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Rey Dang, L'Hocine Houanti, Nhu-Tuyen Lê and Jean-Michel Sahut

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La Responsabilité Sociale de L'entreprise comme système ordonné dans un environnement chaotique

Corporate Social Responsibility as an Orderly System in a Chaotic Environment

La responsabilidad social de la empresa como sistema ordenado en un entorno caótico

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Article abstract

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Rey Dang

ISTEC Ecole supérieure de
commerce et marketing,
France

L'Hocine Houanti

EM Normandie Business School.
Métis Lab/

Nhu-Tuyen Lê

Grenoble École de Management,
Grenoble, France

Jean-Michel Sahut

IDRAC Business School,
France

ABSTRACT

Given the importance of corporate social responsibility (CSR) and corporate governance, this study examines the association between board composition and CSR disclosure on a sample of S&P 500 firms over the period from 2004 to 2015. Unlike existing studies, we control for potential sources of endogeneity using a system-generalized method of moments (system GMM) estimator. In doing so, we find no evidence that board size, board independence or CEO duality has any significant influence on CSR disclosure. Rather, our results suggest that, when the problem of endogeneity is correctly taken into account, the link between board composition and CSR disclosure is neutral.

Keywords: corporate governance; CSR disclosure; agency theory; resource dependence theory; corporate social responsibility; board composition

Résumé

Compte tenu de l'importance de la responsabilité sociale des entreprises (RSE) et de la gouvernance des entreprises, cette étude examine l'association entre la composition du conseil d'administration et la divulgation d'informations RSE sur un échantillon d'entreprises composant l'indice S&P 500 au cours de la période 2004 à 2015. Contrairement aux études existantes, nous contrôlons les potentielles sources d'endogénéité à l'aide d'un estimateur de la méthode des moments généralisée (système GMM). Ce faisant, nous ne trouvons aucune preuve que la taille du conseil, son indépendance ou la dualité des fonctions de PDG ont une influence significative sur la divulgation d'information en matière de RSE. Nos résultats suggèrent plutôt que, lorsque le problème d'endogénéité est correctement pris en compte, le lien entre la composition du conseil d'administration et la divulgation d'information RSE est neutre.

Mots-Clés : gouvernance d'entreprise; Divulgateion d'information RSE; théorie de l'agence; théologie de la dépendance aux ressources; responsabilité sociale des entreprises; composition du conseil.

Resumen

Dada la importancia de la responsabilidad social corporativa (RSC) y el gobierno corporativo, este estudio examina la asociación entre la composición de la junta directiva y la divulgación de la RSC en una muestra de empresas pertenecientes al S&P 500 durante el período de 2004 a 2015. A diferencia de los estudios existentes, controlamos las posibles fuentes de uso de endogeneidad de un estimador con el método de momentos generalizado por sistema (sistema GMM). Al hacerlo, no encontramos evidencia de que el tamaño de la junta directiva, su independencia o la dualidad del CEO tengan una influencia significativa en la divulgación de la RSC. Nuestros resultados sugieren que, cuando el problema de la endogeneidad se tiene en cuenta correctamente, el vínculo entre la composición de la junta directiva y la divulgación de la RSC es neutral.

Palabras Clave: gobierno corporativo; divulgación de RSC; teoría de la Agencia; teoría de dependencia de recursos; responsabilidad social corporativa; composición del tablero



For some years now, there has been increasing public interest concerning the role of companies with regard to social, environmental and ethical issues (Reverte, 2009). Issues such as employee well-being, gender representation within organizations, pollution, waste, and human rights, are gaining prominence. In this context, companies have been required to communicate to a broader audience than just their shareholders and challenged to display more information regarding their operations in the process. Indeed, shareholders, as well as investors, are now particularly keen on receiving information detailing how companies deal with environmental, societal and governance (ESG) risks. Consequently, companies are under growing pressure to disclose ESG information in their annual reports, as these qualities are now perceived as critical factors (e.g. Ioannou and Serafeim, 2015). Corporate social responsibility (CSR) disclosure is, therefore, a major concern for companies that needs to be addressed.

Boards of directors are increasingly viewed as governing bodies with the ability to take important steps toward ESG disclosure (e.g. Michelon and Parbonetti, 2012). In their literature review on agency and resource dependence theories, Hill and Jones (1992) assign to the board of directors (hereafter BoD) a prominent role in controlling the sustainable behavior of their organization, as well as being accountable to shareholders, creditors' groups and various other stakeholders. It is expected that firms with an effective board (through their size, degree of independence, and the dual function of the chair and CEO) are more likely to engage in and facilitate CSR disclosure (Gray *et al.*, 1995).

Existing empirical research provides mixed results regarding the effects of board composition (hereafter BC) on ESG disclosure. For instance, some studies (e.g. Harjoto and Jo, 2011; Husted and de Sousa-Filho, 2019) have found that board independence has a positive and significant influence on CSR disclosure levels. Conversely, other studies have been unable to confirm this relationship (e.g. Hillman *et al.*, 2001; David *et al.*, 2007). The real effect of board mechanisms on CSR disclosure, therefore, remains unclear.

From an econometric standpoint, establishing a causal relationship between BC and CSR disclosure is challenging. Board characteristics are not exogenous variables randomly selected. According to Adams *et al.* (2010), they tend to be endogenously chosen by firms in response to specific situations (e.g. in terms of governance or firm performance – FP). Two main sources of

endogeneity may affect the relationship between board characteristics and CSR disclosure: omitted unobservable firm characteristics (both fixed and time-varying) and reverse causality (e.g. Wintoki *et al.*, 2012; Sila *et al.*, 2016). To the best of our knowledge, existing studies use either ordinary least squares (OLS) or panel data methods, but neither of these take into account endogeneity issues (see Table 1).

This study makes several contributions to existing CSR and corporate governance (hereafter CG) literature. Firstly, in their literature review, Jain and Jamali (2016) call for further research because the effect of BC on CSR disclosure is still an open question and empirical evidence remains inconclusive (see Table 1). Furthermore, the aforementioned authors notice that, among the considerable number of studies analyzing the effects of CSR, only a few specifically examine the effects of BC on CSR disclosure. This does not seem sufficient, given the growing demand for information from stakeholders. Consequently, our paper contributes more generally to the literature on the hitherto inconclusive debate concerning board characteristics and CSR disclosure.

Secondly, our study differs from the existing literature as we deal with endogeneity issues. Specifically, consistent with Wintoki *et al.* (2012) or Sila *et al.* (2016), we use a dynamic panel system estimator to estimate a dynamic model using a system-generalized method of moments (system GMM) estimator. We argue that this approach improves on the traditional pooled OLS and fixed-effect (FE) methods used by existing literature. Our article, therefore, contributes to the issue of BC and CSR disclosure from an econometric standpoint.

The purpose of this article, therefore, is to re-examine the relationship between board characteristics (board independence, board size, and CEO duality) and CSR disclosure by applying a dynamic panel system and, also the GMM. To achieve this, we use a dataset of 382 US firms listed on the Standard & Poor's 500 (S&P 500) Index from 2004 to 2015.

The remainder of this article is structured as follows. Sections 2 and 3 present the theoretical framework and the hypotheses developed, respectively. Section 4 outlines the research design. Sections 5 and 6 present the sample, data and variables. The results and discussion (together with preliminary statistics) and concluding remarks are offered in Sections 7 and 8, respectively.

Theoretical Framework

According to a Green Paper presented by the European Commission in 2001, CSR is “a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis” (Commission of the European Communities, 2001, p. 6).¹ Moreover, the Green Paper views CG as a system or interface that manages and controls relationships between the management, the BoD, and the stakeholders. Fundamentally, CG is set up to optimize the value of a firm, through aligning the interests of managers and shareholders at the lowest cost (Turnbull, 2017). Within this context, Waddock and Graves (1997) argue that CG allows for a balance between the firm’s economic and social interests, as well as between individual and collective ones. It is by taking stakeholder expectations into account and not solely that of shareholder interests, as suggested by the agency theory (Jensen and Meckling, 1976), that many companies have decided to communicate a firm’s CSR orientation via CSR disclosure. Indeed, Reynolds and Yuthas (2008) argue that “what corporations choose to include in these reports provides important signals about organizational interests and priorities” (p. 60).

CSR disclosure is fundamentally based on the “Triple Bottom Line” (TBL) functioning of the firm (Elkington, 1997). This approach gives equal weight to economic, environmental, and social dimensions. In essence, managers run a firm by simultaneously achieving economic, environmental, and social objectives. As such, annual reports should include financial, social, and environmental elements explaining the firm’s CSR strategy. Finally, by definition, sustainable development involves society, the economy, and the environment as a whole (Milne and Gray, 2013). In this context, CSR reporting requires firms to have a deep commitment to collect and disclose detailed data on their operations. In the US, the Security and Exchange Commission’s (SEC) Regulation S-K requires that specific information is disclosed via annual reports. Milne and Gray (2013) stress that transparency, accountability, and responsibility are the key principles of quality CG.

Although sustainability is not required in the US, many companies do issue CSR information, recognizing its importance for keeping stakeholders informed regarding a firm’s CSR policy. Furthermore, these companies often use the

1. Commission of the European Communities: 2001, Green Paper “Promoting a European Framework for Corporate Social Responsibility,” (2001) Brussels.

Global Initiative Reporting (GRI) guidelines as a basis for CSR reporting (Milne and Gray, 2013).

Theoretically speaking, Walls *et al.* (2012) and Jain and Jamali (2016) found that the most widely used theoretical perspectives were agency theory (Jensen and Meckling, 1976) and resource dependence (RD) theory (Pfeffer and Salancik, 1978). This is consistent with strategic management literature examining the role of BoD in a firm’s decision-making (e.g. Judge and Zeithaml, 1992; Goodstein *et al.*, 1994).

Agency theory deals with the relationship between the principal (e.g. shareholder) and the agents of the principal (e.g. managers or directors). Conflicts of interest may arise between principals and agents due to the separation of ownership and control existing in organizations (Berle and Means, 1932; Fama and Jensen, 1983). As such, the primary function of a board is to monitor the actions of agents (managers) in order to protect the interests of the principal (owner) (Jensen and Meckling, 1976; Eisenhardt, 1989). To counter any potential opportunistic behavior and agency costs that arise, BC is put in place to ensure that managers are acting in shareholders’ interests (Dalton *et al.*, 1998).

Agency theory, therefore, posits that effective board structures may ensure alignment of managers’ interests with both shareholders’ and stakeholders’ long-term interests in respect of CSR (Chang *et al.*, 2017). Furthermore, due to the separation of ownership from management, an asymmetry of information can form, which can be exploited by the management. However, the quality of governance can counter this asymmetry of information through disclosure (Healy and Palepu, 1995) or transparency/accountability (Hermalin and Weisbach, 2007).

The other theoretical perspective applied in the literature is RD theory (Pfeffer and Salancik, 1978), which views the firm as an open system interacting with institutional forces but also transacting with other organizations in order to gain the resources required for the firm’s survival (Granovetter, 1985). Within this framework, the function of the BoD is resource provision. Directors are perceived as being a critical channel for valuable resources and information, as well as for advice and counsel on organizational survival and success (Pfeffer and Salancik, 1978). They can provide critical linkages to resources and also leverage social capital through their board linkages (Hillman and Dalziel, 2003). This is assumed to enable managers to adopt pro-social activities that could, in turn, enhance FP (e.g. Berrone and Gomez-Mejia, 2009).



In the context of CSR, directors play a key role as resource providers, as CSR involves the efficient management of the various stakeholder interests (Clarkson, 1995). Put another way, given that the implementation of successful CSR requires a thorough knowledge of multiple stakeholders' requirements, directors who are able to provide a breadth of resources are likely to have a significant influence on a firm's commitment to CSR issues (Chang *et al.*, 2017).

Empirically, the link between CSR and BoD has attracted the attention of research literature around the world – see Jain and Jamali (2016). However, we have only located nineteen empirical studies that specifically tested the effect of BC on CSR disclosure. This is relatively small given the importance of CSR nowadays. Table 1 summarizes these 19 studies.

As highlighted in Table 1, the empirical evidence regarding the effect of BC on CSR disclosure is mixed. In general, empirical studies find a positive relationship existing between board independence and CSR disclosure. However, there is evidence that this link might be negative. As for board size and CEO duality, we have found that the link is mixed. If the mixed results are likely the result of differences due to data stemming from different countries, time periods, sample sizes, and measurement problems of CSR disclosure, then we argue that these results are either directly or indirectly affected by endogeneity issues.

Hypotheses Development

For clarity reasons, it is appropriate to specify what CG is. According to Adams *et al.* (2010), governance quality can either be captured by the BC or by measures that capture board diligence. Board independence, board size, and CEO duality are often used as relevant attributes to proxy the CG quality, as highlighted in Table 1. Because of this, we have developed our hypotheses around these three main mechanisms.

Board Size

The effect of board size on the quality of board decisions and FP (Dalton *et al.*, 1999) remains an open question. Indeed, two conflicting visions are apparent. On the one hand, agency theory argues that large boards often face free-rider problems (Dalton *et al.*, 1999), as well as severe challenges to coordination and communication (Jensen, 1993). In such cases, Goodstein *et al.* (1994) suggest that larger boards are unable to implement strategic action plans. On the other

hand, RD theory suggests that larger boards provide an increased pool of expertise and resources for the organization (Pfeffer, 1972), which can, in turn, increase FP by allowing the firm to become better established in its environment by securing critical resources (Goodstein *et al.*, 1994).

With respect to CSR, boards are responsible for implementing CSR agendas in order to meet stakeholders' expectations (Donaldson and Preston, 1995; Jamali *et al.*, 2008). According to Linck *et al.* (2008), the size of the board reflects a firm's complexity and the degree to which it benefits from advice. Board size is a function of a firm's level of leverage, capital structure or degree of diversification. Following Jizi (2017), we argue that the firms in our sample (i.e. belonging to the S&P 500) are the largest quoted companies in the US and are inherently complex to run. Consequently, we presume that larger boards are more likely to be efficient at dealing with their firm's CSR agenda and the need to communicate with stakeholders. Thus, we propose the following:

H1: CSR disclosure is positively related to board size.

Board Independence

According to agency theory, independent boards are supposed to reduce agency costs, therefore, subsequently increasing a firm's value (Fama and Jensen, 1983). Indeed, independent boards monitor and oversee management behavior more efficiently than non-independent boards, and direct firms' long-term activities in respect of CSR (Post *et al.*, 2011).

Since independent directors are more prone to favor the firm's long-term success and to ensure that management takes into account stakeholders' requests regarding CSR (Luoma and Goodstein, 1999), board independence is more likely to lead to the promotion of CSR because independent directors are more prone to favor long-term success as the priority. Empirically, existing studies have found that board independence is positively and significantly related to CSR choice (Jo and Harjoto, 2011). Compared with non-independent directors, independent directors place more emphasis on the discretionary component of CSR (philanthropy). Furthermore, the accounting literature has also shown that firms with boards consisting of a majority of independent directors are more willing to disclose their CSR activities (e.g. Cheng and Courtenay, 2006; Chau and Gray, 2010). Following Jizi (2017), we suggest that, in order to ensure a firm's sustainability and to reduce information asymmetry, independent boards will

TABLE 1
Summary of the main empirical studies

#	Authors	Sample size	Country	Period	Method	Board independence			Board size			CEO duality		
						Positive effect	Negative effect	No effect	Positive effect	Negative effect	No effect	Positive effect	Negative effect	No effect
1	Ulla, Muttakin and Khan (2019)	46 firms // N = 277	Bengladesh	2008-2014	OLS	X								
2	Jizi (2017)	N = 155	England	2007-2012	FE	X					X			X
3	Chang, Oh, Park and Jang (2017)	293 firms // N = 780	Korea	2003-2005	GEE	X			X					
4	Ntim and Soobaroyen (2013)	75 firms // N = 575	South Africa	2003-2009	OLS, FE	X			X					X
5	Huang (2010)	N = 297	Taiwan	2007	OLS	X								
6	Hillman, Keim and Luce (2001)	N = 247	US	1995	OLS			X						
7	David, Bloom and Hillman (2007)	218 firms // N = 1,307	US	1992-1998	OLS			X						
8	Bear, Rahman and Post (2010)	N = 51	US	2009	OLS							X		
9	Arora & Dharwadkar (2011)	518 firms // N = 1,522	US	2001-2005	FE		X							
10	Harjoto and Jo (2011)	2,508 firms // N = 11,844	US	1993-2004	OLS	X								
11	Bai (2013)	137 hospitals // N = 703	US	2000-2005	OLS					X				
12	Deutsch & Valente (2013)	1,215 firms // N = 4,822	US	1998-2006	2SLS			X		X				
13	Hafsi and Turgut (2013)	N = 95	US	2005	OLS			X			X			X
14	Mallin, Michelon and Raggi (2013)	N = 100	US	2005-2007	SEM	X						X		
15	Zhang, Zhu and Ding (2013)	N = 516	US	2008	Logistic	X								
16	Fabrizi, Mallin and Michelon (2014)	597 firms // N = 2,520	US	2005-2009	OLS			X				X		
17	Jizi, Salama, Dixon and Stratling (2014)	107 banks // N = 291	US	2009-2011	Tobit	X			X			X		
18	Surroca and Tribó (2008)	358 firms from 22 countries	Worldwide	2002-2005	FE		X							X
19	Husted and de Sousa-Filho (2019)	176 firms // N = 704	Latin America ¹	2011-2014	GLS	X			X				X	

¹ Brazil, Mexico, Colombia and Chile // **N**: firm-years observations

OLS: Ordinary Least Squares; **FE**: Fixed Effect; **2SLS**: Two-Stage Least Squares; **SEM**: Structural Equation Modeling; and **GLS**: Generalized Least Squares



shepherd management toward CSR activities and favor extra-financial reporting for stakeholders. We, therefore, assert the following:

H2: CSR disclosure is positively related to board independence.

CEO Duality

CEO duality occurs when the same individual holds both the CEO (management) and chair (control) positions simultaneously (Rechner and Dalton, 1991). According to Surroca and Tribó (2008), CEO duality is evidence of a managerial power concentration existing within a firm. For instance, CEOs have the authority to appoint directors favorable to themselves (Haniffa and Cooke, 2002). In this context, non-independent directors are more likely to countenance managerial decisions that are unfavorable to shareholders' interests to avoid confrontation with a powerful CEO (Dey, 2008) and to keep their seat on the BoD. Furthermore, as chair of the board, the CEO has the power to influence the information provided to board members (Haniffa and Cooke, 2002). Empirically, most studies suggest that a board's capabilities in terms of oversight, monitoring and control are negatively correlated with CEO duality (Tuggle *et al.*, 2010), along with the level of voluntary disclosure (e.g. Chau and Gray, 2010). In contrast, some studies have shown that CEO duality may increase firms' CSR reporting or tone down the supervision and monitoring of stakeholder pressure and release (Haniffa and Cooke, 2005; Jizi *et al.*, 2014).

Contextually, regulatory bodies and investors (especially institutional investors) in the US have proposed a distinct role for the CEO and the chair of the board, because firms with CEO duality may suffer from poor CG (Linck *et al.*, 2009) 2009. As a result, we hypothesize that firms with CEO duality are more likely to reduce the supervision and monitoring role of the BoD, which, in turn, may lower CSR disclosure levels. Given these factors, we put forward the following:

H3: CSR disclosure is negatively related to CEO duality.

Methodology

Model

To test our hypotheses, we have generated the following baseline model:

$$Y_{i,t} = \alpha_0 + \beta_1 X_{i,t} + \beta_2 CV_{i,t} + \varepsilon_{i,t} \quad (1)$$

where i denotes firms in the sample; t refers to time period; $Y_{i,t}$ is our proxy of CSR disclosure; $X_{i,t}$ is a vector of board structure variables; $CV_{i,t}$ is a vector of board and firm characteristics; β_1 and β_2 are parameters to estimate, and $\varepsilon_{i,t}$ is measurement error.

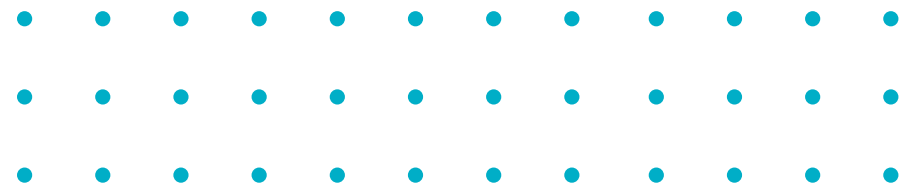
Eq. [1] is generally estimated using OLS or FE methods (e.g. Jizi, 2017^o; Hussain *et al.*, 2018) under the assumption that the relationship between board structure and CSR is static. However, recent studies have shown that this relationship is dynamic in nature (Wintoki *et al.*, 2012). Furthermore, those studies may suffer from endogeneity biases. Indeed, Wintoki *et al.* (2012) argue that traditional econometric approaches (e.g. OLS and FE methods) are not sufficiently effective in dealing with endogeneity issues – which we address in the next subsection.

Endogeneity Issues

Wintoki *et al.* (2012) argue that corporate financial decisions are likely to be dynamic in nature; that is, past action may act as a proxy for important firm attributes that are not observable but significantly influence current action. This phenomenon is referred to by Wintoki *et al.* (2012) as “dynamic endogeneity.” Recent literature (e.g. Wintoki *et al.*, 2012; Sila *et al.*, 2016) argues that models ignoring dynamic endogeneity are more likely to yield biased and inconsistent results. Consequently, Eq. [1] is rewritten as follows:

$$Y_{i,t} = \alpha_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \beta_3 C_{i,t} + \varepsilon_{i,t} \quad (2)$$

At this stage, Eq. [2] raises concerns regarding two other sources of endogeneity: unobserved heterogeneity (or omitted variable bias) and reverse causality. Omitted unobservable firm characteristics (which might be fixed or variable across time), such as country effect (Dhaliwal *et al.*, 2012) or a firm's risk-taking behavior (Sila *et al.*, 2016), may significantly affect the firm's CSR disclosure and also the board mechanisms. However, these antecedents may be difficult to observe and measure, meaning they are usually omitted from an econometric specification. In general, the literature deals with this issue by using panel data analysis and an FE estimator, being able to take this bias into account under certain assumptions (Wooldridge, 2010). However, this treatment may not be sufficient because of a second endogeneity source in the shape of reverse causality (Sila *et al.*, 2016).



The second issue associated with endogeneity is reverse causality (or simultaneity); that is to say, when the dependent and one or more of the explanatory variables are jointly determined (Gippel *et al.*, 2015). For example, on the one hand, it is quite conceivable that a higher proportion of independent directors may increase a firm's CSR disclosure but, on the other hand, it is also possible that firms change their BC in response to a higher CSR commitment. Consequently, not to take this phenomenon into consideration might turn the relationship biased, as the direction of causality can go both ways (Gippel *et al.*, 2015).

Estimation Approach

Following Wintoki *et al.* (2012) and Sila *et al.* (2016), we use the dynamic panel system GMM estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998), as this method may alleviate all the above concerns. A GMM estimator may be viewed as a system of two simultaneous equations, including one for levels and another for differences, allowing us to treat all the explanatory variables in Eq. [2] as endogenous. Following Wintoki *et al.* (2012), firm age and year dummies are assumed to be exogenously determined. We employed a system GMM estimation with Windmeijer-corrected robust errors (Windmeijer, 2005).

Data and Variable Definitions

Sample and Data

The initial study sample included all the companies that made up the S&P 500 as of 31 December 2015 and covering the period from 2004 to 2015. This index represents a broad cross-section of the US equity market, including stock traded on the New York Stock Exchange (NYSE) and Nasdaq stock markets. The S&P 500 captures over 80% of the total domestic US equity float-adjusted market capitalization. The index has already been used in previous studies (e.g. Jo and Harjoto, 2011), but this study focuses exclusively on large-sized companies because they are more likely to be under scrutiny from various stakeholders regarding their CSR policies (e.g. Watts and Zimmerman, 1978).

Financial (SIC codes 6000-6999) and utility (SIC codes 4900-4999) firms were excluded due to their particular features (in terms of specific disclosure requirements and accounting regulations) (e.g. Jiraporn *et al.*, 2014). Finally, observations with insufficient data were also excluded from the analysis. The final sample

consisted of 382 firms and 3,245 firm-year observations. All data comes from the Bloomberg database.

Variables

Dependent variable. Consistent with Ioannou and Serafeim (2015) and Jizi (2017), we proxy a firm's CSR disclosure through Bloomberg's ESG disclosure score, as this measures the "extent of a company's environmental, social, and governance (ESG) disclosure."² Scores range from 0.1 to 100. Firms that disclose little CSR information will display a low score, and those that release more CSR data will have a higher score. The score is adjusted by Bloomberg to account for the firm's industry and to ensure that each firm is evaluated only on data relevant to its particular sector. The existing literature has emphasized that Bloomberg's disclosure scores are the ones attracting investors' attention (Eccles *et al.*, 2011; Ioannou and Serafeim, 2015).

The Bloomberg ESG disclosure score is based on the Global Reporting Initiative's (GRI) *Sustainability Reporting Guidelines*, which is the most widely used framework for voluntary reporting of environmental and social performance (Eccles *et al.*, 2011). As the reliability and credibility of CSR information have been challenged (e.g. Michelon *et al.*, 2016), many companies have established the legitimacy, quality and, ultimately, the credibility of a firm's CSR policy by using the GRI guidelines. As a result, Bloomberg's ESG score is a good indicator of a firm's CSR policy as it ranges from 0-100.

Empirically, the existing literature is largely based on data provided by Kinder, Lydenberg, and Domini (KLD) (see Nollet *et al.*, 2016). Margolis *et al.* (2007) suggested that alternative CSR measures should be considered. To sum up, KLD ratings use a binary scale where a value of "1" indicates the presence of a particular issue, and "0" otherwise. A KLD score is calculated by subtracting the 'concerns' from the 'strengths' to obtain a net value (see Hillman and Keim, 2001). Compared to Bloomberg's ESG score, the KLD measure is not detailed, ranging from -2 to +2 (Nollet *et al.*, 2016).

Independent variables. *Board size* is measured using the total number of board directors (Wintoki *et al.*, 2012). *Board independence* is measured as the proportion of independent – outside/non-executive – directors (following the

2. See the Bloomberg website.



definition of Hermalin and Weisbach, 1998) on the board (Wintoki *et al.*, 2012). Finally, *CEO duality* is measured as a dummy variable that is equal to 1 if the CEO is also the chair, and 0 if otherwise (Wintoki *et al.*, 2012).

Control variables. The size of the firm, economic performance, and firm risk are the most widely used control variables (Waddock and Graves, 1997). Furthermore, McWilliams and Siegel (2000) emphasize the need for any model to take R&D expenditure into account to avoid specification problems. *Firm size* is calculated as the natural logarithm of total assets. Large firms are more likely to be under scrutiny from the community and stakeholders due to their size (e.g. Jizi *et al.*, 2014). In their literature review, Griffin and Mahon (1997) find that the return on assets (ROA) (calculated as operating income before depreciation divided by total assets, according to Wintoki *et al.*, 2012) is a common FP measure in CSR studies. This controls for the impact of a firm's performance level on its CSR investments. This measure is used as a proxy for economic performance. *Leverage* (calculated as the ratio of total debt to total assets, according to Bhagat and Bolton, 2008) allows us to control for whether highly leveraged firms are less willing to allocate funds to CSR activities, and so are less likely to communicate (e.g. Reverte, 2009). Following McWilliams and Siegel (2000), *R&D intensity* is measured as the ratio of R&D expenses to total assets. These authors argue that R&D intensity is a key strategic predictor of CSR since many CSR aspects create a product innovation, a process innovation, or both. This line of reasoning is confirmed by Padgett and Galan (2010). We control for *firm growth* (defined as sales growth between t and $t-1$), since Lins *et al.* (2017) have recently shown that high-CSR firms are more likely to have higher sales growth than low-CSR firms. This suggests that a firm's operational growth is a predictor of CSR. Moreover, given that our period of study extends from 2004 to 2015, this encompasses the last financial crisis (the 2007-2008 global financial crisis). We have decided to take these phenomena into account considering that Lins *et al.* (2017) find it has had a significant effect on CSR intensity and corporate social performance. Following Ivashina and Scharfstein (2010), we define the financial crisis as occurring from 2007 through 2008. As such, we used a binary variable ('Crisis'). Finally, all our regressions include industry dummy variables based on the industry grouping defined by Campbell (1996) in order to take industrial sector differentials into account.

Empirical Results

Descriptive Statistics and Correlation Analysis

Table 2 provides sample distributions by year and by industry. Panel A shows that there is some significant difference in the number of observations over the study period, which can be explained by Bloomberg not evaluating firms' CSR disclosure prior to 2007. Panel B reports the sample distribution by industry based on Campbell's (1996) industry classification. Most of the observations come from three industries: capital goods (16.06%), consumer durables (15.32%) and basic (15.10%) These industrial sectors account for approximately 46% of the whole sample. Firms in the construction sector are the least represented in our sample (2.34%). This suggests the importance of controlling for industry affiliation in our empirical analysis.

Table 3 presents the descriptive statistics of all the variables. The key dependent variable, *CSR disclosure*, has mean and median values of 28.40 and 23.97, respectively. Our values are comparable to those reported by Nolle *et al.* (2016), who documented a mean of 25.16 for firms listed on the S&P 500 over the period 2007-2011. However, our values are slightly lower than those reported by Jizi (2017), who found a mean value of 30.88 for firms listed on the FTSE 350 Index³ during the period 2007-2012.

Regarding our independent variables, Table 3 shows that the mean (median) board size in our sample is 10.75 (11.00). This value is higher than that reported by Wintoki *et al.* (2012), who documented an average (median) value of between 7 and 8 members for a sample of more than 6,000 firms over the period 1991-2003. Our value for the mean (median) proportion of independent directors (outsiders) is 82.36% (85.71%). This is higher than the figures reported in other US studies. Furthermore, the CEO is also the board chair in 58.18% of cases, which is lower than figures found in existing literature (e.g. Bhagat and Bolton, 2008⁹; Linck *et al.*, 2009). This is probably due to the impact of the Sarbanes-Oxley Act (SOX) of 2002 and other contemporary reforms from boards and governance that greatly altered the BC of US companies (Linck *et al.*, 2009)2009.

3. The FTSE 350 Index is a market-capitalization-weighted stock market index that includes the 350 largest market capitalizations on the London Stock Exchange.

TABLE 2
Sample characteristics

Panel A: Year distribution			
Year		Number of firms	Percentage
2004		2	0.06
2005		76	2.34
2006		144	4.44
2007		295	9.09
2008		331	10.20
2009		337	10.39
2010		345	10.63
2011		350	10.79
2012		345	10.63
2013		333	10.26
2014		349	10.76
2015		338	10.42
Total		3.245	100.00
Panel B: Industry classification			
Industry	SIC code	Number of observations	Percentage
Petroleum	13. 29	273	8.41
Consumer durables	25. 30. 36. 37. 50. 55 and 57	497	15.32
Basic	10. 12. 14. 24. 26. 28 and 33	490	15.10
Food and tobacco	1. 20. 21 and 54	226	6.96
Construction	15. 17. 32 and 52	76	2.34
Capital goods	34. 35 and 38	521	16.06
Transportation	40. 42. 44. 45 and 47	148	4.56
Utilities	46. 48 and 49	116	3.57
Textiles and trade	22. 23. 31. 51. 53. 56 and 59	310	9.55
Services	72. 73. 75. 80. 82 and 89	471	14.51
Leisure	27. 58. 70. 78 and 79	117	3.61
Total		3.245	100.00

Panel A reports the sample distribution across years.

Panel B reports the sample distribution across industries based on Campbell's (1996) industrial classification

The sample contains 3,245 firm-year observations over the period 2004–2015.

Finally, the means of our firm size, ROA and leverage variables are 9.38%, 7.82%, and 24.49%, respectively. For comparison, Wintoki *et al.* (2012) report 6–8% for ROA and 15–17% for leverage.

Table 4 reports the variable correlations. As a rule of thumb, a correlation of 0.70 or higher in absolute value may indicate a multi-collinearity issue. Several key relations are worth noting. Firstly, the correlation between $CSR\ disclosure_t$ and $CSR\ disclosure_{t-1}$ is positive and significant (at the 1% level). This result seems to confirm the assertion of Wintoki *et al.* (2002) that past action might significantly affect the current action. As such, any empirical model should be specified in a dynamic manner, with past performance used as an explanatory variable. Secondly, our independent variables are all positively and significantly correlated (at the 1% level) with the dependent variable, which is likely to at least offer some support for the proposition that these independent variables interact with CSR disclosure.

As reported in Table 4, the largest significant correlation among the variables used in Eq. [2] is 0.497 (**in bold**). This figure is well below the threshold of 0.80 suggested by Gujarati (2003). This suggests that the multicollinearity issue is unlikely to be a serious problem in our estimations. We also calculated the variance inflation factors (VIF) for all the variables (unreported). The VIFs ranged from 1.03 to 1.41, well below the cut-off of 10 recommended by Wooldridge (2014). Consequently, multicollinearity has had little impact on our analyses.

OLS and GMM Estimators

In this study, we examine the effect of board structures on CSR disclosure in a dynamic environment. For comparison with the dynamic estimates, Table 5 presents the results from static pooled OLS (column 1) and panel fixed-effects models (column 2). Models 1 and 2 reveal that the coefficients for board size and board independence are positively and significantly correlated (at the 1% level) with CSR disclosure. These results are consistent with Jizi *et al.* (2014) and Jizi (2017), among others, who show a positive relationship between board independence and CSR disclosure levels. Likewise, our results are in line with Jizi *et al.* (2014), who found a positive relationship between board size and CSR disclosure. CEO duality has no significant impact (at the 10% level) on CSR disclosure. Overall, our results are consistent with the existing literature. However, when we estimate Eq. [2] in a dynamic framework, it is another story.



TABLE 3
Descriptive statistics

Variables	Mean	Median	SD	Min.	Max.
CSR disclosure _{<i>t</i>}	28.400	23.967	14.606	5.372	76.764
CSR disclosure _{<i>t-1</i>}	28.324	23.967	14.606	5.372	76.764
Board size	10.748	11.000	2.108	4.000	20.000
Board independence	82.363	85.714	10.527	0.000	100.000
CEO duality (%)	58.182	100.000	49.334	0.000	100.000
Firm size	9.380	9.258	1.210	5.968	13.590
ROA (%)	7.822	7.581	7.975	-61.821	46.841
Leverage (%)	24.487	22.637	16.918	0.000	146.901
R&D (%)	4.788	0.663	16.129	0.000	540.072
Growth (%)	9.166	6.3078	40.051	-100.000	1,549.391
Crisis	0.193	0.000	0.395	0.000	1.000

N = 3,245 except for CSR disclosure_{*t-1*} with N = 2,832. Variables are defined in the subsection on “Variables”.

TABLE 4
Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11
1 CSR disclosure _{<i>t</i>}	1.000										
2 CSR disclosure _{<i>t-1</i>}	0.923***	1.000									
3 Board size	0.357***	0.348***	1.000								
4 Board independence	0.244***	0.237***	0.075**	1.000							
5 CEO duality	0.089***	0.080***	0.057***	0.194***	1.000						
6 Firm size	0.448***	0.437***	0.497***	0.158***	0.126***	1.000					
7 ROA	0.043**	0.036**	-0.095***	-0.049**	-0.001	-0.151***	1.000				
8 Leverage	0.003	0.018	0.104***	0.042**	0.065***	0.073***	-0.218***	1.000			
9 R&D	-0.016	-0.010	-0.067***	0.011	-0.074***	-0.095***	-0.188***	-0.100***	1.000		
10 Growth	-0.087***	-0.081***	-0.053***	-0.079***	-0.004	-0.042**	0.1081***	-0.082***	0.037**	1.000	
11 Crisis	-0.160***	-0.136***	-0.028	-0.075***	0.039**	-0.103***	-0.040**	-0.040**	0.010	0.065***	1.000
VIF		1.38	1.34	1.07	1.06	1.41	1.15	1.09	1.08	1.03	1.03

VIF = variance inflation factors. Variables are defined in the subsection on “Variables”. *** and ** indicate significance at the 1% and 5% levels, respectively.



The results obtained from pooled OLS and FE estimators in a dynamic environment are, respectively, reported in columns 3 and 4 of Table 5. Models 3 and 4 show that the coefficient of the past CSR disclosure variable is found to be positive at the 1% significance level ($\beta = 0.89$; p -value = 0.000 in model 3 and $\beta = 0.51$; p -value = 0.000 in model 4). This result supports the assertion of Wintoki *et al.* (2012) that performance is path-dependent, i.e. past performance has a significant effect on current performance. In this case, current ESG disclosure is influenced by past ESG disclosure. In a dynamic framework, we notice that only board independence has a positive and significant effect (at the 5% level) on CSR disclosure, while board size and CEO duality have no significant influence. These preliminary results seem to support hypothesis 2 – supporting the existing literature (e.g. Jizi *et al.*, 2014; Jizi, 2017) – and reject hypotheses 1 and 3. However, our results are likely to be affected by endogeneity problems, which are not controlled by the OLS and FE methods (Wintoki *et al.*, 2012). Below, we discuss the results obtained from the two-step system GMM method that controls for potential sources of endogeneity.

As noted earlier, the CG literature has emphasized that the CG variables used in Eq. [2] are endogenous (Wintoki *et al.*, 2012; Sila *et al.*, 2016). Due to this, we used a GMM estimator to alleviate the endogeneity issue. However, the validity of this approach depends on the lagged instrumental variables being exogenous (Roodman, 2009). To examine the validity of the system GMM estimator statistically, we conducted a Hansen J -test⁴ and a difference-in-Hansen test.⁵ Table 5 shows that the Hansen J -test yields a p -value of 0.293. This implies that the instruments (as a group) used in the system GMM model are valid. Consistent with Roodman (2009), we applied the difference-in-Hansen test of exogeneity to the subsets of system GMM-type instruments and standard instruments. Again, we do not reject the null hypothesis that the additional moment conditions are valid. The values reported for AR(1) and AR(2) are the p -values that refer to the first- and second-order autocorrelated disturbances in the first-differenced

equation. As expected, there is high first-order autocorrelation and no evidence of significant second-order autocorrelation. Consequently, our test statistics support a proper specification.

Table 5 shows that the β_1 arising from the two-step system GMM (0.669) is higher than that obtained by FE (0.506), but well below the OLS estimate (.885). This is consistent with the two-step system GMM being likely to yield reasonable estimates – or at least better than OLS and FE methods.

Unlike the results for Models 1 to 4, the results obtained after controlling for dynamic endogeneity, simultaneity, and unobserved heterogeneity, using the two-step system GMM estimator with the Windmeijer (2005) finite-sample correction, show that board structure variables have no significant effects (at the 10% level) on CSR disclosure. Consequently, there is no evidence of a significant link between board structures and the level of a firm's CSR disclosure, as suggested by the existing literature. Our results are consistent with the findings of the CG literature (e.g. Wintoki *et al.*, 2012) suggesting that, when the sources of endogeneity are carefully considered (dynamic endogeneity, simultaneity, and unobserved heterogeneity), board structure variables have no effect on FP. It would appear that we see the same phenomenon when we properly specify the relationship between CG mechanisms and CSR disclosure.

Regarding the control variables, we note that firm size alone is positively and significantly (at the 5% level) correlated with CSR disclosure. Our results confirm the view that large firms are more likely to be under scrutiny from various stakeholders (Watts and Zimmerman, 1978). None of the other variables are significantly correlated with CSR disclosure (at conventional thresholds of significance).

Concluding Remarks

In this study, we investigate how BC (namely, board independence and size, and CEO duality) impact firms' CSR disclosure. Indeed, CG theories (agency and RD approach) suggest that BC promotes firms' CSR disclosure. As shown in Table 1, most of the existing empirical studies put aside the endogeneity issue. Therefore, we re-examine this relationship by using a robust GMM specification that accounts for potential endogeneity issues that may have influenced the results of existing studies. Overall, based on GMM estimation, we find that BC is not significantly

4. In essence, Hansen's (1982) test is a test of overidentifying restrictions. The joint null hypothesis assumes that the excluded instruments are correctly excluded from the structural equation and that the structural equation is correctly specified. Under this hypothesis, the test statistic is asymptotically distributed as χ^2 -squared in the number of overidentifying restrictions.

5. The p -values test the validity of the additional moment restriction that is necessary for the system GMM given in Eq. [2].

TABLE 5
Main results

	Static models		Dynamic models		
	Model 1: Pooled OLS	Model 2: Fixed-effects	Model 3: Pooled OLS	Model 4: Fixed-effects	Model 5: System GMM
Intercept	-49.501*** (5.477)	-7.915*** (1.288)	-4.067 (4.581)	-5.897 (4.804)	3.666 (76.164)
CSR disclosure _{<i>t-1</i>}			0.885*** (0.011)	0.506*** (0.032)	0.669*** (0.075)
Board size	1.086*** (0.269)	0.175*** (0.059)	0.209* (0.111)	0.125 (0.098)	0.288 (0.448)
Board independence	0.215*** (0.046)	0.036*** (0.011)	0.048** (0.020)	0.047** (0.019)	0.010 (0.040)
CEO duality (%)	-0.015 (0.986)	0.272 (0.211)	0.367 (0.375)	-0.008 (0.325)	0.067 (1.292)
Firm size	4.244*** (0.484)	0.668*** (0.105)	0.421 (0.448)	1.255*** (0.426)	2.438** (1.132)
ROA (%)	0.199*** (0.052)	0.050*** (0.013)	0.016 (0.021)	0.035* (0.018)	0.004 (0.049)
Leverage	-0.027 (0.027)	-0.023*** (0.006)	0.009 (0.015)	-0.014 (0.014)	-0.034 (0.045)
R&D	0.020 (0.021)	0.002 (0.003)	0.004 (0.006)	0.001 (0.004)	0.001 (0.011)
Growth	-0.023** (0.012)	-0.001 (0.002)	-0.005 (0.003)	-0.003 (0.002)	-0.007 (0.010)
Crisis	-3.740*** (0.476)	1.196*** (0.267)	18.405*** (1.961)	2.804 (2.316)	-1.048 (19.148)
Firm fixed-effects	No	No	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Observations	3.245	3.245	2.831	2.831	2.831
R ²	0.336	0.860	0.848	0.904	
AR1 (<i>p</i> -value)					0.000
AR2 (<i>p</i> -value)					0.837
Hansen <i>J</i> -test (<i>p</i> -value)					0.293
Diff.-in-Hansen test (<i>p</i> -value)					0.873

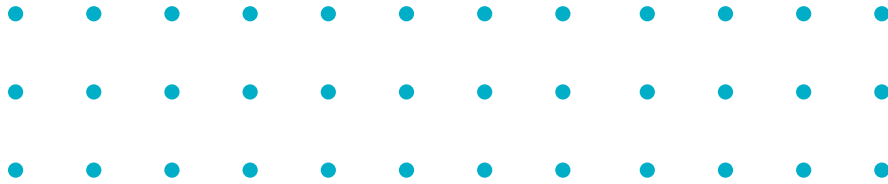
This table presents the results from estimating Eq. [2] through various specifications: (1) a static ordinary least squares (OLS) model; (2) a static fixed-effects model; (3) a dynamic OLS model; (4) a dynamic fixed-effects model; and (5) a two-step generalized method of moments (GMM) approach. Models 1 and 3 are obtained from the OLS method with clustering at the firm level. Models 2 and 4 are obtained from fixed-effects (within-groups estimator). Robust standard errors are in parentheses. *Year dummies* and *industry dummies* (based on Campbell's 1996 industrial classification) are unreported. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.



correlated with CSR disclosure. Our results are consistent with the CG literature (e.g. Wintoki *et al.*, 2012; Sila *et al.*, 2016) suggesting that BC has no significant effect on FP. By contrast, while using the OLS and FE models, we find that board size and board independence are positively and significantly correlated with CSR disclosure (in static models), which confirms the results of existing literature (see Table 1). Furthermore, we find that the level of past CSR disclosure is positively and significantly correlated with firms' current CSR disclosure. This suggests that including the previous level of CSR disclosure in the model may help to control for unobserved historical factors in the relationship between CG and CSR disclosure. Our results support the claim of Wintoki *et al.* (2012) that the link between CG and firm performance (here corporate social performance through CSR disclosure) should be considered in a dynamic framework. Our results are consistent with the CG literature (e.g. Nguyen *et al.*, 2014), arguing that when potential sources of endogeneity are correctly considered BC has no influence on firm performance (and ultimately CSR disclosure). Consequently, beyond differences due to data from different countries (hence different CG systems), period of analysis, measurement and estimation issues, we argue that the results of existing studies (see Table 1) are likely biased due to a failure to account for endogeneity issues. The literature acknowledges two types of endogeneity: *unobservable heterogeneity* and *simultaneity* (Wintoki *et al.*, 2012). They also had a third source of endogeneity: *dynamic endogeneity*. This means that a firm's current actions (here CSR disclosure) are affected by its previous actions. In our case, current CSR disclosure is likely to affect BC choices, which in turn may affect future CSR disclosure. This line of reasoning is supported by Harris and Raviv (2006) or Adams *et al.* (2010), who argue that BC is not *exogenous* but rather *endogenous*. Thus, endogeneity creates serious estimation issues if BC is determined on the basis of unobservable criteria. Generally, CG structures are inherently endogenous because firms model its governance according to the governance issues they encounter. Of course, following Himmelberg *et al.* (1999), we do not ignore, nor minimize, the importance of agency conflicts or provisions of resources but we suggest, as with Wintoki *et al.* (2012), that cross-sectional BC differences are the fruit of both unobservable heterogeneity and a firm's history. As such, any attempt to explain the effect of BC on CSR disclosure that does not take into account that the sources of endogeneity may be biased. The contrasting results presented in Table 1 are likely due to endogeneity issues. We

argue that, in future, investigating the relationship between BC and CSR disclosure needs to consider the sources of endogeneity: (i) *unobservable heterogeneity* (FE effects); (ii) *simultaneity* (better BC may lead to CSR disclosure or *vice versa*); and (iii) *dynamic endogeneity* (current CSR disclosure is affected by past CSR disclosure). We demonstrate that when controlling for endogeneity and taking into account the dynamic nature relationship between BC and CSR disclosure (Wintoki *et al.*, 2012), there is no evidence that board size, board independence, nor CEO duality affect CSR disclosure in any way.

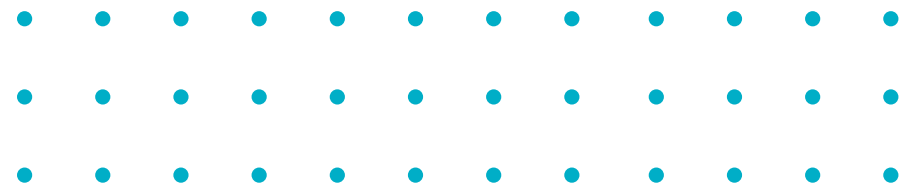
Theoretically, however, reporting an insignificant relationship between BC and CSR disclosure is somewhat unexpected, because many companies have been implementing CSR policies as a part of their strategic agendas, which requires management and BoD involvement. Besides, complying with the CG best practices should be considered as a good sign for stakeholders that a firm is taking CSR into account in its activities and is proactive on this matter. In reality, the insignificant relationship that we observe may indicate that CSR disclosure has been institutionalized, as suggested by Shabana *et al.* (2017). They argue that, in a "defensive reporting" stage, CSR disclosure is used as a tool to fill in the gap between firms' and stakeholders' expectations. Similarly, in an "imitative diffusion" stage, the dissemination of CSR information is widespread among firms. CSR disclosure, therefore, becomes a largely institutionalized tool; a standard to which firms must comply. Thus, BC has no real effect on CSR disclosure as it is institutionalized. Our findings tend to confirm these stages. Moreover, for legislators, firms and, ultimately, stakeholders, our findings help to provide useful insights into the role and efficiency of BoD in CSR disclosure. Furthermore, the insignificant relationship between BC and CSR disclosure may be due to the possibility of reverse causality (Wintoki *et al.*, 2012), i.e. firms choose their BC optimally based on idiosyncratic characteristics, such as the level of a firm's CSR and of its disclosure. We, therefore, argue that our findings have significant implications for both regulators and policymakers. Indeed, in the aftermath of the 2007-2008 financial crisis, many voices have been calling for more regulation and stricter control mechanisms. If CG mechanisms are not useful in improving firms' CSR disclosure then alternative means may need to be explored, because our study shows that BC has no significant effect. Our study is a contribution to this debate surrounding alternative mechanisms that increase and strengthen CSR disclosure.



Our study is subject to some caveats. Firstly, similar to static models, misspecification may affect the results of the dynamic system GMM. However, we have checked our model's validity using many of the different tests available. As such, serious misspecification problems are likely to be minimal. Second, due to the lack of data regarding CG practices, our study, like existing ones, is a proxy for observable CG structures, such as board size, the independence of the board, and CEO duality. Many studies have shown that other governance mechanisms are likely to impact CSR disclosure; for instance, ownership structure or directors' social ties and educational background (Jain and Jamali, 2016). Therefore, it is possible that other CG mechanisms also impact CSR disclosure, as our study only considers one part of the phenomenon. Secondly, future research will profit from examining the relationship between BC and CSR disclosure in SMEs (small and medium-sized enterprises), as they face many of the same difficulties (Baumann-Pauly *et al.*, 2013).

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