Board and corporate social responsibility disclosure of multinational corporations

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Multinational Business Review

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Journal:	*Multinational Business Review*
Manuscript ID	MBR-11-2017-0084.R4
Manuscript Type:	Research Paper
Keywords:	Board independence, Board model, One tier board, Two tier board, Multinational Corporation, CSR disclosure

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Abstract

Purpose-This paper investigates the effects of board model and board independence on corporate social responsibility (CSR) disclosure of multinational corporations (MNCs).

Design/methodology/approach- We developed an empirical model in which CSR disclosure is the dependent variable; board model (two-tier vs one-tier), board independence (a proportion of independent directors on a board) and the interaction variable of board model and board independence together with several variables conventionally used as control variables are independent variables. We collated the panel dataset of 244 Fortune World's Most Admired (FWMA) corporations from 2005 to 2011 of which 117 MNCs use the one-tier board model, and 127 MNCs employ the two-tier board model from twenty countries. We used the random-effect regression method to estimate the empirical models with the data we collated and also ran regressions on the alternative models for robustness check.

Findings- We found a significantly positive effect of a board model on CSR disclosure by MNCs. Two-tier MNCs tend to reveal more CSR information than one-tier MNCs. Our results also confirm the significant moderating impact of board model on the effect of board independence on CSR disclosure. The effect of board independence on CSR disclosure in the two-tier board MNCs tends to be higher than that in the one-tier board MNCs. Our results do not support the effect of board independence on CSR disclosure in general for all types of firms (one-tier and two-tier board). The impact of board independence on CSR disclosure is only significant in two-tier board MNCs and insignificant in one-tier board MNCs.

Originality/value – Our paper is the first that investigates the role of board model on CSR disclosure of MNCs.

Keywords: Board Independence, Board Model, CSR disclosure, Multinational Corporation.

1. Introduction

Brand image is important to multinational companies (MNCs), and this creates pressure on them to present themselves as a good corporate citizen. In responding to this pressure, many MNCs have developed a self-regulation mechanism by imposing codes of conduct to govern their global supply chains and voluntarily disclose the information about their corporate social responsibility (CSR) activities. However, achieving the image of a good corporate citizen is not an easy task for MNCs. Operating in multiple countries; MNCs are faced with the diversity of stakeholders and a range of ethical dilemmas in diverse institutional contexts. These can complicate corporate governance practices and hence influence corporate decisions toward CSR engagement and report in MNCs.

The range of reviews of literature about CSR reporting including Ali *et al.* (2017), Fifka (2013), Parker (2011), Belal & Momin (2009) and Gray *et al.* (1995) reveal that studies tend to focus on firms operating in a single country, and there is a gap in research about the effect of corporate governance on CSR disclosure by MNCs across different countries. Therefore little is known about how corporate governance may promote or constrain CSR engagement and reporting in MNCs (Filatotchev & Wright, 2011; Filatotchev & Stahl, 2015). Our paper addresses this gap in the literature.

We investigated the effects of the two attributes of a corporate board on CSR disclosure. The first is the benefits of a two-tier board over a single tier board. The second is board independence, which is measured by the proportion of independent directors on the board. We selected a sample of firms from Fortune World's Most Admired (FWMA) list published in the period from 2006 to 2012. The FWMA list ranks global firms based on the similar worldwide-applied criteria developed by the rating agency.

We collated the panel dataset of 244 FWMA corporations of which 117 firms are one-tier board MNCs, and 127 firms are two-tier board MNCs across seven years. We used the random-effect regression method to estimate our empirical models with the data we collated. We also ran several regressions on the alternative models for robustness check. Our findings are shown in Section 4-Results. The implications of our research findings for literature and practice are presented in the discussion section.

2. Theoretical Background and Hypotheses

2.1. Corporate Social Responsibility Disclosure

CSR refers to actions taken by companies with respect to their employees, communities, and the environment that goes beyond what is legally required of a company (Barnea & Rubin, 2010). Accordingly, CSR disclosure refers to corporations' communication about their actions in relation to their employees, communities, and the environment (Gray *et al.*, 1995). CSR disclosure, therefore, can be defined as the information that a company discloses about its governance, social and environmental performance.

Stakeholder theory (Freeman, 1984) is the fundamental theory predominantly employed to explain why companies voluntarily disclose CSR information. Adopting the stakeholder theory, researchers such as Jizi *et al.* (2014) argued that firms engage in CSR activities and reporting to address societal concerns and maintain positive relationships with key stakeholders in order to improve the sustainability of the business. Gamerschlag *et al.* (2011) articulated that firm characteristics act as a proxy for the degree of stakeholder pressure that companies face, therefore they are likely to determine whether CSR disclosure occurs or not. In the recent review of empirical literature about determinants of CSR disclosure, Ali *et al.* (2017) concluded that firm characteristics, namely company size, industry sector, profitability,

dependence on capital markets, company visibility, age, assets and corporate governance mechanisms are predominantly considered drivers of the CSR reporting agenda in both developed and developing countries.

Mason & Simmons (2014) proposed a stakeholder system model of CSR that embeds CSR in corporate governance. The model incorporates four stakeholder constituencies — investors, clients and suppliers, employees, and community and environmental groups in every level of CSR from the evolution of CSR strategy to its enactment through CSR processes and CSR issues. According to Mason & Simmons (2014) model, CSR communication or disclosure is an outcome of board decisions which are probably determined by characteristics of a corporate board.

Previous empirical literature examining the links between board characteristics and CSR disclosure found board duality (Haniffa & Cooke, 2005), board independence (Khan, 2010; Khan *et al.*, 2013; Jizi *et al.*, 2014; Kaymak & Bektas, 2017), board size (Haji, 2013; Jizi *et al.*, 2014; Kaymak & Bektas, 2017), the existence of foreign nationals on boards (Khan, 2010) correlated to CSR disclosure. However, little attention has been paid to the role of board model in CSR disclosure. Besides, these studies did not focus on the issue of CSR disclosure practices at MNCs. Kaymak & Bektas (2017) is a rare study which we found investigating the effect of board characteristics on CSR disclosure of MNCs. Nevertheless, similar to the other studies, Kaymak & Bektas (2017) did not consider the impact of a board model enforced by MNC's home country on disclosure of CSR. The other limitation of this empirical study is that it was built upon on cross-sectional data (data of corporate governance and CSR related issues of 80 publicly traded firms in 2010).

Furthermore, almost the studies examining the effects of board characteristics on CSR disclosure used the context of a single country. The reviews of literature about CSR reporting

including Gray *et al.* (1995) Belal & Momin (2009), Parker (2011), Fifka (2013), and Ali *et al.* (2017) reveal that a large body of literature about CSR disclosure focuses on firms operating in a one country context, either developed or developing countries while little research has been on CSR disclosure in firms operating in multi-countries.

Operating in multi-countries, MNCs are faced with a diversity of stakeholders and the complexity of ethical dilemmas. Several studies articulate the role of institutional pressures for the choice of a CSR approach in MNCs (Barkemeyer & Figge, 2014). Meanwhile, CSR engagement and reporting may be determined by the MNC's home country context, since moral attitudes and behaviours can be shaped by home country's cultural and legislative context (Spicer *et al.*, 2004; Husted & Allen, 2006). Aguilera & Jackson (2003) conceptualised how cross-national diversity regarding institutional configurations shape the way each stakeholder group responds to a firm's decision making and control over resources. Nevertheless, little is known about the factors governing the CSR engagement and reporting in MNCs. Filatotchev & Stahl (2015) call for more empirical research about how corporate governance may promote and constrain CSR engagement and CSR reporting of MNCs. Thus, it is crucial to investigate how boards in different national corporate governance systems influence CSR engagement and reporting of MNCs.

2.2. Corporate board

A corporate board consists of two groups of directors – executive directors and independent directors. In corporate governance literature, the terms ‘executive directors’, ‘managers’, ‘chief executive officers/ CEOs’, ‘inside directors’ are used interchangeably to indicate the directors who are employed by a firm to manage the firm’s business. Similarly, the terms 'independent directors' (IDs), 'non-executive directors', 'non-management directors' and 'outside directors' are

equivalently applied to imply the people who are employed by a firm to advise on and supervise managerial decisions but not to run the firm's business. Executive directors are insiders of the firm and manage the firm's daily business, so may have privileged access to particular information while IDs are outsiders with no direct links to the firm and thus may be more objective and benefit from a divergent viewpoint (Kaymak & Bektas, 2017).

As the board of directors is responsible for the development of sustainable business strategies and the supervision of the responsible use of the firms' assets, it is the board that takes the crucial decisions about a firm's CSR policies (Jizi *et al.*, 2014). In light of increasing worldwide awareness of the importance of ethical issues, especially rising pressures from customers and investors, board characteristics, which were initially designed to protect shareholder interests, potentially affect corporate decisions in disclosing CSR information. Therefore, this paper aims to examine the potential effects of a board model on CSR disclosure in MNCs, taking into account its direct effect and moderating effect on the link between board independence and CSR disclosure.

2.3. The direct effect of board model on CSR disclosure in MNCs

The terms 'board model', 'board system', 'board type' and 'board structure' have been interchangeably used in literature to indicate the configuration of a board where supervision and management functions are organised in the same board or the two separate boards. There have been two types of board model evolved worldwide. A one-tier (unitary/single) board model is composed of both managers and IDs meanwhile a two-tier (dual) board model consists of a management board that manages the firm's operations, plus a separate supervisory board that excludes managers (or executives) and is charged with overseeing the firm's activities. Traditionally, the one-tier board is adopted in common law countries while the two-tier board

model is mandated in civil/code law countries (Rahman, 2009; Millet-Reyes & Zhao, 2010). For instance, the United States and the United Kingdom provide examples of unitary board structures, while Germany and Austria are considered prototypes of the two-tier board structure (Belot *et al.*, 2014). However, the recent reforms of corporate governance regulations in several civil law countries such as France and Italy allow firms to choose either the one-tier or the two-tier board model (see Pellegrini *et al.* (2016) for the case of Italy and Belot *et al.* (2014) for France). Therefore, nowadays most countries have mandated one of these two models except a few nations such as France, Italy allow both models.

In corporate governance literature, there are some studies such as Pellegrini & Sironi (2017), Pellegrini *et al.* (2016), and Millet-Reyes & Zhao (2010) providing empirical evidence of the effect of board model on firm performance but there are hardly any studies about the impact of board model on CSR disclosure.

In general, the two-tier board model adds a supervision layer to managerial decision making. This mechanism is likely to strengthen the justice of corporate decisions and prevent a CEO engaging in opportunistic behaviours (Rose, 2007). Also, in the two-tier board system, the supervisory board is responsible for appointing, dismissing and monitoring members of the management board (Jungmann, 2006). Therefore, CEOs in the two-tier board system are subjected to a higher level of monitoring and supervision compared to the counterparts in the one-tier system. CEOs in the two-tier board system are, thus, faced with higher pressure for transparency. Moreover, in the two-tier system, the separation of the board of supervision and board of management prevents direct communications and interaction between executive managers and non-executive managers (IDs). This is likely to enhance the impartiality and quality of monitoring and supervision. IDs of the firms using the two-tier board system are probably free from CEO's influence, thus in a better position to do what is right for shareholders

in the long term. Therefore, IDs in the dual board system are more likely to demand a higher level of voluntary disclosure in comparison to their counterparts in the one-tier system. In contrast, the structure of one-tier boards in which executive and non-executive directors operate on one board may jeopardise the board's ability to monitor executive directors and provide independent advice to management (Bezemer *et al.*, 2014). Consequently, CEO in the one-tier system is likely to have a dominant role in the board. In many one-tier board firms, CEO can take the position of the chairman of the board which enables him/her to have a substantial influence on board decisions (Maassen, 1999). They are, therefore, faced with less pressure for transparency and disclosure of CSR information than the counterparts in the two-tier board system.

Besides, when investing in a firm, shareholders are interested in not only stock value and return but also the firm's sustainability. Viewing CSR disclosure as an essential tool for improvement of stock return and firm's value in the long term, the shareholders are likely to vote for more transparency and disclosure of CSR information to the public (Krüger, 2015). The separation of supervisory board and management board that characterised the two-tier board model put IDs in a better position to monitor the way CEOs implement the shareholders' vote for CSR disclosure in comparison with the IDs in the one-tier board system. This is because a high level of monitoring can be achieved if IDs have an appropriate degree of detachment to the management. Therefore, in general, firms using the two-tier board model are likely to reveal more CSR information than firms with the one-tier board model.

The effect of board model on the level of CSR disclosure can be seen more clearly in cases of MNCs. To prevent institutional risks in the countries where they operate, many MNCs create their CSR self-regulation (Campbell, 2006, 2007). One good example of MNCs' self-regulation is the codes of conduct which many MNCs impose on their global supply chains.

Nevertheless, it is not the presence of the self-regulation but the enforcement of this that matters. Monitoring the enforcement by supervisors who detach from executive directors as in the two-tier board system is deemed to be more effective than that given by supervisors who sit in the same board meetings with executive directors as in the one-tier board system. This will lead to better enforcement of the self-regulation and hence more CSR disclosure in MNCs using the two-tier board model than in the one-tier-board MNCs. Accordingly, we propose that:

Hypothesis 1: MNCs using the two-tier board model tend to disclose more CSR information than MNC using one tier board model.

2.4. The direct effect of board independence on CSR disclosure in MNCs

The terms 'board independence' and 'board composite' are used interchangeably to indicate the proportion of independent directors (IDs) on board. Agency theory makes the strong proposition about the benefits of having independent board members who can question managerial decisions and conduct more thorough monitoring activities (Dalton *et al.*, 1999). One would expect an ID to challenge management more rigorously and promote the disclosure of information (Kaymak & Bektas, 2017). *First*, IDs are supposed to focus less on short-term financial performance targets and more on the measures that enhance long-term corporate sustainability, such as engaging in CSR and reporting on CSR (Hung, 2011). *Second*, IDs offer objective advice to corporate boards on strategic decisions (Tricker, 2015); thus, board resource diversity could be gained from having more independent members (Bear *et al*., 2010). The wider the variety of board resource is the more potential for problem-understanding and problem-solving with positive engagement in CSR performance and CSR disclosure (Hafsi & Turgut, 2013).

Stakeholder theory suggests that IDs will be in a better position to represent stakeholders because they are not influenced by dominant groups and vested interests in the organisation. IDs

will have a better dialogue with groups outside the organisation; this drives greater corporate responsiveness to societal needs (Johnson & Greening, 1999). Having more IDs allows a company to engage in more boundary spanning activities and this may lead to higher transparency and disclosure of the firm (Kaymak & Bektas, 2017). Therefore, firms with a high proportion of IDs on boards are expected to display a higher engagement in CSR reporting (Jizi *et al.*, 2014).

The diverse institutional environments that MNCs occupy and the increased media scrutiny that they face should compel these firms to seek better linkages with their stakeholders and enhance their CSR efforts. A higher number of IDs on boards, which is expected to create more board independence in functioning an ID's role, will make MNCs pay more significant attention to its external environment and legitimacy through stakeholder engagement and CSR disclosure. As such, we propose that.

Hypothesis 2: Board independence is positively associated with CSR disclosure in MNCs.

2.5. The moderating effect of the board model

As discussed above, when having more IDs on board, there will be more demand for more CSR disclosure. This effect of board independence on CSR disclosure is likely to be stronger in two tier-board firms than in one-tier companies. This is because psychologically when being detached from management, IDs in two-tier board firms do not observe managerial activities as much as IDs in one-tier companies; so they are more concerned about CEOs' accountability and are likely to demand more information than the counterparts in the one-tier board firms. Having high proportion of IDs on board with higher demand for transparency as in two-tier board firms will lead to more CSR disclosure in comparison with that in one-tier board firms which have the same high proportion of IDs on board, but IDs have less demand for transparency.

Furthermore, the separation between a supervisory board and management board in the two-tier system strengthens the independence and effectiveness of IDs (Millet-Reyes & Zhao, 2010). Having a high number of IDs on board who have a high level of detachment from CEOs is likely to induce more pressure for CEO in revealing CSR information, greater monitoring of the implement of shareholders' votes for CSR disclosure and better enforcement of self-regulation in MNCs. This indicates that a two-tier board model may enhance the effect of board independence on CSR disclosure.

On the other hand, the interactions between IDs and executive directors when sitting in the same board meetings as characterised in the one-tier board system probably reduce the independence of the IDs. The possible lack of independence of IDs in one-tier board companies may diminish the effectiveness of having independent board members. Therefore, having a high or low number of IDs on board may not matter much to the level of CSR disclosure in one-tier board MNCs. This means that a one-tier board model may weaken the effect of board independence on CSR disclosure.

In brief, due to the nature of a board model, there is a higher level of separation between IDs and CEO in the two-tier board system in comparison with that in on one-tier board system and so the two-tier board model may strengthen the effect of board independence on CSR disclosure while the one-tier board model is likely to lessen the impact of board independence on CSR disclosure. Accordingly, we propose that:

Hypothesis 3: The effect of board independence on CSR disclosure in the two-tier board MNCs tends to be higher than that in the one-tier board MNCs.

3. Research Methodology

3.1. Data

We selected a sample of the firms from Fortune World's Most Admired (FWMA) list. The FWMA list rates global firms based on the similar worldwide-applied criteria developed by the rating agency. This rating exercise includes global companies from many countries in the world, which enables the findings to go beyond economic activities in a single country. This allows more chance for the generalisation of the results towards the development of a global theory on corporate governance (Fortune, 2012).

The data collection process comprised three stages. In the first stage, we collected 345 names and the corresponding heard-quarter countries from FWMA ranking results released from March 2006 to March 2012 on the Fortune website. This means that the survey was conducted in the year before the release date of the FWMA ranking results, i.e. annually between 2005 and 2011. In the second stage, we manually checked financial reports of firms incorporated in civil law countries for the information about a board model used by the firms. The reason for this is because the recent reforms in several civil law countries allow firms to choose one among the two models. We got rid of the firms incorporated in civil law countries but using one-tier board model. We yielded the shortlist of 244 firms of which 117 firms use the one-tier board model, and 127 firms employ the two-tier board. The MNCs originated from 20 countries (the US, UK and Australia; Japan, Germany, Belgium, Brazil, China, Denmark, Finland, France, Italy, Luxembourg, Mexico, Netherlands, South Korea, Spain, Sweden, Switzerland and Turkey). Then we manually collected data for financial soundness reputation and the data for global competitiveness reputation from the Fortune website; ranging from 1 to 17. After that, we collected annual data on CSR disclosure, the percentage of IDs, debt-to-equity ratio, sale growth,

number of employees and industry sectors between 2005 and 2011 automatically from Bloomberg. In the final stage, we collected the number of foreign countries where an MNE has subsidiaries or its operation network from the company website.

We have created a sample of 1,023 firm-year observations from 244 FWMA firms in from twenty countries of which 117 firms adopt a one-tier board model and 127 firms use a two-tier board model. This is an unbalanced dataset.

3.2. Empirical Models

To test hypothesis H1, we firstly investigated the effect of board model (two-tier vs one-tier) on CSR disclosure, then examined if the mean of CSR disclosure in two-tier board MNCs is statistically higher than the mean of CSR disclosure in one-tier board MNCs. In particular, we compared the mean of CSR disclosure of the two sub-samples (one-tier MNCs vs two-tier MNCs), conducted two-tail-t-test to see the difference is statistically significant and one-tail- t-test to see if the mean of CSR disclosure in the two-tier board firms is statistically higher than that in the one-tier board firms.

To test hypothesis H2, we inspected if the effect of board independence on CSR disclosure is statistically significant and positive. To test hypothesis H3, we evaluated if the effect of the interaction variable (*Bmodel*Bindependence*) on CSR disclosure is statistically significant and positive; then examined if the effect of board independence on CSR disclosure in the two-tier board MNC group is statistically higher than that in the one-tier board MNC group. In particular, we estimated the effect of board independence on CSR disclosure in two sub-samples (one-tier MNCs and two-tier MNCs) and compared the size of the effect of board independence on CSR disclosure reported in the two-tier subsample with that reported in the

one-tier subsample; then conducted t-test to see if the difference of the size of the effect is statistically significant.

To obtain robust hypothesis results, we followed the hierarchical approach suggested by Aiken and West (1991) to estimate the effects of each predictor on its own without other predictors in the estimation model and also its effect in the estimation model which other predictors are included. Specifically, only control variables were included in step 1. In step 2, only *Bmodel* and control variables were used. In step 3, only *Bindepen* and control variables were included. In step 4, *Bmodel, Bindepen* and control variables were examined in the same model. In step 5, all the predictors including *Bmodel, Bindepen, Bmodel*Bindependence* and control variables were investigated in the same model.

To estimate the effects of board model, board independence and their interaction effect on CSR disclosure in the same model as mentioned above, we developed an estimation model in which CSR disclosure is the dependent variable while board model, board independence and the interaction variable (the product of the board model and board independence are independent variables. We included several variables conventionally used as control variables in our model.

Dependent variable

$\boldsymbol{CSR}_{\boldsymbol{disclose\ i;t}}$ is CSR disclosure score of firm *i* at time *t*. It is proxied by the environment, social and governance disclosure score (ESG) which were calculated by the Proprietary Bloomberg ESG group. This indicator was used in the previous studies such as Aragón-Correa *et al.* (2016) and Lai *et al.* (2016). The scores range from 1 for firms which revealed a minimum amount of data related to CSR activities in environmental, social and governance aspects to 100 for those which exhibited every data point.

Independent variables

$\boldsymbol{Bindepen_{i;t}}$ is the board independence of firm i at time t. It is measured by the percentage of IDs on total board members popularly used in previous research such as (Rashid, 2015).

$\boldsymbol{Bmodel_{i;t}}$ is the board model of firm *i* at time *t.* It is a dummy variable, assigned 0 is for a firm having the one-tier board and 1 is for a firm with the two-tier board as used in Millet - Reyes & Zhao (2010).

$\boldsymbol{Bmodel_{i;t}} * \boldsymbol{Bindepen_{i;t}}$ is interaction variable of board model and board independence of firm *i* at time *t*. We used mean centred scores of board independence and board model to calculate the interaction variable to eliminate the possibility of multicollinearity (Aiken & West, 1991).

Control variables

We included several variables popularly used as control variables in CSR literature.

$\boldsymbol{roe_{i;t}}$ is the return on equity ratio of firm i at time t. Firms with higher profitability are motivated to disclose information to favourably distinguish themselves from other firms (Muttakin *et al.*, 2015). Research conducted by Giannarakis (2014) and Khan (2010) shows that profitability has a positive effect on CSR disclosure. As such, ROE was controlled in the model.

$\boldsymbol{compete_{i;t}}$ is the global competitiveness reputation of firm *i* at time *t.* Firms with higher global competitive reputation are motivated to disclose information to favourably distinguish themselves from other firms. Other research conducted by Kolk (2003) suggests MNCs with high competitiveness tend to reveal more CSR information. Thus, we included $compete_{i;t-1}$ as a control variable.

$\boldsymbol{leverage_{i;t}}$ is the debt-to-equity ratio of firm *i* at time *t*. Demand for non-financial disclosure tends to increase once firms rely more on debtors (Ntim & Soobaroyen, 2013) thus, was controlled in the model.

$\boldsymbol{salesgrow_{i;t}}$ is the sale growth ratio of firm *i* at time *t*. The effectiveness of governance mechanisms and CSR approach is dependent on a firm's growth opportunities (Florackis, 2008), so it was controlled in this model.

$\boldsymbol{employee_{i;t}}$ is the number of employees of firm *i* at time *t*. This indicator reflects firm size (Luo & Bhattacharya, 2006; Glavas & Piderit, 2009). Big firms may be more cautious about their image in the eye of the public and have more resources to invest in CSR communication.

$\boldsymbol{foreign_{i;t}}$ is the number of foreign countries where firm *i* has subsidiaries or representative offices at time *t*. Firms operating in more foreign markets, particularly with institutional void (El Ghoul *et al.*, 2017), may expose to more pressure to disclosure about their CSR information. Kolk (2003) indicates that MNEs operating in more foreign markets tend to reveal more CSR information. We, hence, included $foreign_{i;t}$ as a control variable.

$\boldsymbol{industry_i}$ is the industry where firm *i* operates. Ntim & Soobaroyen (2013) and (Menz, 2010) suggest that firms in different industries may expose to varying levels of pressure to disclosure about their CSR information. Therefore, we controlled for industry effect in the model.

Based on the assumption that CSR reporting of the current year is the outcomes of operation in the previous year (Jo and Harjoto, 2012; Bear *et al*. 2010), we developed the baseline model with the one-year lag of the independent and control variables. Equation 1 presents our baseline model.

$$CSR_{disclose\ i;t} = \beta 0 + \beta 1 Bmodel_{i;t-1} + \beta 2 Bindepen_{i;t-1} + +\beta 3 Bindepen_{i;t-1} * Bmodel_{i;t-1} + \beta 4 roe_{i;t-1} + \beta 5 compete_{i;t-1} + \beta 5 leverage_{i;t-1} + \beta 7 salesgrow_{i;t-1} + \beta 8 employee_{i;t-1} + \beta 9 foreign_{i;t-1} + \beta 10\ industry_i + \varepsilon it \quad \textbf{(1)}$$

Further, we examined if the effect of board independence on CSR disclosure in the group of two-tier board MNCs is statistically greater than that in the group of one- tier board MNCs by estimating Equation (2) on each of two sub-samples (one-tier MNCs and two-tier MNCs), then comparing the size of the effect of board independence on CSR disclosure reported in the two subsamples and conducting t-test to see if the difference of the size of the effect is statistically significant.

$$CSR_{disclose\ i;t} = \beta 0 + \beta 2 Bindepen_{i;t-1} + \beta 4 roe_{i;t-1} + \beta 5 compete_{i;t-1} + \beta 5 leverage_{i;t-1} + \beta 7 salesgrow_{i;t-1} + \beta 8 employee_{i;t-1} + \beta 9 foreign_{i;t-1} + \beta 10\ industry_i + \varepsilon it \quad \textbf{(2)}$$

For robustness check, we employed two approaches. The first approach is to follow the hierarchical approach (Aiken and West, 1991) as mentioned above and check if the hypothesis testing results hold when each predictor is investigated in separation from other predictors and when they are examined in the same model. The second approach we used is to develop the alternative model with the same specifications as the Equation 1 but using the two-year lag of the independent and control variables (Equation 1*).

$$CSR_{disclose\ i;t} = \beta 0 + \beta 1 Bmodel_{i;t-2} + \beta 2 Bindepen_{i;t-2} + \beta 3 Bmodel_{i;t-2} * Bindepen_{i;t-2} + \beta 4 roe_{i;t-2} + \beta 5 compete_{i;t-2} + \beta 6 leverage_{i;t-2} + \beta 7 salesgrow_{i;t-2} + \beta 8 employee_{i;t-2} + \beta 9 foreign_{i;t-2} + \beta 10\ industry_i + \varepsilon it \quad \textbf{(1*)}$$

We also checked robustness of the results obtained from Equation (2) by employing an alternative model with the same specifications as Equation (2) but using the two-year lag of the independent and control variables (Equation 2*).

$$CSR_{disclose\ i;t} =$$

$$\beta 0 + \beta 2 Bindepen_{i;t-2} + \beta 4 roe_{i;t-2} + \beta 5 compete_{i;t-2} + \beta 5 leverage_{i;t-2} +$$

$$\beta 7 salesgrow_{i;t-2} + \beta 8 employee_{i;t-2} + \beta 9 foreign_{i;t-2} + \beta 10\ industry_i + \varepsilon it \quad \textbf{(2*)}$$

3.3. Estimation Method

Various diagnostic tests on our dataset were conducted. *First*, we checked multicollinearity by examining correlation coefficients among predictors and their Variance Inflation Factor (VIF). Many studies in econometrics (e.g. Marquaridt, 1970; Neter *et al.*, 1989; Mason & Perreault Jr, 1991; Mason *et al.*, 2003; Belsley *et al.*, 2005) show that multicollinearity would not be a problem if VIFs are lower than 10. As presented in Table 1, although the correlations among three key predictors (board model, board independence, interaction variable) are quite high, all the VIFs are lower than 10, so multicollinearity does not appear as a problem, and our estimation model (Equation 1) is acceptable.

(Table 1 here please)

Second, we conducted a Hausman test based on the difference between fixed-effect and random-effect estimations as suggested by Baltagi (2004). We used the whole sample and each of the sub-samples alternatively for testing. The Hausman test results (p = 0.086 for the whole sample; p = 0.998 for the two-tier board sub-sample; p= 0.899 for the one-tier board sub-sample) suggest that the random-effects regression is more relevant than the fixed-effects regression.

Third, we examined the potential autocorrelation of the dependent variable. We conducted the Durbin-Watson test. The first-order Durbin-Watson test is insignificant (p> 0.05), so we accept the null hypothesis of no first-order autocorrelation (Durbin & Watson, 1971).

Fourth, we examined the potential endogeneity of *Bindepen* (board independence). We conducted the Durbin-Wu–Hausman tests (see Hausman 1978 for the detailed explanation of the test). The Hausman test results (p <0.05) are significant, so endogeneity appears in our dataset. To deal with the endogeneity problem of board independence (*Bindepen*), we used the Instrumental variable Two-Stage Least Square regression method as suggested by Wooldridge (2013). We included *Sound_Finance* as an instrumental variable for *Bindepen*. *Sound_Finance* was measured in terms of financial soundness of a firm compared to their peers in their industry, which is positively linked with the level of board independence (Anderson *et al.*, 2004). Data for this variable was collected from FWMA reputation rating result released annually on Fortune website. This data has been used in academic research over the past two decades (Stanwick & Stanwick, 1998; Roberts & Dowling, 2002). Fombrun & Shanley (1990) criticised that there was a *financial halo* in Fortune reputation rating; nevertheless, Flanagan *et al.* (2011)argued that the most recent data continues to be a useful and valid source of data. *Sound_Finance* meet the two requirements for a good instrument variable: *Sound_Finance* is uncorrelated with the error term but significantly correlated with *Bindepen* (p<0.01). The Durbin (score) chi-sq test of endogeneity of *Bindepen* instrumented by *Sound_Finance* produced large p-values (p = 0.237 for the whole sample; p = 0.351 for the sub-sample of one-tier board; p = 0.176 for the sub-sample of two-tier board). Wu-Hausman F-test results display large p-values (p = 0.240 for the whole sample; p = 0.357 for the sub-sample of one-tier board; p = 0.182 for the sub-sample of two-tier board). Further, the first-stage regression summary statistics show that *Sound_Finance* is not

weak (P=0.000). Moreover, the Sargan (score) chi2 and the Basmann chi2(102) produce small p-value (p=0.000) for the tests of over-identifying restrictions. This suggests that *Sound_Finance* is a good instrument and the endogeneity problem was fixed for the models by using this instrument variable.

4. Results

Descriptive statistics of our dataset are presented in Table 2. The average size of MNCs in our sample is the one with 67,669 employees. The smallest MNC had 1,960 staff in 2010, and it came from the UK while the biggest MNC employed 2,100,000 staff in 2008 and is from the US. The mean of the proportion of independent directors is 81.57 percent for the one-tier board firms; 32.72 percent for the firms with the two-tier board. The min value of board independence (*Bindepen)* of zero indicates that independent directors are not used at some MNCs, and that is the cases of an MNC from Japan. The maximum value of *Bindepen* of 100 percentages and that is the case of MNC from the US. The lowest score of CSR disclosure is 10.75 percents, and that is the case of MNC from the US, and the highest CSR disclosure score of 79.75 percent is of an MNC from Germany.

(Table 2 about here please)

Table 3 displays the results obtained from the random-effects regression of the baseline models using data from the whole sample. As can be seen from Model 2, 4, and 5 in Table 3, a board model has a statistically significant effect on CSR disclosure (p=0.000, β = 7.178 when a board model is investigated in separation from other predictors; p=0.001, β = 9.053 when board model is examined in conjunction with board independence; and p=0.00, β = 11.14 when all the predictors are examined in the same model). These results are consistent with the ones obtained

from the alternative models presented in Model 2*, 4*, and 5* in Table 4, meaning that the result is robust and confirming the statically significant and positive effect of board model on CSR disclosure.

(Table 3 about here please)

(Table 4 about here please)

As mentioned in section 3, to test hypothesis H1, we not only estimated the effect of board model on CSR disclosure but also examined if the mean of CSR disclosure in two-tier board MNCs is statistically higher than the mean of CSR disclosure in one-tier board MNCs. The first *t-test* of the mean difference of CSR disclosure between the two sub-samples has p=0.000, confirming that there is a statistically significant difference in the level of CSR disclosure between the two sub-samples. The second *t-test* of the mean of the two-tier group significantly higher than that of the one-tier groups has p=0.000, confirming that the mean of CSR disclosure of the two-tier board model group (44.728) is statistically higher than that of the one-tier board model group (34.207). This confirms our H1 that two-tier board MNCs tend to disclose more CSR information than one-tier board MNCs.

As can be seen from Model 3, 4, and 5 in Table 3, the effect of board independence on CSR disclosure by MNCs is statistically insignificant (p=0.977 when a board independence is investigated in separation from other predictors; p=0.975 when board independence is examined together with the board model; and p= 0.790 when all the predictors are examined in the same model). These results are consistent with the ones obtained from the alternative models presented in Model 3*, 4*, and 5* in Table 4, indicating that the result is robust and confirming the statically insignificant effect of board independence on CSR disclosure. Thus, H2 is not confirmed when all types of firms (both one-tier and two-tier board) were considered.

The regression output in the Model 5 in Table 3 demonstrates that the moderating effect of board model on the impact of board independence on CSR disclosure is statistically significant (at 90% confidence interval) and positive (p= 0.074, β = 0.133), suggesting that H3 is confirmed. This result is in line with the one obtained from the alternative model presented in Model 5* in Table 4. It is worth to note that R^2 obtained from Model 1, 2, 3, 4, and 5 is 0.657, 0.691, 0.692, and 0.703 respectively. This means that the full model with control variables, *Bmodel, Bindependence* and the interaction variable (*Bmodel* Bindepen*) is the best model.

As mentioned in section 3, to test hypothesis H3, we not only evaluated if the effect of the interaction variable (board model* board independence) on CSR disclosure is statistically significant and positive but further examined if the effect of board independence on CSR disclosure in the group of two-tier board MNCs is statistically more significant than that in the group of one- tier board MNCs.

As reported in Table 5, board independence has a statistically significant effect (p= 0.000; β= 0.158) on CSR disclosure by MNCs with two-tier board model (Model 7) but does not have a statistically significant effect (p=0.811; β= 0.014) on CSR disclosure by MNCs with one-tier board model (Model 6). It is worth to note that these results are respectively consistent with the results reported in Model 7* and Model 6* which were used for robustness check.

(Table 5 about here please)

Furthermore, we conducted two t-tests of significant difference in the size of the effect of board independence (*Bindepen)* on CSR disclosure (*CSRdisclose)* in the two subsamples. The t-test result of p = 0.992 confirms the effect of *Bindepen* on *CSRdisclose* in the one-tier board sub-sample is significantly different from 0.158 which is the size of the effect of *Bindepen* on *CSRdisclose* in the two-tier board sub-sample. Similarly, the t-test result of p = 0.998 confirms the effect of *Bindepen* on *CSRdisclose* in the two-tier board sub-sample is significantly different

from 0.014 which is the size of the effect of *Bindepen* on *CSRdisclose* in the one-tier board sub-sample. These results confirm that the effect of board independence on CSR disclosure in the two-tier board group is statistically higher than that in the one-tier board group. In other words, H3 is fully validated.

5. Discussions

Our result of statistically significant and positive effect of board model on CSR disclosure suggests the higher level of CSR disclosure in two-tier board MNCs in comparison with one-tier board MNCs. Moreover, our result of the mean of CSR disclosure of the two-tier board MNCs is statistically higher than that of the one-tier board group strongly shows that two-tier board MNCs tends to disclose more CSR information than one-tier board MNCs. To the best of our awareness, this finding is unique because no existing research has been found examining this issue.

Our result of the insignificant effect of board independence on CSR disclosure of MNCs in general for all types of firms (one-tier and two-tier board) indicate that a higher ratio of IDs on board does not lead to a higher level of CSR disclosure in MNCs in general. However, by examining the moderating impact of board model on the effect of board independence on CSR disclosure, we successfully show that board independence has a statistically significant impact on CSR disclosure in two-tier board MNCs but insignificant on CSR disclosure in one-tier board MNCs. This finding is a significant discovery because to the best of our knowledge there has been not any study looking into this matter.

Our findings are more insightful than the results from Kaymak & Bektas (2017). In their research, Kaymak & Bektas (2017) did not consider the moderating impact of board model. Their finding of the significant effect of board independence on CSR disclosure may be

attributed to the possibility that their sample consists of a majority of two-tier board MNCs, but there is no information about a board model used by MNCs in their paper. In our study, we purposely used a research sample which has a quite balanced number of MNCs using one-tier board (117 firms) and two-tier board (127 firms). We are, therefore, able to clearly show that board independence positively contributes to CSR disclosure only in the case of two-tier board firms but does not matter in case of one-tier board firms. Our study shows that a separation between a board of supervision and board of management is necessary for independent supervision on the matter of revealing CSR information, and this takes effect in the case of MNCs with two-tier board models.

Our paper makes three contributions to the literature. *First*, to the best of our knowledge, our paper is the first that investigates the role of board model on CSR disclosure of MNCs. We hypothesised and proved the effects (direct and moderating) of board model on CSR disclosure using empirical evidence of a global-level dataset of MNCs from twenty countries across three continents utilizing the panel dataset spanning across seven years. *Second,* our paper responds to several calls for more research on CG and CSR practices across countries. Specifically, our paper replies to the call for an investigation of how corporate governance may promote and constrain CSR activities of MNCs (Filatotchev & Stahl, 2015). While corporate governance and CSR activities have been practised in MNCs in diverse institutional contexts, little research has examined the link between the corporate board and CSR disclosure at MNCs. To our awareness, our paper is the first that provides longitudinal empirical evidence for the effect of different attributes of a board on CSR disclosure by MNCS. To date, several studies, e.g., Gul & Leung (2004), Patelli & Prencipe (2007), Jizi *et al.* (2014), have examined how board affects CSR disclosure of firms, but these studies did not consider the role of board model/system. Moreover, they were based on samples of firms from one country, and little research is found using a

sample of firms from multiple countries. *Third,* our paper contributes to the knowledge of global corporate governance. Most corporate governance studies typically examine the relationship between corporate governance mechanism and firm performance in a specific time frame and geographically limited empirical settings (Zattoni & Van Ees, 2012). By providing empirical evidence from the samples of the MNCs from twenty countries across three continents (America, Europe and Asia), our paper has responded to the call by Zattoni & Van Ees (2012) for the development of the global theory of comparative corporate governance.

From a managerial and policy perspective, we emphasise the role of a board model in CSR disclosure and transparency in MNCs. The separation of a board of management and board of supervision as in two tier-board model enhances the role of board independence in firms' decision relating to CSR reporting. We advise the MNCs who wish to improve CSR reporting and transparency to consider the use of two-tier board model and employ a higher number of outside directors on board. We note that once a firm uses a one-tier model, number of IDs on a board does not matter to the level of CSR disclosure. We advise regulators to enforce an application of two-tier board model to improve CSR reporting and transparency in MNCs. We also recommend regulators to continue mandating publicly traded companies to include more external members on their boards, especially for two-tier board MNCs.

6. Conclusion

This article examines the effects of board model (both direct and moderating) and board independence on CSR disclosure of MNCs. We developed an empirical model in which CSR disclosure is the dependent variable; board model (two-tier- vs one-tier), board independence (a ratio of IDS vs inside directors), and the product of board model and board independence together with several variables conventionally used as control variables are independent

variables. We collated the panel dataset of 244 FWMA corporations from twenty countries during the period from 2006 to 2012 of which 117 MNCs have the one-tier board and 127 MNCs with the two-tier board model. We used the random-effect regression method to estimate the empirical model with the data we collated. We also ran several regressions on the alternative models for robustness check. We found the significant effect of board model on CSR disclosure. MNCs using two-tier board model tends to disclose more CSR information than MNCs using one-tier board model. We did not find the significant effect of board independence on CSR disclosure of MNCs in general. However, we did see the significant effect of board independence on CSR disclosure in two-tier MNCs, and that effect is not significant in one-tier board MNCs. Our results confirm the moderating impact of board model on the effect of board independence on CSR disclosure. In particular, the impact of board independence on CSR disclosure appears to be more pronounced in two-tier board MNCs than in one-tier board MNCs.

Our paper has two limitations which future research could overcome. The first is that we omitted some variables popularly used as control variables in corporate governance such as board interlocking, board diversity, CEO duality, incentive system, ownership structure because of unavailability of the data. The second limitation is that our paper only focused on how MNC's corporate governance (board model and board independence) affect its approach to transparency and legitimacy at headquarter level and did not examine the practices at a subsidiary level. We recommend future research to look into how corporate governance system and institutional context of host countries influence on CSR approach at both subsidiaries and headquarter level of MNCs.

Table 1: Correlation matrix

	Variable	1	2	3	4	5	6	7	8	9	10	11	VIF
1	*CSRdisclose*	1.00											
2	*Bmodel*	0.36***	1.00										3.3
3	*Bindepen*	0.29***	0.84***	1.00									5.27
4	*Bmodel*Bindepen*	0.22***	0.77***	0.93***	1.00								2.54
5	*roe*	-0.10**	-0.23***	0.24***	0.22***	1.00							1.16
6	*compete*	0.01	-0.27***	0.28***	0.28***	0.06	1.00						1.09
7	*leverage*	-0.02	-0.01	0.02	0.03	0.05	0.01	1.00					1.01
8	*salesgrow*	-0.09**	-0.12***	0.12***	0.15***	0.17***	0.03	-0.01	1.00				1.05
9	*employee*	0.04	-0.00	-0.01	0.03	-0.01	0.01	-0.01	-0.02	1.00			1.01
10	*foreign*	0.15***	0.02	0.07*	0.08*	0.11***	0.04	-0.03	-0.03	0.06	1.00		1.06
11	*SOUND_FINANCE*	0.12***	0.28***	-0.26***	-0.21***	-0.04	-0.71***	-0.00	-0.02	-0.01	-0.03	1.00	

*p<0.05, ** p<0.01, *** p<0.001; Mean VIF = 1.94

Table 2: Descriptive statistics

	Mean			S.D.			Min			Max		
	Whole sample	*One-Tier*	*Two-Tier*	*Whole sample*	*One-Tier*	*Two-Tier*	*Whole sample*	*One-Tier*	*Two-Tier*	*Whole sample*	*One-Tier*	*Two-Tier*
$CSR_{disclose}$	41.21	34.21	44.73	13.19	14.26	11.14	12.81	10.74	12.81	79.75	66.53	79.75
Bmodel	0.37	0	1	0.483	0	0	0	0	1	1	0	1
Bindepen	56.72	81.57	32.72	28.93	10.53	20.52	0.00	42.86	0.00	100.00	100.00	70.00
roe	16.89	22.19	10.04	24.90	29.46	12.82	-200.77	-200.77	-48.89	312.76	316.78	108.32
compete	11	11.99	9.87	3.94	3.66	3.95	2	2	2	17	17	17
leverage	152.86	149.25	135.55	502.14	535.02	454.01	0.00	0.00	0.00	8228.99	8228.99	7559.11
salesgrow	5.88	8.02	3.40	18.51	19.82	15.82	-52.35	-58.06	-38.13	208.42	208.42	79.22
employee	102000.00	112000.00	111000.00	95194.94	210000.00	97703.16	1960	1960	2790	495000	2100000	495000
foreign	38.23	37.79	39.00	38.61	39.52	37	1	1	1	200	200	200
Sound_Finance	5.35	5.96	8.14	3.36	3.61	3.69	1	1	1	15	17	16

Table 3: Regression results for the whole sample- based line models (one year lag independent variables)

ESG	(1)		(2)		(3)		(4)		(5)	
	Coefficient	P value	Coefficient	P value	Coefficient	P	Coefficient	P value	Coefficient	P value
L1.Bmodel			**7.178*****	**.000**			**9.053*****	**.001**	**11.137*****	**.000**
L1.Bindepen					**.001**	**.977**	**.003**	**.955**	**.015**	**.790**
L1.moderator									**.133**$^{+}$	**.074**
L1.roe	-.011	.688	-.004	.889	-.011	.692	.000	.989	-.006	.819
L1.compete	.083	.431	.120	.254	.083	.430	.153	.231	.121	.257
L1.LEVERAGE	.000	.264	.000	.453	.000	.269	.000	.874	.000	.436
L1.SALES_GROWTH	.016	.223	.016	.228	.016	.225	.016	.284	.015	.257
L1.EMPLOYEE_NO	.000	.701	.000	.701	.000	.707	.000	.668	.001	.696
L1.foreign	.043	.050	.040	.054	.043*	.050	.026	.394	.020	.392
Industry	Controlled		Controlled		Controlled		Controlled		Controlled	
Year	Controlled		Controlled		Controlled		Controlled		Controlled	
_cons	18.750***	.000	16.984***	.000	18.805***	.000	15.984**	.003	17.154**	.005
N	490		490		490		490		490	
R^2	.657		.690		.657		.692		.703	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: Regression results for the whole sample - alternative models (two year lag independent variables)

	(1*) Coefficient	P value	(2*) Coefficient	P value	(3*) Coefficient	P value	(4*) Coefficient	P value	(5*) Coefficient	P value
L2.Bmodel			**8.049*****	**.000**			**8.941****	**.002**	**13.655*****	**.000**
L2.Bindepen					**-.029**	**.457**	**-.027**	**.667**	**-.067**	**.411**
L2.moderator									**.293****	**.001**
L2.roe	-.005	.878	.006	.845	-.002	.942	.012	.704	.000	.994
L2.compete	.194	.195	.232	.108	.194	.197	.352*	.042	.244	.089
L2.LEVERAGE	-.000	.875	.001	.348	-.000	.919	.000	.504	.000	.519
L2.SALES_GROWTH	-.003	.851	-.003	.841	-.003	.843	-.002	.887	-.003	.855
L2.EMPLOYEE_NO	.000	.279	.000	.187	.000	.267	.000	.133	.000	.115
L2.foreign	.035	.115	.042*	.039	.040	.078	.029	.305	.012	.570
Industry	Controlled		Controlled		Controlled		Controlled		Controlled	
Year	Controlled		Controlled		Controlled		Controlled		Controlled	
_cons	19.119***	.001	16.571***	.000	20.849***	.001	16.463	.016	23.226**	.012

N	324	324	324	324	324
R^2	.728	.757	.732	.765	.789

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Regression results for the two sub-samples

	Baseline model (RE)				**Alternative model/Robustness check (RE)**				
One-year lag	**Model 2- One-tier**		**Model 3 -Two-tier**		***Two-year lag***	**Model 2* One-tier**		**Model 3* Two-tier**	
CSRdisclose	Coeff	P-value	Coeff	P-value	*CSRdisclose*	Coeff	P-value	Coeff	P-value
L1.Bindepen	0.014	0.811	**0.158**	**0.000**	*L2.Bindepen*	0. 087	0.285	**0.207**	**0.001**
L1.roe	0.005	0.886	-0.019	0.618	*L2.roe*	0. 020	0.605	0.006	0.830
L1.compete	0.205	0.196	-0.094	0.432	*L2.compete*	0. 327	0.120	0.069	0.687
L1.leverage	0.000	0.684	0.001	0.105	*L2.leverage*	0.001	0.187	0.006	0.664
L1.salesgrow	0.022	0.176	0.006	0.711	*L2.salesgrow*	-0.00	0.984	0.014	0.675
L1.employee	0.00	0.617	0.00	0.155	*L2.employee*	0.00	0.044	0.00	0.749
L1.foreign	0.054	0.171	0.035	0.330	*L2.foreign*	0.001	0.820	0.017	0.623
industry	Controlled		Controlled		*industry*	Controlled		Controlled	
year	Controlled		Controlled		*year*	Controlled		Controlled	
N	292		198		N	209		115	
R-sq	0.807		0.624		R-sq	0.851		0.758	

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Manuscript ID: MBR-11-2017-0084.R2

Reviewer 1's comment- 1. The first part of the introduction on page 2- "Although there has been a large body of literature about corporate social responsibility (CSR) disclosure, it has mainly examined firms operating in one country. The reviews of literature about CSR reporting including Gray et al. (1995), Belal and Monin (2009), Parker (2011), Fifka (2013) and Ali et al. (2017), reveal that little literature has studied CSR disclosure of multinational corporations (MNCs)."- is not suitable in its current place. I noticed this was partially addressed based on the comments that I provided, but the paragraphs is still in the wrong section. The statements about the literature gap should be placed before the research question or the literature review part.

Our response
We have revised the introduction section which is highlighted in yellow on page 1.

Reviewer 1's comment 2. This H3 statement – a board model (two-tier vs. one-tier) strengthens the effect of board independence on CSR disclosure in MNCs - is too vague. Which board model between the two increases the relationship between board independence and CSR disclosure? Or do both one-tier and two-tier systems strengthen it? Is your argument related to H3? Please clarify your argument.
Our response.
We have revised our argument and H3. The major add-on is highlighted in yellow on page 11.
We also revise hypothesis 1 to make it clearer and consistent with hypothesis 3.

Due to the revision of the statements for hypothesis H1 and H3, we have provided more explanations about the approach we used to test the hypotheses. Please note that there is no change in our approach, just more explanations which are added to the method section on page 13.

Reviewer 1's comment 3. Reorganize the order of the method section to Data, Variables, and Model (specification). This is the typical order of academic articles in the management field.
Our response
We've reorganised the method section as per your recommendation. Data and variables are now relocated to the beginning of the method section on page 11.

Reviewer 1's comment 4. Please explain either how to deal with the high correlation issue between board models and board independence or the reasons why we can accept this model even if the two variables (board models and board independence) have high correlations (the correlation value of 0.89 between board models and board independence is quite high).
Our response
We are aware of the high correlation between board model and board independence. To address the concern about possible multicollinearity, we've undertaken two measures. The first is that we've developed detailed explanations about why our estimation model is acceptable.
"Following the guidance by Belsley et al.(2005), Mason et al.(2003), Mason and Perreault Jr (1991), Neter et al.(1989) and Marquaridt (1970) who suggest that would not be a problem when Variance Inflation Factors (VIFs) are lower than 10, we examined correlation

coefficients among predictors and their VIFs. As presented in Table 1, although the correlations among three key predictors (board model, board independence, interaction variable) are quite high, all VIFs are lower than 10, so multicollinearity does not appear as a problem and our estimation model is acceptable"
We've included these discussions in this revised manuscript which is highlighted in yellow on page 17.

The second measure is that we followed the hierarchical approach suggested by Aiken and West (1991) to estimate the effects of each predictor on its own without other predictors in the estimation model and also its effect in the estimation model which other predictors are included. Specifically, we ran a regression of the following models

1. The model with all control variables.
2. The model with all control variables and Bmodel.
3. The model with all control variables and Bindepen
4. The model with all control variables, Bmodel, and Bindepen.
5. The model with all control variables, Bmodel, Bindepen, and the interaction variable (Bmodel*Bindepen)

The estimation testing results of the above models are reported in Table 3 (baseline models) The hypothesis testing results hold when each predictor is investigated in separation from other predictors and when they are examined in the same model. This indicates that multicollinearity is not a problem in that full model (Model 5) with high correlations among predictors.

We have revised our paper to enable the inclusion of these models. The newly add-on relating to estimation method is highlighted in yellow (line 21-23 on page 13 and line 1-2 on page 14). The add-on relating to the results is highlighted in line 5-13 on page 20; line 9-15 on page 21; line 22-25 on page 21.

Reviewer 1's comment 5. Contribution and implication are better located in the discussion section.

Our response: We have moved the contributions and implications to the discussion section.