practices (Abbott et al., 2004). The independent AC members could reduce agency problem, information asymmetry, and the possibility of collusion by management by monitoring management practices effectively, thus, improve CSR reporting (Fama, 1980; Fama & Jensen, 1983). Companies with independent AC would probably face lower internal control problems (Yang & Krishnan, 2005). Abbott et al. (2004) state that there is a significant negative association between AC independence and the occurrence of restatements. Anderson et al. (2004) report that ACs with fully independent members are significantly correlated with a lower debt cost. Other studies conclude that ACs with independent members could reduce earning management (Klein, 2002; Bedard et al., 2004; Kang et al., 2011). However, previous research has mainly focused on whether AC independence improved its effectiveness, and they ignore how much the percentage is enough (Bronson et al., 2009). Sarbanes-Oxley Act of 2002 (SOX) obligates all listed companies to have fully independent AC members. Bronson et al. (2009) support the SOX requirement, and they indicate that the benefits from AC independence would accomplish only when the AC is entirely independent. However, DeFond and Francis (2005) suggest that the presence of some insiders in AC might be beneficial because they would have an essential particular experience and knowledge about the firm. Mangena and Pike (2005) conclude that AC, with most independent members, are more efficient in supporting the credibility of both financial and non-financial disclosure such as CSR.

Few studies explore the connection between CSR/CSRA and AC independence. Al-Shaer and Zaman (2018) indicate that AC independence increases the credibility of a sustainability report. Mangena and Tauringana (2007) report a significant positive link between voluntary disclosure level and AC independence. Other studies (Said et al., 2009; Appuhami & Tashakor, 2017; Buallay & Al-Ajmi, 2019; Mohammadi et al., 2020) support these results, and they find that AC independence affects CSRD level positively. More recently, Dwekat et al. (2020b) state that AC independence is one of the most critical AC configurations that would improve CSRD level. While Haniffa and Cooke (2005) use a sample of 139 Malaysian companies, and they reveal an inverse relationship between CSRD and AC independence. However, Katmon et al. (2019) find no association between CSRD quality and AC independence. Based on the previous discussion, the second hypothesis will be as follow:

H2a*: There is a significant positive relationship between AC independence and CSRA.*
H2b*: There is a significant positive relationship between AC independence and CSRA level.*
H2c*: There is a significant positive relationship between AC independence and CSRA scope.*
H2d*: There is a significant positive relationship between AC independence and CSRA assurer.*

Audit committee Size

The size of AC is one of the significant factors that affect its effectiveness (Jizi et al., 2014). As agency theory suggests, larger AC could be more active (Jensen, 1993). The larger size of AC leads to a diversity of skills, experiences and knowledge, which leads to better controlling of CSRD (Bedard et al., 2004; Appuhami & Tashakor, 2017). Besides, the smaller size of AC might not have sufficient resources (Alotaibi & Hussainey, 2016). Therefore, the quality of supervision and monitoring tasks would be lower. Yekini and Jallow (2012) have also concluded that companies with four AC members or more would probably disclose high-quality CSR information on their annual reports. According to the Blue-Ribbon Committee (BRC), AC should consist of at least three members (Abbott et al., 2004) and should not exceed six members (National Association of Corporate Directors (NACD), 2000). Different Scholars investigate the effect of AC size on CSR, for instance, Alotaibi and Hussainey (2016), using a sample of 171 non-financial Saudi listed companies, found a significant positive relationship between AC size and the quantity of CSRD; however, they indicate an insignificant relationship with quality of CSRD. Yekini and Jallow (2012) also reported a positive association between the size of AC and corporate community involvement disclosure. Buallay and Al-Ajmi (2019) support the previous results, and they find a significant positive association between AC size and the level of banks sustainability reporting in the Gulf Cooperation Council.

Other researchers support this direction, and they imply that companies with more AC members will have a higher CSRD quantity (Appuhami & Tashakor, 2017) and CSRD quality (Katmon et al., 2019). However, recently Dwekat et al. (2020b) argued that a smaller AC size combines with other AC configurations would enhance CSRD level. In contrast, Jizi et al. (2014) indicate no association between AC size and CSRD. Concerning sustainability assurance, Kend (2015) and Al-Shaer and Zaman (2018) find an insignificant association between AC size and the CSR reporting credibility. Based on the previous arguments, our third hypothesis will be as follow:

H3a: *There is a significant positive relationship between the size of AC and CSRA.*
H3b: *There is a significant positive relationship between the size of AC and CSRA level.*
H3c: *There is a significant positive relationship between the size of AC and CSRA scope.*
H3d: *There is a significant positive relationship between the size of AC and CSRA assurer.*

Audit committee meetings

Previous literature uses AC meetings' frequency to measure AC activity and diligence (Sharma et al., 2009; Feng et al., 2012; Appuhami & Tashakor, 2017). The frequency of AC meetings indicates the number of meetings held by AC during the financial year since more AC meetings indicate high activity levels (Kalbers & Fogarty, 1993). BRC states a positive relationship between the frequency of AC meetings and a better-governed company (DeFond & Francis, 2005). The number of AC meetings is recommended in different CG codes and is used as a proxy by auditing companies to measure AC's efficiency and performance (Feng et al., 2012). For instance, BRC (1999) suggest at least four meetings each year, KMPG (1999) recommends three and four meetings, and PWC (1993) proposes at least four meetings. Abbott et al. (2004) find a positive association between AC meetings' frequency and a lower fraud rate. Karamanou and Vafeas (2005) argue that the high frequency of AC meetings would improve the responsibilities related to supervision, monitoring, and reporting, thus enhance monitoring performance. With more frequent meetings, AC would have more knowledge and experiences related to auditing, accounting, and sustainability (Abbott et al., 2004). Karamanou and Vefeas (2005) indicate a significant positive connection between AC meetings and the reported earnings quality. Previous empirical studies have addressed the relationship between AC meetings and disclosure. Kelton and Yang (2008) conclude that AC meetings' high frequency would improve internet financial disclosure. Also, Kent and Stewart's (2008) and Allegrini and Greco (2013) find a significant positive relationship between voluntary disclosure level and the frequency of AC meetings. Additionally, Al-Shaer and Zaman (2018) suggest a positive association between

AC meetings and the sustainability report's credibility. These results were supported by Jizi et al. (2014), Appuhami and Tashakor (2017), and Buallay and Al-Ajmi (2019), who replay a positive relationship between CSRD and AC meetings in their results. However, Othman et al. (2014) use a sample of the top 94 Malaysian firms, and they find an insignificant association between AC meetings frequency and the level of voluntary ethics disclosure. Depend on the preceding discussion; our fourth hypothesis will be as follow:

H4a*: There is a significant positive relationship between AC meetings and CSRA.*

H4b*: There is a significant positive relationship between AC meetings and CSRA level, scope, and assurer.*

H4c*: There is a significant positive relationship between AC meetings and CSRA level, scope, and assurer.*

H4d*: There is a significant positive relationship between AC meetings and CSRA level, scope, and assurer.*

5.3. Methodology

5.4.1. Sample selection and data sources

The study sample consists of European firms listed on the STOXX Europe 600 from 2011 to 2018. This index represents large, intermediate and small firms in terms of capitalisation across 17 European countries, covering around 90% of free-float market capitalisation in Europe. The countries that make up the index are Spain, Norway, Austria, Germany, Denmark, Sweden, Luxembourg, France, Ireland, Belgium, Finland, Italy, the Netherlands, Poland, Switzerland, Portugal, and the UK. The highest proportion relates to the UK, with around 28 per cent of the index, followed by France, Germany and Switzerland, with approximately 15 per cent each. Financial companies are excluded from the sample because of their different nature and regulations related to reporting social and environmental disclosures (Dwekat et al., 2020b; Hong and Andersen, 2011). Previous studies show that European companies are the leaders in issuing external CSRA reports (Hasan et al., 2003; Kolk, 2008; Simnett et al., 2009). KPMG (2013) reports European countries to have long experience in CSR reporting. Using a sample of 130 global assured CSR reports from 2002 to 2004, Mock et al. (2007) also found that around 67% of CSRA reports were issued in the European Union.

Data were collected from several sources and in different stages. First, based on the Global Reporting Initiative (GRI) database, the sample companies were identified whether they had issued an external CSRA report during the study period or not. If so, we then collect data about the assurance provider, level of assurance and assurance scope for companies that issued CSR reports in a given year. Table 29 shows more details about the sample structure and distribution over the years, countries, and industries. Data on AC (independence and financial expert), CSR committee, and Governance Score components were collected from ASSET4-Thomson Reuters. However, other AC variables (size and meeting) were collected from Bloomberg, while all the financial data were collected from DataStream.

Table 29 Distribution of external assurance reports across years, geographic zones, and industries.

	CSRA Report		
	0	**1**	**Percentage of total CSRA reports**
Panel A: Year			
2011	569	154	11.61
2012	547	176	13.27
2013	530	193	14.56
2014	548	175	13.2
2015	521	202	15.23
2016	539	184	13.88
2017	595	128	9.65
2018	609	114	8.6
Panel B: Geographic Zone			
Austria	33	31	2.34
Belgium	123	37	2.79
Denmark	142	18	1.36
Finland	82	94	7.09
France	639	153	11.54
Germany	608	184	13.88
Ireland	53	11	0.83
Italy	114	118	8.9
Luxembourg	48	0	0
Netherlands	230	90	6.79
Norway	129	23	1.73
Poland	27	5	0.38
Portugal	18	14	1.06
Spain	119	121	9.13
Sweden	300	108	8.14
Switzerland	319	81	6.11
United Kingdom	1.474	238	17.95
Panel C: Industry			
Basic Materials	349	227	17.12
Consumer Discretionary	927	193	14.56
Consumer Staples	416	104	7.84
Energy	205	139	10.48
Healthcare	486	66	4.98
Industrial	1.022	282	21.27
Real Estate	334	66	4.98
Technology	335	49	3.7

Telecommunications	232	88	6.64
Utilities	152	112	8.45
Total	4.458	1.326	

This table presents the distribution of CSRA reports across years, countries, and industries. CSRA report is a dummy variable equal to 1 if the firm issued a sustainability assurance report in a given year and 0 otherwise.

Source: Edited by author

5.4.2. Variable measurement

Dependent variable (CSRA)

The GRI Sustainability Disclosures database "data legend" stores and tracks critical reporting and related company data. Each company that has published CSR/integrated reports that is included in the database has an accompanying profile, including the company's name, logo, size, status, sector, country, description, and other valuable data that facilitate the interaction between the reporting firm and different types of stakeholders. More significantly, all the sustainability, CSR or integrated reports publicly available and registered with GRI have a report profile page. Such profiles provide high-level reporting information.

Concerning CSRA, the GRI Sustainability Disclosures database provides a wide range of information extracted from CSRA reports if the reporting company has issued CSRA in a given year. To test the study hypothesis, data about external assurance on whether the reporting company has published a CSRA report in a given year or otherwise, the type of assurance provider, assurance scope and level of assurance were retrieved from the GRI database. CSR assurer term refers to independent external experts who provide CSRA services. Simultaneously, the GRI categorises them into three main groups: accounting firms, small consultancy or professional services firms, and engineering firms. In line with Manetti and Toccafondi (2012) and O'Dwyer et al. (2011), we divided CSR assurers into two groups: accounting firms, which take a value of 1, and non-accounting firms, which take a value of 0. CSRA Scope refers to the extent of the information included in CSRDs and covered by the assurance. Coverage consists of the whole CSRA, specific section(s), and greenhouse gas emissions (GHG) only or not specified. The level of CSRA indicates the depth and extent of work undertaken by the assurance provider with regards to CSRA. CSR assurers usually provide two levels: "reasonable assurance" (i.e., high but not absolute) or "limited assurance" (i.e., moderate); the higher the level, the more rigorous the assurance process. Table 30 indicates the measurements of the dependent variables.

Independent variables (AC characteristics)

According to previous Board and CSR/CSRA articles, AC characteristics are chosen, which have evidence of independence, financial expert, size, and meetings on CSR/CSRA (Appuhami & Tashakor, 2017; Dwekat et al., 2020b; Al-Shaer & Zaman, 2018). Consistent with previous literature (Fuhrmann et al., 2017; Al-Shaer &Zaman, 2018; Clarkson et al., 2019), the study controls several factors that could influence the decision to obtain a CSRA report. The decision to obtain a CSRA report is also affected by firms' CG attributes (Martinez-Ferrero et al., 2017, Zhou et al., 2013; Al-Shaer & Zaman, 2018; Velte, 2020), in which both firm and country factors justify the CSRA decision (Castelo Branco et al., 2014; Kend, 2015, Liao et al., 2018; Ruhnke & Gabriel 2013; Velte, 2020). CG balances all stakeholders' wellbeing and alleviates business risks (Martinez-Ferrero et al., 2017). Besides, Martinez-Ferrero and Garcia-Sanchez (2017) and Martinez-Ferrero et al. (2017) evidence a positive impact between the board strength and CSRA adoption. After carefully reviewing prior CSRA literature, this study applies CSR committee, the board size, CEO separation and institutional ownership as control variables.

Concerning firm characteristics, Sierra et al. (2013) and Tarquinio and Rossi (2017) show that firm size is considered a crucial input factor of CSRA, which positively affects managers' decisions to obtain CSRA reports. Consequently, it is expected that firm size to be positively correlated with CSRA reports. Furthermore, it is assumed that firms' financial situation might impact the adoption of CSRA. Castelo Branco et al. (2014) found that profitability was positively linked with CSRA. Additionally, greater leverage will lower the opportunity to obtain a CSRA report (Castelo Branco et al., 2014; Sierra et al., 2013). Therefore, profitability and leverage are expected to have a positive and negative relationship with CSRA, respectively. Chen et al. (2016) indicate that the decision to obtain the CSRA report is affected by audit fees. Table 30 shows the measurements of all independent and control variables.

5.4.3. Regression models

Based on Clarkson et al. (2019) and Fuhrmann et al. (2017), this study uses four variants of the following logit regression models to test the hypothesis. The first model tests the influence of AC characteristics and board characteristics on the implementation of CSRA reports. Subsequently, CSRA level, CSRA scope and the decisions about CSR assurer are then tested, respectively.

$\boldsymbol{CSRA} = \beta_0 + \beta_1 AC\_EXP_{it-1} + \beta_2 AC\_IND_{it-1} + \beta_3 AC\_SIZE_{it-1} + \beta_4 AC\_MEETING_{it-1} + \beta_5 CSRCOMM_{it-1} + \beta_6 SIZE_{it-1} + \beta_7 LEV_{it-1} + \beta_8 ROE_{it-1} + \beta_9 B\_SIZE_{it-1} + \beta_{10} SEPARATION_{it-1} + \beta_{11} IO_{it-1} + \beta_{12} AUDITFEE_{it-1} + Fixed\ effects + \varepsilon_{\mathrm{it}}$ (1)

$\boldsymbol{CSRA\_Level} = \beta_0 + \beta_1 AC\_EXP_{it-1} + \beta_2 AC\_IND_{it-1} + \beta_3 AC\_SIZE_{it-1} + \beta_4 AC\_MEETING_{it-1} + \beta_5 CSRCOMM_{it-1} + \beta_6 SIZE_{it-1} + \beta_7 LEV_{it-1} + \beta_8 ROE_{it-1} + \beta_9 B\_SIZE_{it-1} + \beta_{10} SEPARATION_{it-1} + \beta_{11} IO_{it-1} + \beta_{12} AUDITFEE_{it-1} + Fixed\ effects + \varepsilon_{\mathrm{it}}\ (\mathbf{2})$

$\boldsymbol{CSRA\_\ Scope} = \beta_0 + \beta_1 AC\_EXP_{it-1} + \beta_2 AC\_IND_{it-1} + \beta_3 AC\_SIZE_{it-1} + \beta_4 AC\_MEETING_{it-1} + \beta_5 CSRCOMM_{it-1} + \beta_6 SIZE_{it-1} + \beta_7 LEV_{it-1} + \beta_8 ROE_{it-1} + \beta_9 B\_SIZE_{it-1} + \beta_{10} SEPARATION_{it-1} + \beta_{11} IO_{it-1} + \beta_{12} AUDITFEE_{it-1} + Fixed\ effects + \varepsilon_{\mathrm{it}}\ (\mathbf{3})$

$\boldsymbol{CSR\_Assurer} = \beta_0 + \beta_1 AC\_EXP_{it-1} + \beta_2 AC\_IND_{it-1} + \beta_3 AC\_SIZE_{it-1} + \beta_4 AC\_MEETING_{it-1} + \beta_5 CSRCOMM_{it-1} + \beta_6 SIZE_{it-1} + \beta_7 LEV_{it-1} + \beta_8 ROE_{it-1} + \beta_9 B\_SIZE_{it-1} + \beta_{10} SEPARATION_{it-1} + \beta_{11} IO_{it-1} + \beta_{12} AUDITFEE_{it-1} + Fixed\ effects + \varepsilon_{\mathrm{it}}\ (\mathbf{4})$

Where dependent and independent variables are defined in Table 30, ε is the error term, and βk are the regression coefficients.

Table 30 Measurements of the variables

Independent Variable	Label	Operational Definition
CSR_ Assurance	*CSRA*	The dummy variable equals one if the firm issued a CSRA report in a given year and 0 otherwise.
CSRA level	*CSRA_Level*	Dummy variable equal to 1 if the level of assurance was reasonable/high, and 0 otherwise.
CSRA Scope	*CSRA_ scope*	Dummy variable equal to 1 if the CSRDs were fully assured, and 0 otherwise.
CSRA assurer	*CSR_Assurer*	Dummy variable equal to 1 if an accountancy firm provided the CSRA, and 0 otherwise.
AC Financial Expert	*AC_EXP*	Dummy variable equals one if the firm has an AC with at least 1 “financial expert” as defined in SOX or 0 otherwise.
AC Independence	*AC_IND*	The proportion of independent board members on the AC
AC Size	*AC_SIZE*	The total number of AC members at the end of the fiscal year
AC Meeting	*AC_MEETING*	The number of AC meetings through the year
CSR Committee	*CSRCOMM*	Dummy variable equal to 1 if the company had a CSR committee, and 0 otherwise
Firm Size	*SIZE*	Natural logarithm of total assets.
Return on Equity	*ROE*	The ratio of net income to total equity.
Financial Leverage	*LEV*	The ratio of total debt to total assets.
Board Size	*B_SIZE*	The total number of board members at the end of the fiscal year
CEO Separation	*SEPARATION*	Dummy variable equal to 1 if there was separation between CEO and board chair or 0 otherwise.
Institutional Ownership	*IO*	Total percentage of institutional ownership.
Audit Fees	*AUDITFEE*	Natural logarithm of the audit fees paid by the reporting company in a given year.

Source: Edited by author

5.5. Empirical results

5.5.1. Correlation and descriptive statistics

To check multicollinearity between the study variables, Pearson’s correlation of all the variables is calculated and reported in Table 31. The values show that the highest correlation of 0.708 is between AUDITFEE and ROE. According to Hair et al. (2006) and Gujarati and Porter (2003), if the correlations are less than 0.80, no multicollinearity concern may affect the results. We can also notice that the CSRA is significantly correlated to AC size, AC meeting, CSR committee, firm size, ROE, financial leverage, board size and audit fees.

Table 31 Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) CSRA	1											
(2) AC_EXP	0.021	1										
(3) AC_IND	-0.013	0.180*	1									
(4) AC_SIZE	0.117*	0.021	-0.179	1								
(5) AC_MEETING	0.220*	0.033	-0.006	0.033	1							
(6) CSRCOMM	0.240*	0.088*	0.087*	0.073*	0.131*	1						
(6) SIZE	0.390*	-0.02	-0.072	0.271*	0.296*	0.315*	1					
(7) ROE	0.0643*	0.018	0.085*	0.025	-0.083	-0.029	-0.133	1				
(8) LEV	0.080*	0.016	-0.057	0.132*	0.108*	0.123*	0.315*	0.072*	1			
(9) B_SIZE	0.215*	0.004	-0.298	0.374*	0.242*	0.196*	0.515*	0.043*	0.260*	1		
(10) SEPARATION	0.008	0.002	0.156*	0.057*	-0.049	-0.079	0.086*	0.01	-0.055	-0.188	1	
(11) IO	-0.152	0.188*	0.428*	-0.016	-0.147	0.009*	0.269*	0.107*	-0.024	-0.335	0.249*	1
(12) AUDITFEE	0.296*	0.039	-0.009	0.224*	0.278*	0.259*	0.708*	0.068*	0.3064*	0.412*	-0.106	-0.182

This table presents the Pearson’s correlation coefficients of the dependent and independent variables. All variables are as defined in Table 30.
*Statistical significance at $p < 1\%$ using two-sided t-statistics.

Source: Edited by author

Table 32 Descriptive statistics

Variables	Mean	SD	Min	Max
CSRA	0.40	0.42	0	1
CSRA_Scope	0.14	0.35	0	1
CSRA_Assurer	0.39	0.49	0	1
CSRA_Level	0.83	0.38	0	1
AC_EXP	0.78	0.41	0	1
AC_IND	0.79	29.18	0	1
AC_SIZE	3.76	1.33	0	10
AC_MEETING	5.30	2.40	0	26
CSRCOMM	0.64	0.48	0	1
SIZE	15.28	1.51	5.89	19.78
ROE	0.17	76.47	101176	2409.86
LEV	0.58	0.21	0.01	2.83
B_SIZE	2.33	0.35	0.69	3.37
SEPARATION	0.76	0.42	0	1
IO	0.46	23.60	0	123
AUDITFEE	7.59	1.33	0	16

Source: Edited by author

Table 32 summarises the descriptive statistics of all variables used in the study analysis. It shows that nearly 40% of the 3340 firm-year observations issued CSRA report. Regarding CSRA assurance scope, almost 14% of the 1315 firm-year observations in their CSRA report were fully assured. Besides, nearly 39 % of these firms hired an accountancy firm as an assurance provider, and almost 83% of the 1315 firm-year observations of their CSRA level was reasonable. Concerning AC variables, the mean values in Table 32 reveal nearly

9 AC members (AC_SIZE), of which about 79% are independent (AC_IND). AC members tend to meet around five times a year (AC_MEETING). Nearly 78% of our sampled firms have at least one financial expert member. Besides, approximately 76% of our sampled firms separate between the CEO and board chair (CEOSEP). Regarding the CSR committee (CSRCOM), almost 64% of our sampled firms have a CSR committee.

5.5.2. AC attributes and CSRA

Table 33 introduces all models results (1 to 4) that are examined applying logistic regressions. All explanatory variables are lagged to account for endogeneity concerns. Model 1 presents the association between AC attributes and the decision to obtain CSRA. The findings in Model 1 indicate that AC financial expert has a significant ($p<.05$) positive impact on CSRA. This result support H1a, which show that companies with expert AC member tend to adopt the CSRA report. This result is in line with Al-Shaer and Zaman (2018). AC financial expert member could clarify matters that would challenge the auditor and managers to a better degree of financial disclosure (Bedard and Gendron, 2010), attract human resources (Helfaya & Moussa, 2017), reduce agency costs linked to the flow of information (Shaukat et al., 2016), thus, improve the credibility of CSRD and assurance. Model 1 findings also indicate a highly significant ($p<.01$) positive association between AC independence and CSRA. Thus, our second hypothesis (H2a) is accepted. This result is consistent with the agency theory perspective; according to Fama and Jensen (1983), the independent AC members could reduce agency problem, information asymmetry, and collusion by management by monitoring management practices, thus increasing the adoption of sustainability assurance. This result is also in line with Al-Shaer and Zaman (2018), who indicate that AC independence improves sustainability reports' credibility. In the same direction, AC with most independent members is more efficient in supporting non-financial disclosure credibility (Mangena & Tauringana, 2007), such as CSR (Appuhami & Tashakor, 2017; Musallam, 2018). Very recently, Dwekat et al. (2020b) report that AC independence is one of the essential AC attributes that would increase CSR reporting level. Moreover, AC size significantly ($p<.05$) impact the CSRA positively. This finding support H3a, which indicate that firms with larger AC size tend to adopt CSRA report. According to previous CSRA studies, larger AC sizes have more diverse knowledge and skills and expand the classical financial objectives to other concerns, such as CSR practices. Appuhami and Tashakor (2017) and Katmon et al. (2019) have found similar results and indicated that firms with more AC members would have a higher level of CSR reporting quantity and quality. In contrast, Model 1 indicate no significant association between AC meeting and CSRA; thus, H4a is rejected.

Consequently, to understand CSRA reports' features, along with AC attributes, Models 2, 3 and 4 examine the impact of AC attributes on CSRA level, CSRA scope, and CSRA assurer, respectively. Model 2, which examines the effects of AC attributes on the CSRA level, shows lower AC meeting leads to higher CSRA levels. This means a significant negative association between AC meeting and CSRA level (-0.213; p < .01). Therefore, H1b, H2b, H3c, and H3d are rejected. Model 3 analyses the effect of AC attributes on the CSRA scope. The results show that AC financial expert positively influences CSRA scope (0.559; p < .05). This result is in line with our findings in Model 1, which indicates that companies with AC financial expert are more likely to have a fully assured CSR report. Thus, H1c is accepted. However, AC independence, AC size, and AC meeting do not significantly affect the CSRA scope. Therefore, H2c, H3c, and H4c are rejected. Additionally, Model 4 test the effect of AC attributes on CSRA assurer. Nevertheless, the findings show that there is no significant association between AC attributes and CSRA assurer. Hence, H1d, H2d, H3d, and H4d are rejected.

Concerning our control variables, consistent with the previous CSRA literature, our results reveal that the CSR committee influence positively (1.753; p<.01) CSRA (Martinez-Ferrero & Garcia-Sanchez, 2017; Kend, 2015). The primary CSR committee responsibilities are monitoring CSR policies and performance, which would help the board to control and adopt better sustainability patterns that would improve CSR level (Post et al., 2011; Liao et al., 2018) and enhancing the credibility of voluntary disclosure through the dissemination of an external assurance statement (Martinez-Ferrero & Garcia-Sanchez, 2017). In line with Sierra et al. (2013) and Castelo-Branco et al. (2014), Table 5 indicates a significant positive association between firm size (SIZE) and CSRA (0.655; p<.01). ROE is positively associated with CSRA (0.00132, p<.05). Sierra et al. (2013) find a similar result, and they argued that firm performance is associated with higher CSRA adoption. Financial leverage (LEV) reveals a significant and negative relationship with CSRA (-0.851, p<.01), which is consistent with the outcomes stated by DeBeelde and Tuybens (2015) and Casey and Grenier (2015). Board size (B_SIZE) impact the level of CSRA positively (2.139, p<.01). Consistent with Martinez-Ferrero et al. (2017), this result indicates that companies with larger board size are more likely to adopt CSRA (Model 5) and have a high (reasonable) CSRA level (Model2). Finally, our results also indicate that the separation between CEO and chairman of the board contribute positively to the CSRA (0.423, p<.01).

Table 33 Audit committee attributes and CSRA

	(1)	(2)	(3)	(4)	(5)
VARIABLES	***CSRA***	***CSRA_LEVEL***	***CSRA_SCOPE***	***CSRA_Assurer***	**ASSET4**
AC_EXP $_{(t-1)}$	0.298**	0.481	0.559**	-0.13	0.410***
	(0.127)	(0.339)	(0.221)	(0.309)	(0.125)
AC_IND $_{(t-1)}$	0.00705***	-0.00337	-0.00397	-0.0011	0.00852***
	(0.00228)	(0.00771)	(0.00446)	(0.00727)	(0.00221)
AC_SIZE $_{(t-1)}$	0.104**	0.078	-0.129	-0.0588	0.151***
	(0.0462)	(0.12)	(0.0786)	(0.101)	(0.0467)
AC_MEETING $_{(t-1)}$	0.0114	-0.213***	0.0482	-0.00711	-0.0660**
	(0.026)	(0.0616)	(0.0359)	(0.0496)	(0.0271)
CSRCOMM $_{(t-1)}$	1.753***	1.28	0.308	0.0883	1.703***
	(0.194)	(0.886)	(0.376)	(0.355)	(0.135)
SIZE $_{(t-1)}$	0.655***	-0.326*	-0.155	0.386**	0.728***
	(0.0638)	(0.194)	(0.119)	(0.158)	(0.068)
ROE $_{(t-1)}$	0.00132**	0.00391	0.00369	0.00336	0.00114
	(0.000644)	(0.00275)	(0.00236)	(0.00227)	(0.000812)
LEV $_{(t-1)}$	-0.851***	0.0442	1.546***	0.118	-0.335
	(0.322)	(0.806)	(0.561)	(0.715)	(0.31)
B_SIZE $_{(t-1)}$	0.147	2.139***	-0.196	0.318	1.066***
	(0.221)	(0.53)	(0.39)	(0.594)	(0.218)
SEPARATION $_{(t-1)}$	0.423***	0.671**	0.245	-0.365	0.565***
	(0.136)	(0.336)	(0.231)	(0.334)	(0.141)
IO $_{(t-1)}$	-0.00530*	-0.0149*	-0.00406	0.00125	-0.000851
	(0.00304)	(0.00853)	(0.00596)	(0.00702)	(0.00305)
AUDITFEE $_{(t-1)}$	0.0924	0.191	-0.0067	-0.0722	0.109*
	(0.0607)	(0.218)	(0.105)	(0.151)	(0.0581)
Constant	-12.51***	-3.027	-0.629	-0.729	-17.30***
	(0.909)	(2.515)	(1.578)	(2.061)	(1.006)
Observations	3.340	871	922	913	3.340
Year fe	Yes	Yes	Yes	Yes	Yes
Country fe	Yes	Yes	Yes	Yes	Yes
Industry fe	Yes	Yes	Yes	Yes	Yes

Pseudo R^2	0.294	0.2113	0.1814	0.2193	0.3794

All variables are as defined in Table 30. *Statistical significance at $p < 1\%$ using two-sided t-statistics.

Source: Edited by author

5.5.3. Further analysis

Using other data source (ASSET4) to measure CSRA

As formerly stated, this study depends on the GRI database to gather all the data related to CSRA, including the CSR level. CSRA scope and CSRA assurer. ASSET4-Thomson Reuters is another database that offers data on whether the firm issued a CSRA report or not. Consequently, we compared CSRA data presented by GRI with those retrieved from ASSET4-Thomson Reuters. We noticed differences in the number of CSRA reports issued by the sample companies throughout the study period (2011-2018). Hence, H1a, H2a, H3a, and H4a were re-examined using the data from ASSET4-Thomson Reuters. Model 5 indicates that mainly the relationships remain similar to the main findings except for the AC meeting (see Table 33). Thus, in line with Model 1, H1a, H2a, H3a are supported, while H4a is rejected. On the other hand, we notice that Pseudo R2 and the significant value of AC financial expert (AC_EXP) and AC size (AC_SIZE) are higher in Model 5.

Countries with High CSRA Reports

Based on the sample distribution of CSRA reports across years, countries, and industries (see Table 29), we examine the sample of seven countries with the highest number of CSRA reports. Finally, we study the UK sample as it has the most significant number of CSRA reports during the study period. The regression results based on Models 6, 7, 8,9 and 10, reported in **Error! Reference source not found.** 34, show that the direction is similar and coefficients for AC attributes are significant throughout these subsamples, except for AC independence.

Table 34 Countries with High CSRA Reports

	(6)	(7)	(8)	(9)	(10)
VARIABLES	***CSRA***	***CSRA***	***CSR_LEVEL***	***CSR_SCOPE***	***CSR_Assurer***
AC_EXP $_{(t-1)}$	0.411***	1.121**	0.568	0.547**	-0.65
	(0.141)	(0.539)	(0.373)	(0.243)	(0.411)
AC_IND $_{(t-1)}$	0.00399	0.014	-0.00843	-0.00285	0.013
	(0.00285)	(0.0102)	(0.00865)	(0.00502)	(0.00961)
AC_SIZE $_{(t-1)}$	0.139***	0.222**	0.0501	-0.186**	-0.00583
	(0.0515)	(0.0948)	(0.122)	(0.0888)	(0.19)
AC_MEETING $_{(t-1)}$	0.00246	0.0277	-0.253***	0.0704*	-0.0173
	(0.028)	(0.0638)	(0.068)	(0.0398)	(0.0942)
CSRCOMM $_{(t-1)}$	1.348***	0.990**	1.274	0.136	-0.575
	(0.205)	(0.397)	(0.898)	(0.387)	(0.812)
SIZE $_{(t-1)}$	0.689***	0.544***	-0.163	-0.0613	1.004***
	(0.072)	(0.136)	(0.202)	(0.137)	(0.303)
ROE $_{(t-1)}$	0.00122**	0.000891	0.00446	0.00308	0.00271
	(0.00059)	(0.000902)	(0.00306)	(0.00199)	(0.00386)
LEV $_{(t-1)}$	-0.800**	-1.229*	0.023	1.703***	0.332
	(0.352)	(0.633)	(0.88)	(0.631)	(1.121)
B_SIZE $_{(t-1)}$	-0.0347	0.329	2.566***	-0.0257	-0.732
	(0.245)	(0.493)	(0.592)	(0.431)	(0.768)
SEPARATION $_{(t-1)}$	0.442***	1.053***	0.439	0.379	0.635
	(0.148)	(0.365)	(0.364)	(0.258)	(0.517)
IO $_{(t-1)}$	-0.00816**	-0.0140**	-0.0178*	-0.00529	-0.00317
	(0.00342)	(0.00667)	(0.00995)	(0.00667)	(0.00791)
AUDITFEES $_{(t-1)}$	0.0644	0.326**	0.215	-0.118	-0.281
	(0.0676)	(0.133)	(0.226)	(0.127)	(0.295)
Constant	-11.50***	-16.35***	-6.898***	1.366	-10.09***
	(0.928)	(2.196)	(2.635)	(1.586)	(3.017)
Observations	2.616	1.076	713	713	675
Year fe	Yes	Yes	Yes	Yes	Yes
Country fe	Yes	Yes	Yes	Yes	Yes
Industry fe	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.275	0.2831	0.2353	0.2058	0.2135

***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. The table shows the findings of the logistic regression models for a sample of European companies listed on the STOXX600 during the period 2011-2018. The sample for these models was chosen based on the countries with the highest observations. Namely, Models (6, 8,9, and 10) test a sample of the highest seven countries in terms of the number of CSRA reports issued during the study period; Model (7) tests a sample of UK companies only that have the highest number of CSRA reports during the study period (refer to table 1 for more details). All explanatory variables are 1-year lagged to account for possibly endogenous interdependence.

Source: Edited by author

5.6. Conclusion

Following the recent calls in the contemporary literature to further examine the relationship between other CG mechanisms (such as AC attributes) and firms' decisions to obtain CSRA (Velte, 2020; García-Sánchez, 2020; Farooq & de Villiers, 2017; Martinez-Ferrero et al., 2017), the purpose of this study is to test the influence of AC attributes over the adoption of CSRA. The study also offers insight into the effect of AC attributes on the scope and level of CSRA and the selection of CSRA assurer. In sum, it examines how AC financial expert, AC independence, AC size, and AC meetings and CSRA aspects are linked. Contextually, this is achieved using a sample of non-financial European companies listed on the STOXX 600 index over 2011-2018. The data were collected for 3340-year observations from the GRI and ASSET4-Thomson Reuters databases.

In conclusion, our study presents evidence of the complementary impact of the AC's strength and CSRA issues. It also offers that the assurance of CSR report, AC attributes, CSR committee, and other CG attributes can behave as a complementary tool to reduce the agency conflict and fulfil a wider set of stakeholders' demands. Precisely, it shows, as predicted, that firms tend to have assured CSR reports if they have a larger AC size (AC_SIZE) with more independent (AC_IND) and financial expert (AC_EXP) members. In line with Kend (2015) and Al-Shaer and Zaman (2018), the AC is found to be an effective mechanism in a good CG structure and not simply ceremonial or symbolic. Furthermore, such AC attributes contribute positively to the scope and level of the CSRA report. However, we do not find any relationship between any AC attributes and the accountancy firm's selection as CSR report assurer.

These findings have valuable theoretical and practical implications. Our results contribute to the agency theory because CSRA and CG (such as AC attributes) alleviate the conflict of interest between agent and principal. Outcomes align with the complementary impact between the AC strength and the CSRA adoption offered by the accountancy firms. Our findings also contribute to legitimacy theory; good CG structure and CSRA are considered the essential tools to fulfil the social needs that guarantee the company's survival in association with the society's goals in which it is placed. This study's primary practical implication for regulators and policymakers of European companies is to recognise how the AC structure's strength affects the CSRA aspects. Our study could be worthwhile for these consultants and regulators to present the CSRA statement to strengthen CSR reports' reliability and credibility. The outcomes recommend that AC members use external CSRA as a legitimation mechanism that guarantees company survival in the long run and a tool of active communication.

On the other hand, our results highlight the critical role of AC financial experts and independent members in increasing the adoption of CSRA. Consequently, regulators and policymakers could encourage firms to increase the proportion of AC independent members. Even though most CG codes enforce firms to involve at least one AC member with financial and accounting knowledge, our outcome underlines the importance of the AC financial specialist member role in improving the adoption and level of CSRA. Therefore, legislators and regulators may encourage firms to involve more than one financial specialist member in AC.

Our study has a few limitations that future scholars could consider. First, in this study, we examine the direct effect of AC structure on the adoption of CSRA and the scope, level and CSRA provider; further research could consider the indirect (moderating) impact of some variables such as CSR committee, board independence and CSR (ESG) disclosure score. Second, an additional limitation is related to CSRA measurement; the adoption of CSRA measured using a binary variable, although it is the most common measurement for it (Simnett et al., 2009; Kend, 2015; Martinez-Ferrero et al., 2017; Al-Shaer & Zaman, 2018). Third, our study investigates the CSRA level and scope using dummy variables; for instance, the mere adoption of the CSRA process does not mean a high-quality CSRA assurance level, as it is a multidimensional structure that is influenced by various aspects (Francis, 2011). Future scholars could try to offer a more comprehensive quality measure for CSRA and expand the results here stated to study the quality of CSRA.

Fourth, regarding the assurer of CSRA, we measure it using a binary variable equal to one if an accountancy firm provided the CSRA and zero otherwise. Simultaneously, the GRI classifies them into three key groups: accountancy, small consultancy, and engineering companies. Thus, the future researcher could repeat this study to investigate the effect of AC attributes on the selection of accountancy, consultancy, or engineering companies. Fifth, it would be noteworthy for future investigations to not only include other CSRA aspects that may be influenced by AC attributes but also to define how such CSRA engagement could affect the stakeholder’s perceptions of company reputation and image or market value, among other aspects. Sixth, concerning methodological implications, Dwekat et al. (2020b) conclude that more than one best possible AC and board attributes combination to achieve higher CSRD levels. Thus, it could be more attractive for future studies to use creative methods, for example, fuzzy sets (fsQCA) that combine quantitative and qualitative approaches (Ragin, 2000). Finally, future investigations could complement this study by conducting interviews with AC members and offering insights into AC’s role concerning CSRA within specific institutional and organisational settings.

6. General conclusions

6.1. General conclusions

In the contemporary business context, social and environmental norms have increased attention from a vast array of scholars in different countries worldwide. In this vein, significant pressure has been imposed on companies by various stakeholders to stay aligned with such social and environmental norms. Under such circumstances, the board and CG mechanisms are deemed as a sufficient basis to assure that companies run within the framework of their environmental and social responsibilities. One of the most vital CG and board monitoring mechanisms is AC. Its characteristics and existence would improve board supervision, enhance auditor's performance, and decrease the information asymmetry between different stakeholders and managers, thus improving firms' disclosures, such as CSR. However, few scholars have been addressed the effect of AC characteristics on CSR. Therefore, this thesis investigated the impact of AC characteristics on CSRD in four articles.

The ***first article*** (chapter 2) is the first study that presents a full picture of the board-CSR field by using a combination of two methodologies, bibliometric and social network analysis. Thus, it maps the knowledge of preceding works and suggests new avenues for future investigations for the connection between board characteristics and CSRP and CSRD. In this article, we analysed 242 articles published on Web of Science database (WoS) journals for the period (1992- 2019). Depending on the same sampled articles used in the first article, the ***second article*** (chapter 3) reviewed the previous board-CSR literature by applying a content analysis method. By doing that, this article offers a novel picture of the most critical drivers of CSRP/CSRD and provides constructive suggestions to guide future research. The first and second articles' main findings suggest that few studies on the board and CSR field have studied other board variables such as AC characteristics. Besides, CSR strategies are forming from several combinations of the board attributes and consider one dimension to be insufficient to generate an effective strategy. In this perspective, it should be stated that there is more than one best possible characteristics combination to achieve higher levels of CSRD. Therefore, the ***third article*** (chapter 4) fills the literature gap, adding novelties, showing evidence from the European context and, consequently, shedding light to inconclusive results in preceding literature concerning the effect of AC and board characteristics on CSRD by applying a novel research methodology (fsQCA).

Moreover, responding to the second article recommendations to further examine the link between board attributes and the decisions to obtain CSRA report, the ***fourth article*** (chapter 5) test the effect of AC attributes (namely AC financial expert, AC independence, AC meetings, and AC size) on the adoption of CSRA. The third article used a sample of the top 69 non-financial European companies (based on market capitalisation) for 2016–2018. In comparison, the fourth article used a sample of European companies listed on STOXX Europe 600 over 2011-2018. This broader sample was chosen to select a larger number of CSRA observations during the study period, and European firms were precisely selected because they are considered leaders in obtaining CSRA reports.

Generally, after examining the effect of AC characteristics on CSRD in this thesis, it can be concluded that CSRD is a complex phenomenon affected by different combinations of AC and board attributes. This means that different configurations of AC and board characteristics indicate a high CSRD level, and the effect of the particular board or AC attributes on a high CSRD level depends on other board or AC attributes. Additionally, the assurance of CSR report, AC attributes, CSR committee, and other CG attributes can behave as a complementary tool to reduce the agency conflict and fulfil a broader set of stakeholders' demands.

More specifically, the *first article* indicates that the growing literature shows how the interest in the connection between board and CSR is increasing, especially since 2014. Besides, most of the most productive journals in the field are high-quality journals with a high scientific impact, highlighting the increasing awareness of the significance of the research on this topic. The results also reveal that the literature's considerable impact since almost 83% of articles are cited at least once, and nearly 42% are cited more than ten times. Bear et al. (2010), Jo and Harjoto (2011) and Jamali, Safieddine, and Rabbath (2008) have the most significant value in the literature since they are the most cited articles in the field (with more than 250 citations). Although the investigations on this field are distributed worldwide, nearly 67% of the scholarly articles are in developed countries and concentrated primarily in Spain, the USA, China, Australia, and the UK. While on the other hand, research on the field still relatively low in developing countries. Hence, future investigations may consider concentrating on these countries.

The findings of Social Network Analysis also revealed that two or more authors study almost 93% of sampled articles; this indicates that scholars in this field tend to work cooperatively. Garcia-Sanchez and Martinez-Ferrero have the highest Authors co-occurrence with ten works, noting that they both are from the University of Salamanca. However, the collaborations in other countries such as Harjoto and Jo in the USA and Khan and Muttakin in Australia are relatively low with four and two collaborations. Therefore, the literature structure does not find a robust network of collaborations among scholars. The study finds only one significant network of scholars, all of whom are Spanish.

The co-citation analysis indicates two main groups of cited documents in the literature. The first cluster focuses on theory (stakeholders and agency theory), and the second group comprises four articles on the impact of corporate governance on CSR, usually cited jointly (Bear, Post, Haniffa, and Khan's works). The keywords and co-citation analysis results show that agency theory and stakeholder are the most popular theories used by researchers to explain the relationship between board and CSR.

The *second article* indicates that the link between board characteristics and CSR is widely investigated by previous research. However, the findings are still mixed and ambiguous. According to the research analyses, the findings underline a deep awareness of the board's critical role in shaping CSR strategies. In line with the first article's co-citation results, from a theoretical framework, the content analysis results revealed that both stakeholder theory and agency theory are the most common theories used by scholars to explain the relationship between board and CSR. Therefore, it could be more valuable for future scholars to investigate further the role of board in guiding the trends and patterns of CSR-related activities by using other theories such as critical mass theory, signalling theory, and resource dependency theory.

Concerning data sources, almost 26 % of the sampled articles depend on companies' financial statements, websites, and CSR standalone reports as well-organised data sources. Besides, KLD, COMPUSTAT, EIRIS, and Bloomberg are deemed informative databases for most prior research. More importantly, most previous works have used traditional statistical methods (for instance, ordinary least square regression). It should be observed that using a static model such as random-effects, fixed-effects, and pooled OLS may produce biased results because these estimators have not an adequate ability to address the potential risk stem from the endogeneity issue. Thus, to overcome the harmful impact of endogeneity problem, comparatively few scholarly articles have used some estimators such as lagged model, two or three-stage least squares regression analysis (2SLS, 3SLS), two-stage Heckman model, and generalised method of moments (GMM) estimator.

Regarding the CSR measurement, approximately 45% of our sampled articles have examined CSRD as dependent variables, and most of these studies are concentrated in developing countries. Additionally, many of these efforts were restricted to report the extent of CSRD in the annual report. However, negligible efforts have been devoted to assessing CSRD quality. Therefore, the second article promotes future researchers for additional investigations to provide indicators of the qualitative analysis of CSR reporting, which, in turn, reinforces the understanding of CSR level.

Given the results preceding, this second article offers future directions for different stakeholders on the nexus between board-CSR relations. In this sense, companies, policymakers, regulators, and academicians should expand their investigations to include the attributes and peculiarities of each board dimension. For instance, provide a comprehensive analysis of the board independence-CSR relationship. More obviously, examine board independence in terms of these aspects, gender, education, experience, and age. In the same way, women on the board and CSR committee members are highly required to assess the effect of their different attributes on CSR-related actions.

Additionally, the overwhelming majority of the authors concluded that the level of CSR would increase with a high percentage of independent board members, the existence of women in the board, large board size, the existence of CSR committee and the non-CEO duality. On the other hand, there are some significant attributes of the board committees that have been neglected by previous investigations. Therefore, future research could consider the characteristics of board committees. In particular, an AC is considered as one of the vital CG elements, enhancing the company's credibility and transparency, hence the CSRD. Therefore, to obtain an exhaustive understanding of CSR, examine the AC attributes such as (size, independence, gender, financial experience, and diligence) is highly required. The results also indicate that the CSR strategies are forming from several combinations of the board attributes (for instance, gender diversity, size, independence, etc.), and consider one dimension is not enough to generate an effective strategy. In this context, it should be mentioned that there is more than one best possible attribute combination to achieve a high level of CSR score (Cuadrado-Ballesteros et al., 2017b; Dwekat et al., 2020b). Thus, it could be attractive for future research to use creative methods, for example, fuzzy sets that combine quantitative and qualitative approaches (Ragin, 2000).

From the diversity perspective, board diversity could assist firms to improve the board decision quality to achieve a better CSR level (Cucari et al., 2018). Board diversity can be measured through various variables such as gender diversity, board age diversity, education and experience diversity. Most of the studies focus on gender diversity and pay less attention to other variables. Moreover, Board interlocks allow the company to benefit from other knowledge and skills (Lamb and Roundy, 2016; Rao and Tilt, 2016b), therefore improving the human capital of the board and affect the quality of board interactions and improving monitoring ability (Carpenter & Westphal, 2001). Thus, increasing the possibility of adopting more CSR practices (Shropshire, 2010). However, few works focus on the link between board interlocks and CSR. In this context, future research could expand research on these variables.

The precise impact of specific board characteristics on CSR cannot be seen in isolation. In this vein, mapping an interaction of specific board characteristics will lead to a greater or lesser degree of good governance, which, in turn, influences the company's CSR path. Thus, future investigations may pay more attention to the moderating effect of each board dimension on CSR.

The first and second articles are not free of limitations; the First limitation in our search criteria because of its employed bibliometric and content analysis techniques. Second, a considerable constraint is the likelihood of the non-inclusion of one or more critical studies in a substantial database, which was not anticipated to be a shortage of methodology. Third, these articles merely cover published articles in the English language. Finally, most scholarly articles in the two studies sample have been done in developed countries; thus, the findings should be interpreted carefully with more attention to the unequal distribution of the examined articles between developed and developing countries.

The *third article's* results support the key two tenets of complexity theory (equifinality and complexity). According to equifinality tenet, different configurations of AC and board characteristics indicate a high level of CSRD. While the complexity tenet indicates that the impact of the individual board or AC characteristics on a high CSRD level relies on other board or AC characteristics. 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 CSRD, 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 vast majority of CG codes globally enforce companies to involve at least one member of AC with accounting and financial expertise, the result emphasises the significance of AC financial expert member role in upgrading the level of CSRD. Accordingly, regulators and policymakers may encourage companies to include more than one financial expert on AC. The study results also reveal that AC independence, board independence, AC financial expert, AC chair independence, gender diversity independence, gender diversity affect CSRD positively (Jizi et al.,2014; Appuhami & Tashakor 2017). While CEO duality and AC size contribute negatively to CSRD (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.

The findings of the third article are relevant to regulators, professionals, and policymakers in establishing and revising the guidelines related to the composition of AC and board of directors. For example, CEO duality is one of the main variables that contribute negatively to high CSRD level; however, 35 % of our sample do not separate between the chairman of the board and CEO. On the other hand, it will be useful to revise AC composition; for example, our results reveal that high CSRD levels are achieved with a low number of AC members, together with different AC and board attributes. This article also contributes to the board and CSR field using a new methodology that mixes quantitative and qualitative approaches. As far as our knowledge goes, this the first study that applies FsQCA (configurational approach) to the link between AC and CSRD.

Still, this study also has its limitations. First, the few variables could be considered when using QCA since the combination grows exponentially, decreasing 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). Further, 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 concoction between AC, board, and the level of CSRD, 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 CSRD (ESG score) into three measures (governance, social and environmental) and different institutional frameworks by expanding the sample or use different countries.

Finally, the *fourth article's* results present evidence of the complementary impact of the AC's strength and CSRA issues. It also offers that CSRA, AC attributes, CSR committee, and other CG attributes can behave as a complementary tool to reduce the agency conflict and fulfil a wider set of stakeholders' demands. Precisely, it shows, as predicted, that firms tend to have assured CSR reports if they have a larger AC size with more independent and financial expert members. Consistent with Kend (2015) and Al-Shaer and Zaman (2018), the AC is found to be an effective mechanism in a good CG structure and not simply ceremonial or symbolic. Moreover, such AC attributes contribute positively to the scope and level of the CSRA report. However, we do not find any relationship between any AC attributes and the accountancy firm's selection as the assurer of the CSR report.

The fourth article's outcomes have significant theoretical and practical implications. Our outcomes contribute to the agency theory because CSRA and CG (such as AC attributes) alleviate the conflict of interest between agent and principal. The findings align with the complementary impact between the AC strength and the CSRA adoption offered by the accountancy firms. Our results also contribute to legitimacy theory; good CG structure and CSRA are considered the essential tools to fulfil the social needs that guarantee the company's survival in association with the society's goals in which it is placed. This study's critical practical implication for regulators and policymakers of European companies is to recognise how the AC structure's strength influences the CSRA aspects. Our study could be worthwhile for these consultants and regulators to present the CSRA statement to strengthen CSR reports' reliability and credibility. The outcomes recommend that AC members use external CSRA as a legitimation mechanism that guarantees company survival in the long run and a tool of active communication.

On the other hand, our results highlight the critical role of AC financial experts and independent members in increasing the adoption of CSRA. Consequently, regulators and policymakers could encourage firms to increase the proportion of AC independent members. Even though most CG codes enforce firms to involve at least one AC member with financial and accounting knowledge, our outcome underlines the importance of the AC financial specialist member role in improving the adoption and level of CSRA. Therefore, legislators and regulators may encourage firms to involve more than one financial specialist member in AC.

This article has a few limitations that future scholars could consider. First, in this study, we examine the direct effect of AC structure on the adoption of CSRA and the scope, level and CSRA provider; further research could consider the indirect (moderating) impact of some variables such as CSR committee, board independence and CSR (ESG) disclosure score. Second, an additional limitation is related to CSRA measurement; the adoption of CSRA measured using a binary variable, even though it is the most common measurement for it. Third, this study examines the CSRA level and scope using dummy variables; for example, the mere adoption of the CSRA process does not mean a high-quality CSRA assurance level, as it is a multidimensional structure that is influenced by various aspects (Francis, 2011). Future researchers could propose a more comprehensive quality measure for CSRA and expand the results here stated to study the CSRA quality. Fourth, concerning the CSRA assurer, we measure it using a binary variable equal to one if an accountancy firm provided the CSRA and zero otherwise. Simultaneously, the GRI classifies them into three key groups: accountancy, small consultancy, and engineering companies. Therefore, future scholars could replicate this study to investigate the effect of AC attributes on the selection of accountancy, consultancy, or engineering companies. Fifth, it would be noteworthy for future investigations to not only include other CSRA aspects that may be influenced by AC attributes but also to define how such CSRA engagement could affect the stakeholder's perceptions of company reputation and image or market value, among other aspects.

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