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Connecting the Dots: Do Financial Analysts Help Corporate Boards Improve Corporate Social Responsibility?

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This paper presents an examination of the joint impact of board structural elements at firm level and financial analysts as market-level corporate governance (CG) on corporate social responsibility (CSR) performance. Our study contributes to the CG–CSR literature by adopting the bundling approach, a perspective that has recently attracted researchers' attention as an answer to any heterogeneity and fragmentation in existing findings. It is based on an extensive sample consisting of 7,739 firm-year observations of US firms for the 2006–2015 period. The findings suggest that financial analysts complement the corporate board with more independence, gender diversity and a specialized CSR committee to realize a certain level of CSR performance of a firm. The findings also indicate that analysts substitute for those internal governance factors that are associated with weaker boards – larger sizes and dual-role CEOs. We also draw implications for research and practice from our findings.

Introduction

Interest in examining the role played by corporate governance (CG) on corporate social responsibility (CSR) performance is on the rise (Haque and Ntim, 2020; Jain and Zaman, 2020). Our study aimed to examine the effects of various governance mechanisms on CSR by taking into consideration their joint influence on corporate strategy. The extant research has predominantly looked at both internal and external mechanisms in isolation, with limited regard for the complementarity and substitution that may exist between them (Misangyi and Acharya, 2014). The relevant literature shows that corporate boards, as internal CG tools, exercise good oversight of their firms' ethical issues (Byron and Post, 2016; García-Meca and Sánchez-Ballesta, 2009). However, the extant research conducted on this topic has failed to reach a consensus on whether boards of directors only pursue profit maximization goals or also satisfy stakeholder demands, thereby achieving CSR goals (Oh, Chang and Kim, 2018).

Additionally, Dyck, Morse and Zingales (2010) and Kim, Li and Zhang (2011) argued that financial analysts engage in a form of market-level governance and curb any propensities to managerial fraud and unprecedented rent extraction. However, the extant research on the relationship between external governance and ethical behaviours has also yielded mixed findings (e.g. Adhikari, 2016; Chen *et al.*, 2016a; Shi, Connelly and Hoskisson, 2017; Yu, 2008). To reconcile these inconsistencies, we studied the CG–CSR nexus by bundling analysts with firm-level CG mechanisms. In so doing, we drew key insights mainly from

agency theory and from the wider literature on the CG–CSR relationship.

In this respect, Aguilera *et al*. (2015) advocated the need to move beyond the '*one-size-fits-all*' perspective (p. 497), while Jain and Jamali (2016) suggested that, in order to understand the effects of their external and internal aspects on CSR outcomes, CG mechanisms should be rethought '*as bundles rather than piecemeal*' (p. 266). In line with this, we argued that the best way to look at CG mechanisms would involve taking a bundling approach suited to enabling the examination of their interactive effects. Previously, some efforts had been made to guide CG research towards the study of firm-level CG bundles in relation to CSR (e.g. Cuadrado-Ballesteros, Martínez-Ferrero and García-Sánchez, 2017; Oh, Chang and Kim, 2018). However, to the best of our knowledge, no study had hitherto considered the complementary and substitutive effects of the different levels of CG on a firm's CSR performance. We filled this void by testing the monitoring effectiveness of governance bundles.

Against the backdrop of this research gap, this paper aims to shed light on the individual and joint effects of various CG mechanisms; more specifically, it investigates how board composition – a firm-level device – interacts with the coverage of financial analysts – a market-level one – to achieve a certain level of CSR performance. Scholars had hitherto studied the relationship between different CG levels and financial performance (e.g. Abdi and Aulakh, 2012; Essen, Engelen and Carney, 2013; García-Castro, Aguilera and Ariño, 2013; Misangyi and Acharya, 2014); our study differs by focusing on the CG–CSR nexus. It also differs from Jacoby *et al*. (2019), whose work was restricted to the environmental information transparency of firms.

The idea of inter-linkages between different governance mechanisms has long been acknowledged in the CG literature (Baysinger and Butler, 1985). Later, Milgrom and Roberts (1995) introduced the complementarities and substitutions that exist among the various CG mechanisms, while Rediker and Seth (1995) called these 'governance bundles'. In support of this, García-Castro, Aguilera and Ariño (2013) found complementarities among internal and external mechanisms in relation to financial performance, while Lang, Lins and Miller (2004) argued that market-based mechanisms – such as financial analysis – substitute for weaker firm-level ones. Some others provide testable propositions and call for future empirical contributions (e.g. Schiehll, Ahmadjian and Filatotchev, 2014; Ward, Brown and Rodriguez, 2009).

To test the bundling hypothesis and its effect on CSR, we explored the complementary and substitutive relationships that occur between board-level mechanisms and analysts' coverage. Our analysis of 7,739 firm-year observations of US firms for the 2006–2015 period confirmed our main argument and contributes to the existing literature in several ways. First, it provides several insights into how various governance mechanisms interact with each other in a complementary and substitutive fashion and distils the different configurations of governance mechanisms that can adequately promote CSR. Our study demonstrates that, although a single mechanism can be seen to have significant direct effects on CSR, the bundling of multiple ones provides a far better explanation.

Second, in contrast to prior evidence, our findings reveal that, when acting as essential external monitoring devices, financial analysts complement stronger boards by endowing them with higher independence, gender diversity and the presence of a sustainability committee, while substituting for weaker boards' structural elements – such as large sizes and dual CEO–chair roles – in achieving their objectives. Finally, our additional analysis of the configurational effect of internal mechanisms reveals both complementarity and substitution between various board attributes in affecting CSR. This finding contributes to firm-level bundling research (Misangyi and Acharya, 2014; Oh, Chang and Kim, 2018; Rediker and Seth, 1995).

Corporate governance and CSR

Effective CG can mitigate most agency problems (Dalton *et al*., 2007; Eisenhardt, 1989) by inhibiting any opportunistic behaviours (Liu and Lu, 2007). From the stakeholders' point of view, CG is referred to as the '*structure of rights and responsibilities among the parties with a stake in the firm*' (Aoki, 2001, p. 11). Ferrell, Liang and Renneboog (2016) considered CSR – defined as the 'social responsibility of business [that] encompasses the economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time' (Carroll, 1979, p. 500) – to be among the key causes of agency issues. Anecdotal

evidence indicates that effective governance helps to maintain a balance between the social and economic performances of firms, thus helping them meet any accountability challenges (Bonn and Fisher, 2005; Hussain, Rigoni and Orij, 2018).

Although the empirical literature recognizes the relationship between CG and CSR (Adhikari, 2016; Arora and Dharwadkar, 2011; Bear, Rahman and Post, 2010; De Villiers, Naiker and van Staden, 2011; Filatotchev and Nakajima, 2014; Haque, 2017; Hillman, Keim and Luce, 2001; Jamali, Safieddine and Rabbath, 2008; Jo and Harjoto, 2012), the extant studies have yielded largely mixed findings, which suggests the need to conduct further research in order to generate a consensus. We addressed this issue by looking at different levels of CG mechanisms and taking a holistic approach. The literature categorizes governance into internal (firm-level) and external (market-level) mechanisms (Jensen, 1993; Walsh and Seward, 1990), which respectively operate from inside and outside the locus of a firm. Firms are facing increasingly significant pressure from both internal and external stakeholders to exhibit responsible behaviours (Lys, Naughton and Wang, 2015; Surroca, Tribó and Zahra, 2013); however, to date, CG research has predominantly examined the role played by internal monitoring mechanisms.

The board of directors, managerial incentive and compensation contracts, and ownership structures are the most commonly researched governance system elements (cf. Daily, Dalton and Cannella Jr, 2003), which share the conventional logic of aligning shareholder and managerial interests and resulting in improved firm performance (Aguilera *et al*., 2015). Recent reviews of internal mechanisms (Jain and Jamali, 2016) and board characteristics (Byron and Post, 2016; García-Meca and Sánchez-Ballesta, 2009) confirm their positive association with CSR. Few studies, however, report a negative association (cf. Arora and Dharwadkar, 2011).

We focused on various board characteristics – board independence, diversity, CSR committee existence, board size and CEO duality, as firm-level governance aspects relevant for environmental performance (Walls, Berrone and Phan, 2012) – that have been widely studied in relation to CSR (Duru, Iyengar and Zampelli, 2016; Harjoto and Rossi, 2019; Husted and de Sousa-Filho, 2019) and often theoretically 'emphasized as effective in monitoring and aligning the interests of managers and shareholders' (Addo, Hussain and Iqbal, 2021, p. 2). Despite significant scholarly attention, the findings pertaining to the relationships between these governance devices and CSR are contrasting, as is evident from our synthesis of prior studies in Table 1. In line with Oh *et al*. (2018), we argued that such divergent results could be the outcome of neglecting the complex nature of governance. To understand the 'complex puzzle of CG', due attention should thus be paid to external mechanisms as 'a key dimension in the overall governance system' (Aguilera *et al*., 2015, p. 485).

External CG mechanisms – such as CG rating agencies, activist owners, external auditors, financial analysts and the market for corporate control, among others – are equally important (Aguilera *et al*., 2015; Harjoto and Jo, 2011; Shi, Connelly and Hoskisson, 2017). In this context, several studies have examined the relationship between analyst oversight and ethical firm behaviours (e.g. Adhikari, 2016; Chen, Harford and Lin, 2015; Harjoto and Jo, 2011; Jo and Harjoto, 2014; Kim, Li and Li, 2014; Shi, Connelly and Hoskisson, 2017; Yu, 2008) and have generally advocated a positive association between the two (Jo and Harjoto, 2014; Yu, 2008). Investors are greatly dependent on analysts to translate the CSR-related information into useful information for effective decision-making (Luo *et al*., 2015). Dhaliwal *et al*. (2012) and Ioannou and Serafeim (2015), among others, find that analysts heed and use CSR information to conduct their analysis and prepare recommendations for investors. The mainstream accounting literature shows that analysts monitor firms' reporting behaviour (Yu, 2008). In line with this literature, we therefore argue that analysts act as external monitors. The positive link between analyst coverage and CSR is consistent with the stakeholder orientation perspective, whereby CSR is perceived to benefit different stakeholders. With this view, CSR becomes legitimate in the eyes of analysts and stakeholders, rather than a mere demonstration of managerial opportunism.

This perspective recently changed when Adhikari (2016) and Shi, Connelly and Hoskisson (2017) found otherwise, arguing that, in the presence of high expectations for short-term profits, external monitoring is counterproductive with regard to the socially responsible performance of firms because external governance pressures for high economic performance can promote managerial short-termism and even financial fraud.

Table 1. Overview of research on CG mechanisms and outcomes of firms' ethical and social behaviours

CG mechanisms	Studies (*relationship with ethical behaviours*)	Theories and results of previous studies						Context
		Agency	Legitimacy	Resource dependence	Stakeholder	Stewardship	Other(s)	
Board independence	Coffey and Wang (1998) (*insignificant*)						Managerial control	USA
	Johnson and Greening (1999) (*positive*)	√			√			USA
	Kassinis and Vafeas (2002) (*positive*)				√		UET	USA
	Ibrahim, Howard and Angelidis (2003) (*insignificant*)							USA
	Shaukat, Qiu and Trojanowski (2016) (*positive*)			√			RBV	UK
	Sundarasen, Je-Yen and Rajangam (2016) (*negative*)	√						Malaysia
	Surroca and Tribó (2008) (*negative*)	√			√			International
	Walls, Berrone and Phan (2012) (*negative*)	√			√			USA
	Webb (2004) (*positive*)	√						USA
Gender diversity	Ardito, Dangelico and Petruzzelli (2021) (*negative*)						UET; SRT	USA
	Atif *et al.* (2021) (*positive*)						CRM	USA
	Coffey and Wang (1998) (*insignificant*)						Managerial control	USA
	Deschênes *et al.* (2015) (*positive*)				√			Canada
	Marquis and Lee (2013) (*positive*)						UET	USA
	Shaukat, Qiu and Trojanowski (2016) (*positive*)			√			RBV	UK
	Walls, Berrone and Phan (2012) (*positive*)	√			√			USA

Table 1. (Continued)

CG mechanisms	Studies (*relationship with ethical behaviours*)	Theories and results of previous studies						Context
		Agency	Legitimacy	Resource dependence	Stakeholder	Stewardship	Other(s)	
	Webb (2004) (*positive*)	√						USA
	Zhang, Zhu and Ding (2013) (*positive*)				√			USA
Presence of CSR committee	Eberhardt-Toth (2017) (*positive*)				√			International
	Elmaghrabi (2021) (*positive*)						CMT	UK
	García-Sánchez *et al.* (2020) (*positive*)	√			√			USA
	Hussain, Rigoni and Orij (2018) (*positive*)	√			√			USA
	Mallin and Michelon (2011) (*positive*)		√					USA
	McKendall, Sánchez and Sicilian (1999) (*insignificant*)						CC&BN	USA
	Rodrigue, Magnan and Cho (2013) (*insignificant*)						MFH	USA
	Uyar *et al.* (2020) (*positive*)			√			UET	International
	Uyar *et al.* (2021) (*positive*)				√			International
	Walls, Berrone and Phan (2012) (*positive*)	√			√			USA
Board size	Atif *et al.* (2021) (*positive*)						CRM	USA
	García-Sánchez, Rodríguez-Domínguez and Frías-Aceituno (2015) (*positive*)				√			International
	Hussain, Rigoni and Orij (2018) (*insignificant*)	√			√			USA
	Kassinis and Vafeas (2002) (*negative*)				√			USA

Table 1. (Continued)

CG mechanisms	Studies (*relationship with ethical behaviours*)	Theories and results of previous studies						Context
		Agency	Legitimacy	Resource dependence	Stakeholder	Stewardship	Other(s)	
	Mallin and Michelon (2011) (*positive*)		√					USA
	Marquis and Lee (2013)((*positive*)						UET	USA
	Olthuis and van den Oever (2020) (*negative*)						UET	Netherlands
	Uyar *et al.* (2020) (*negative*)			√			UET	International
	Walls, Berrone and Phan (2012) (*negative*)	√			√			USA
CEO duality	Atif *et al.* (2021) (*negative*)						CRM	USA
	Bear *et al.* (2010) (*positive*)	√						International
	Berrone *et al.* (2010) (*insignificant*)						SEW	USA
	Hussain, Rigoni and Orij (2018) (*negative*)	√			√			USA
	Jizi *et al.* (2014) (*positive*)					√		USA
	McKendall, Sánchez and Sicilian (1999) (*insignificant*)						CC&BM	USA
	Ntim and Soobaroyen (2013) (*insignificant*)					√		South Africa
	Sundarasen, Je-Yen and Rajangam (2016) (*negative*)	√						Malaysia
	Surroca and Tribó (2008) (*negative*)	√			√			International
	Walls, Berrone and Phan (2012) (*insignificant*)	√			√			USA

Table 1. (Continued)

CG mechanisms	Studies (*relationship with ethical behaviours*)	Theories and results of previous studies						Context
		Agency	Legitimacy	Resource dependence	Stakeholder	Stewardship	Other(s)	
	Webb (2004) (*negative*)	√						USA
Financial analyst	Adhikari (2016) (*negative*)						NA	USA
	Harjoto and Jo (2013) (*positive*)						SPT	USA
	Harjoto, Laksmana and Lee (2015) (*positive*)				√			USA
	Iatridis (2015) (*positive*)	√	√		√			USA
	Ioannou and Serafeim (2012) (*positive*)				√		IL	International
	Ioannou and Serafeim (2015) (*positive*)	√			√		IL; SCT	USA
	Jo and Harjoto (2011) (*positive*)	√					CRH	USA
	Jo and Harjoto (2014) (*positive*)	√			√			USA
	Luo *et al.* (2015) (*positive*)	√	√		√			USA
	Zhang *et al.* (2015) (*positive*)						RCV	USA

Notes: While agency theory has often been used in the CG literature, there are other theories that relate it to firm outcomes. Agency theory is used to understand the principal–agent interest divergence (Jensen and Meckling, 1976) and posits that managers behave in a self-serving manner, whereas shareholders want to protect their financial interests and gain the control of management by electing a board (Klettner, 2021). Hillman and Dalziel (2003) suggested that, besides the role of effective monitors, boards perform that of resource providers. According to resource dependence theory, directors can facilitate access to external vital resources that would otherwise be quite challenging for firms to acquire (Hillman, Withers and Collins, 2009; Pfeffer and Salancik, 1978). Stewardship theory offers an alternative view of managers' motivations and posits that managers act as stewards and for collective benefits aligned with the interests of shareholders (Davis, Schoorman and Donaldson, 1997). Therefore, to ensure effective decision-making, internal directors should dominate a non-executive board because they are better informed than outsiders (Ramdani and Van Witteloostuijn, 2010). Yet another theoretical paradigm – stakeholder theory – suggests that firms should be socially responsible and balance the interests of a wide range of stakeholders and not just those of their shareholders (Freeman, Wicks and Parmar, 2004). This premise is aligned with the legitimacy view, which champions socially acceptable corporate behaviours (Suchman, 1995).

CRH = conflict-resolution hypothesis; CC&BN = corporate crime & board monitoring; CRM = critical mass theory; IL = institutional logic; MFH = monitoring function hypothesis; RCV = reputational capital view; RBV = resource-based view; SCT = social construction theory; SPT = social pressure theory; SRT = social role theory; SEW = socio-emotional wealth theory; UET = upper echelon theory; NA = not available.

Table 1 briefly reviews the effects of board and analyst monitoring on CSR and relevant theoretical paradigms. To summarize, we argued that the literature on the governance mechanisms and CSR relationships points to the heterogeneity and equivocality of the existing results, which calls for more in-depth research involving a comprehensive framing of the underlying research problem (Jain and Jamali, 2016). Our framework is based on agency theory, however, the stakeholder perspective provides the rationale for firms' engagement in CSR.

The bundling approach and hypotheses development

While the inconsistencies found in the existing literature on the CG–CSR link are not surprising, Oh, Chang and Kim (2018) suggested an 'oversimplified view about governance mechanisms based on an assumption of independence' and studies on the 'joint effects of various governance mechanisms on CSR' as the possible reasons for them (p. 4). Similarly, Aguilera *et al*. (2008), Hoskisson, Castleton and Withers (2009) and Yoshikawa, Zhu and Wang (2014), among others, advocated the fact that – despite their distinct roles, characteristics and functions – governance mechanisms are not independent, which makes them eligible to be successfully combined in various bundles. An investigation of the joint effects of, or the *bundling* of, governance devices (Rediker and Seth, 1995; Ward, Brown and Rodriguez, 2009) can overcome the limitations associated with the assumptions of independence of each such device. Therefore, in line with Aguilera *et al*. (2015) and Oh, Chang and Kim (2018), we proposed and tested the effects of a bundle of interrelated governance mechanisms on CSR outcomes. Our perspective was consistent with other studies that also promoted the bundling approach (see e.g. Desender *et al*., 2013; Ward, Brown and Rodriguez, 2009).

While adopting the CG bundling approach, we drew key insights from agency theory, according to which there are two views of the bundling of governance mechanisms – namely, complementarity and substitutive (Schepker and Oh, 2013). With a few exceptions (Chen, Harford and Lin, 2015; Core, Guay and Rusticus, 2006; Harjoto and Jo, 2011; Jacoby *et al*., 2019; Sun, 2009), most researchers have focused on the interactions between internal CG practices, such as those enacted by boards of directors (see Cuadrado-Ballesteros, Martínez-Ferrero and García-Sánchez, 2017; Oh, Chang and Kim, 2018; Ramdani and van Witteloostuijn, 2010). For instance, Misangyi and Acharya (2014) performed a qualitative comparative analysis of the S&P 1500 publicly traded corporations and found that, in the case of high-profit firms, outside directors' ownership complements both director independence and CEO incentives.

Recently, Oh, Chang and Kim (2018) showed that the relationship between board independence and CSR is insignificant in the presence of high executive ownership, meaning that the two mechanisms are mutually exclusive; however, the relationship between executive incentive intensity and CSR is significant in the presence of higher board independence, meaning that the two factors are mutually enhancing. Cuadrado-Ballesteros, Martínez-Ferrero and García-Sánchez (2017) found that board gender diversity and independence jointly improve CSR. Finally, Rediker and Seth (1995) showed that board independence and managerial compensation are inversely related, implying a substitution.

However, the CG literature pertaining to the interactions occurring between different levels of governance is hitherto limited; our analysis empirically contributes to advancing the debate by analysing the effects on firms' CSR engagement of both the complementarity and substitutive views, based on the interrelationships between firm- and market-level mechanisms. Based on the above discussion, we present our theoretical framework in Figure 1.

The complementary effects of governance mechanisms

Governance mechanisms complement each other when two or more of them function in a synergistic manner and when an increase in the level of one marginally benefits another (cf. Siggelkow, 2002). In our context, this means that any increase in the activity level of one governance mechanism increases the marginal effect on CSR of another. We posited that the individual effectiveness on CSR of different monitoring mechanisms will increase the likelihood of their joint impact on CSR being even greater or, at least, the same. This is particularly true for the mechanisms that strengthen monitoring.

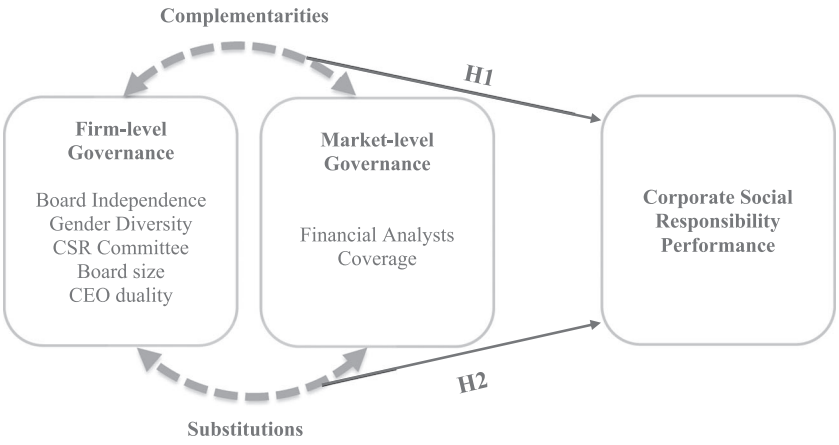

Figure 1. Theoretical framework of corporate governance and CSR performance

As such, there is limited theory in relation to what constitutes a strong board; however, a general debate on effective monitoring held among governance researchers indicated a few common characteristics (Misangyi and Acharya, 2014). Hussain, Rigoni and Orij (2018) argued that board diversity and the existence of a sustainability committee strengthen the board's monitoring capabilities and enhance a firm's stakeholder orientation. Boards enhance their control by establishing specialized committees – such as sustainability ones – which demonstrates their commitment to sustainable corporate practices (McKendall, Sánchez and Sicilian, 1999). Female representation on a board ensures strong monitoring because females are more caring and community minded (Liu, 2018) and are capable of contributing to ideas from diverse perspectives (Adams and Ferreira, 2009).

Additionally, the 'separation of top-level decision management and control means that outside directors have incentives to carry out their tasks and not collude with managers to expropriate residual claimants'; such incentives arise out of the fear of a potential reputation loss in the directorship market due to failed monitoring (Fama and Jensen, 1983, p. 315). Hence, the level of monitoring improves with an increase in the number of independent directors. On a similar note, financial analysts add another layer of monitoring on top of that of the board of directors and support a firm's CSR investments provided they are in line with the interests of shareholders and other stakeholders. If this is so, and these control mechanisms individually favour CSR engagement, the same mechanisms should also work jointly in the same direction.

However, few studies have analysed the interaction between analysts and traditional governance variables, and none have hitherto empirically confirmed their complementarity as such; yet, in the literature, we find theoretical hints favouring this argument. As analysts exert pressure on boards and owners to legitimize their firms' actions, such firms are likely to bring about change in their internal CG mechanisms (García-Sánchez *et al*., 2020). Through their information intermediary role, financial analysts also lower the costs of board monitoring by enhancing the board's ability to discipline managers (Chen, Harford and Lin, 2015; Knyazeva, 2008). Monitoring and curbing opportunistic behaviours is not the only reason motivating firms to enact such a change; they often do so for impression management and in order to be positively evaluated by analysts (Bednar, 2012; Washburn and Bromiley, 2014). This suggests that analyst coverage and board-level mechanisms have the capability to mutually enhance each other's effects in reducing agency conflicts, which is what we explored in our study with respect to firm engagement in CSR.

More precisely, we argued that analyst coverage works in tandem with board independence, gender diversity and the presence of a CSR committee to promote ethical behaviours. In this respect, Harjoto and Jo (2011) found support for the conflict-resolution hypothesis that the choice to engage in CSR is positively associated with effective CG mechanisms – a higher proportion

of outside directors, a higher number of analysts following a firm and a higher proportion of institutional investors. Similarly, Westphal and Graebner (2010) found that any negative evaluations made by analysts can spur firms to change their formal board compositions, including increasing board independence. This is because analysts, with their ability to affect stock prices, can deter managers from enacting any value-destroying behaviours. Similarly, a higher number of female board members is positively associated with greater analyst forecast accuracy (Gul, Hutchinson and Lai, 2013). We therefore hypothesize that analyst coverage can work synergistically with strong boards to improve a firm's CSR performance, as depicted in Figure 1. The CG bundle is effective when external aspects play a complementary role by activating internal monitoring devices. Therefore, our first set of hypotheses are

H1: Internal and external governance mechanisms have complementary effects on CSR performance.
H1a: Board independence and analyst coverage have complementary effects on CSR performance.
H1b: Board diversity and analyst coverage have complementary effects on CSR performance.
H1c: The presence of a CSR committee and analyst coverage have complementary effects on CSR performance.

The substitutive effects of governance mechanisms

Governance mechanisms substitute for each other if the marginal effects of one on an outcome increase (decrease) with the decrease (increase) of another (cf. Siggelkow, 2002). Another instance of substitutability can arise when the negative effects of one actor are neutralized due to the interaction of the focal actor with another mechanism (Sihag and Rijsdijk, 2019). For example, if a CEO who is generally considered to be short-term-oriented and little interested in CSR investment chairs a board, the independence of that same board can neutralize any detrimental effects of that CEO's dual role on CSR (Hussain, Rigoni and Orij, 2018).

wIn the complementarity view, two or more governance aspects operate simultaneously to achieve a level of performance; conversely, in the substitutive view, the mechanisms counteract each other, which means they cannot work together. A combination of contradictory aspects may even result in higher costs than benefits (Rediker and Seth, 1995). Given that CG involves substantial resource allocation, a cost is associated with every mechanism used to monitor and control any agency issues. This means that the addition of multiple mechanisms can involve substantial costs for a firm – to the point of outweighing any potential benefits – especially if the mechanisms are not carefully bundled. There is even a possibility of 'diminishing behavioural returns' (Zajac and Westphal, 1994, p. 122) as a consequence of combining multiple CG mechanisms to enhance their impact on CSR (Oh, Chang and Kim, 2018). In such circumstances, the combined mechanisms do not synergize; rather, they substitute for each other's effects on the firm's long-term social benefits.

The analysis of a substitutive collection of external and internal factors, although rarely performed, can reveal the conditions conducive to a firm gaining social benefits. In countries characterized by weak investor protection, agency issues are pronounced and governance quality is low. In such countries, analysts are then more likely to exert a form of control over agency issues and to act as substitutes for other low-quality governance mechanisms (Sun, 2009). Similarly, better analyst coverage is associated with a reduction in executive compensation (cf. Chen, Huang and Zhang, 2015; Kuhnen and Niessen, 2012), as CEOs are more highly compensated – especially in the presence of weak governance structures (Core, Holthausen and Larcker, 1999). In this vein, the analysis performed by Chen, Harford and Lin (2015) suggests that the private benefits accrued by managers increase with a decrease in analyst monitoring, which means that a firms' governance deteriorates with a decrease in analyst coverage, as firm managers tend to act more cautiously when subjected to the continuous scrutiny linked to analyst monitoring (Chen *et al*., 2016b). This shows that substitution works when, in a bundle, a failing or weakening control mechanism is substituted by another strong dominant one, with the positive effects of the latter being accentuated by the presence of the former.

Just like researchers generally assume what constitutes effective board monitoring, governance and agency theorists shed light on what weakens

a board's monitoring capability. When the CEO also serves as the chairperson of a board, much power is placed in the hands of one person and the independence of the board is undermined (De Villiers, Naiker and van Staden, 2011), making it difficult to prescribe any behavioural norms. Hence, the level of monitoring drops if the CEO plays a dual role. Similarly, larger boards are less likely to perform effectively and more likely to be plagued by free-riding, communication and coordination problems (Jensen, 1993), which result in weak decision-making. CEO–chair duality and large boards, therefore, give managers an opportunity to expropriate rents and act in their best interests.

We then posited that a higher analyst coverage, as a strong governance mechanism, and CEO duality or larger boards, as weak ones, substitute for each other, with the existence of the prior being able to attenuate the weak governance effects of the latter. The existing literature provides justification of our argument. For instance, Wiersema and Zhang (2011) found that any unfavourable or negative analyst recommendations can lead to CEO dismissal. Similarly, the positive link between CEO duality and a firm's stock price crash risk diminishes in the presence of higher analyst coverage (Chen, Huang and Zhang, 2015). Concerning board size, Addo, Hussain and Iqbal (2021) revealed that large boards are associated with excessive risk taking, and that this effect is attenuated by high institutional holdings, implying that the weak monitoring of large boards can be substituted by external governance.

To summarize the above argument, we posited the competing hypothesis that external analyst coverage and weak board characteristics do not work in tandem; rather, they substitute for each other. This indicates that one governance mechanism becomes effective when another fails to improve a firm's CSR performance, as depicted in Figure 1. Therefore, we hypothesize:

H2: Internal and external governance mechanisms have substitutive effects on CSR performance.
H2a: Board size and analyst coverage have a positive substitutive effect on CSR performance.
H2b: CEO duality and analyst coverage have a positive substitutive effect on CSR performance.

Methods

Sample

To test our hypotheses, we looked at the information related to the 2006–2015 timeframe available in four databases. We collected internal and external governance data from Boardex and the Institutional Brokers' Estimate System (I/B/E/S), respectively. We collected economic and financial data from Compustat, and matched the firms' CSR performance from their MSCI ESG ratings (formerly KLD Research & Analytics Inc.), which are based on publicly available and privately collected information suited to determine whether firms are socially responsible in seven performance areas. After excluding any observations with missing information, we obtained an unbalanced US sample of 7,739 firm-year observations.

Measures

Dependent variable. Our CSP measure was drawn from the KLD Stats database, which is considered one of the most reliable (Graves and Waddock, 1994). The CSR performance information was based on our sample firms' strengths and concerns in seven performance areas: community, diversity, employee, environment, governance, human rights and product. The MSCI ESG rating is designed to measure a company's resilience to long-term, industry material environmental, social and governance (ESG) risks. Furthermore, this database covers any business involvement in specific controversial business categories, such as Alcohol, Gambling, Military Contracting, etc. These ratings provide a value of 0 or 1 for various social responsibility indicators. For each company in our sample, we excluded the governance dimension and added the strengths and concerns along each of the remaining six dimensions to construct our CSP proxy. Following El Ghoul *et al*. (2011) and Siegel and Vitaliano (2007), we then computed the sum of each firm's strengths minus the sum of its concerns.

Independent variables. As a measure of firm-level governance, we selected board independence, gender diversity, CSR committee, board size and CEO duality (Duru, Iyengar and Zampelli, 2016; Hajoto and Rossi, 2019; Husted and de Sousa-Filho, 2019). We measured board independence 'BInd' and gender diversity 'WoB' as the percentages of

independent and female directors on the board, respectively. The existence of a CSR/sustainability committee on the board, 'CSRCom', was a dummy variable that took the value 1 if there had been a committee or a director tasked with dealing with CSR issues, and 0 otherwise. Board size 'BSize' was measured as the total number of directors on the board, and 'CEO_duality' was included as a dummy that took the value 1 if the CEO of a firm had also been its chairperson. In line with Cormier and Magnan (2014), Dhaliwal *et al*. (2012) and Simpson (2010), we created 'An_Coverage' as the natural logarithm of the number of analysts that had followed a firm throughout a year.

Control variables. Following previous studies – for example, Chaney, Faccio and Parsley (2011), Cohen and Zarowin (2010), Dhaliwal *et al*. (2012) and Oh, Chang and Kim (2018) – we controlled for many firm-level aspects. Among the management-level variables, we included: top management team average age 'TMT_age' as the mean value of all the executives' ages; top management team ownership 'Ownership_TMT' as the percentage of shares held by top management team members; and top management teams' long-term incentives intensity 'Incentives_TMT' as an objective alignment mechanism measured by the number of times top managers had received incentives during a financial year. Among the firm-level aspects, we included the following: 'Size', as the natural logarithm of total assets; 'ROA', as the return-on-assets ratio; 'Leverage', as the ratio of long-term debt to total assets; 'Market_cap', as the market-to-book ratio; and 'Cur_ratio' as the ratio of current assets to current liabilities. Finally, 'Industry' and 'Year' were included as dummy variables to control for different sectors and years, respectively.

Regression models and technique of analysis. Our study aimed to test the direct effects (Model 1) and complementary/substitutive effects (Models 1A to 1E) on CSP. To do so, we used the following models in which CSP was regressed on board characteristics and analyst coverage, their interactions and control variables:

$$\begin{aligned}\mathrm{CSP} = {} & \delta_1 \mathrm{BInd}_{it} + \delta_2 \mathrm{WoB}_{it} + \delta_3 \mathrm{CSRCom}_{it} + \delta_4 \mathrm{BSize}_{it} + \delta_5 \mathrm{CEO\_duality}_{it} + \delta_6 \mathrm{An\_Coverage}_{it} \\ & + \delta_7 \mathrm{TMT\_age}_{it} + \delta_8 \mathrm{Ownership\_TMT}_{it} + \delta_9 \mathrm{incentives\_TMT}_{it} + \delta_{10} \mathrm{Firm\_Size}_{it} \\ & + \delta_{11} \mathrm{ROA}_{it} + \delta_{12} \mathrm{Leverage}_{it} + \delta_{13} \mathrm{Market\_cap}_{it} + \delta_{14} \mathrm{Cur\_ratop}_{it} \\ & + \sum_{j=15}^{24} \delta_j \mathrm{Industry}_{it} + \sum_{k=25k}^{34} \mathrm{Year}_t + \mu_{it} + \eta_i \end{aligned} \quad \text{(Model 1)}$$

$$\begin{aligned}\mathrm{CSP} = {} & \delta_1 \mathrm{BInd}_{it} + \delta_2 \mathrm{WoB}_{it} + \delta_3 \mathrm{CSRCom}_{it} + \delta_4 \mathrm{BSize}_{it} + \delta_5 \mathrm{CEO\_duality}_{it} + \delta_6 \mathrm{An\_Coverage}_{it} \\ & + \delta_7 \mathrm{BInd} * \mathrm{An\_Coverage}_{it} + \delta_8 \mathrm{TMT\_age}_{it} + \delta_9 \mathrm{Ownership\_TMT}_{it} + \delta_{10} \mathrm{Incentives\_TMT}_{it} \\ & + \delta_{11} \mathrm{Firm\_Size}_{it} \delta_{12} + \mathrm{ROA}_{it} + \delta_{13} \mathrm{Leverage}_{it} + \delta_{14} \mathrm{Market\_cap}_{it} + \delta_{15} \mathrm{Cur\_ratop}_{it} \\ & + \sum_{j=16}^{25} \delta_j \mathrm{Industry}_{it} + \sum_{k=26}^{35} \delta_k \mathrm{Year}_t + \mu_{it} + \eta_i \end{aligned} \quad \text{(Model 1A)}$$

Bind*An_Coverage (in Model 1A) was replaced by WoB*An_Coverage, CSRCom*An_Coverage, BSize*An_Coverage and CEO_duality*An_Coverage in Models 1B, 1C, 1D and 1E, respectively.

In addition to our main models, we examined the effects of internal bundles by considering the two-way interactions between board characteristics only, considering them fundamental for governance (Models 2A to 2J).[1] BInd*WoB (in Model 2A) was replaced by BInd*CSRCom, BInd*BSize, BInd*CEO_duality, WoB*CSRCom, WoB*BSize, WoB*CEO_duality, CSRCom*BSize, CSRCom*CEO_duality and BSize*CEO_duality in Models 2B, 2C, 2D, 2E, 2F, 2G, 2H, 2I and 2J, respectively.

[1]Governance research has tested and confirmed an association between various interactions of board attributes and the responsible behaviour of firms. Therefore, to respond to recent calls made by researchers, we added this analysis as a supplementary one in this study and narrowed our scope to testing configurations of internal–external control mechanisms.

All models incorporated a firm-fixed effect,[2] η_i, while μ_{it} represents the disturbance term. Each firm was represented by i, and t refers to the time period. δ represents the parameters to be estimated. We use a linear regression model for panel data analysis that allows us to control for one time-invariant intercept for each company.

Findings

Descriptive analyses

Table 2 shows the mean and standard deviation values and bivariate correlations. CSR performance was found to have a mean value of −0.107 and, on average, nine analysts were found to follow a firm annually. With respect to board variables, a board was found to be made up of around nine directors, almost 75% of whom were outsiders and only 0.06% female. Panel B reports the correlation matrix, which shows low or moderate correlation among variables.

Direct, complementary and substitutive effect. Table 3 presents the results of our regression Models 1 and 1A–1E. In Model 1, CSR performance is positively affected by board independence, board diversity, the existence of a specialized CSR committee and analyst coverage ($\delta_1 = 0.005$, $p < 0.01$; $\delta_2 = 2.747$, $p < 0.01$; $\delta_3 = 1.384$, $p < 0.01$; $\delta_5 = 0.084$, $p < 0.01$), and is negatively affected by board size and CEO duality ($\delta_4 = -0.029$, $p > 0.10$; $\delta_5 = -0.387$, $p < 0.01$). Board size, however, was found to not be significant. Regarding the individual CG effects, our findings are consistent with the premise that effective and strong CG – be it internal or external – inhibits any opportunistic behaviours of managers and improves the ethical practices of firms. Conversely, weaker board attributes are detrimental to such activities.

The results of Models 1A to 1E again show that all governance mechanisms remain associated with CSR performance. To test the marginal effects of internal and external mechanisms, we calculated their respective coefficients by analysing their individual and interaction ones in order to examine the CG bundle. The results of Model 1A show that the interaction between board independence and analyst coverage is positively significant ($\delta_7 = 0.001$, $p < 0.10$). After calculating the coefficient, we found that the relationship between the presence of external directors on a board and CSR performance is strengthened when a firm is followed by a higher number of financial analysts ($\delta_1 + \delta_7 = 0.005 + 0.001 = 0.006$) compared to the direct relationship between board independence and CSR ($\delta_1 = 0.005$). Similarly, the result of Model 1B indicates that the interaction between gender diversity and analyst coverage is significant and positive ($\delta_7 = 0.102$, $p < 0.01$). After accounting for the coefficients of the individual and joint effects, the magnitude reveals that the effect on CSR performance of the presence of female directors on a board ($\delta_2 = 1.625$) is more pronounced when analyst coverage is higher ($\delta_2 + \delta_7 = 1.625 + 0.102 = 1.727$). The finding of Model 1C reveals a positive and significant interaction between the existence of a CSR committee and analyst coverage ($\delta_7 = 1.151$, $p < 0.01$). Examining the marginal effect, we found support for the hypothesis that the relationship between the existence of a CSR committee and CSR performance ($\delta_3 = 0.654$) is stronger in the presence of a higher financial analyst coverage ($\delta_3 + \delta_6 = 0.654 + 1.151 = 1.805$). Consistent with our hypotheses H1, H1a, H1b and H1c, our findings support the complementarity view, which posits that an increase in the level of analyst coverage will marginally accentuate the effect of board independence, gender diversity and CSR committee on a firm's CSR.

The result of Model 1D shows a positive interaction between board size and analyst coverage ($\delta_7 = 0.049$, $p < 0.10$). Accounting for coefficients, we found support for the hypothesis that the negative relationship between larger boards and CSR performance ($\delta_4 = -0.060$) becomes weaker when a firm is followed by a higher number of financial analysts ($\delta_4 + \delta_7 = -0.060 + 0.049 = -0.011$). Similarly, the result of Model 1E shows a positive interaction between CEO duality and analyst coverage ($\delta_7 = 0.047$, $p < 0.10$). The calculation of the magnitude indicates that the negative relationship between CEO duality and CSR performance ($\delta_5 = -0.957$) is weaker when a firm is followed by a higher number of financial analysts ($\delta_5 + \delta_7 = -0.957 + 0.047 = -0.910$). In line with hypotheses H2, H2a and H2b, these results support the substitutive hypothesis, suggesting that an increase in the

[2]The Hausman test is neither a necessary nor a sufficient condition for deciding between fixed and random effects as an analysis technique (Clark and Linzer, 2015), nonetheless, it is the only reasonable test to make a choice between fixed or random effect panel regressions.

Table 2. Descriptive statistics and correlation matrices

Panel A. Mean and standard deviation of variables used in regressions

	Mean	Std dev.
CSP	−0.107	2.530
An_coverage	9.000	6.986
BInd	75.026	20.024
WoB	0.056	0.106
CSRCom	0.241	0.428
BSize	9.026	2.407
CEO_duality	0.462	0.499
TMT_age	52.932	4.203
Ownership_TMT	0.114	0.197
Incentives_TMT	8.592	2.681
Size	7.533	1.792
ROA	0.002	1.005
Leverage	0.246	0.223
Market_cap	3.002	42.521
Cur_ratio	2.808	4.399

Panel B. Bivariate correlations between variables used in regressions

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. CSP	1														
2. An_coverage	0.301***	1													
3. BInd	0.125***	0.113***	1												
4. WoB	0.053***	0.015**	0.001***	1											
5. CSRCom	0.317***	0.249***	0.309***	−0.013	1										
6. BSize	0.241***	0.306***	0.122***	−0.109***	0.461***	1									
7. CEO_duality	0.027***	0.123***	0.002	0.019***	0.051***	0.043***	1								
8. TMT_age	0.049***	0.032***	0.001	0.026***	0.138***	0.189***	0.142***	1							
9. Ownership_TMT	−0.077***	−0.061***	−0.079***	0.004	−0.188***	−0.177***	−0.051***	−0.052***	1						
10. Incentives_TMT	0.241***	0.299***	0.206***	−0.080***	0.489***	0.085***	0.022***	0.113***	−0.185***	1					
11. Size	0.299***	0.135***	−0.002***	0.4406	0.194***	0.574***	0.119***	−0.199***	0.590***	0.519***	1				
12. ROA	0.020***	0.008	0.009	0.018**	0.028***	0.029***	0.005	−0.031***	−0.049***	0.027***	0.095***	1			
13. Leverage	−0.053***	−0.067***	0.005	−0.078***	−0.0221	−0.077***	0.006	−0.007	−0.069***	−0.053***	0.003	−0.122***	1		
14. Market_cap	0.012*	0.002	0.006	0.012	0.008	0.007	0.008	−0.012	0.005	0.021***	−0.004	0.022***	−0.012	1	
15. Cur_ratio	−0.035***	−0.039***	0.014*	−0.129***	−0.032***	−0.192***	−0.071***	0.095***	−0.252***	−0.107***	−0.227***	−0.005	−0.153***	−0.000	1

Sample: 7,739 observations from 2006 to 2015.

Table 3. Regression analysis linking internal- and market-level corporate governance with CSR performance

	Model 1		Model 1A		Model 1B		Model 1C		Model 1D		Model 1E	
	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.
Main variables												
BInd	0.005***	0.002	0.005***	0.004	0.005***	0.002	0.005***	0.002	0.005**	0.002	0.005***	0.002
WoB	2.747***	0.325	2.737***	0.325	1.625***	0.576	2.692***	0.323	2.748***	0.335	2.691***	0.324
CSRCom	1.384***	0.081	1.379***	0.081	1.385***	0.081	0.654***	0.116	1.370***	0.082	1.378***	0.081
BSize	−0.029	0.028	−0.029	0.028	−0.031	0.028	−0.025	0.028	−0.060**	0.025	−0.027	0.028
CEO_duality	−0.387***	0.078	−0.387***	0.078	−0.387***	0.078	−0.398***	0.078	−0.424***	0.080	−0.957***	0.126
An_coverage	0.084***	0.006	0.048**	0.022	0.076***	0.007	0.075***	0.006	0.072***	0.007	0.071***	0.007
Bind*An_coverage			0.001*	0.000								
WoB*An_coverage					0.102***	0.043						
CSRCom*An_coverage							1.151***	0.130				
BSize*An_coverage									0.049***	0.010		
CEO_duality*An_coverage											0.047***	0.008
Control variables												
TMT_age	0.032***	0.010	0.031***	0.010	0.032***	0.010	0.032***	0.010	0.031***	0.011	0.033***	0.010
Ownership_TMT	−0.013	0.189	−0.011	0.189	−0.007	0.189	−0.055	0.188	0.013	0.196	0.011	0.189
Incentives_TMT	0.016	0.025	0.015	0.025	0.016	0.025	0.017	0.025	0.022	0.020	0.016	0.025
Firm_size	0.324***	0.047	0.324***	0.047	0.328***	0.047	0.273***	0.047	0.300***	0.049	0.278***	0.048
ROA	0.025	0.322	0.036	0.322	0.031	0.322	−0.011	0.320	0.063	0.345	−0.041	0.321
Leverage	0.065	0.233	0.072	0.233	0.067	0.233	0.070	0.232	0.069	0.242	0.101	0.233
Market_cap	0.002***	0.001	0.002***	0.001	0.002***	0.001	0.002***	0.001	0.002***	0.001	0.002***	0.001
Cur_ratio	0.124***	0.031	0.124***	0.031	0.123***	0.031	0.122***	0.031	0.126***	0.031	0.122***	0.031
					Controlled by year and industry							
R^2	0.417***		0.416***		0.418***		0.415***		0.416***		0.420***	
Wald chi-square	1,128.63		1,132.19		1,134.61		1,219.63		1,117.77		1,165.22	

Sample: 7,739 observations from 2006 to 2015.
*, ** and *** represent statistical significance at the 90%, 95% and 99% levels, respectively.

level of analyst coverage decreases the marginal effects of board size and CEO duality on a firm's CSR.

Following Marquis, Toffel and Zhou (2016), Oh, Chang and Kim (2018) and Panwar *et al.* (2015), we provide a wide array of interaction plots (Graphs 1, 2, 3, 4 and 5), all of which depict the moderating effect of analyst coverage on the relationship between board mechanisms and CSR performance. These graphs suggest that, when the presence of outside directors (Graph 1), female directors (Graph 2) and a CSR committee (Graph 3) on a board is higher, additional monitoring by financial analysts increases the marginal gain for CSR performance, supporting the complementary effect hypothesis. Furthermore, when a board is large (Graph 4) and the CEO takes on a dual role (Graph 5), the additional monitoring performed by financial analysts minimizes the marginal detrimental effect on CSR performance, supporting the substitutive effect hypothesis. This implies that an external control mechanism reinforces the role of only those internal mechanisms that strengthen a firm's CG and improve the functioning of the board. Conversely, an external factor plays a substitutive role and partially counters the negative effects of those internal factors that worsen a firm's CG and reduce the effectiveness of the board.

Moreover, we include Graphs 6 and 7 to clarify the evolution and influence of CEO duality on CSP. The conjugation of the roles of CEO and chair, considered as inversely related to the strength of a board, experienced a rebound between 2006 and 2010, when a certain (and limited) evolution began to become apparent – decreasing until reaching values close to 40% in 2016.

To ensure the validity of our evidence, we performed a robustness analysis (see Table 4). To do so, we replaced the analyst coverage measure used in the first set of models with negative analyst recommendations. Positive or negative recommendations can have implications in determining the value of a firm's stock (Shi, Connelly and Hoskisson, 2017). Following Shi, Connelly and Hoskisson (2017), we measured 'Neg_recommendation' as the total number of negative recommendations issued by securities analysts across the various quarters of each year. After replacing analyst coverage with the negative recommendations in Models 1A–1E, we found results that were similar to our initial ones – confirming the latter's robustness. In the presence of negative analyst recommendations, the negative marginal effect of board size and CEO duality on CSR performance becomes weaker, while the positive marginal effects of board independence, gender diversity and a CSR committee on CSR performance get stronger.

Additionally, a configuration of internal factors can have implications for firm behaviours that differ from those of a mix of internal and external ones. Therefore, we performed additional analyses to examine the impact of the possible configurations of board-level mechanisms on CSR performance, and regressed Models 2A to 2J (Table 5). To focus on the key insights, below we discuss the results of only those configurations that are significant – that is, Models 2A, 2E, 2F, 2G and 2H.[3]

In Model 2A, the interaction between board independence and diversity was found to be positively significant ($\delta_7 = 0.011$, $p < 0.05$). Examining the joint effect, the magnitude revealed that, in the presence of a greater proportion of female directors on the board, the relationship between the presence of non-executive directors on a board and CSR outcomes ($\delta_1 = 0.005$) is strengthened ($\delta_1 + \delta_7 = 0.005 + 0.011 = 0.016$). Similarly, in Model 2E, the interaction between the proportion of female directors on the board and the existence of a CSR committee was found to be positive and significant ($\delta_7 = 1.342$, $p < 0.01$). After calculating the coefficient, we found that, when a firm has a CSR committee, the relationship between female presence on the board and CSR performance ($\delta_2 = 3.897$) is strengthened ($\delta_2 + \delta_7 = 3.897 + 1.342 = 5.239$). Both results confirm the complementary effects on CSR performance of board independence and gender diversity, and of gender diversity and the existence of a CSR committee.

The results of Model 2F show that the interaction between board size and board diversity was also found to be positive ($\delta_7 = 0.122$, $p < 0.01$). The examination of the coefficient indicated that, when a board has a higher female presence, the negative – and non-significant – relationship between board size and CSR ($\delta_4 = -0.009$) is weakened ($\delta_4 + \delta_7 = -0.009 + 0.122 = 0.113$). This suggests that the impact of board size on CSR performance is countered by the presence of more female directors; hence, in a bundle, the presence

[3]The results in Table 5 remained robust when we replaced analyst coverage with the negative recommendations of analysts. These results are available upon request.

Table 4. Robust results for analysts' coverage following negative recommendation

	Model 2A		Model 2B		Model 2C		Model 2D		Model 2E	
	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.
Main variables										
BInd	0.005**	0.002	0.007***	0.002	0.007***	0.002	0.007***	0.002	0.007***	0.002
WoB	4.245***	0.365	2.686***	0.478	4.278***	0.364	4.233***	0.365	4.290***	0.365
CSRCom	1.344***	0.085	1.358***	0.085	1.009***	0.103	1.357***	0.085	1.361***	0.085
BSize	−0.017	0.030	−0.021	0.030	−0.017	0.030	−0.044	0.030	−0.016	0.030
CEO_duality	−0.360***	0.082	−0.363***	0.082	−0.355***	0.082	−0.358***	0.082	−0.507***	0.097
Neg_estimation	0.040***	0.017	0.056***	0.016	0.053***	0.016	0.039**	0.017	0.061***	0.017
BInd*Neg_recommendation	0.001***	0.000								
WoB* Neg_recommendation			0.645***	0.121						
CSRCom* Neg_recommendation					0.124***	0.020				
BSize* Neg_recommendation							0.010***	0.002		
CEO_duality* Neg_recommendation									0.053***	0.019
Control variables										
TMT_age	0.055***	0.012	0.054***	0.012	0.053***	0.012	0.055***	0.012	0.054***	0.012
Ownership_TMT	−0.016	0.199	0.014	0.199	−0.009	0.199	−0.013	0.199	0.017	0.200
Incentives_TMT	0.015	0.027	0.016	0.027	0.017	0.027	0.017	0.027	0.014	0.027
Firm_size	0.457***	0.048	0.496***	0.047	0.484***	0.047	0.457***	0.048	0.496***	0.047
ROA	0.652*	0.357	0.481	0.355	0.500	0.355	0.629*	0.356	0.463	0.356
Leverage	−0.104	0.244	−0.135	0.244	−0.125	0.243	−0.121	0.244	−0.136	0.244
Market_cap	0.002***	0.001	0.002***	0.001	0.002***	0.001	0.002***	0.001	0.002***	0.001
Cur_ratio	0.135***	0.032	0.138***	0.032	0.139***	0.032	0.134***	0.032	0.142***	0.032
Controlled by year and industry										
R^2	0.427***		0.427***		0.425***		0.427***		0.425***	
Wald chi-square	1,028.95		1,022.27		1,032.48		1,031.70		999.31	

Sample: 7,739 observations from 2006 to 2015.
*, ** and *** represent statistical significance at the 90%, 95% and 99% levels, respectively.

Table 5. Regression analysis linking internal-level corporate governance with CSR performance

	Model 2A		Model 2B		Model 2C		Model 2D		Model 2E	
	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.
Main variables										
BInd	0.005**	0.002	0.006***	0.002	0.005**	0.003	0.004*	0.002	0.005**	0.002
WoB	3.591***	0.423	4.027***	0.339	2.748***	0.325	2.732***	0.325	3.897***	0.356
CSRCom	1.333***	0.083	1.264***	0.420	1.384***	0.084	1.368***	0.082	1.223***	0.086
BSize	−0.010	0.028	−0.003	0.028	−0.029	0.036	−0.028	0.028	−0.012	0.027
CEO_duality	−0.370***	0.078	−0.367***	0.077	−0.387***	0.078	−0.737***	0.262	−0.371***	0.076
An_coverage	0.126***	0.007	0.126***	0.007	0.084***	0.006	0.084***	0.006	0.125***	0.007
BInd*WoB	0.011**	0.005								
BInd*CSRCom			0.001	0.005						
BInd*BSize					0.000	0.000				
BInd*CEO_duality							0.004	0.003		
WoB*CSRCom									1.342***	0.560
Control variables										
TMT_age	0.036***	0.010	0.035***	0.010	0.032***	0.010	0.032***	0.010	0.037***	0.010
Ownership_TMT	−0.075	0.189	−0.064	0.186	−0.013	0.189	−0.008	0.189	−0.039	0.183
Incentives_TMT	0.023	0.026	0.019	0.025	0.016	0.025	0.014	0.025	0.023	0.025
Firm_size	0.135***	0.050	0.126***	0.049	0.324***	0.047	0.321***	0.047	0.134***	0.049
ROA	−0.232	0.338	−0.172	0.333	0.025	0.322	0.017	0.322	−0.173	0.327
Leverage	0.267	0.235	0.263	0.231	0.065	0.233	0.075	0.233	0.366	0.230
Market_cap	0.002***	0.001	0.002***	0.001	0.002***	0.001	0.002***	0.001	0.002**	0.001
Cur_ratio	0.116	0.031	0.117***	0.030	0.124***	0.031	0.124***	0.031	0.108***	0.029
				Controlled by year and industry						
R^2	0.426***		0.427***		0.417***		0.417***		0.434***	
Wald chi-square	1,342.76		1,348.94		1,128.38		1,130.77		1,387.12	

	Model 2F		Model 2G		Model 2H		Model 2I		Model 2J	
	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.
Main variables										
BInd	0.005**	0.002	0.005**	0.002	0.005**	0.002	0.005***	0.002	0.005**	0.002
WoB	3.695***	0.420	2.162***	0.461	2.885***	0.335	2.739***	0.325	2.748***	0.325
CSRCom	1.338***	0.082	1.384***	0.081	0.518***	0.088	1.273***	0.112	1.384***	0.081
BSize	−0.009	0.028	−0.029	0.028	−0.073***	0.029	−0.029	0.028	−0.009	0.033
CEO_duality	−0.348***	0.078	−0.453***	0.086	−0.403***	0.080	−0.454***	0.091	−0.020	0.326
An_coverage	0.084***	0.006	0.084***	0.006	0.079***	0.006	0.084***	0.006	0.084***	0.006
WoB*BSize	0.122***	0.043								
WoB*CEO_duality			1.118*	0.623						

Table 5. (Continued)

	Model 2F		Model 2G		Model 2H		Model 2I		Model 2J	
	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.	Coeff.	Std err.
CSRCom∗BSize					0.117∗∗∗	0.009				
CSRCom∗CEO_duality							0.201	0.139		
BSize∗CEO_duality									−0.039	0.033
Control variables										
TMT_age	0.031∗∗∗	0.010	0.031∗∗∗	0.010	0.034∗∗∗	0.011	0.032∗∗∗	0.010	0.032∗∗∗	0.010
Ownership_TMT	−0.063	0.191	−0.013	0.189	−0.007	0.190	−0.018	0.189	−0.013	0.189
Incentives_TMT	0.010	0.026	0.015	0.025	0.023	0.026	0.014	0.025	0.017	0.025
Firm_size	0.296∗∗∗	0.048	0.326∗∗∗	0.047	0.295∗∗∗	0.048	0.321∗∗∗	0.047	0.325∗∗∗	0.047
ROA	−0.011	0.340	0.034	0.322	−0.002	0.322	0.027	0.322	0.030	0.322
Leverage	0.049	0.235	0.069	0.233	0.036	0.237	0.068	0.233	0.060	0.233
Market_cap	0.002∗∗∗	0.001	0.002∗∗∗	0.001	0.002∗∗∗	0.001	0.002∗∗∗	0.001	0.002∗∗∗	0.001
Cur_ratio	0.123∗∗∗	0.031	0.124∗∗∗	0.031	0.121∗∗∗	0.032	0.124∗∗∗	0.031	0.124∗∗∗	0.031
	Controlled by year and industry									
R^2	0.420∗∗∗		0.417∗∗∗		0.432∗∗∗		0.416∗∗∗		0.417∗∗∗	
Wald chi-square	1,226.48		1,132.03		1,101.24		1,131.33		1,130.34	

Sample: 7,739 observations from 2006 to 2015.
*, ** and *** represent statistical significance at the 90%, 95% and 99% levels, respectively.

of female directors on the board and board size serve as substitutes. We obtained similar results for Models 2G and 2H, with the findings of Model 2G showing that the interaction between CEO duality and board diversity is also significant and positive ($\delta_7 = 1.118$, $p < 0.10$). An examination of the coefficient shows that, when a board has a high ratio of female directors, the negative relationship between CEO duality and CSR outcomes ($\delta_5 = -0.453$) is constrained and weakened ($\delta_5 + \delta_7 = -0.453 + 1.118 = 0.665$). This suggests that the detrimental impact of CEO duality on CSR performance is attenuated in the presence of female directors on the board, and that both internal factors serve as substitutes. Finally, the result of Model 2H shows that the interaction between board size and CSR committee is positive ($\delta_7 = 0.117$, $p < 0.01$). Examining the coefficient reveals that the negative relationship between board size and CSR performance ($\delta_4 = -0.073$) is weakened when the board has a sustainability committee ($\delta_4 + \delta_7 = -0.073 + 0.117 = 0.044$). This suggests that the negative effect of board size on CSR performance is reduced in the presence of a CSR committee and that both internal factors serve as substitutes.

Overall, the results of the supplemental analysis indicate that, although the bundling of some board configurations (Models 2B, 2C, 2D, 2I and 2J) is ineffective in promoting a firm's sustainable practices, the above models are examples that confirm the effectiveness of bundles.[4]

Discussion

This study set out to test the joint effects of financial analyst coverage as a market-level and board characteristics as a firm-level governance mechanism on a firm's CSR performance. We suggested that a *bundle* of these mechanisms can increase a firm's stakeholder orientation and address any agency problems better than a single monitoring dimension by curbing managerial opportunism and aligning the objectives of all parties – managers, shareholders and other stakeholders such as employees, suppliers, customers, non-governmental organizations, environmental and social groups, communities, etc.

As hypothesized, the results show that a higher analyst coverage interacts with board-level mechanisms to promote firms' CSR performance. More precisely, analyst coverage works synergistically with strong board-level mechanisms – that is, board independence, board diversity and the presence of a CSR committee – to improve CSR performance, thus confirming the complementary effect hypothesis. The finding is in line with that of Aguilera *et al*. (2015), who expressed that external CG is likely to directly and moderately impact board composition and the design of executive compensations in order to enhance monitoring. In contrast, with weak board-level mechanisms, analyst coverage works in a substitutive manner to promote CSR performance, thus confirming the substitutive effect hypothesis. Analyst monitoring is activated to affect any ineffective decision-making processes and managerial discretion when firms have larger boards and CEO duality. This result provides support for the initial premise – made by Walsh and Seward (1990) – that external mechanisms are likely to be activated when internal ones fail to control managerial opportunism; it is also in line with Lang, Lins and Miller (2004), who advocated that market mechanisms could protect firms with weak or ineffective firm- or country-level control mechanisms. Akin to Daily, Dalton and Cannella Jr (2003) and Chen, Harford and Lin (2015), our results provide evidence of the substitution that occurs between different levels of mechanisms.

Summing up, the finding yields an interesting insight: that analyst coverage is a necessary condition for effective governance because its presence in various configurations tends to improve social business behaviours or restrain poor ones. A reason for this result is that analysts improve both direct and indirect monitoring of managers (Chen, Harford and Lin, 2015; Chen, Huang and Zhang, 2015). Direct monitoring occurs as analysts interact with management by raising questions in conference calls. Indirect monitoring occurs as they gather, integrate and communicate information to institutional and individual investors.

Additionally, the findings of our supplemental analysis reveal that a greater presence of female directors on boards tends to work jointly with other board attributes in affecting a firm's CSR by complementing the mechanisms associated

[4]To take a step further in understanding governance configurations, we performed a post-hoc analysis (see Online Appendix A). The aim of the post-hoc analysis is to test the effects of governance bundles with three monitoring mechanisms on CSR performance.

with stronger boards, while constraining those associated with weaker ones. The fact that all the configurations with gender diversity were found to influence CSR behaviours suggests that a higher female representation on a board serves as a necessary condition for effective monitoring. Finally, larger boards and the presence of a CSR committee serve as substitutes. These results extend those of Oh, Chang and Kim (2018), who identified substitution generally among monitoring and incentive alignment, by revealing the existence of both complementarity and substitution among a broader set of board-level monitoring mechanisms. An unexpected result revealed that board independence – which is considered akin to a 'silver bullet' for vigilant monitoring (Misangyi and Acharya, 2014) – does not affect CSR outcomes when combined with other board instruments. Similarly, our primary analysis confirmed the direct effect of individual CG mechanisms – except board size – on CSR. This supports the existing evidence concerning the better oversight exercised on CSR strategy by firms with stronger internal CG mechanisms (Byron and Post, 2016; García-Meca and Sánchez-Ballesta, 2009; Harjoto and Rossi, 2019; Husted and de Sousa-Filho, 2019; Jain and Jamali, 2016; Walls, Berrone and Phan, 2012). Similarly, we found a significant relation between analyst coverage and CSR outcomes, thus complementing those studies that confirmed the growing attention of analysts towards long-term benefits and CSR engagement (García-Sánchez *et al*., 2020). This is because firms' social practices result in improved financial performance and firm value – which, eventually, increase shareholder wealth (Harjoto and Jo, 2011). Therefore, analysts have a reason to care about such initiatives (Luo *et al*., 2015). This is in line with the conventional logic that analysts provide favourable recommendations for CSR-oriented firms which improve firms' market value (Ioannou and Serafeim, 2015).

Conclusion

The corporate scandals of Enron, Lehman Brothers, WorldCom, BP and Volkswagen, among others, and the introduction of the Sarbanes–Oxley Act, marked a sea change in the public awareness of CG and corporate responsible behaviours. Despite the ongoing debate, the extant literature could not reach a consensus on the CG–CSR link. To reconcile the mixed results, recent research advocated the study of governance bundles, which predominantly focuses on the bundling of internal governance mechanisms and comparatively less on market-level governance. However, we contend that external monitoring – such as financial analyst coverage – is a vital component of the overall governance system (cf. Aguilera *et al*., 2015).

Analysts have broadened their focus due to the ongoing proliferation of investor requirements for social information, especially in the wake of numerous globally publicized corporate scandals. However, no efforts had hitherto been made to test the bundling hypothesis empirically in the context of CSR, while considering analyst coverage as an external mechanism and board structural elements as an internal one. We filled this void by moving beyond one-size-fits-all prescriptions, thus responding to the calls made in this respect by Aguilera *et al*. (2015) and Misangyi and Acharya (2014, p. 1686), who stated 'it is not at all clear whether the mechanisms aimed at enhancing the monitoring of internal actors serve as substitutes or complements'.

In this vein, to reduce the inconsistency found among the existing results, we revisited the assumption of the independence of governance mechanisms. Based on agency theory, this study contributes to the extant literature (e.g. Aguilera *et al*., 2015; Milgrom and Roberts, 1995; Misangyi and Acharya, 2014; Oh, Chang and Kim, 2018; Rediker and Seth, 1995; Ward, Brown and Rodriguez, 2009) by confirming the strong relationships between different governance configurations and CSR outcomes. Although our results suffer from being the product of the examination of only a few governance variables,[5] our analysis of different configurations is helpful in understanding that a CG bundle is effective when analyst coverage as a market-level CG aspect plays a complementary or substitutive role by either activating or constraining the impact of board-level ones. We therefore contribute by confirming both the complementary and substitutive hypotheses.

Based on our results, we suggest that more than one combination of monitoring devices can achieve the same level of performance, implying that governance bundles can reach equifinality

[5]The analysis of other CG mechanisms such as institutional ownership, outside directors' ownership, etc. may yield different results.

(Addo, Hussain and Iqbal, 2021). This facilitates the design of optimal configurations, as it may not always be wise or even possible to include many devices at the same time as each one requires certain resources and involves specific costs. Firms should therefore strike a trade-off between those mechanisms and select any cost-effective solutions that can yield the same level of output.

Our study has merits for practitioners because it helps understand which mix of control mechanisms can offer the best social outcomes and align objectives of managers and stakeholders. It suggests that higher analyst coverage is fundamental and necessary for firms to ensure their sustainable business growth, and should thus be part of each configuration. Similarly, firms should note that board-level mechanisms are conducive to profit maximization objectives and addressing the needs of various stakeholder. Besides, the results, which are useful in enabling the design of effective boards by investors and shareholders, also suggest various (in)effective internal configurations. For instance, the joint presence of a higher director independence and a CSR committee on a board, and a higher director independence and CEO duality, may not have any effective complementary impact on CSR performance. Nevertheless, board diversity due to a high female presence effectively mixes with all other mechanisms. Our study may help governments and regulatory bodies to understand how firm-level CG mechanisms positively affect CSR performance. The joint efforts of public institutions seem to be necessary to regulate board composition and structure, thus ensuring greater CSR commitment, which could be reinforced further by financial analyst coverage.

The results of this study should be interpreted with caution, as they are subject to certain limitations, the main of which pertains to our sample being restricted to US firms. Analysing the relationships in an international context could be useful, as different results could be obtained in different settings. Also, our study covered the years from 2006 to 2015 and, during this sample period, public awareness improvements, policy changes or stakeholder demands for more responsible corporate behaviours may have occurred. Future research may use other research designs (qualitative or experimental) to incorporate such factors in the analysis. Advanced tools may also help examine complex interactions between various CG mechanisms. Furthermore, our study only examined the global construct of CSR performance; as such, it could not reach any conclusions concerning its individual dimensions (e.g. resource use, innovation, workforce or human rights scores).

In that respect, our study clearly establishes many avenues of future research in addition to those aimed at overcoming its limitations. First, it opens up a debate on how a bundle should be designed that offers optimal results concerning both long- and short-term firm benefits, etc. As our work is one of the few studies which focuses on understanding the configuration of the different levels of governance mechanisms that can enhance firms' CSR outcomes, we could only include a few traditional CG factors. Future research may validate these findings by examining other mechanisms related to incentives and compensation, or ownership structures (e.g. institutional ownership, outside directors' ownership) that could yield different results. Accordingly, other external factors could be tested – such as the legal environment, external auditors, stakeholder activism, the market for corporate control and the media (Aguilera *et al*., 2015). Future research could also examine how various CG bundles function in state-owned versus privately owned firms. Finally, future research may study the contingent effect of governance on the relationship between CSR and access to finance, as there is a recent trend of sustainable financing by financial institutions.

Conflict of interest

The authors declare that they have no conflict of interest.

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