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경영학석사학위논문

**Corporate Governance and Firm Environmental Disclosure:  
In the context of a Family Firm Dominated Economy**

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## **Abstract**

Grounded on institutional theory, much environmental management research has regarded that corporations would make the same strategic choices when facing common sets of institutional pressures. In this study, we consider corporation's responsiveness to environmental policy and regulation is different and they exhibit heterogeneous strategies depending on its distinct governance mechanism. By focusing on firm environmental disclosure which is a way of corporations' voluntary action against climate change issue, we examine how corporate ownership structure and board composition affect corporations' heterogeneous environmental strategies, especially in the family firm dominated economy. As a result of the logistic regression analysis with the sample of 241 Korean firms, we find that under the concentrated ownership structure, the foreign and institutional investors and the outside directors play an important role in encouraging firms to actively engage in firm environmental disclosure, while controlling shareholders group has a negative impact on the disclosure. In the current situation where the firms' participation is significantly underscored in solving global environmental problems, this study gives meaningful implications for environmental policy makers to design the most effective corporate environmental programs along with theoretical and managerial implications.

**Keywords:** corporate environmental management; firm environmental disclosure; carbon disclosure project; corporate governance

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## 1. INTRODUCTION

Under the rubric of institutional theory, environmental research has mostly assumed that corporations would show homogeneous environmental strategies when they face institutional pressure (Chen et al., 2008; Deegan et al., 2002; Rahaman et al., 2004; Reid & Toffel, 2009). This scholarly perspective is based on the assumption that corporations equally undergo legitimation process under the strong pressure of global environmental regime which urges corporations to adopt environmental management in their business practices (Di Maggio & Powell, 1983; Oliver, 1991). Some scholars, however, have recently started to question such a monotonous assumption from the institutional perspective and examine the reason why some firms show different level of activeness in environmental strategies when responding to same sets of institutional pressure. (Darnall & Edwards, 2006; Delmas & Toffel, 2008; Hoffman, 2001; Lewis et al., 2014; Walls & Hoffman, 2013). In this vein, with firm-level perspective, a group of researchers has focused on corporations' distinct organizational characteristics, such as capabilities, resources (Darnall & Edwards, 2006; Sharma & Vredenburg, 1998) or the managerial discretion (Bansal & Roth, 2000; Cordano & Frieze, 2000) so as to explain such heterogeneity in corporate environmental strategies. As one way of such scholarly interests, researchers have recently paid attention to corporate governance in explaining each firm's different level of responses to environmental issues (Benn et al., 2014; Berrone et al., 2010; Darnall & Edwards, 2006; Ben-Amar & McIlkenny, 2015; Lewis et al., 2014; Walls et al., 2012).

In the corporate social responsibility (hereafter, CSR) context, it is often believed that corporations' social behaviours are determined mostly by the top management's different level of demands on organizational legitimacy (Berrone et al., 2010; Haniffa & Cooke, 2005; Oh et al.,

2011; Walls et al., 2012). Furthermore, the extant CSR research has emphasized that ownership structure (Johnson & Greening, 1999; Oh et al., 2011), board independence, leadership and composition (Ben-Amar & McIlkenny, 2015; Brown et al., 2006; Jo & Harjoto, 2011) have a significant impact on corporations' CSR strategies and social performance (Beltratti & Stulz, 2012;; Nardis & Tonello, 2010; Walls et al., 2012). In accordance with such dominant perspective in the CSR context, here, we claim that corporate internal governance structure plays an important role in making differences in corporations' responses to institutional pressures.

In this research, we only consider the relationship between corporate governance and its environmental responses in order to differentiate it from the prior research which has dealt with ambiguously mixed concept of corporations' social and environmental responsibility. In addition, our research especially focuses on Concentrated Ownership Structure (COS), which is frequently witnessed in most family firm dominated economies. By dividing shareholder groups into Controlling Shareholder (CS), managerial, institutional, and foreign investors (Chang, 2003; Demsetz & Villalonga, 2001; Hill & Snell, 1989), and considering various forms of board composition when analyzing the corporate governance, we aim to investigate which form of corporate governance mechanism affects corporations' distinct strategic responses to environmental pressure in the context of family firm dominated economy.

With regard to corporations' environmental responses, our research especially focuses on corporations' response to request for voluntarily disclosing climate change information. Prior studies on social and environmental responsibility agree that corporations' engagement in such voluntary disclosures reflects corporate governance actors' choices and values on legitimacy (Ben-Amar & McIlkenny, 2015; Khan et al., 2013), and willingness to ensure the accountability of the organization (Berrone et al., 2010; Haniffa & Cooke, 2005; Walls et al., 2012). Following

previous research, we assume that firm environmental disclosure as a reflection of organizational will to response to environmental issues, and the indication of the reason corporations show heterogeneous strategy for environmental issues.

Our study makes two major contributions. First, by diversifying corporations' responses to institutional pressure at the level of corporate governance, we complement the stringency of institutional theory in the field of environmental management studies. Second, by specifically focusing on corporate governance (e.g. COS), we improve diversity and depth of research on the relationship between corporate governance and environmental strategy. In order to test our hypotheses, we conducted the logistic regression analysis with the sample of 241 Korean firms. As a result, foreign and institutional investors in the ownership structure and outside directors in the board positively affect a corporate engagement in voluntary environmental disclosure, while CS is negatively associated with firm environmental disclosure.

## **2. THEORY & HYPOTHESES**

### **2.1. Institutional pressures and corporate environmental strategy**

In analyzing the relationship between environmental policy and corporate business strategies, much extant environmental management studies has regarded that corporations would show homogeneous environmental strategic patterns when they face certain sets of institutional pressures (Ambec & Lanoie, 2008; Berchicci & King, 2007; Delmas & Toffel, 2008; Etzion, 2007; Hart et al., 1996; Reid & Toffel, 2009; Walls & Hoffman, 2013). Such assumption stems from the institutional perspective, which strongly emphasizes the influence of institutional mechanisms on corporations' legitimation process in which the corporations converge on

dominant environmental strategy in order to obtain organizational legitimacy (Campbell, 2007; Delmas & Toffel, 2008; DiMaggio & Powell, 1983). In terms of legitimation process, it is believed that corporations are influenced by isomorphic pressures of coercion, normatization, and mimetism<sup>1</sup> (DiMaggio & Powell, 1983; Oliver, 1991). Although it is still persuasive perspective in CSR research field, some researchers have recently started to question the institutional theorists' oversimplification of corporations' responses to institutional pressures (Darnall & Edwards, 2006; Delmas & Toffel, 2008; Hoffman, 2001; Lewis et al., 2014; Walls & Hoffman, 2013).

In order to supplement the explanation power of institutional theory in environmental management arena, several authors have begun to turn their look on corporations' distinct organizational characteristics in explaining different corporate environmental strategies. This group of researchers suspects the simple function of institutional mechanisms on corporations' environmental strategies and argues that corporations' environmental strategies can vary with their distinct organizational characteristics (Delmas & Toffel, 2008; Hoffman, 2001; Lewis et al., 2014). Such organizational characteristics include, for examples, the capabilities, resources, and ownership structure of the firm (Darnall & Edwards, 2006; Sharma & Vredenburg, 1998), corporate identity (Lewis et al., 2014; Sharma, 2000; Walls et al., 2012), and the characteristics of individual managers and their discretion (Bansal & Roth, 2000; Cordano & Frieze, 2000). Using insights from upper echelons and resource based theory at the firm-level perspective, such

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<sup>1</sup> The coercive influence refers to the ability of external forces to inflict pain on the organization for being noncompliant. The normative influence refers to social values encroaching on the organization to conformity, and mimetism refers to the organizational inclination to imitate the practices of other firms operating within a given institutional mechanism (Berrone et al., 2010; Oliver, 1991).

prior research has insisted on the diversity of corporations' responses to environmental or social issues.

## **2.2. Corporate Governance and Firm Environmental Disclosure**

In this vein, some scholars have highlighted the function of corporate governance in explaining corporations' distinct environmental strategy (Benn et al., 2014; Berrone et al., 2010; Darnall & Edwards, 2006; Ben-Amar & McIlkenny, 2015; Walls et al., 2012). They argue that corporations' responses to institutional pressure not only rely on external institutional mechanisms but also on the internal decision makers' different level of demand on legitimacy (e.g. brand or family reputation or ethical images of the firm).

First, grounded on the legitimacy theory, a significant number of researchers have argued that corporate governance plays a central role in determining firms' engagement in social issues. In the previous CSR literature, firms' participation in social or environmental activities have been regarded as a process of gaining support from the stakeholders and reducing organizational legitimacy gap (Gray et al., 1997; Moir, 2001). With regard to it, the top management has been known to have the central position to concern over the organizational legitimacy and takes responsibility for ensuring the accountability of the firm by conforming to institutionalized social norms (Beltratti & Stulz, 2012; Ben-Amar & McIlkenny, 2015; DiMaggio & Powell, 1983; Jo & Harjoto, 2011; Nardis & Tonello, 2010; Walls et al., 2012). Meanwhile, in terms of top management's different demand on legitimacy, many CSR researchers use upper echelons theory or agency theory in order to explain each corporate governance group's distinct interpretations on the legitimacy (Fama & Jensen, 1983; Hambrick & Madison, 1984; Hambrick, 2007).

Specifically, the upper echelons theory highlights top managers' different experiences, values, and personalities and relates such personal values with the top managers' different perspective on the social reputation (Hambrick & Madison, 1984; Hambrick, 2007). On the other hand, agency theory emphasizes each corporate governance group's organizational identity stemming from the internal structure of corporate governance (Abbott & Parker, 2000; Fama & Jensen, 1983). Using such personal- and structural-oriented perspectives, many CSR researchers have underscored the effect of corporate governance mechanism on corporations' heterogeneous environmental strategies.

As opposed to such broad recognition in the CSR arena, however, only a handful of research has focused on the relationship between corporate governance and environmental strategy so far (Walls et al., 2012). Walls et al. (2012), and Bansal & Gao (2008) argued that CSR is a multidimensional construct so that researchers should make distinction between various dimensions of CSR. In reality, companies are required to be equipped with new corporate governance especially to effectively confront the powerful institutional changes caused by climate change (Hart et al., 1996; Hart, 1995; Marcus & Geffen, 1998; Roome, 1992). Even though we acknowledge that there has been a few of environmental research focusing on corporate governance, however, scholars' interest has been mostly focused on dispersed ownership structure (DOS), where the composition and dynamics are distinguished from concentrated ownership structure (COS), mostly witnessed in family firm dominated economies (La Porta et al., 1999). In this research, we examine the relationship between corporate governance and firm responses to environmental issue in the context of COS, so that supplement understanding of corporate governance in the field of environmental studies.

In terms of firm environmental response, we consider firm environmental disclosure

which has been regarded as the practical behaviour of the firm to be 'legitimated' in the era of post-Kyoto regime (Ben-Amar & McIlkenny, 2015; Khan et al., 2013; Lewis et al., 2014). According to voluntary disclosure theory, such corporate decisions are made out when the decision makers' perceived benefits from the disclosure override that of costs (Verrecchia, 1983, 1990). Throughout the process of making decisions on disclosing corporate information, top management takes considerations on various potential advantages and disadvantages from engaging in voluntary disclosure, such as increased social reputation, the reinforcement of upright images of the organization (Bebbington et al., 2008; Clarke & Gibson-Sweet, 1999) or the potential danger of being exposed to legal actions from the public (Cormier & Magnan, 1999; Healy & Palepu, 2001). Top management considers various possibilities from revealing corporate environmental information, and estimates such corporate behaviours would pay for themselves, individually or collectively (Berrone et al., 2010; Haniffa & Cooke, 2005; Walls et al., 2012). Given that top management's decisions are the embodiment of each corporate governance group's opinions (Damall & Edwards, 2006; Hambrick & Madison, 1984; Hambrick, 2007), and the organizational structure (Abbott & Parker, 2000; Fama & Jensen, 1983), we claim that corporate decisions on disclosing environmental disclosure are likely to be influenced by internal corporate governance structure, specifically ownership structure and board composition (Berrone et al., 2010; Haniffa & Cooke, 2005; Walls et al., 2012).

### **2.3. Ownership structure in the family firm dominated economy**

Corporate governance based on its differences in function and characteristics can be divided into DOS and COS (La Porta et al., 1999). DOS refers to the traditional subject of corporate governance studies where ownership and management of a company is separated by shareholders

and managers. On the other hand, in the COS, often found in family firm dominated economy, the controlling shareholder (CS), mostly on behalf of a family ownership and holding the biggest ownership together with the control over management is positioned as a unique existence. Since the CS has a chain effect on the meaning of other shareholder groups' ownership in a row, the COS possesses different characteristics from the DOS (Baek et al., 2004; Classens et al., 2000; Joh, 2003). Drawing upon studies on corporate governance and CSR (Johnson & Greening, 1999; La Porta et al., 1999; Oh et al., 2011), this study divided the individual corporate governance group into CS, managerial, institutional, and foreign investors. In addition, by considering various forms of board of directors and audit committee, we insist that corporations' different internal governance structure has an distinguished impact on firm environmental disclosure.

## **2.4. Corporate ownership structure**

### **2.4.1. CS ownership and managerial ownership**

Concentrated ownership is classified as an external shareholder who acts as a surveillant of top managers (Shleifer & Vishny, 1986). Under the COS, however, the CS is the main power that has a huge impact on both ownership and management, which in the agency theory it is generally viewed that the CS is in the same status as the top managers under the DOS who distort corporate governance based on their dominant control over management, depriving shareholders of their wealth. Thus, the CS indirectly dominates all the affiliated companies through the pyramid structure and is classified as an internal stakeholder that causes disparity between ownership and control in the agency problem (Bebchuk et al., 2000; Classens et al., 2000; Johnson et al., 2000; La Porta et al., 1999; Mitton, 2002). Unlike the agency problem in DOS where it occurs between

CEO and shareholders, the problem in COS is caused by the disparity between the CS and other shareholders (Baek et al., 2004; Classens et al., 2000; Joh, 2003).

Throughout several CSR literature, it has been argued that the CS who dominantly decides upon the organization's strategies is negatively associated with the corporations' social behavior (Chau & Gray, 2002; Ho & Wong, 2001). In such prior studies, the CS is regarded as a group that mainly focuses on the benefits of family ownership and affiliate ownership, while having little interest in public interests (Khan et al., 2013; Oh et al., 2011). Of course, the CS is sometimes regarded becoming more active in paying attention to public interests than any other shareholder groups when their behaviors are considered to have direct connection with their family reputation or likely to be criticized as moral laxity from the public (Adams et al., 1996; Dyer & Whetten, 2006; Kets de Vries, 1993; Post, 1993; Ward, 1987). However, in most general situations, the CS tends to be reluctant to engage in social issues unless their detachment from the issues is expected to incur public condemnation or to be classified as an unethical behaviour by the public (Khan et al., 2013; Lewis et al., 2014; Verrecchia, 1983, 1990). With regard to it, most of the prior research on voluntary disclosure and corporate governance-CSR argues that the CS is disinterested in and, by extension, avoids the unnecessary involvement in social issues (Khan et al., 2013; Oh et al., 2011).

In particular, compared to other social responsibility issues (e.g., accounting fraud, labor abuses of human rights, and the collusion between politics and business), environmental issues, especially climate change issues have more vague causal relationship with individual corporation's behaviour. Thus, we can interpret that the CS is less likely to perceive that such issues as distinct risk factor for their reputation (e.g. problematic search, Cyert & March, 1963). In light of the discussion so far, we can think that the CS has less motivation for voluntarily

disclosing environmental information that comes at the expense of thoroughly revealing corporate environmental activities to the public. Based on the discussion above, we propose the following hypothesis.

*Hypothesis 1a. In the family firm dominated economy, CS ownership is negatively associated with firm environmental disclosure.*

Under the COS, top managers act like a CS or an employee who is directly controlled by CS. Since important decisions made by managers mostly reflect interests of the CS, his own independent decisions are very limited in the process of strategic implementation (Classens et al., 2000; La Porta et al., 1999). It is clearly different situation compared to that of DOS where the managerial discretion is widely offered for the top managers. Focusing on such discretion given for top managers in the DOS, much previous literature on corporate social or environmental management has focused on various characteristics of managerial group (Delmas & Toffel, 2008; Hoffman, 2001; Lewis et al., 2014). However, managers under the COS hardly retain individual control and their identity tends to be weak. For instance, Samsung Electronics, the representative company of COS, is a subsidiary of Samsung Group and its CEO is presumably elected by the CS of Samsung family. Initiated by the chairman Lee Kun-Hee, the environmental strategy is adopted and conducted by most affiliates of Samsung group. Recently, green memory chip was released to the public and it was also a part of CS' unilateral decisions for the company to get involved in green industry. In light of this discussion, we expected that top managers who are strongly influenced by the CS will also have a negative relationship with firm environmental

disclosure since they strictly follow CS' decisions or tendency to avoid potential risks of revealing firm environmental information.

*Hypothesis 1b. In the family firm dominated economy, managerial ownership is negatively associated with firm environmental disclosure.*

#### **2.4.2. Institutional ownership and foreign ownership**

According to the main stream of environmental research, institutional investors have already played an important role in influencing a corporate environmental friendly behaviours and transparency. First, institutional investors tend to invest in firms who take the environmental responsibility on themselves (Gilson & Kraakman, 1991; Holderness & Sheehan, 1988; Pound, 1992; Smith, 1996). For example, Coffey & Fryxell (1991) found that institutional investors invest more in socially and environmentally responsible companies since the strong signal with ethical business practices may appeal to them who prefer long-term economic performance to a short-term one. Second, institutional investors regard a firm's proactive intention to solve environmental problems as a means of its sustainable development (Turban & Greening, 1997). Lastly, institutional investors act as a monitor in governance to encourage companies to supply environmentally-qualified products and they consider that such behaviours form their eco-friendly organizational identity (Johnson & Greening, 1999). Johnson & Greening (1999) argues that stakeholders including consumers tend to believe that a firm is clean and sound when the

percentage of institutional ownership is high, and the institutional investors also believe themselves that it is their responsibility and identity to make their company more environmentally responsible.

With these findings, we contend that institutional investors will probably perceive firm environmental disclosure as a means of strategic opportunity and the enhancement of their environmental legitimacy and identity. To test this, we therefore suggest the following hypothesis.

*Hypothesis 2a. In the family firm dominated economy, institutional ownership is positively associated with firm environmental disclosure.*

Foreign investors have played an important role in improving the governance structure of a firm that has hardly experienced oversea investments (Jeon et al., 2011; Yoshikawa et al., 2010). They are not only the major sources of new funds from outside of a firm compared to individual investments, but they also serve to monitor problems in which agents such as top managers are highly involved. Such role of foreign investors who already have accumulated knowledge related to corporate governance restructuring are distinct in certain emerging markets where the monitoring device for the CS is weakly rooted within an organization (Khanna & Palepu, 1999). For example, Gehrig (1993) found that, just like institutional investors, foreign investors tend to invest in firms where profitability is stable and accounting system is clean in order to minimize the investment risk caused by asymmetric information. Khanna & Palepu (1999) also observed that foreign investors invest in transparent companies where internal transactions are low when the companies are located in emerging markets like India. Drawing upon these studies, Oh et al. (2011) concluded that foreign investors unlike local investors have a definite preference for

soundness and transparency, which enables them to perform the role of surveillants.

Above discussions lead to the idea that, with similar reasons for shares of institutional investors, shares of foreign investors will be positively associated with the firm environmental disclosure, which is an active form of publicizing soundness of their organization. Through research on companies in Egypt, Soliman et al. (2012) revealed that foreign ownership has a significant effect on corporations' engagement in social activities. Kim et al. (2008) also asserted that, in terms of risk management, since foreign investors early recognized the importance of a firm's ability to react to non-financial issue such as climate change problem, a firm's decision on environmental management strategy could be adjusted by the shares of foreign investors.

*Hypothesis 2b. In the family firm dominated economy, foreign ownership is positively associated with firm environmental disclosure.*

## **2.5. Board composition**

### **2.5.1. Board Independence: the proportion of outside directors in the board**

As to board composition, we mainly consider the existence of independent outside directors and audit committee that are considered to have a distinct correlation with corporations' CSR activities and refer to board independence and the independence of board committee respectively (Abbott & Parker, 2000; Khan et al., 2013; Zhang, 2008). Especially in the corporate governance

structure where much ownership is concentrated on family-oriented owners so that the existence of surveillants is highly demanded, such independent bodies and members are believed to have a significant influence on business ethics or CSR strategies (Fama & Jensen, 1983; Garcia-Meca & Sánchez-Ballesta, 2010; Khan et al., 2013).

From the perspective of agency theory, many scholars suggest that outside directors in the board function as a reliable mechanism to prevent dominant owners' or managers' dictatorial and unethical behaviours, and diffuse agency conflicts between owners and managers<sup>2</sup> (Ben-Amar & McIlkenny, 2015; Fama & Jensen, 1983; Khan et al., 2013). Fama & Jensen (1983) argue that the existence of independent outside directors in the board reinforces the effectiveness of entire corporate governance mechanism and helps to protect various stakeholders' interests. In this vein, prior research on voluntary disclosure and CSR has documented that outside directors have incentives to establish a reputation as professional and ethical monitors who encourage inside directors or managers to actively engage in social behaviors and release non-financial information to the public (Jo & Harjoto, 2012; Khan et al., 2013). With regard to it, Patelli & Prencipe (2007) argue that by voluntarily releasing non-financial information to the external world, outside directors tend to strengthen their image as professional surveillants of inside directors or managers. This is consistent with the result of Garcia-Meca & Sánchez-Ballesta (2010)'s meta-analysis research that suggests that independent directors' presence on the board enhances transparency and soundness of the firm. Khan et al.(2013) also argue that corporations tend to be more active in CSR disclosures and activities when outside directors exist in the board.

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<sup>2</sup> In the context of COS, such agency conflicts generally take place between CS and other small shareholder groups.

Here, we contend that outside directors play an important role in encouraging firm to actively respond to environmental issues in order to reinforce their social reputation as reliable monitors of the firm (Fama & Jensen, 1983). Prior research on corporate governance and CSR suggests that outside directors' existence refers to the level of board independence of the firm, and the board independence has been usually measured in terms of the proportion of outside directors in the board (Ben-Amar & McIlkenny, 2015; Chen et al., 2008; Garcia-Meca & Sánchez-Ballesta, 2010; Khan et al., 2013). Consistent with it, therefore, we assume that the proportion of outside directors in the board, or the board independence is positively associated with firm's responding to requests to disclose environmental information.

*Hypothesis 3. In the family firm dominated economy, the proportion of outside directors in the board is positively associated with firm environmental disclosure.*

### **2.5.2. Independence of board committee: Independent audit committee**

As much attention has been received on corporations' social responsibility and business justice from the academia, the role of the independent audit committee is also increasingly emphasized in business strategy arena (Abbott & Parker, 2000; Yatim, 2009; Zaman & Sarens, 2013). Abbott & Parker (2000) and Zhang (2008) indicate that the existence of independent audit committees implies the independent level of board committee and such independence reduces information assymetry among management, board, and various stakeholders of the firm.

Also, the existence of independent audit committee is recognized as an important role in the governance process and strengthening the linkage between companies and the society (Khan et al., 2013; Zaman & Sarens, 2013). Prior literature suggests that the audit committee has not only a right for overseeing accounting processes but also for controlling over the entire governance structure and the whole management by inspecting and reporting corporations' financial and non-financial information to the public (Abbott & Parker, 2000; Beasley, Carcello, Hermanson, & Neal, 2009; Yatim, 2009; Zaman & Sarens, 2013; Zhang, 2008). From the perspective of agency theory, the role of the audit committee is considered to be an independent monitor of management, or described as a reliable guardian of the public interest (Beasley et al., 2009; Fama & Jensen, 1983; Zaman & Sarens, 2013).

In our research, we insist that the existence of independent audit committee has a positive impact on firm environmental disclosure. We assume that compared to internal audit function whose discretion is strongly confined by CS, independent body of audit committee is more likely to disclose environmental information in order to fulfill the public expectation to ensure public interests (Abbott & Parker, 2000; Beasley et al., 2009; Yatim, 2009; Zaman & Sarens, 2013; Zhang, 2008). Thus, we suggest the following hypothesis.

*Hypothesis 4a. In the family firm dominated economy, the existence independent audit committee is positively associated with firm environmental disclosure.*

As opposed to the perspective of agency theory, institutional theorists argue that the existence of audit committee itself has nothing to do with corporations' actual social performance (Beasley et al., 2009; Cohen et al., 2007). They have often considered the role of the audit committees is

ceremonial, only focusing on providing symbolic legitimacy to the firm. Actually in many family firm dominated economies, even though the establishment of the audit committee is required based on firm size, there is lack of relevant regulations on member composition of the audit committee which can significantly determine the actual independence of the board committee (Abbott & Parker, 2000; Fama & Jensen, 1983; Khan et al., 2013). In Korea, for example, under the commercial law, companies should set up an independent audit committee comprising of at least three members of the board including at least two independent directors when the total sales of the firm exceeds two trillion won, or about 20 billion U.S. dollars (See Korean commercial law clause 542-11 in 2012). Under such circumstance in COS where CS can fill family or affiliated members in the remaining seats in the audit committee, we might not affirm that the existence of audit committee itself guarantee the actual independence of the board committee. Instead of focusing only on the existence of audit committee, we additionally assume that the existence of independent audit committee is positively linked with firm environmental disclosure especially when all members in the committee are composed of outside directors. Abbott & Parker (2000) recommend that we also concentrate on the characteristics of audit committees including the member composition in the committee, not only on the existence itself, in order to analyze appropriate effect of audit committee. Also, Menon & Williams (1994) argue that the audit committees are more eager to actively satisfying public interest and acting as a monitor of management when there is no room to be intervened by inside directors in audit committee's decision making process. Therefore, we predict that the existence of audit committee will have a positive effect on firm environmental disclosure especially when all the members in the committee are outside directors.

*Hypothesis 4b. For firms establishing an independent audit committee, the existence of audit committee is positively associated with firm environmental disclosure if the committee is only composed of outside directors.*

### **3. METHODS**

#### **3.1. Sample and Data collection**

In this study, our main research interest is to investigate the relationship between corporate governance mechanism and firm environmental disclosure in the family firm dominated economy. To test the effect of corporate governance, we adopt the logistic regression model estimation with data of 241 Korean firms in 2013, which are subject companies being asked to voluntarily engage in Carbon Disclosure Project (CDP). Among the total 250 subject companies of CDP, we exclude 9 companies due to missing or incomplete information.

In terms of corporate governance, Korean companies are the exemplars of the COS. After 1976 when the Korean government began trading stocks in the market, it controlled over the CS of conglomerates called “Chaebol.” Due to the heterogeneity of a legal system and an economic environment, the corporate governance structure of Korean firms widely differ from the one of firms in developed countries such as America, Japan, and Germany. The corporate governance of Korean firms can be viewed as a ruling system owned by the owner-manager. Most of Korean conglomerates are directly or indirectly controlled by the owner-manager who owns 30 to 40 percent of a firm. Thus, the corporate governance of Korean companies shows pyramidal

ownership structure, reciprocal shareholding between affiliated companies, and tunneling in between affiliates, which are the common characteristics that firms with COS have demonstrated in family firm dominated economy (Classens et al., 2000).

Data sources are as follows. The information about a firm environmental disclosure was obtained from Korea Sustainability Investing Forum (KSIF, <http://www.kosif.org>), which is a local partner of CDP in Korea, dealing with Korean companies' engagement in CDP's request to disclose information on corporate environmental strategies. Established in 2002, CDP is a U.K. based non-profit organization that works with global institutional investors to persuade large corporations to annually disclose information on environmental strategies for greenhouse gas (GHG) emissions (Lewis et al., 2014; Reid & Toffel, 2009). As an independent branch, KSIF has reported the result of Korean largest companies' engagement in CDP request from 2008 annually, and the number of subject companies has increased from 50 in 2008 to 250 in 2013. As of 2013, including head office of CDP in London, there are more than 60 local partners of CDP and over the number of 5,000 firms are subject to respond to CDP's request for disclosing environmental information.

We acquired corporate financial data for our control variables from KIS-VALUE data base offered by Korea Investor's Service and from TS2000 established by Korea Listed Companies Association (KLCA). In collecting information about corporate governance, each ownership and board composition data was obtained from KIS-VALUE, TS2000, and Korea Financial Supervisory Service DART.

## **3.2. Measures**

### **3.2.1. Independent variable**

The independent variables in this study contain information on ownership structure and board composition of companies. In terms of ownership, *CS ownership* (CSO) is the sum of the biggest shareholder's ownership and family or affiliate ownership while *managerial ownership* (MO) and *foreign ownership* (FO) is the sum of top managers' stock holding ratio and percentage of shares taken by foreigners, respectively. *Institutional ownership* (IO) includes securities company ownership, insurance company and bank ownership.

In the case of variables for board composition, first, we see *the proportion of outside directors in the board* (POD) in order to indirectly measure the level of board independence of the firm (Ben-Amar & McIlkenny, 2015; Chen et al., 2008; Garcia-Meca & Sánchez-Ballesta, 2010; Khan et al., 2013). *The existence of independent audit committee* (IAC) was a binary variable coded '1' if a firm has an independent audit committee. Lastly, in order to measure the effect of *member composition of the audit committee* (MCAC), we coded '1' if the audit committee is only composed of outside directors, and '0' if there is an inside director in the committee (Abbott & Parker, 2000; Menon & Williams, 1994).

### **3.2.2. Dependent variable**

Our analysis focuses on corporations' different strategic response to environmental issues, which we measure by observing corporations' acquiesce to the request from the CDP to disclose climate change information. In 2013, from the head office of CDP and through the KSIF, 250 largest Korean companies (in terms of market capitalization) were asked to complete a questionnaire including questions on corporate governance, climate change strategy, reduction targets and current status of GHG emissions, and the potential risks and opportunities to the firm posed by climate change issue<sup>3</sup>. The result of the survey is stored in and posted on CDP database, and provided to thousands of institutional shareholders across the world informing as to whether each company has responded to the questionnaire or declined to do so (Reid & Toffel, 2009). In evaluating CDP, Reid & Toffel (2009) states that it is the largest repository of corporate GHG emissions data in the world. Consistent with previous research, our dependent variable, *CDP* is a binary variable coded '1' if firms answered the CDP questionnaire and '0' otherwise (Lewis et al., 2014; Reid & Toffel, 2009).

### **3.2.3. Control variables**

To clearly examine the relationship between corporate governance mechanism and firm environmental disclosure, we controlled for the factors that could affect corporations' environmental disclosure. Including variables that have been believed to be related to disclosure,

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<sup>3</sup> For further information on questionnaire in 2013, refer to website, <https://www.cdp.net/en-US/Programmes/Pages/More-questionnaires.aspx#2013>

such as *firm size* (FSIZE), *leverage* (LEV), *firm age* (FAGE), *return on assets* (ROA) and *industry sector* (IND) (Khan et al., 2013), we also additionally consider “*Target* (TARGET)” and “*Chaebol* (CHAEBOL)” as our control variables. In this research, *Target* refers as to whether corporations are designated as a managed object of a governmental regulation, “Target Scheme” which requires companies to reduce the amount of GHG emissions. Corporations’ social behaviours or voluntary actions are believed to be significantly influenced by the stringency of the institutional regulatory environment (Lewis et al., 2014; Reid & Toffel, 2009), and the Target Scheme is one of the few regulations directly regulating GHG emissions of Korean firms. Referring to 2012-135 notified by The Korea Ministry of Knowledge Economy in 2012, *Target* was coded as ‘1’ if firms were the managed objects of Target Scheme, and ‘0’ otherwise. Similarly, in terms of *Chaebol*, which we here observe a governmental restriction on mutual investment of conglomerates in Korea, we try to control for the influence institutional regulatory environment on corporate decisions on social behaviour<sup>4</sup>. Even though it is not directly related with climate change issue, such a strong regulation on as to large companies’ business ethics makes corporations to be more eager to ensuring social reputation (Chang, 1996, 2003; Lewis et al., 2014; Reid & Toffel, 2009). We named our control variable Chaebol and coded as ‘1’ if firms are the target companies of governmental restriction on mutual investment with other group-affiliated firms and ‘0’ otherwise.

With regard to rest of other control variables, we controlled for the *firm size* as natural logarithm of total assets in order to capture the tendency of large firms to disclose voluntary

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<sup>4</sup> In Korea, mutual investment of group-affiliated companies whose financial capitalization exceeds 5trillion won (about 50 billion U.S. dollars) is strictly restricted by the commercial law, in order to secure business ethics and justice in the industry

information more than small firms (Lewis et al., 2014; Reid & Toffel, 2009). Following prior research, we also controlled for *leverage*, since companies with high debt ratio are believed to have a tendency to disclose social responsibility information to the public (Khan et al., 2013; Purushothaman et al., 2000). *Leverage* variable is measured as the ratio of total debt to total assets. Also consistent with prior research, we controlled for *return on assets*, *firm age*, and *industry sector* that are considered to affect corporate social behaviour and voluntary disclosure. Firm age is measured as the number of years that the firm has been in operation. In terms of industry sector, we used the firm's two-digit Korea standard industrial classification (KSIC).

### 3.3. Estimation method

We tested our hypotheses using logistic regression model and estimated the likelihood that a firm would engage in CDP. The following equation is used to test our hypotheses:

$$P(\text{CDP}_{ijt} = 1) = F(\beta_0 + \mathbf{X}_{ijt}\beta_i + \varepsilon_i)$$

Where  $i$  represents firms,  $j$  represents industry  $j$ ,  $t$  represents year, and  $\text{CDP}_{ijt}$  is the dependent variable.  $X$  is a set of explanatory variables including control and independent variables that are supposed to have a bearing on firm environmental disclosure. Due to the time-lag effect, we take

time series analysis method by observing one-year lagged data of our control variables, while using current year data of corporate governance. To see the effect of member composition of the audit committee on firm environmental disclosure, related to our explanatory variable in hypothesis 4b, we conduct a separate analysis only targeting 159 firms with an independent audit committee among 241 firms of our sample firms.

#### **4. RESULTS**

<Table 1> reports the means, standard deviations and correlation coefficients between the dependent, independent, and control variables. Among 241 firms, 91 firms responded to CDP request to disclose corporate environmental information (about 38%). The average ownership of CS, managerial, foreign and institutional ownership is 39.4, 0.08, 19.5, and 5.9% respectively. The average ratio of outside directors in the board is 53.5%, while the number of firms having an independent audit committee is 159 (about 66%). Among 159 firms with an independent audit committee, 140 firms have the audit committee with all of the committee members are outside directors (about 88%). Most of the correlations between the variables were significant at the  $p < 0.05$  level. All correlations are well below the commonly used cut-off threshold of 0.7, and all value of variance inflation factor (VIF) is ranged from 1.04 at minimum to 2.24 at maximum. As Hair et al. (1995) suggested, there was no multicollinearity problem since cut-off was below 10.

Insert <Table 1> about here

Using logistic regression model, we test our hypotheses and report the coefficient estimates for the independent and control variables. We interpret the magnitude of our coefficient estimates using odds ratios and marginal effects. More detailed results for each model appear in <Table 2> and <Table 3>.

Insert <Table 2> and <Table 3> about here

<Table 2> shows the test results of our hypotheses 1a through 4a, which considers the total sample size (241 firms) of our research within its analysis. In <Table 2>, Model 1 includes the relationship between our control variables and dependent variable, *CDP*, showing that *firm size*, *leverage*, and *target* are positively significant in corporations' response to request for environmental disclosure. In hypothesis 1a and 1b, we suggested that an increase in CS ownership and managerial ownership leads to a decrease in the probability of firm response to request for disclosing environmental information. According to Model 2 which shows such relationships, the coefficient estimate for CS ownership is -1.405 ( $p < 0.001$ ), indicating that hypothesis 1a is clearly supported. More specifically, following prior research and recommendations by Dobson (2002), we explain our results using odds ratio (Zhang et al., 2013). In terms of CS ownership, our results suggest that a 5% increase in the CS ownership decreases the odds ratio (the probability of a firm to respond to CDP/the probability of a firm not to respond to CDP) by approximately 7% ( $\exp(-1.405 * 5\%) - 1 = -0.07$ ). To put it differently in terms of

marginal effect, when all the variables are held at their sample mean levels, a 5% increase in the CS ownership leads to a -1.1% decrease in the probability that this firm disclose environmental information. In terms of managerial ownership, however, we could not find statistical significance which indicates that hypothesis 1b is not supported.

Hypothesis 2a and 2b were to examine whether institutional ownership and foreign ownership are positively associated with firm environmental disclosure respectively. According to model 3 including both relationships, the coefficient estimates for institutional ownership and foreign ownership are 1.039 ( $p < 0.01$ ) and 1.538 ( $p < 0.001$ ) respectively. These results offer statistically significant evidence that greater presence of institutional ownership and foreign ownership in ownership structure is connected with more active firm environmental disclosure. These results also suggest that a 5% increase in institutional ownership increases the odds ratio by approximately 5% ( $\exp(1.039 * 5\%) - 1 = 0.05$ ), while a 5% increase in foreign ownership increases the odds ratio by approximately 8% ( $\exp(1.538 * 0.05) - 1 = 0.08$ ). Setting all other variables at their means, a 5% increase in the institutional ownership leads to 0.4% increase in the probability of firm environmental disclosure. Similarly, a 5% increase in the foreign ownership leads to a 0.7% increase in the probability of this firm response to request for CDP. Hypothesis 2a and 2b are clearly supported.

In hypothesis 3, we suggested that the proportion of outside directors in the board is positively related with firm environmental disclosure. According to Model 4, the coefficient estimate for the proportion of outside directors in the board is 0.929 ( $p < 0.05$ ), indicating that hypothesis 3 is supported. Also in terms of odds ratio, our results suggest that a 5% increase in the proportion of outside directors in the board increases the odds ratio by approximately 5% ( $\exp(0.929 * 5\%) - 1 = 0.05$ ). In terms of marginal effect, it can be differently explained that a 5%

increase in the proportion of outside directors in the board leads to a 1.9% increase in the probability of firm environmental disclosure. Hypothesis 4a was to examine the relationship between the existence of audit committee and firm environmental disclosure. With regard to it, Model 5 indicates that the existence of audit committee is not statistically significant in corporations' response to request for environmental disclosure. Thus, hypothesis 4a is not supported. In Model 6 (Full model in our main analysis) that simultaneously examines the effects of our explanatory variables on dependent variable, institutional ownership, foreign ownership and the proportion of outside directors in the board were positively associated with firm environmental disclosure at the significant level,  $p < 0.01$ ,  $p < 0.05$ , and  $p < 0.05$  respectively, while the CS ownership had a negative effect on firm environmental disclosure ( $p < 0.05$ ). It still confirms hypothesis 1a, 2a, 2b and hypothesis 3. However, the effect of managerial ownership (hypothesis 1a) and the existence of audit committee (hypothesis 4a) were still not significant in Model 6.

In <Table 3> for the test of the hypothesis 4b, we only consider the firms with independent audit committee (159 firms) within its analysis. Hypothesis 4b suggests that member composition in the audit committee influences firm environmental disclosure. Before the test, we divided audit committee into dichotomous groups depending on as to whether the committee is only composed of outside directors or not, in order to capture the true sense of independence of board committee from the inside directors. As a result of our separate analysis on 159 firms having an independent audit committee (Model 8), audit committees only composed of outside directors increased the odds that firms would disclose environmental information by a factor of 2.89 ( $\exp(1.058)$ ,  $p < 0.05$ ). This means that setting all other variables to their means, firms whose independent audit committee is only composed of outside directors had a 51% probability of

acquiescing to CDP request, versus 26% for firms whose independent audit committee includes inside directors. In other words, the probability of acquiescing to CDP request is 25% higher when the independent audit committee is only composed of outside directors. Thus, hypothesis 4b is supported.

## **5. DISCUSSION**

In this research, we insist that corporations' responses to environmental issues vary with the characteristics of corporate governance structure. For this purpose, we examined the relationship between corporate governance mechanism and firm environmental disclosure in the family firm dominated economy. Throughout our test result, we could identify that under the COS, the foreign and institutional investors and the outside directors play an important role in encouraging firms to actively engage in firm environmental disclosure, while CS ownership has a negative impact on the disclosure. This implies that each corporate governance group has different motivations for engaging in social issues and different level of demand for organizational reputation from such activities.

To be more specific on ownership structure, we could first observe a negative association between CS ownership and firm environmental disclosure. Here, we interpret that CS has less motivation for voluntarily disclosing environmental information that comes at the expense of thoroughly revealing corporate environmental activities to the public. Throughout previous research, it is believed that CS tends to avoid being involved in social issues unless their

detachment from the issues is expected to incur public condemnation (Khan et al., 2013; Lewis et al., 2014; Verrecchia, 1983, 1990). In light of the result of prior research and our empirical analysis, CS is highly expected to perceive that the involvement in such voluntary programs has little to do with their social reputation.

On the other hand, we could find that foreign and institutional ownership has a positive influence on corporations' response to request for disclosing environmental information. We expect that they put high value on public interest and constructing ethical or eco-friendly images by actively participating in voluntary environmental programs. In addition, from the perspective of agency theory, we can also judge that they try to reinforce their organizational identity as a surveillant of CS by underscoring corporations' social behaviours in which the CS are not much interested. The result is in the same vein with the study of Coffey & Fryxell (1991), Oh et al. (2011) who argued that foreign- and institutional investor's role of surveillant have a positive influence on corporate social activities and performance as well. However, we could not see statistical significance in hypothesis 1a related to managerial ownership. With regard to it, we interpret that most firms which have COS as a governance structure, managers do not have a distinguished role in corporations' environmental activities in that they are strongly controlled by CS' policy and have little discretion on engaging in voluntary environmental programs.

In terms of board composition, we examined the proportion of outside directors in the board and the existence of audit committee throughout our main analysis. In another set of analysis, we separately investigated the effect of independent audit committee on firm environmental disclosure by additionally considering the member composition of the committee. From these analyses, we tried to find how the independence of board and board committee affects firm environmental disclosure.

As a result of our analyses, we found that outside directors play an important role in corporations' environmental activities by acting in both board and board committee. This result is consistent with the result of prior CSR research, such as that of Garcia-Meca & Sánchez-Ballesta (2010) and Khan et al. (2013) which indicate that the existence and high proportion of outside directors in the board composition have positive impact on corporations' CSR disclosure. In this research, we suggest that outside directors play an important role in corporations' environmental activities in that they recognize such behaviours would enhance their social reputation as a "guardian of public interest" (Beasley et al., 2009; Fama & Jensen, 1983; Zaman & Sarens, 2013).

However, we could not observe statistical significance in the effect of existence of independent audit committee itself on firm environmental disclosure. On the one hand, this supports the institutional theorists' perspective that the existence of independent board committee itself is nothing more than providing symbolic legitimacy to the firm. However, by observing the member composition of audit committee, we could see the positive impact of independence board committee on firm environmental disclosure when all committee members are composed of outside directors. This implies that the true sense of the independence of board committee depends on the member composition of the committee that can block the inside directors' intervention in the decision making process of the committee. The result of our analysis supports the viewpoint of Abbott & Parker (2000) that suggests that we should focus not only on the existence of board committee, but also on its characteristics in order to rightfully see the true function of board committee.

## **6. CONCLUSION**

Our findings provide theoretical and practical implications and propose a new perspective of environmental issue that future studies can take as a useful reference. First, and most importantly, this study contributes to enriching the institutional theory in the environmental management research. Existing environmental policy and management research has highlighted the unilateral influence of institutional pressure on corporate environmental strategies, regarding that corporations would make the same strategic choices when facing common sets of institutional pressures (Chen et al., 2008; Deegan et al., 2002; Rahaman et al., 2004; Reid & Toffel, 2009). In our efforts to unravel the relationship between corporate governance mechanism and different corporate responses to environmental issues, we identify specific corporate strategic responses on environmental regulatory pressure and contribute to diversity of institutional perspective on environmental research. Second, by considering entire corporate governance mechanism in a consolidated analysis framework, we provide a broader and well-balanced perspective for those who research on corporate governance-environmental management. In most previous environmental research, scholarly interest has been highly focused on certain subgroup's role, such as that of CEOs or managerial groups, who are believed to be the main agent who independently implements corporate environmental strategies under the DOS. Unlike previous research, however, we consider ownership structure and board composition as a whole, and examine the effect of corporate governance mechanism on firm responses to an environmental issue. Walls et al.(2012) argue that environmental researchers should comprehensively consider the entire corporate governance structure in a single consolidated analysis, since ownership, board of directors, and management do not work in isolation but closely interrelated with each other in their own corporate governance mechanism. Our research strongly supports this

perspective. Lastly, our study particularly focused on the COS that has intrinsic mechanism mostly found in family firm dominated economies. We found that foreign and institutional investors in the corporate ownership structure and outside directors in the board composition are positively associated with firm environmental disclosure. This can give meaningful implications for environmental policy makers, especially in the family firm dominated economies, to design the most effective corporate environmental programs and develop effective regulations on corporate environmental governance.

In spite of these contributions, our study has several limitations. First, in our efforts to explain corporations' distinct responses to environmental issues, we confine institutional pressure to corporations' responses to CDP, a specific type of environmental programs. We acknowledge that each subgroup of corporate governance has different level of demand for organizational legitimacy, depending on the characteristics of each program and regulation. For example, under the COS, CS is regarded as not only a group that has low level of interest in public issues, but also becomes highly sensitive to social issues if they recognize such issues as threatening factors for their social reputation (Adams et al., 1996; Dyer & Whetten, 2006; Kets de Vries, 1993; Post, 1993; Ward, 1987). Even though we could identify here that CS is not interested in participating in CDP, they might show high level of activeness in engaging in environmental programs if such issues are receiving substantial attention from the public. At this point, we might be able to only suggest that CS perceives that the potential costs of engagement in CDP override that of potential benefits in the status quo. In order to add more confidence to the result of our research, it is necessary in future research to select other sets of environmental programs or regulations, and investigate the relationship between corporate governance and responses to such different institutional pressures.

In addition, our analysis cannot still fully explain the role of corporate governance mechanism in corporations' actual contribution to sustainable development. Our research restrictedly focuses on corporations' response to request for firm environmental disclosure, but not on actual corporate environmental performance. Even though we here claim that the surveillant role of foreign and institutional investors, and outside directors encourages firms to be more active in environmental programs, they may not have positive relationship with the actual improvement of corporate environmental performance. By defining the term "Greenwashing effect" as corporations' deceptive environmental management practices, some scholars warn that researchers avoid hastily forming a direct interpretation corporations' activeness in environmental issue as their actual contributions to sustainable development (Delmas & Burbano, 2011; Roulet & Touboul, 2014). In this vein and to extend our research, it is necessary in future research to investigate the relationship between corporate governance mechanism and corporate actual environmental performance.

In this study, we attempted to provide a comprehensive understanding of corporate governance that could enhance corporations' participation in environmental programs and regulations. In closing, future research needs to extend the context of our study by considering various factors for corporations' different environmental strategies and responses to institutional pressures. Since environmental management research requires multilateral analysis like other management studies (Walls et al., 2012), more specific and multifaceted approach will be needed in the future.

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<TABLE 1>

Descriptive statistics (N=241)

	Mean	S.D.	Min	Max	CDP	LEV	ROA	FSIZE	FAGE	TARGET	CHAEBOL	CSO	MO	IO	FO	POD	IAC
CDP	0.378	0.486	0	1	1												
LEV	0.464	0.253	0.017	1.908	0.279*	1											
ROA	0.055	0.225	-0.284	3.364	0.032	-0.222*	1										
FSIZE	28.348	1.722	22.717	32.882	0.488*	0.344*	-0.09	1									
FAGE	37.602	19.173	2	114	0.257*	0.118	0.052	0.421*	1								
TARGET	0.456	0.499	0	1	0.369*	0.041	-0.084	0.303*	0.286*	1							
CHAEBOL	0.539	0.499	0	1	0.256*	0.186*	0.02	0.433*	0.197*	0.312*	1						
CSO	39.361	17.294	0	87.43	-0.207*	-0.02	0.119	-0.068	-0.004	0.02	0.125	1					
MO	0.084	0.187	0	1.31	-0.047	0.107	-0.065	-0.038	-0.048	-0.091	-0.067	-0.037	1				
IO	5.888	8.741	0	42.64	0.159*	0.053	-0.048	0.075	-0.013	0.002	-0.034	-0.015	0.039	1			
FO	19.453	15.957	0	76.56	0.261*	-0.174*	-0.006	0.291*	0.065	0.088	0.017	-0.37*	-0.046	0.101	1		
POD	0.535	0.139	0	0.889	0.177*	-0.033	-0.041	0.146*	-0.064	0.057	0.142*	-0.063	-0.097	-0.089	0.187*	1	
IAC	0.66	0.475	0	1	0.288*	0.254*	-0.022	0.561*	0.232*	0.148*	0.478*	-0.057	-0.07	0.025	0.252*	0.123	1

Note: **CDP** dummy variable equals 1 if a firm respond to CDP's request to disclose climate change information, **LEV** ratio of total debt to total assets, **ROA** return on assets, **FSIZE** natural logarithm of total assets, **FAGE** the number of years since the firm's inception **TARGET** dummy variable equals 1 if a firm is designated to obligatorily reduce the amount GHG emissions by the government, **CHAEBOL** dummy variable equals 1 if a firm is the target company of governmental restriction on mutual investment with other group-affiliated firms, **CSO** percentage of shares owned by controlling shareholders, **MO** percentage of shares owned by managerial group, **IO** percentage of shares owned by institutional investors, **FO** percentage of shares owned by foreign investors, **POD** proportion of outside directors in the board, **IAC** dummy variable equals 1 if a firm has an independent audit committee  
All control variables are lagged one year, while current year data is used for independent variables.

\*  $p < 0.05$

&lt;TABLE 2&gt;

**Results of logistic regression - firm environmental disclosure (Main analysis, N=241)**

Model	(1)	(2)	(3)	(4)	(5)	(6)
Variables	CDP	CDP	CDP	CDP	CDP	CDP
IND	Yes	Yes	Yes	Yes	Yes	Yes
LEV	0.964* (2.053)	1.120* (2.276)	1.825** (3.190)	1.027* (2.216)	0.962* (2.072)	1.888** (3.085)
ROA	1.037 (0.845)	1.105 (1.005)	0.977 (1.070)	0.888 (1.091)	0.997 (0.875)	1.093+ (1.887)
FSIZE	2.143*** (3.753)	1.904*** (3.380)	1.450* (2.512)	1.984*** (3.502)	2.330*** (3.519)	1.767** (2.585)
FAGE	0.075 (0.184)	0.066 (0.161)	0.356 (0.850)	0.271 (0.635)	0.067 (0.165)	0.493 (1.112)
TARGET	1.932*** (3.730)	2.079*** (3.887)	2.273*** (4.080)	1.863*** (3.689)	1.945*** (3.726)	2.409*** (4.105)
CHAEBOL	0.042 (0.098)	0.222 (0.503)	0.235 (0.521)	-0.040 (-0.093)	0.129 (0.289)	0.516 (1.025)
CSO		-1.405*** (-3.503)				-1.116* (-2.465)
MO		-0.066 (-0.163)				-0.459 (-0.852)
IO			1.039** (2.729)			1.257** (3.134)
FO			1.538*** (3.316)			1.243* (2.443)
POD				0.929* (2.412)		1.062* (2.560)
IAC					-0.315 (-0.608)	-0.882 (-1.516)
Observations	241	241	241	241	241	241
df_m	13	15	15	14	14	19
ll_0	-159.8	-159.8	-159.8	-159.8	-159.8	-159.8
Ll	-107.4	-100.5	-96.90	-104.3	-107.2	-88.74
chi2	104.7	118.4	125.7	110.8	105.1	142.0

Note: Standardized beta coefficients; *t* statistics in parentheses

Models show the test results of our hypotheses 1a through 4a, which consider the total sample size (241 firms) of our research.

**CDP** dummy variable equals 1 if a firm respond to CDP's request to disclose climate change information, **LEV** ratio of total debt to total assets, **ROA** return on assets, **FSIZE** natural logarithm of total assets, **FAGE** the number of years since the firm's inception **TARGET** dummy variable equals 1 if a firm is designated to obligatorily reduce the amount GHG emissions by the government, **CHAEBOL** dummy variable equals 1 if a firm is the target company of governmental restriction on mutual investment with other group-affiliated firms, **CSO** percentage of shares owned by controlling shareholders, **MO** percentage of shares owned by managerial group, **IO** percentage of shares owned by institutional investors, **FO** percentage of shares owned by foreign investors, **POD** proportion of outside directors in the board, **IAC** dummy variable equals 1 if a firm has an independent audit committee

All models include industry effects.

+  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

**<TABLE 3>**  
**Results of logistic regression - firm environmental disclosure**  
**(Separate analysis for firms with an independent audit committee, N=159)**

	(7)	(8)
	CDP	CDP
IND	Yes	Yes
LEV	1.059 <sup>+</sup> (1.790)	1.342 <sup>*</sup> (2.126)
ROA	4.752 <sup>+</sup> (1.883)	5.182 <sup>*</sup> (2.047)
FSIZE	2.121 <sup>**</sup> (3.263)	2.116 <sup>**</sup> (3.189)
FAGE	0.041 (0.087)	-0.028 (-0.058)
TARGET	2.120 <sup>***</sup> (3.374)	2.067 <sup>**</sup> (3.248)
CHAEBOL	0.260 (0.508)	0.234 (0.432)
MCAC		1.058 <sup>*</sup> (1.994)
Observations	159	159
df_m	13	14
ll_0	-110.1	-110.1
Ll	-71.97	-69.83
chi2	76.17	80.45

Note: Standardized beta coefficients; *t* statistics in parentheses

Models only consider the firms with an independent audit committee (159 firms).

**CDP** dummy variable equals 1 if a firm respond to CDP's request to disclose climate change information, **LEV** ratio of total debt to total assets, **ROA** return on assets, **FSIZE** natural logarithm of total assets, **FAGE** the number of years since the firm's inception **TARGET** dummy variable equals 1 if a firm is designated to obligatorily reduce the amount GHG emissions by the government, **CHAEBOL** dummy variable equals 1 if a firm is the target company of governmental restriction on mutual investment with other group-affiliated firms, **MCAC** dummy variable equals 1 if the audit committee is only composed of outside directors

All models include industry effects.

<sup>+</sup>  $p < 0.1$ , <sup>\*</sup>  $p < 0.05$ , <sup>\*\*</sup>  $p < 0.01$ , <sup>\*\*\*</sup>  $p < 0.001$

## 국문 초록

제도화 이론에 기초하여 많은 환경 경영 연구는 공동의 제도적 압력에 대해 기업이 동일한 전략적 선택을 보일 것이라 주장해왔다. 본 연구에서는 환경적 규제에 대한 기업의 반응이 지배구조 메커니즘에 따라 서로 다른 전략을 보일 것이라 간주한다. 기후 변화 문제에 대한 기업의 자발적 행동 방안의 한가지로서의 자발적 환경 정보 공시에 초점을 맞추어, 우리는 특히 가족 기업 문화가 지배적인 경제 내에서, 기업의 소유 구조와 이사회 구성이 기업의 환경 경영 전략에 어떠한 영향을 미치는지 분석한다. 241개의 한국 기업 샘플을 기반으로 로지스틱 회귀 분석을 시행한 결과, 우리는 집중 소유 구조 (Concentrated Ownership Structure) 하에서 외국인 투자자와 기관 투자자, 그리고 이사회 내의 사외 이사 비율이 기업의 환경 정보 공시에 긍정적인 영향을, 반면 지배주주 지분율은 부정적인 영향을 미친다는 점을 발견하였다. 기후 변화를 비롯한 환경 문제 해결에 기업의 적극적 참여가 강조되고 있는 현 상황에서 본 연구는 경영학 이론에 대한 공헌, 실천적 함의와 더불어 환경정책 입안자의 효율적 규제 구상에 공헌한다.

**키워드:** 환경경영; 자발적 환경경영 정보 공시; 탄소정보공개 프로젝트 (Carbon Disclosure Project, CDP); 기업 지배구조

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