How Firms Respond to Growing Environmental Concerns? The Choice of CSR and Long-Term Performance

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Corporate managers have used CSR to offset corporate social irresponsibility. However, few studies have investigated whether firms solve their irresponsibility issues directly. Moreover, CSR research has lumped together all kinds of social behaviors under "CSR." This paper examines whether firms confront their negative environmental issues and try to solve them through CSR. To this end, we classify the CSR that firms can choose after environmental irresponsibility into three types: (i) direct CSR, which is environment-related CSR; (ii) indirect CSR, which is irrelevant to environmental concerns; and (iii) no CSR. In addition, we investigate whether firms trying to alleviate environmental concerns through environmental CSR enjoy higher long-term profitability. The study results show that the more firms suffered from environmental concerns, the more they preferred environment-related CSR over all other types. This preference became stronger when the degree of related diversification increased and weaker when the degree of unrelated diversification increased. Finally, we find that firms that implement direct CSR or directly address negative environmental concerns through environmental CSR will enjoy higher future profitability than will firms that implement indirect CSR and disregard environmental concerns.

Key words: CSR, environmental concern, diversification, long-term profitability

I. Introduction

Corporate social responsibility (CSR) has received much attention over the past decades, from both scholars and managers. Researchers have extensively investigated the motives for and consequences of CSR (Hart, 1995; Lee & Byun, 2016; Orlitzky, Schmidt, & Rynes, 2003; Surroca, Tribo, & Waddock, 2010; Wood, 1991).

While CSR is gaining increasing attention, the strategy management literature has paid relatively little attention to corporate social irresponsibility (CSI), an important factor for firms to consider because the punishment stakeholders inflict for CSI is greater than

the premium generated by CSR (Lee & Hong, 2015; Price & Sun, 2017; Trudel & Cotte, 2009). A few studies show that corporate managers use CSR to offset CSI (Kotchen & Moon Jon, 2012; Strike, Gao, & Bansal, 2006). However, strategy scholars have not yet deeply studied whether firms solve their irresponsibility issues directly. Instead, they have merely lumped together all kinds of social behaviors under the "CSR" rubric without regard to its multiple activities.

Given that environmental issues have become an integral part of CSR and play an important role in the corporate landscape (Flammer, 2013), we examine how firms respond to growing concerns about environmental issues by classifying the CSR that firms can choose; (1) direct CSR, which is environment-related CSR; (2) indirect CSR, which is irrelevant to environmental concerns; and (3) no CSR. We investigate under what circumstances firms become more responsible for their negative environmental issues. We also investigate the effects of direct CSR on long-term performance as compared to the effects of indirect or no CSR.

Through empirical study, we found that the more firms suffered from environmental concerns, the more they preferred environment-related CSR over the other CSR types, a preference that became stronger among the firms implementing a high degree of related diversification strategies and weaker among the firms implementing a high degree of unrelated diversification strategies. This study also shows that firms that directly address their negative environmental concerns through environmental CSR will enjoy higher future profitability than will firms that implement indirect CSR and disregard environmental concerns, indicating that firms can turn evils into blessings more effectively through direct CSR than they can through indirect or no CSR.

II. LIterature Review

2.1 Motives for CSR

There are four major motives for CSR: legal, social, economic, and ethical (Bansal & Roth, 2000). First, complying with legislation is important for firms because legal costs such as penalties or fines have increased (Cordano, 1993). The theoretical background of this motive is institutional theory, which concerns how firms seek legitimacy within a given environment (DiMaggio & Powell, 1983). Firms need to live up to social expectations and continuously respond to changing social norms (Pfeffer & Salancik, 1978). Institutions can be divided into formal institutions, such as constitutions, laws, and policies, and informal institutions such as behavioral norms and mental frames North (North, 1994). Within

an established set of regulations, norms or values, firms are motivated to improve the appropriateness of their actions through CSR because, otherwise, the firm's legitimacy may weaken, damaging its corporate authorization to operate or its long-term survival (Meyer & Rowan, 1977; Zucker, 1987).

The second driver for CSR is stakeholder pressure. This motive is directly connected with stakeholder theory, which defines "stakeholders" as individuals or groups who affect and are affected by corporate business operations (Freeman, 1984). Firms are pressured to satisfy numerous stakeholders, such as employees, customers, shareholders, creditors, suppliers, local communities, and even the natural environment (Lawrence & Morell, 1995; Mitchell, Agle, & Wood, 1997; Starik, 1995), because firms are social entities that interact with diverse stakeholders and recognize their contributions to their survival (Clarkson, 1995; Donaldson & Preston, 1995; Mitchell et al., 1997).

In the third motive for CSR, firms pursue economic opportunities through CSR by accumulating or improving firm-based resources such as reputation (Hart, 1995; Russo & Fouts, 1997; Surroca et al., 2010), product quality (Shrivastava, 1994), government procurement (Flammer, 2018) and environmental innovation (Cordano, 1993). This motive is related to resource-based theory, which emphasizes performance as the key business outcome (Russo

& Fouts, 1997). The resource-based view proposes that valuable, rare, inimitable and non-substitutable firm resources and capabilities constitute the key sources of sustained competitive advantage (Barney, 1991; Wernerfelt, 1984). This perspective classifies resources as tangible, intangible, and personnel-based (Grant, 1999). Corporate social responsibility can constitute a resource or capability that can lead to a sustained competitive advantage (Hart, 1995).

The last motivation for CSR is the ethical motive. Ethically motivated firms engage in CSR because it is the "right thing to do" (Wood, 1991). This motive might be influenced by top management or the corporate culture (Buchholz, 1991; Lawrence & Morell, 1995). Theoretically, this motive is connected to stewardship theory. In contrast to the agency theory, which emphasizes how managers' interests diverge from those of their principals (Jensen & Meckling, 1976), stewardship theory describes situations in which managers are not motivated by personal interests but rather act as stewards whose interests are aligned with the goals of their principals (Davis, Schoorman, & Donaldson, 1997; Fox & Hamilton, 1994). Agency theorists argue that CSR signals an agency problem, in which managers use CSR to further their social, political, or career agendas at the expense of shareholders (McWilliams, Siegel, & Wright, 2006), while stewardship theorists argue that CSR is a moral imperative by which

managers to do the right thing without regard to corporate financial performance. However, this motive is particularly hard to observe in quantitative data.

These four drivers for CSR are not mutually exclusive because firms might have several and multilayered desires simultaneously or in stages. For instance, (Jones, 1995) used an integrated model of ethical, social, and economic motives to propose the instrumental stakeholder theory. He argued that firms conducting business with stakeholders based on trust and cooperation have an incentive to show a sincere commitment to ethical behavior. This ethical behavior enables them to achieve a competitive advantage because firms use it to develop lasting and productive relationships with stakeholders. On the basis of an understanding of the four motives for CSR and their underlying assumptions, we will adopt the synthetic approach of stakeholder theory and the resource-based view (Jones, 1995).

2.2 Corporate social irresponsibility and CSR

Corporate social irresponsibility and corporate social responsibility are conceptually distinct dimensions (Muller & Kräussl, 2011), but are highly correlated. Corporations not only do good but also do bad, either simultaneously or sequentially (Fombrun, Gardberg, & Barnett, 2000; Mishina, Dykes, Block, &

Pollock, 2010). Firms can use CSR as ex-ante insurance or an ex-post treatment against corporate negative events (Shiu & Yang, 2017). According to (Werther & Chandler, 2005), CSR can serve as brand insurance in case an act of social irresponsibility violates society's expectation. From another perspective, a firm suffering from negative events can use CSR as a damage control mechanism (Godfrey, Merrill, & Hansen, 2009). For example, after acts of corporate social irresponsibility, firms can do more philanthropy, establish a sustainability committee at the board level, or improve their corporate social performance (Muller & Kräussl, 2011). Both ex-ante insurance and ex-post treatment are intended to alleviate the negative impacts of irresponsibility through social behaviors.

2.3 Consequences of CSR

Involvement in CSR activities and policies generates positive impacts at the individual, organizational, and institutional levels. First, the individual level of analysis suggests that CSR increases firm attractiveness to prospective employees (Turban & Greening, 1997), while enhancing organizational identification (Abraham, Gershon, & Waldman, 2007), organizational citizenship behavior (de Luque, Washburn, Waldman, & House, 2008), employee relations (Agle, Mitchell, & Sonnenfeld, 1999), retention, in-role performance (Jones,

2010), and employee commitment (Maignan, Ferrell, & Hult, 1999). Second, at the organizational level, CSR activities improve moral capital (Godfrey, 2005), competitive advantage (Greening & Turban, 2000), attractiveness to investors (Graves & Waddock, 1994), operational efficiencies and performance (Sanjay & Harrie, 1998), product quality (Agle et al., 1999), and financial performance (McWilliams & Siegel, 2000; Waddock & Graves, 1997; Wang, Choi, & Li, 2008) and also reduces firm risk (Bansal & Clelland, 2004). Finally, the institutional level of analysis suggests that CSR outcomes include firm reputation (Fombrun & Shanley, 1990; Waddock & Graves, 1997), customer loyalty (Maignan et al., 1999), and consumer choice of company/product (Arora & Henderson, 2007).

This paper concentrates on the relationship between CSR and financial performance, the focus of substantial research since the 1970s. At first, CSR was considered a signal of an agency problem by which managers used CSR to achieve their personal goals. This perspective argues that resources devoted to CSR could be spent more wisely to increase firm efficiency and return to shareholders (McWilliams et al., 2006). Agency theorists argue that CSR is negatively associated with corporate financial performance (Ackerman, 1973). However, instrumental stakeholder theorists suggest a positive relationship between CSR and corporate financial performance (Jones, 1995;

Waddock & Graves, 1997), by which the satisfaction of diverse stakeholder groups is instrumental for financial performance (Donaldson & Preston, 1995). The relationship between CSR and corporate financial performance also shows an inverted-U shape (Wang et al., 2008) and exhibits no direct relationship (McWilliams & Siegel, 2001). Recently, meta-analysis using two variables in light of 30 years of empirical data shows that CSR is positively associated with corporate financial performance and that reputation seems to be an important mediator of this relationship (Orlitzky et al., 2003).

2.4 Firm diversification and CSR

Diversification is a corporate-level strategy to create greater value by using recourses more efficiently. Firms diversify in response to excess capacity of productive resources, including factors the firm has acquired through the market, services the firms has generated, and knowledge the firm has accrued (Montgomery, 1994; Penrose, 1959). Through diversification, firms internalize the supply of proprietary knowhow and physical assets common to two or more production processes (Montgomery, 1994; Teece, 1998), or create opportunities for financial economies (Bergh, 1997).

Rumelt (1982) classified corporate diversification into nine categories: single business; dominant vertical; dominant constrained;

dominant linked‐unrelated; related con-strained; related linked; and unrelated business. However, most recent literature considers the degree of diversification as a continuous variable (Montgomery, 1982; Montgomery & Wernerfelt, 1988). This study adopts the latter approach and calculates the degree of diversification using the entropy measure.

Corporate diversification has been widely studied in the strategy literature because scholars have shown that it can be a source of competitive advantage, growth, and firm survival (Montgomery, 1994; Penrose, 1959). The advantages of diversification is econo-mies of scope. Economies of scope, known as a *sub-additive*, occur when the costs of pro-viding the services of a sharable input to two or more products are less than the total costs of providing these services for each product separately (Panzar & Willig, 1981). Based on the shared and recurring use of proprietary knowhow or an indivisible physical asset, economies of scope make product diversifica-tion efficient (Teece, 1980).

Related diversifiers enjoy more economies of scope than do unrelated diversifiers be-cause they are more likely to share common activities and competencies (Rumelt, 1982). Within a related-diversified firm, resource sharing is common among product divisions (Gupta & Gerchak, 2002). Related diversi-fiers' product division managers concentrate

on finding innovative ways to share activities and resources, while unrelated diversifiers' managers concentrate on financial innovation (Park, 2003) For example, the product divi-sions of related diversifiers tend to concen-trate on improving process and technology innovation in order to make resource sharing effective (Brush, 1996). Moreover, sharing re-sources among product divisions generates closer interrelationships and/or interdependencies (Chakrabarty, 2015). The destinies of the product divisions are interconnected (Brush, 1996; Gupta & Gerchak, 2002). Meanwhile, within unrelated-diversified firms, production and distribution-related activities are rarely shared between product divisions because they operate dissimilar industry groups. Instead of economies of scope, unrelated diversifiers create value through financial economies among product divisions by allocating internal capital to the product divisions efficiently, using in-ternal borrowing or the financial trading of products, services, and assets among unrelated product divisions (Bergh, 1997; Desai, Foley, & Hines, 2004).

The relationship between diversification strategy and financial performance has been extensively researched in the strategic man-agement literature (Christensen & Montgomery, 1981; Montgomery & Wernerfelt, 1988). Rumelt (1982) showed that firms that diversified in-to related businesses were more profitable than those that diversified into unrelated areas

because related diversifiers were more likely to exploit common resources and capabilities and enjoy economies of scope. On the other hand, Chandler (1990) noted that a successful diversification strategy depends on how it is implemented. Hill et al. (1992) argued that a diversification strategy alone does not bring superior performance and that the firm must also adopt the proper internal organizational arrangement. For example, related diversifiers enjoy benefits from economies of scope, while unrelated diversifiers enjoy benefits from efficient internal governance mechanisms. Hill et al. (1992) emphasized that related diversifiers perform better if their organizational arrangements facilitate cooperation between business units, while unrelated diversifiers perform better when their organizational arrangements facilitate competition between business units.

Meanwhile, the relationship between diversification and CSR, the key issue of this study, remains largely unexplored (Kang, 2013). Diversification is a very important factor for instrumental stakeholder theory because large diversified firms influence people "from the cradle to the grave" (Clinard & Yeager, 1978). Given that stakeholders are all those who affect and are affected by corporate business operations (Freeman, 1984), the more firms diversify, the larger their impact on more stakeholders. Recently, Kang (Kang, 2013) discovered that diversified firms pay more

attention to stakeholder demands than do others because diversification increases the range of stakeholder demands and the social issues related to firm operations. A positive firm image created by CSR can be effectively leveraged across a number of different products and markets (Drumwright, 1996; Lichtenstein, Drumwright, & Braig, 2004). In addition, diversified firms have more incentives to respond to stakeholders because diversification itself can create an economy of scope for CSR investment. Studies on the influence of international diversification on CSR have shown mixed results. (Low & Yeats, 1992; Lucas, Wheeler, & Hettige, 1992) argued that international diversifiers exploit the weak social and environmental standards in foreign countries. Counter arguments emphasized that international diversifiers transfer their best practices across geographical areas and improve social justice (Bansal & Roth, 2000; Christmann, 2004).

III. Hypotheses

3.1 Environmental concern and subsequent CSR

Amid the increase in environmental concerns, firms can choose three CSR responses, as illustrated below. First, direct CSR refers

to the CSR in which firms directly engage in environmental issues and try to improve their environmental performance. Indirect CSR refers to CSR engagement in other sectors, such as social or governance issues, rather than environmental activities. Third, no CSR refers to the total lack of any CSR activities. These three responses are mutually exclusive and collectively exhaustive.

As corporate environmental concerns grow, environmental activists can cost firms money (Lenox & Eesley, 2009), and a damaged reputation in the eyes of investors, customers, or employees can indirectly imposes costs (Sharma & Henriques, 2005). Corporate environmental concerns are negatively associated with corporate financial performance such as negative abnormal stock returns (Muller & Kräussl, 2011). To avoid economic loss, firms might do "good" and try to offset the "bad" (Kotchen & Moon Jon, 2012). If firms involve in irresponsible issues, firms can counteract negative consequences through CSR (Groening & Kanuri, 2018). This can help alleviate the financial damage caused by negative issues (Godfrey et al., 2009). In addition, CSR can be used even when CSR cannot ease the financial damage. By engaging in CSR activities, firms might avoid negative attention and derive stakeholder support (Cordano, 1993; Dillon & Fischer, 1992). Therefore, firms, given the economic and stakeholder management motives, are likely to engage in

instrumental CSR after corporate environmental irresponsibility.

For the resource-based view, CSR can constitute an intangible resource or capability that can lead to a sustained competitive advantage (Hart, 1995; Surroca et al., 2010). Firms should conduct their transactions with stakeholders on the basis of trust and cooperation (Jones, 1995). To obtain stakeholder support through CSR, it is better for firms to engage in environmental CSR because addressing environmental issues can be seen as a more direct and faithful response to stakeholders claims (Freeman & Evan, 1990). In addition, by preventing a recurrence of the environment concerns at issue, a firm might recover its reputation faster through direct CSR than through indirect CSR.

Deflecting stakeholders' negative perceptions towards activities that might be perceived as unsustainable is critical for firms to ensure organizations' license to operate (Palazzo & Richter 2005). Not all firms implement CSR activities with an emphasis on the environment (Nam, Park, & Boo, 2015). Environmentally controversial industry sectors where firms' failure to meet stakeholders' societal expectations often emphasize to engage in environmental CSR activities as protecting and promoting the natural environment (Roeck & Delobbe, 2012). Although it may appear paradoxical that one of the largest polluters are working on environmental issues, it plays as

effective signals to stakeholders about firms' ethical stance and moral values. Firms with growing environmental concerns will engage in corporate environmental responsibility rather than other CSR or no CSR. We thus propose the following:

Hypothesis 1: The more a firm is environmentally irresponsible, the more it will choose environmental CSR rather than non-environmental CSR or no CSR

3.2 Moderating role of diversification strategy on the CSR choice

After negative environmental issues, diversified firms can engage in a number of corporate social responsibilities across environmental, governance, and a wide range of social fields such as community, diversity, employee relations, human rights and product quality and safety (Strike, Gao, & Bansal, 2006). Firms implementing a diversification strategy encounter more pressures than do focused firms, from their diversified stakeholders (Kang, 2013). Therefore, the main effect from hypothesis 1 will remain for diversified firms deciding on a CSR type after a negative corporate environmental event. However, this effect might be moderated depending on the degree of diversification relatedness.

The economic benefits of diversification are economies of scope based on the common and recurrent use of tangible and intangible resources (Teece, 1980). The cost of transactions is much lower among the product divisions within a diversified firm than in the external market (Rumelt, 1982). Increases in the degree of relatedness also increase the returns to scale in the use of one or more essential production factors. The more firms are related, the more they are likely to share common activities and competencies (Rumelt, 1982). Related diversifiers are also more likely to share their destinies with the product divisions (Brush, 1996; Gupta & Gerchak, 2002). For example, the more firms are related, the more they are under similar environmental regulations and norms. Accordingly, we can expect that related diversifiers are more likely to share environment-related knowhow, physical resources, and management systems. In other words, related-diversified firms can easily spread the costs and benefits of direct CSR across their affiliates. Based on the economies of scope, therefore, the higher the degree of diversification relatedness, the more likely firms are to have economic incentives to engage in direct CSR.

On the other hand, unrelated-diversified firms operate in distinct industry groups and product divisions and thus rarely share tangible or intangible resources (Chakrabarty, 2015). Even though unrelated diversifiers engage in the environmentally proactive activities captured by the Kinder, Lydenberg,

Domini Research & Analytics (KLD) database, such as investing in environmental technology, promoting climate-friendly policies and practices, conducting pollution reduction programs, using recycled materials, and developing innovative products with environmental benefits, these are hard to share with other product divisions in other industries. Therefore, the higher the degree of diversification unrelatedness, the less likely the firms are to have economic incentives to engage in direct CSR. We thus propose the following:

Hypothesis 2a: The association between corporate environmental irresponsibility and the choice of environmental CSR will be stronger for a firm with a high degree of related diversification

Hypothesis 2b: The association between corporate environmental irresponsibility and the choice of environmental CSR will be weaker for a firm with a high degree of unrelated diversification

3.3 CSR choice type and its long-term financial performance

Hart (1995) asserted that environmental social responsibility could constitute a resource and capability leading to a sustained competitive advantage. Empirical evidence shows that firms with higher environmental performance also enjoy superior financial performance

(Russo & Fouts, 1997) and that corporate environmental reputation is valued in the marketplace, as measured by Tobin's q (Konar & Cohen, 2001).

Responding to stakeholder demands after environmental concerns entails both costs to and opportunities for corporations (Freeman, 1984; Wang & Bansal, 2012). However, corporate responses via CSR will be reported by independent rating agencies such as KLD Research & Analytics. Based on their environmental scores, firms implementing direct CSR are likely to enhance their reputations more than will firms implementing indirect CSR or no CSR.

Stakeholders and firms reciprocally interact each other. The stakeholders provide vital resources to the firm and influence the operations of the firm, while the firm satisfies their demands (Wernerfelt, 1984). Therefore, firms have to focus on arranging corporate activities in ways that strike a balance between stakeholders' various demands (Huang & Kung, 2010). Since it is difficult to accommodate all stakeholders' demands with limited resources, it will be effective for survival to reflect the most priority needs. Firms that have caused environmental problems are struck by environmental issues to their stakeholders. Therefore, they are likely to be asked to address environmental issues. Stakeholders will make clear their intentions and attitudes through message delivery or even outward

expressions to solve environmental problems. It is critical to point out that firms that cause environmental problems are trying to solve problems by implementing CSR related to the environment. Paying attention to the environment will be perceived as effective ways firms can respond to their stakeholders. Moreover, firms that avoid addressing environmental concerns are likely to suffer future regulatory scrutiny, compliance costs, and damaged reputations in the eyes of various stakeholders (Lenox & Eesley, 2009; Sharma & Henriques, 2005). Therefore, direct CSR produces better long-term financial performance (as measured by Tobin's q, incorporating firms' market value and the intangible effects of environmental performance) than does indirect CSR or no CSR (King & Lenox, 2002). We thus propose the following:

Hypothesis 3: The more a firm has shown direct CSR after an environmental concern, the more likely it will be to enjoy higher long-term financial performance

Ⅳ. Method

4.1 Sample and Data

In order to test hypotheses, we merged Morgan Stanley Capital International (MSCI) database (formerly KLD) and Compustat data for 1,296 publicly traded U.S. companies. The full sample comprises unbalanced panel data covering 2007 to 2010, with 6,564 observations. The final sample of 6,564 observations was narrowed to 2,340 observations since we could not use the last year's environmental concern scores as an explanatory variable. To test hypothesis 3, we retained the above data only if the firms had suffered from environmental concerns. We focused on only firms with a score on environmental concern greater than zero. This process results in 238 firms and 546 firm-year observations.

The MSCI database is known as the "largest multidimensional corporate social performance database available to the public" (Deckop, Merriman, & Gupta, 2006). The MSCI's data include companies on the S&P 500 Index, Domini Social 400 Index, Large Cap Social Index, Russell 2000 Index, and Broad Market Social Index, as well as the 1000 largest U.S. companies. The data cover around 80 indicators in seven major issue areas: the environment, community, corporate governance, diversity, employee relations, human rights, and product quality and safety. Each issue area has a number of "strength and concern" items, for which a binary measure indicates the presence or absence of a strength or concern. Previous studies demonstrated the construct validity of MSCI's ratings, and showed their predictive validity (Chatterji, Levine, & Toffel,

2009; Sharfman, 1996).

4.2 Variables

4.2.1 Dependent variables

1) *CSR Choice type $_t$*

For hypothesis 1, 2a, and 2b, we classified the three CSR types firms can choose after suffering from environmental concerns based on the MSCI database. *Type 1 (Direct CSR)* was coded "1" for companies that obtained positive environmental strength scores by engaging in environmental responsibility activities. *Type2 (Indirect CSR)* was coded "2" for companies that obtained positive scores on non-environmental CSR areas (excluding the positive environmental scores). *Type 3 (No CSR)* was coded "3" for companies with no positive corporate social responsibility scores.

2) *Long-term Corporate Financial Performance*

In order to test hypothesis 3, we use Tobin's *q* to measure market-based corporate financial performance because it can capture the value of long-term investments such as intangible investments (Dowell, Hart, & Yeung, 2000). Tobin's *q* is calculated by dividing market value by replacement value; market value consists of the sum of firm equity, debt, and preferred stock and replacement value of the sum of plant, equipment, inventory, and short-term assets (Konar & Cohen, 2001).

4.2.2 Independent Variables

1) *Environmental concern $_{t-1.}$*

We obtained environmental concern scores from the environmental category of the MSCI data (Deckop et al., 2006). There are seven dichotomous environmental concern variables: hazardous waste; regulatory problems; ozone-depleting chemicals; substantial emissions; agricultural chemicals; climate change; and other concerns related to the environment.

2) *Diversification*

To measure the degree of related and unrelated diversification, we used the entropy measure (Jacquemin & Berry, 1979), widely used in strategy research. The entropy measure of diversification is defined as

$$\text{Total Diversification} = \sum_{i=1}^{N} P_i \ln \frac{1}{P_i},$$

where P_i is the sales attributed to segment i and $\ln(1/P_i)$ is the weight given to each segment as the natural logarithm of the inverse of its share. The index considers both the number of segments the firm operates and each segment's proportion of total sales.

Total diversification can be divided into related and unrelated diversification components. Related diversification captures the diversification across four-digit SIC industries within a two-digit SIC industry, and unrelated diversification captures the diversification across

two-digit SIC industries.

3) *Type of CSR*

In order to test hypothesis 3 that how direct CSR after environmental concern affect long-term performance, we use the CSR choice type variables created before. Based on the MSCI database, we classified the three CSR types firms can choose after suffering from environmental concerns, which are *Direct CSR*, *Indirect CSR*, and *No CSR*.

4.2.3 Control Variables

1) *Control Variables*

For hypothesis 1 and 2, we control for several variables that might influence corporate environmental responsibility. We include *firm size* as a control variable because larger firms have greater resources and larger scales of operations for creating CSR. Firm size is measured by the natural logarithm of annual employment (Deckop et al., 2006; Waddock & Graves, 1997). We also control for corporate *profitability*, measured as return on assets (Deckop et al., 2006; Russo & Fouts, 1997). As corporate financial performance is directly associated with subsequent CSR, high levels of corporate financial performance may provide the slack resources necessary to engage in CSR (Orlitzky et al., 2003; Waddock & Graves, 1997). As McWilliams & Siegel (2000) proposed that R&D is positively cor-

related with CSR, we include firm *R&D intensity*, calculated by dividing total R&D expenditures to total sales. We also include the natural logarithm of financial *leverage*, *cash* and *growth*, which might affect corporate environmental responsibilities (Kang, 2013). Leverage is measured by long-term debt as a proportion of total capital. Growth is measured by the annual change in sales divided by total sales. Finally, we control for *other concerns* based on the MSCI. We measure these other concerns as the sum of the concern score of six categories: community; corporate governance; diversity; employee relations; human rights; and product quality and safety. We control this variable because the more negative issues firms have, the higher their deadweight costs from environmental concerns (Godfrey et al., 2009). All remaining inter-temporal trends and inter-firm heterogeneities were controlled for with a firm fixed-effects model and year dummy indicators.

For hypothesis 3, we control for capital intensity, firm size, R&D intensity, growth, cash, profitability, diversification, and total concerns in the model. First, to control for physical resources, we include the natural logarithm of *capital intensity*, calculated by dividing capital expenditures by total sales (King & Lenox, 2002). Second, we control for *firm size*, recognized as a determinant of financial performance (Ullmann, 1985). Firm size is measured as the natural logarithm of

the number of employees (Waddock & Graves, 1997). Third, to control for intangible resources, we control for *R&D intensity* by using the ratio of R&D expenditure to a firm's total sales. An important determinant of firm performance, R&D intensity captures the corporate endowment of unique technological knowledge and is positively related to patents and product innovation (Hitt, Hoskisson, & Kim, 1997). Fourth, to control for variations in production (King & Lenox, 2002), we include *growth*, defined as the annual change in sales divided by total sales. We also control for *cash* and *profitability*, which are associated with market valuation. In addition, to control for the advantages and disadvantages of diversification, we include the degree of *related*

diversification and *unrelated diversification* by using the entropy measure (Montgomery & Wernerfelt, 1988). We also calculate *total concerns* by combining the concern item scores of seven MSCI categories because corporate social performance affects corporate financial performance (Surroca et al., 2010). Finally, to control for trend and industry effects, we include year dummy indicators and industry dummy indicators. Tables 1 and 2 present the descriptive statistics for all the variables.

4.4 Data analysis

Given the nature of the dependent variable, we employ the most widely used model, the Multinomial Logit Model (MNL), to investigate

〈Table 1〉 Descriptive statistics and correlation matrix (Whole firms)

Variable	Mean	S.D.	Min.	Max.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) Direct CSR	0.14	0.35	0	1	1												
(2) Indirect CSR	0.39	0.49	0	1	-0.32	1											
(3) No CSR	0.47	0.50	0	1	-0.38	-0.75	1										
(4) Environmental concern	0.23	0.65	0	5	0.38	-0.09	-0.17	1									
(5) Unrelated diversification	0.15	0.29	0	1.69	0.17	-0.08	-0.04	0.26	1								
(6) Related diversification	1.16	0.48	0	3	0.19	-0.14	-0.01	0.15	-0.03	1							
(7) Others concern	1.83	1.55	0	11	0.30	-0.06	-0.16	0.37	0.19	0.1	1						
(8) Firm Size	1.50	1.21	0	5.99	0.38	0.01	-0.30	0.29	0.26	0.14	0.54	1					
(9) Profitability	0.01	0.19	-2.68	1.99	0.06	-0.02	-0.07	0.05	0.06	0.03	0.06	0.18	1				
(10) R&D intensity	0.07	0.14	0	0.99	-0.01	0.02	-0.02	-0.01	-0.01	-0.01	-0.00	-0.02	-0.09	1			
(11) Cash	4.33	1.70	0	11.27	0.33	0.02	-0.27	0.22	0.13	0.13	0.40	0.51	0.11	0.01	1		
(12) Leverage	-1.83	1.41	-6.91	0.96	0.06	-0.03	-0.03	0.11	0.08	0.02	0.08	0.10	-0.06	0.01	-0.04	1	
(13) Growth	-2.11	1.23	-6.91	4.53	-0.11	0.04	0.04	-0.04	-0.07	-0.10	-0.12	-0.21	-0.12	0.03	-0.02	-0.06	1

N=2,340

〈Table 2〉 Descriptive statistics and correlation matrix (Firms with environmental concerns)

Variable	Mean	S.D.	Min.	Max.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) Tobin's q	0.82	2.10	-0.09	51.47	1												
(2) Direct CSR (Type1)	0.41	0.49	0	1	0.07	1											
(3) Indirect CSR (Type2)	0.28	0.45	0	1	-0.05	-0.53	1										
(4) No CSR (Type3)	0.30	0.46	0	1	-0.03	-0.55	-0.42	1									
(5) Total concern	4.55	2.57	1	15	0.13	0.32	-0.03	-0.32	1								
(6) Related diversification	1.32	0.47	0	2.98	0.07	0.28	-0.12	-0.18	0.21	1							
(7) Unrelated diversification	0.31	0.41	0	1.69	0.01	0.13	-0.08	-0.06	0.14	-0.11	1						
(8) Capital intensity	0.37	5.20	0	154.8	0.03	-0.04	-0.02	0.06	-0.03	-0.03	-0.04	1					
(9) Firm size	2.27	1.36	0	6.06	0.11	0.48	-0.13	-0.38	0.60	0.25	0.30	-0.09	1				
(10) Cash	0.10	0.58	0	14.98	0.18	0.43	-0.10	-0.36	0.56	0.22	0.24	-0.05	0.72	1			
(11) R&D intensity	0.05	0.10	0	0.69	0.01	0.05	0.03	-0.08	0.04	0 .07	0.03	-0.01	0.11	0.14	1		
(12) Growth	5.12	1.97	0	11.28	0.02	-0.03	0.05	-0.01	-0.04	-0.03	-0.04	0.43	-0.06	-0.02	-0.01	1	
(13) Profitability	0.03	0.12	-1.65	0.56	0.01	0.15	-0.10	-0.05	0.14	0 .02	0.07	-0.03	0.22	0.23	0.05	0.01	1

N=546

CSR choice after involvement in environmental irresponsibility. The multinomial logit model assumes that the categories of a model's dependent variable are conceptually distinct from each other, through the independence of irrelevant alternatives (IIA). As this is reasonable in the context of our analysis, we estimate using MNL models and adjust the standard errors for intra-firm correlation by clustering.

To test hypothesis 3, we adopt the dynamic panel estimator (Arellano & Bond, 1991), an approach that can simultaneously control for firm-level effects and the autoregression that may affect Tobin's q across the years. While the static panel model does not allow the incorporation of any temporal dependency (lags) of the dependent variable, the dynamic panel model allows use of the lags of the dependent variable as explanatory variables. In addition, dynamic panel models use the time dimension to make internal instruments available (Arellano & Bond, 1991). We adopt the Arellano-Bond system generalized method of moments (GMM) by using lagged differences as instrument variables to deal with endogenous regressors (Arellano & Bond, 1991). The system GMM methods can thereby remove bias from unobserved heterogeneity by first-differencing and from endogeneity by using the instrumental variables of the available lags and levels. Furthermore, Arellano-Bond system GMM does not need a complete specification of the probability distribution of the dataset. By

using the Arellano-Bond system GMM estimations, we are allowed to have some endogenous variables in the equation.

V. Results

The results of the multinomial models are presented in Table 3. Models 2 and 3 in Table 3 include the diversification variables discussed in the preceding section. Hypothesis 1 proposes that the more a firm is environmentally irresponsible, the more it will be positively associated with direct CSR rather than indirect CSR or no CSR. This hypothesis is tested with the full sample, shown in Table 3. The variable *Environment concern*$_{t-1}$ is highly significant for both indirect CSR and no CSR, indicating a strong preference for direct CSR over other CSR types. Model 1 in Table 3 shows that the result strongly supports hypothesis 1. To clearly assess the simultaneous effect of the explanatory variables on the probabilities of the three CSR choices, it is useful to discuss the variables' marginal effect, presented in Figure 1. This figure shows that an increased environment concern score increases the probability of choosing direct CSR and reduces the probability of choosing indirect CSR or no CSR.

Hypotheses 2a and 2b propose that the association between corporate environmental irresponsibility and the choice of direct CSR will be stronger (weaker) for a firm with a high degree of related (unrelated) diversification. We test whether the degree of relatedness and un-relatedness moderates the main effect of the choice of CSR type. The results shown in Model 2 in Table 3, indicate that the degree of diversification relatedness is highly associated with the choice of direct CSR and the interaction term with the environment concern variable also shows the preference for the choice of direct CSR. Marginal effect shown in Figure 2 clearly shows a preference for direct CSR with the growing environmental concerns becomes stronger for firms implementing highly related diversification while it weaker for firms implementing low level of related diversification strategy. Therefore, hypothesis 2a is supported.

On the other hand, Model 3 in Table 3 showed that the interaction term between environmental concern and the degree of unrelated diversification weakens the preference for direct CSR over indirect CSR only, partially supporting hypothesis 2b. The marginal effect of hypotheses 2b in Figure 3 indicates that highly unrelated diversifiers rarely shows the increase in probability to choose direct CSR no matter how many environmental concerns are. Interestingly, with the growing environmental concerns, the probability that highly unrelated diversifiers choose indirect CSR increases. Accordingly, the main effect

⟨Table 3⟩ Multinomial logit model with fixed effect: comparison with direct CSR

DV: CSR Choice type	Model 1		Model 2		Model 3	
	Indirect CSR	No CSR	Indirect CSR	No CSR	Indirect CSR	No CSR
Environmental concern$_{t-1}$	−0.630*** (0.15)	−0.891*** (0.15)	0.245 (0.31)	0.010 (0.37)	−0.760*** (0.19)	−1.035*** (0.19)
Related diversification$_{t-1}$			−0.694*** (0.20)	−0.467*** (0.20)		
Environmental concern$_{t-1}$ × Related diversification$_{t-1}$			−0.660*** (0.23)	−0.679*** (0.28)		
Unrelated diversification$_{t-1}$					−1.010*** (0.37)	−0.063 (0.36)
Environmental concern$_{t-1}$ × Unrelated diversification$_{t-1}$					0.587* (0.33)	0.385 (0.38)
Other concerns	−0.070 (0.06)	−0.029 (0.06)	−0.081 (0.06)	−0.037 (0.06)	−0.072 (0.06)	−0.030 (0.06)
Leverage	−0.020 (0.06)	−0.000 (0.06)	−0.013 (0.06)	0.003 (0.06)	−0.007 (0.06)	0.003 (0.06)
Cash	−0.208*** (0.06)	−0.409*** (0.06)	−0.194*** (0.07)	−0.398*** (0.06)	−0.217*** (0.06)	−0.415*** (0.06)
R&D Intensity	0.002 (0.002)	−0.002 (0.00)	0.002 (0.00)	−0.002 (0.00)	0.001 (0.00)	−0.002 (0.00)
Firm Size	−0.346*** (0.09)	−0.507*** (0.09)	−0.337*** (0.09)	−0.500*** (0.09)	−0.318*** (0.09)	−0.521*** (0.09)
Profitability	0.314 (0.84)	0.207 (0.80)	0.349 (0.88)	−0.213 (0.84)	0.375 (0.86)	0.220 (0.82)
Growth	0.116 (0.07)	0.137 (0.07)*	0.101 (0.07)	0.126* (0.07)	0.115 (0.07)	0.141* (0.07)
Year dummies	Included		Included		Included	
N	2340		2340		2340	
Log likelihood	−2030.9		−2007.9		−2016.1	
χ^2	378.68***		389.10***		400.00***	

Standard errors are in parentheses.
* p < 0.10, ** p < 0.05, *** p < 0.01
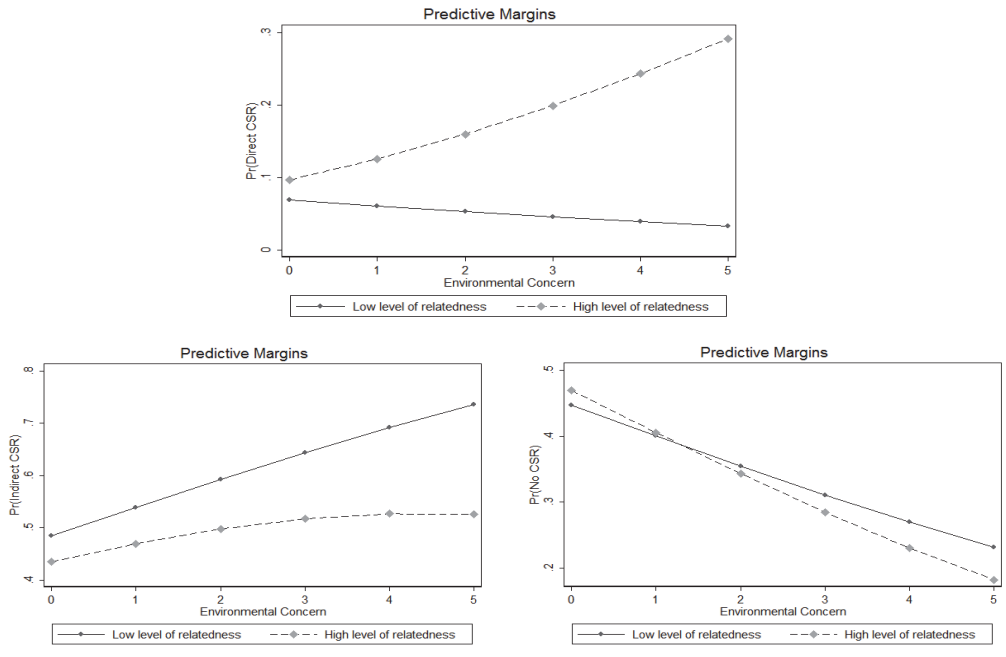
of the preference for direct CSR is weakened by the level of un-relatedness diversification strategy.
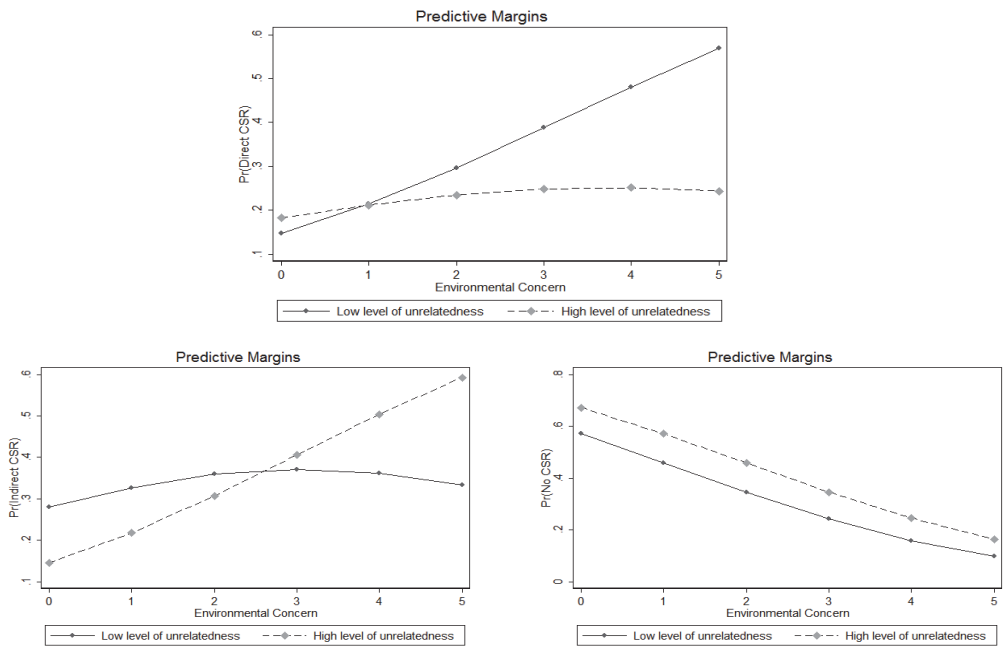
The result of testing hypothesis 3 is shown in Table 4, indicating the results of the system GMM estimator. Hypothesis 3 proposes that the more a firm shows direct CSR after an environmental concern, the more likely it
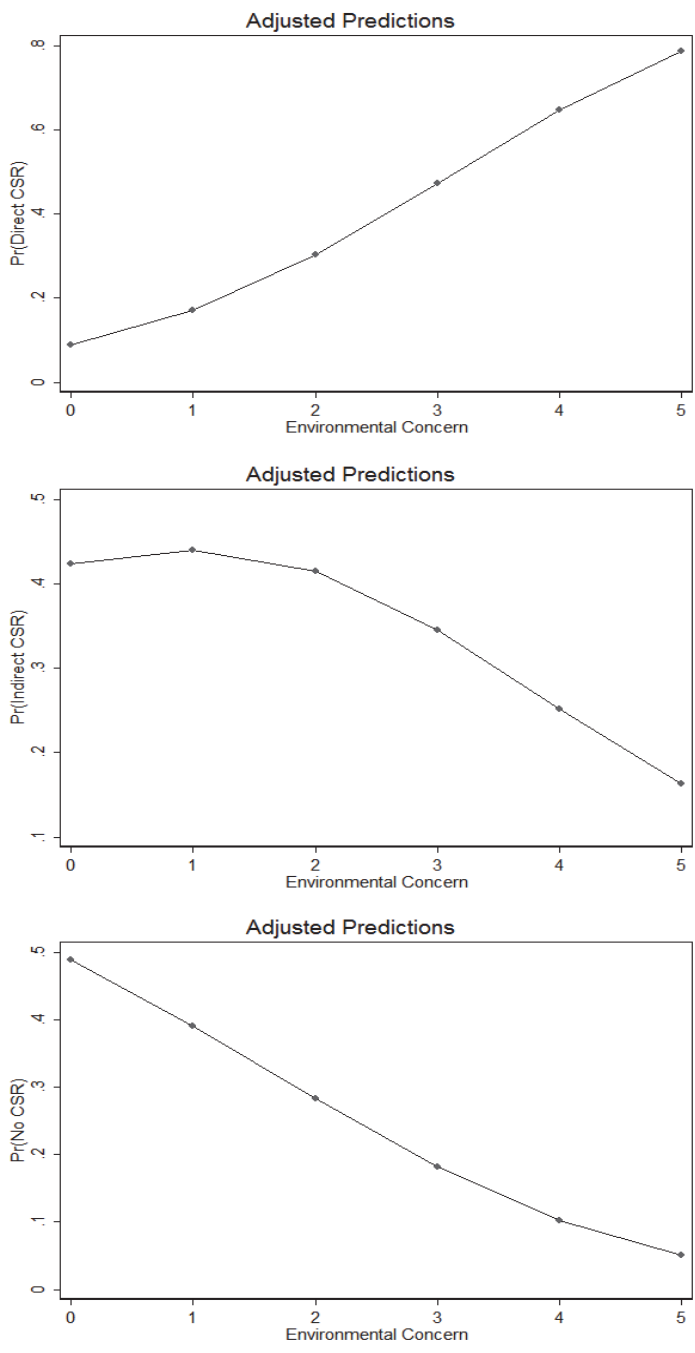
〈Figure 1〉 Marginal effect of H1

〈Figure 2〉 Marginal effect of H2a

〈Figure 3〉 Marginal effect of H2b

〈Table 4〉 System GMM regression estimates: comparison with direct CSR

DV: Tobin's q $_t$	Model 4	Model 5
Tobin's q $_{t-1}$	0.530** (0.25)	0.531** (0.25)
Indirect CSR		-0.073* (0.04)
No CSR		-0.014 (0.05)
Total Concern	-0.000 (0.01)	-0.001 (0.01)
Related diversification	0.163* (0.10)	0.158 (0.10)
Unrelated diversification	0.462*** (0.14)	0.484*** (0.14)
Capital Intensity	0.057 (0.07)	0.053 (0.08)
Firm Size	0.193 (0.14)	0.186 (0.14)
Cash	0.005 (0.01)	0.006 (0.01)
Growth	0.000 (0.04)	-0.000 (0.04)
R&D Intensity	-0.067 (0.05)	-0.068 (0.05)
Profitability	0.265** (0.135)	0.258* (0.13)
Year dummies	Included	Included
Industry dummies	Included	Included
N	546	546
x^2	499.59***	492.95***

Standard errors are in parentheses.
* p < 0.10, ** p < 0.05, *** p < 0.01

will be to enjoy higher long-term financial performance. In Model 4, the negative coefficient for indirect CSR, based on direct CSR, shows that direct CSR raises corporate long-term profitability significantly more than indirect CSR does. However, the effects of direct CSR and no CSR on long-term profitability are not statistically different (as discussed below). Therefore, hypothesis 3 is partially supported.

VI. Discussion and Conclusion

This paper examines which CSR types firms choose in response to growing environmental concerns. The results show that firms are likely to choose to address environmental issues directly by engaging in environment-related CSR rather than pursuing CSR irrelevant to the environmental concern or doing nothing. In addition, the preference for direct CSR becomes stronger as the degree of related diversification increases and becomes weaker as the degree of unrelated diversification increases. Finally, firms trying to directly address negative environmental concerns through environmental CSR will enjoy higher future profitability than will firms that disregard environmental concerns. Importantly, not only stakeholders but also markets register the effects of direct CSR. We can conclude that when firms involved in irresponsible behaviors, it is better to solve against them head to head. Some may concern that pursuing CSR activities directly related to irresponsible behaviors reveal the firms' past wrongdoings they want to erase. However, direct confronting can be a much more effective way rather than making images with other good deeds or avoiding with silence. We can infer that stakeholders want the firms who caused the problem to solve the problem.

In addition, the preference for direct CSR becomes stronger as the degree of related diversification increases and becomes weaker as the degree of unrelated diversification increases. The higher the relevance of business, the more likely they are to cover benefits and risks. High degree of related diversification means sharing loss derived by the irresponsible behaviors. Therefore, highly relatedly diversified firms have a strong incentive to solve the problems directly.

The empirical analysis has produced two significant results. First, the degree of relatedness or un-relatedness of a diversification strategy influences the choice of CSR type. Kang (2013) argues that the level of related diversification has no relationship with CSR, while the level of unrelated diversification increases CSR activities. However, our examination of firms' CSR choices shows that the degree of relatedness strengthens the incentive to allocate corporate resources to improve environmental performance because of the economies of scope. This implies that scholars should study CSR categories separately instead of incorporating all of them together. Second, the last hypothesis is partially supported, indicating that the effects of direct CSR and no CSR on long-term profitability are not statistically different. This result might be caused by the fact that responding to stakeholder demands with CSR entails costs for corporations (Bansal & Hoffman, 2012; Freeman, 1984).

6.1 Theoretical and managerial implications

Though CSR research has typically lumped together all kinds of social behaviors without regard to category and authenticity, we classified three CSR modes and examined whether firms address their negative issues directly after acts of corporate environmental irresponsibility. Prior studies show that firms use CSR to offset CSI, however, there is a paucity of empirical investigation whether firms solve their irresponsibility issues directly. This study provides valuable insights into the effect of CSR on CSI by examining what type of CSR firms likely to choose after CSI. This paper also contributes to the recent methodological trend of using the MSCI, which employs numerous strength and concern items to measure CSR. These items are divergent constructs (Mattingly & Berman, 2006) and should not be combined together, as is customary in the empirical literature. This paper treats strength and concern items separately and uses them to create independent measures of CSR and environmental concern, respectively (Kotchen & Moon, 2012). Finally, the strategy management literature has paid relatively little attention to the relationship between diversification and CSR. Considering the advantages of related diversification (economies of scope), we investigated the economic and social motives for environmental CSR, thus expanding the management literature on diversification and CSR.

Our findings are practically relevant and provide important implications for executives. When firms involved in negative issues, corporate managers have to understand the effect of implementing direct CSR activities which are directly related to irresponsible behaviors of the firms. Firms implementing direct CSR perform better than do firms conducting indirect CSR in the long run. Researchers argued that CSI increases the risk of firms as increasing stakeholder sanctions (Kolbel, Busch, & Jancso, 2017). Exacerbating firms' risk due to CSI is greater than risk reduction due to CSR (Chava, 2014). Firms' efforts to solve irresponsible behaviors in an effective manner are important. Corporate managers should understand that firms implementing direct CSR perform better than do firms conducting indirect CSR in the long run. Direct CSR enables firms with a high degree of related diversification to enjoy economies of scope. Therefore, highly related diversifiers can not only directly address negative environmental issues but also enjoy relatively higher future profitability.

6.2 Limitations and future research

MSCI measures are categorical variables combined into a continuous scale. However, MSCI data cannot show the intensity of the item. That is, no matter how serious the en-

vironmental problem is, concern item is measured as a binary variable. Therefore, future studies should be conducted considering the intensity of the negative issues that firms are in. Moreover, to measure the outcome of the environmental CSR, future studies are recommended to analyze additional data sources for environmental performance such as Trucost which is one of the largest greenhouse emission database, or data from information disclosure regulation, U.S. Environmental Protection Agency's Toxics Release Inventory (TRI) program. Analysis of these environmental performance data sources will enrich the research contents.

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기업은 부정적 환경 이슈와 관련하여 어떻게 대응하는가?
CSR 방식의 선택과 장기적 성과에 대한 영향

이규민* · 이종선** · 배종태***

요 약

기업들은 부정적인 사건과 연관된 사회적무책임활동(CSI, Corporate Social Irresponsibility)을 상쇄시키기 위한 방편으로 사회적책임활동(CSR, Corporate Social Responsibility)을 이행하기도 한다. 부정적인 사건을 만회하기 위해 CSR활동을 시행할 때 해당 사건과 직접적으로 연관된 활동을 펼치는 것과 우회적인 활동을 펼치는 것 중 어느 쪽이 더 효과적인지에 대해서는 많은 연구가 이루어지지 않았다. 본 논문은 기업이 환경과 관련된 부정적인 사건에 연루된 이후 (1) 환경 관련 CSR 시행, (2) 환경 비(非)관련 CSR 시행, (3) CSR 미시행 중 어떠한 CSR활동 유형을 선택하는지, 아울러 이러한 선택에 따라 기업의 장기적 성과는 어떤 영향을 받는지에 대하여 중점적으로 살펴 보았다. 더불어 기업의 다각화 전략에 따라 CSR활동 유형 선택이 어떻게 달라지는지 살펴 보았다. 이를 위해 MSCI와 Compustat을 통해 2007년부터2010년까지의 기간에 해당되는 패널 데이터를 구축하여 이를 바탕으로 다항 로짓 모형(Multinomial logit model: MNL) 분석을 실시하였다. 그 결과 기업은 더 많은 환경 관련 사건들에 연루될수록 추후 환경과 관련된 CSR 활동을 선택함으로써 환경문제를 직접 해결하는 방식을 견지하는 것으로 나타났다. 이러한 경향은 관련 다각화가 높은 기업일수록 더욱 강화되었는데, 이는 환경 문제 해결에 소요되는 비용과 그 혜택이 범위의 경제성을 띄고 다른 계열사에 공유될 수 있기 때문인 것으로 설명될 수 있다. 한편, 비관련다각화 된 기업의 경우에는 이러한 범위의 경제성이 낮기 때문에 만회하기 위한 방안으로 환경 관련된 분야를 직접적으로 선택하는 경향은 줄어드는 것으로 밝혀졌다. 부정적인 사건과 직접적으로 연관된 분야의 CSR 활동을 선택하는 것이 기업의 장기 성과에 긍정적인 영향을 주는지 알아보기 위하여 GMM 분석을 시행하였고, 그 결과 환경 문제에 연루된 이후 환경과 관련된CSR을 선택하여 직접적으로 정면 돌파한 기업이 비(非) 환경CSR을 선택한 기업에 비해 더 높은 장기 성과를 보인 것으로 나타났다. 결자해지(結者解之)의 자세로, 부정적인 이슈를 직

면하고 이를 직접 해결하는 방식의 CSR활동을 시행하는 기업이 장기적으로 효과가 있다는 시사점을 얻었다.

주제어: 기업의 사회적 책임(CSR), 환경 이슈, 다각화, 장기적 성과

• 저자 이규민은 현재 삼정KPMG의 전략컨설팅그룹(Strategic Consulting Group) Sustainability 부문에 시니어 컨설턴트로 재직 중이다. 경희대학교 국제학부 및 경제학부를 졸업하였으며, KAIST 경영대학 경영공학과에서 석사를 취득하였다. 주요 관심분야는 지속가능경영, 임팩트투자, 사회적기업 등이다.

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