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Does ESG Performance Enhance Firm Value? Evidence from Korea

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Abstract: We analyze whether a firm's corporate social responsibility (CSR) plays a significant role in promoting its market value in an emerging market, namely Korea. We employ environmental, social, and corporate governance (ESG) scores to evaluate CSR performances and examine their effect on firm valuation. We find that CSR practices positively and significantly affect a firm's market, in line with previous studies on developed countries. However, its impact on share prices can differ according to firm characteristics. For firms in environmentally sensitive industries, the value-creating effect of CSR is lesser than for firms that do not belong to sensitive industries. Specifically, corporate governance practice negatively influences the firm value of environmentally sensitive firms. Further, governance practice significantly promotes market value only for *chaebols*, while investors do not significantly value governance practice carried out by other firms. This finding suggests the value-enhancing effects of governance structure reformation in the former. This work mainly contributes to the literature by verifying a positive CSR-valuation relationship in emerging markets, which provides substantial policy and welfare implications in markets where governments play a major role in promoting CSR. A stronger valuation effect of CSR in *chaebols* may present economic background for the intervention of the Korean government in the reformation of *chaebol*.

Keywords: ESG; firm value; corporate social responsibility; sustainable development; Korea; environmentally sensitive industries; family-managed business groups; corporate governance

1. Introduction

Corporate social responsibility (CSR) is part of a firm's management practice toward the public good, beyond what is required by law. To be specific, CSR is a function of a firm's behavior toward its different stakeholders, such as communities, investors, employees, customers and suppliers. In terms of management practices, CSR represents a firm's discretionary multidimensional activities, which include social, ethical, environmental, and political actions [1]. The CSR strategies of a firm are closely associated with its sustainable growth plans. A firm's CSR is aimed toward promoting long-term profit, and establishing a positive relationship with society and investors' trust, thereby enabling the firm's survival. Evidence increasingly suggests a positive association between CSR and the value of a firm [1,2], making it a major issue for firms and other interested parties, including individual investors, policymakers, and scholars.

Extant literature has examined the CSR-valuation effect, mostly in advanced countries, while evidence from developing markets is limited. This is because there are fewer businesses or institutions that can capably allocate resources for socially responsible activities in developing

countries. Emerging countries naturally place more focus on operating efficiency and profits, than on softer values, such as environmental conservation, fair distribution of wealth, and community relations. Accordingly, the demand of measuring CSR is relatively small in emerging markets, which hinders the development of reliable and multi-dimensional CSR measures. This scarcity of well-defined measure is probably a major reason behind the limited CSR-valuation evidence in emerging markets [2–4].

With this research, we address the aforementioned gap in the literature by evaluating the CSR–valuation relationship in the Korean market. This value relevance of CSR is a potentially more interesting research question in emerging markets because it may have more substantial implications for corporate policy and social welfare. In advanced markets, the private sector plays a significant role in promoting CSR practices, which implies considerable incentives for firms to adopt CSR practices without government interventions; CSR activities have been mainly driven by the concerns of investors, companies, campaign groups and consumers. Yet, governments have initiated CSR agendas in emerging markets and have required firms to adopt the codes of CSR. China, India, Brazil and South Africa are representative examples. If a positive value relevance of CSR is verified in emerging markets, private firms may also have significant incentives to engage voluntarily in CSR practices. Moreover, emerging markets experience social issues more seriously, such as corruption, poverty reduction and human rights. A voluntary CSR engagement of firms implies that these private firms take more serious roles in resolving such social issues, which may lead to a more substantial increase of social welfare in these emerging markets.

Among developing markets, the Korean financial market is particularly interesting for our evaluation for several reasons. First, the Korean market has a unique set of family-owned business conglomerations, the so-called *chaebols*, which currently face demands for reformation. While *chaebols* have led rapid economic growth with government and public support, critics have increasingly called for their reformation because of problems and political scandals related to owner risks in *chaebol* affiliates. “Socially responsible management practice” is one of the major agendas in these demands, especially in terms of better corporate governance structure. Furthermore, Korea increasingly experiences serious air pollution and other emissions from the industrialization of neighboring China. Thus, public concern for environmental protection and emissions regulations have increased, thereby making CSR practices a major social agenda in the Korean market.

We thus employ the environmental, social, and corporate governance (ESG) score published by the Korea Corporate Governance Service (KCGS) as a proxy to measure the level of CSR engagement in a corporation. The total ESG score is the main variable that captures a firm’s overall CSR performance. We also separately analyze each component of the ESG score, which allows us to identify potential economic sources behind the valuation effect of CSR. To construct proxy variables for investors’ valuation of a firm, we extract each firm’s financial information, such as the market value of shares and the book value [5]. Further, we consider the potential role of environmentally sensitive industries. Extant studies posit that investors may value CSR activities more substantially in environmentally sensitive industries. Finally, we analyze whether the market valuation reflects the investors’ demand for CSR reformation in the set of family owned large conglomerates, *chaebols*. This demand for reformation is particularly strong for reforming corporate governance structures of *chaebol* affiliates, and thus, we expect a more significant valuation effect from better governance practices in these firms. Our dataset provides an extensive sample of 705 corporations listed on the Korea Stock Exchange, comprising every KOSPI-listed (Korea Composite Stock Price Index) and some KOSDAQ (Korea Securities Dealer Automated Quotation) firms. The sample period is chosen between 2010 and 2015 because only a scaling grade of ESG data is available before 2010.

We summarize the main results of our examination as follows. Investors in the Korean stock market positively value CSR practices. The total ESG measure and its three central factors positively affect the stock price of a firm. The effects are all statistically significant as well. However, we also find that the value-enhancing effect of CSR activity is not equally applicable for firms. Surprisingly, the positive valuation effect of CSR becomes weaker for environmentally sensitive industries.

This result is robust, even when we analyze the total ESG score, or each category of the score separately. Further, there exists a significant difference in the effect of CSR activities for family owned large conglomerates, *chaebol* affiliates. Specifically, governance practice is more highly valued than other variables by the investors for the group of *chaebol* affiliates. Thus, we confirmed the hypothesis, according to which investors' demands for reformation of governance structures and reduction of owner risk exist.

We provide novel insights that complement extant literature by examining the valuation effect of CSR. Our findings support the positive valuation effect that CSR holds for a developing country. Not only developed markets, but emerging markets also require CSR practices to promote firm value, which indicates the possibility of a firm's voluntary adoption of CSR practices in emerging markets. However, we found a rather weak valuation effect of CSR for environmentally sensitive industries, which differs markedly from the literature [2]. Moreover, the stronger valuation effect of CSR in *chaebol* affiliates suggests that a corporation's governance structure significantly affects CSR-valuation relationships, which is largely unexamined in extant studies [1]. Such a strong valuation effect of CSR in *chaebols* supports previous and future interventions of governments in reforming the governance structure of *chaebols* in the Korean financial markets. Finally, by using an extensive sample of Korean firms, we were able to mitigate a sample selection bias and ensure better representativeness of the Korean stock market. This allowed us to overcome the limitations of current literature [4].

This work proceeds as follows. Section 2 reviews the literature. Section 3 develops empirical predictions Sections 4 and 5 describe our methodologies and empirical data, respectively. Section 6 provides our main empirical findings. Section 7 provides the conclusion.

2. Literature Review

2.1. ESG Overview

In CSR research, it is essential to use standardized and uniformly comparable CSR information. However, it is difficult to clearly define the specific construct of CSR, and thus there is a lack of consensus [1]. The ESG concept was first proposed in the report of the United Nations Principles of Responsible Investment, which recommends that investors consider ESG scores as a key factor in their investment decisions. In practice, management consulting firms and investors widely use ESG scores as a major index to understand a firm's overall CSR performance. ESG essentially evaluates a firm's environmental, social, and corporate governance practices and combines the performances of these practices. A firm's *environmental performance* indicates the firm's effort to reduce resource consumption and emissions. A firm's *social performance* indicates respecting human rights, the quality of employment, the responsibility of the product, and community relations. Finally, a firm's *corporate governance performance* indicates the rights and responsibilities of the management of a firm (governance structure). Despite the relatively late appearance of the concept of ESG, studies on the association between ESG and firm value or operating performance are abundant [2,4].

The ESG score may lack consistency in and criteria for measurement because of its nonfinancial attributes. Relying on firms' self-reports or own surveys has intrinsic shortcomings because of the self-reporting or -generation bias. Even with quantified data, CSR performances are difficult to compare among peers and across periods [4,6]. Malik [1] states that unrefined datasets cause inconsistency in research results. In order to avoid measurement bias, some scholars have used standardized ESG ratings provided by external ratings agencies, such as *Kinder, Lydenberg and Domini* (MSCI KLD Social Index), *Bloomberg*, and *Thomson Reuters Eikon*. Among them, the KLD index, a recently developed measure, explicitly evaluates multiple aspects of a firm's CSR activities. Consequently, the KLD index has been almost exclusively used in recent studies investigating the U.S. market. Because this set of studies is vast and multidimensional, we refer to the survey paper of Malik [1] for a comprehensive list of works with the KLD index. However, this index is limited to the U.S. stock market, so it cannot be applied to foreign markets. Even datasets of international data-collecting institutions, such as

Bloomberg or *Thomson Reuters Eikon*, have limitations, since their datasets do not include a wide range of ESG information on Korean corporates. Similarly, extant studies on the Korean financial markets have adopted an index by the Korea Economic Justice Institute (KEJI), which covers only 200 samples per year. Thus, our study was able to overcome the limitations of extant studies and datasets by employing ESG performance scores provided by the KCGS, which includes every firm listed on the Korean stock market.

2.2. The Effect CSR on the Firm

Extensive research has been carried out on the effects of CSR activities on a firm; however, the results are inconsistent. According to one perspective, CSR activities increase firm cost, making it an economic disadvantage [7]. Similarly, some studies argue that there is neither an association [7,8] nor a negative relationship [9,10] between CSR and profitability.

Nevertheless, research has also promoted the value-enhancing theory. That is, CSR positively influences a firm in a direct and indirect way, thereby enhancing competitive advantage and shareholder value. Indeed, the benefits a firm could achieve from CSR activities include enhancement in operating efficiency [11,12], improvement in corporate reputation [13], employee productivity [14], capital market benefits [15,16], risk management [17], assurance of better operating performance, expansion of the product market, and reinforcement of a firm's association with its society and stakeholders.

Further, most extant studies demonstrate direct and positive association between CSR and a firm's financial performance [4,12]. Margolis et al. [18] conducted a meta-analysis of 251 studies that analyzed the relationship between CSR and performance. They conclude that the overall effect of a firm's CSR on its performance is positive.

Our research is most closely related to the value-enhancing effect of CSR. According to Malik's [1] review, which summarizes research on the value-creating capabilities of CSR activities, firms' superior quality of social and environmental practices can directly promote their value by positively influencing stock market returns. The author also argues that other forms of CSR-related benefits ultimately lead to higher firm value. Peiris and Evans [19] directly provide supporting evidence for the value-enhancing theory.

However, most literature on CSR has so far focused on developed countries, such as the U.S. and other advanced countries in Europe. Studies on the value relevance of CSR activities that target emerging markets, especially the Korean stock market, are still insufficient. Furthermore, research on Korea is limited because of its reliance on surveys or CSR reports generated by individual firms. In fact, scarce research has utilized the concept of ESG, which is evaluated by outside rating institutions.

Thus, based on evidence of CSR's value-creating effect observed in developed markets, we utilize the ESG standard to find out whether CSR-related benefits exist for Korean firms, and if investors in the Korean stock market positively value the firm's commitment to CSR. We formulate this positive valuation effect of CSR in the Korean market as a main testable hypothesis in later sections.

We must remark that the Miralles-Quirós et al. [2] study is the basis of our motivation. The authors analyzed the value relevance of CSR activities in the Brazilian stock market using quantified ESG scores provided by an alternative third-party auditor as a proxy variable for CSR performances. They used the valuation model presented by Ohlson [5] to examine how each pillar of ESG affects the market value of firms. In addition, Miralles-Quirós et al. [2] analyzed how the CSR-valuation effect differs across business sectors, by using an indicate variable that reflected Brazilian environmental conservation.

Research on Korean CSR is still an emerging field. For example, Choi et al. [20] found that CSR activities positively affect financial performance using the stakeholder-weighted CSR index. More recently, Han et al. [4] analyzed non-linear relationships between CSR and financial performance of Korean firms based on ESG disclosure scores measured by *Bloomberg*. They conclude that a firm's environmental performance has a negative relationship, the governance performance has a positive relationship, and the social performance has no relationship, with financial performance.

Similar to our work, Kim and Cho [21] used Ohlson's [5] valuation model to test if environmental activities of Korean firms could enhance their value. They argue that the level of activities related to environmental conservation has a significantly positive association with the stock price. In addition, Lee and Kim [22] analyzed the market valuation of ESG performance based on the ESG grade data from KCGS. The authors showed that the level of CSR practices is positively associated with the corporate value by using Tobin's Q. A few other studies also find a positive association between CSR and a firm's market value [23,24]. However, these extant studies on Korea differ markedly from our study employing the ESG scores published by KCGS. These studies used the datasets covering only a small number of companies in the Korean financial market (e.g., Bloomberg) or adopted a measure of CSR practice that deviates from the ESG standard. Even when researchers use the ESG data provided by KCGS, they largely examine grade data, not raw points of the evaluation.

It is noteworthy that our work differs from a set of recent studies that integrates a firm's financial and social performances together from the perspective of entrepreneurship. For example, Parente et al. [25] develop a new model of entrepreneurship for business studies, in terms of "humane entrepreneurship". This idea of humane entrepreneurship is closely related to the definition of social performance; entrepreneurs have to extend their priorities toward their employees, people, environment, and society, which are represented by the category of social performance in the CSR literature. This branch of studies tries to develop a new performance measure by incorporating a firm's financial performance and social/environmental performances altogether. However, our study still focuses on the relationship between a firm's ESG performance and its market valuation, a classical measure of financial performance.

3. Hypothesis Development

We now formulate our empirical hypotheses with regard to the valuation effect of CSR in Korea. First, we expect a positive CSR-valuation relationship in the Korean financial market. As described above, most extant studies conducted in advanced countries demonstrate a direct and positive relationship between CSR and a firm's financial performance and valuation [1,4,18,19]. Because social, environmental and corporate governance issues are important in developing markets as well, the value-enhancing capabilities of CSR tend to be appreciated in developing countries. While managers in developing markets are believed to pay more attention to reducing operating costs, such a focus of managers is not inconsistent with the value-enhancing capability of CSR. Investors in developing markets understand the potential positive effect of CSR and reflect this in their firm valuation.

Next, we expect that firms belonging to environmentally sensitive industries have a stronger valuation effect of CSR than the average Korean firm does. Each firm faces different CSR requirements according to the industry type and its region of operation [6,26]. CSR requirements are generally stricter for firms that belong to environmentally sensitive industries [2]. These firms have to meet with higher standards for eco-friendly manufacturing, lower polluting processes, non-toxic packing and etc. Firms with a greater CSR performance are more likely to satisfy these requirements and to obtain the recognition of their interested parties in environmentally sensitive industries. These requirements are relatively insignificant in non-environmentally sensitive industries; companies practicing CSR may be less significantly recognized by their stakeholders. Accordingly, firms in environmentally sensitive industries confront a more positive valuation of CSR compared to an average firm. In fact, Miralles-Quirós et al. [2] tested and confirmed the same hypothesis for the Brazil market by introducing an interaction variable that captures an additional valuation effect of CSR in environmentally sensitive industries.

Finally, we predict that *Chaebol* affiliates face a greater valuation effect of CSR compared to an average Korean firm. Unlike other developing or developed countries, Korea has a unique business ecosystem in that the family owned large business conglomerates, *chaebols* such as *Samsung Electronics* strongly influence the national economy. These groups have historically led rapid economic growth in Korea and received extensive government and public support [24,27]. However, they have

recently been experiencing declining profits, coupled with a growing sense of owner risk problems, such as weak governance structure [28], tunneling by controlling shareholders [29,30], and political scandals. Hence, there is rising public demand for reformation of the *chaebol's* governance structure. The improvement in governance structure may particularly lead to the reduction of owner risk and positively affect the market valuation of the members [31,32]. *Chaebol* affiliates' social and environmental practices may be highly valued as well; their social and environmental practices help improving the reputation, which has recently confronted severe criticism for the aforementioned reasons. Therefore, investors tend to place a greater value for *chaebols'* CSR practices as compared to an average Korean firm's CSR performances. Because the demand of reformation in *chaebol* is most closely associated with its governance structures, this positive valuation effect in *chaebol* affiliates is more significant in the examination of corporate governance practices. In the spirit of Miralles-Quirós et al. [2], we can also test this hypothesis by introducing an interaction dummy that represents an additional valuation effect of CSR in *chaebol*.

Two examples are representative of such a vast demand of reformation. The first example is related to circular equity investment, a specific type of cross shareholdings. *Chaebols* controlled by an owner whose power over the group often exceeds legal authority. The circular equity investment across *chaebol* affiliates is one of the main factors that allows such an excess power of the owner, which is criticized severely. In fact, the Korean government recently prohibited new circular investment and restricted capital increase in the existing circularly invested companies.

The other example is related to the role of outside directors. Based on such an excess controlling power, the owners of *chaebol* affiliates also exert substantial influence in deciding outside directors, who are supposed to be independent, which may be a value destructive misrepresentation of shareholders. Even the Korean government recognized the significance of these problems and forced *chaebols* to improve objectivity on their board of directors in the 2000s. Yet, this influence of the owners of *chaebols* is an implicit one and very difficult to detect. Accordingly, the issue of outside directors is still unresolved in the Korean financial market.

In sum, we test the following empirical hypotheses:

Hypotheses 1 (H1). *A positive CSR–valuation effect exists in the Korean financial market.*

Hypotheses 2 (H2). *Firms belonging to environmentally sensitive industries face a greater valuation effect of CSR compared to an average Korean firm.*

Hypotheses 3 (H3). *Chaebol affiliates have a stronger valuation effect of CSR compared to an average Korean firm, especially in terms of corporate governance practices.*

4. Methodology

To examine the effect of a firm's CSR activities on its market valuation, we incorporate Ohlson's [5] valuation model. On the association between valuation and accounting information, the author describes a firm's market value as a function of accounting information, such as its contemporaneous and future earnings, dividends, and book asset values. Ohlson [5] also states that the model can include other non-accounting, but value-relevant, information. With CSR performance representing the nonfinancial variable of interest, extant studies on CSR have used this model to evaluate the value relevance of CSR—for example, Miralles-Quirós et al. [2], and Kim and Cho [21].

In this study, we use the modified model in line with Barth and Clinch [33]. They used two primary variables of equity book value and earnings in the valuation model. They also showed that the model that deflates Ohlson's [20] financial variables by the most effective at mitigating scale effects. Therefore, we use the specification proposed by Barth and Clinch [33]. We then express our benchmark valuation model:

$$P_{i,t} = \alpha + \beta_1 BVPS_{i,t} + \beta_2 EPS_{i,t} + \varepsilon_{i,t} \quad (1)$$

In model (1), the dependent variable is $P_{i,t}$, the stock price of firm i at the end of year t . The two independent variables in year t are the book value per share of firm, $BVPS_{i,t}$, and the earnings per share of firm, $EPS_{i,t}$. The error term, $\varepsilon_{i,t}$ is the residual for the price per share of firm i in year t .

We then consider a firm's CSR performance as the nonfinancial explanatory variable for the firm value in addition to the baseline model. The expression of the model is:

$$P_{i,t} = \alpha + \beta_1 BVPS_{i,t} + \beta_2 EPS_{i,t} + \beta_3 ESG_{i,t} + \varepsilon_{i,t} \quad (2)$$

In model (2), $ESG_{i,t}$ is the ESG score of firm i in year t . This ESG score is used to measure the degree of a firm's CSR performance. Note that we also use three separate ESG scores of each firm as a proxy of the firm's CSR performance based on recent literature [2,22]. We investigate the effects of the three categories of ESG scores, as well as the total score. As mentioned in Section 2.1, the three central factors of ESG include performance of environmental activities, social activities, and corporate governance structures. The coefficient on the ESG score, β_2 will be significantly positive if evidence supports the first empirical hypothesis.

We then investigate whether the influence of CSR activities differs by firm characteristics. First, we predict that firms belonging to environmentally sensitive industries have a stronger valuation effect of CSR compared to an average Korean firm. To test this hypothesis, we follow the approach of Miralles-Quirós et al. [2]. They argued that this hypothesis can be tested by examining the coefficient on an interaction term of ESG scores and a dummy variable for an environmentally sensitive firm. To be specific, we augment the basic model by including the interaction term of ESG scores and a dummy variable for an environmentally sensitive firm. The extended model is:

$$P_{i,t} = \alpha + \beta_1 BVPS_{i,t} + \beta_2 EPS_{i,t} + \beta_3 ESG_{i,t} + \beta_4 ESG_{i,t} \cdot ESI_i + \varepsilon_{i,t} \quad (3)$$

In model (3), the indicator variable ESI_i equals to 1 if a firm i is included in environmentally sensitive industries and 0, otherwise. The coefficient on $ESG_{i,t}$, β_3 represents the valuation effect of CSR for an average Korean firm. The coefficient on the interaction variable, β_4 captures the additional valuation effect of CSR practices for environmentally sensitive industries. By investigating the significance and positivity of β_4 , we can test whether environmentally sensitive firms in Korea are more rewarded for their CSR efforts. We identify the industrial sectors of energy, materials, and utilities as the environmentally sensitive industries in line with Miralles-Quirós et al. [2].

Furthermore, we expect that *chaebol* affiliates face a stronger valuation effect from their CSR practices than an average Korean firm does. To test this hypothesis, we add an interaction variable between ESG scores and the indicator variable for *chaebol* affiliates, in the spirit of model (3). Our final model is:

$$P_{i,t} = \alpha + \beta_1 BVPS_{i,t} + \beta_2 EPS_{i,t} + \beta_3 ESG_{i,t} + \beta_4 ESG_{i,t} \cdot FF_i + \varepsilon_{i,t} \quad (4)$$

In model (4), FF_i is an indicator variable that has the value of 1 if a firm i is a member of a *chaebol* and 0 otherwise. As explained above, the coefficient on $ESG_{i,t}$, β_3 estimates the valuation effect of CSR for an average Korean firm. The coefficient on the interaction variable, β_4 captures the additional valuation effect from the ESG practices in *chaebol* affiliates. As the pressure for improving governance structure in *chaebol* escalates, we expect the coefficient of β_4 in model (4) to take a positive and significant value. The coefficient β_4 is more significantly positive in the examination of corporate governance scores, if the investors regard the governance structure reformation of *chaebol* affiliates as an urgent and important one. For this purpose, we define a firm as an affiliate if it is a member of a business conglomerate with total assets over ₩2 trillion (*Korean won*) and if the conglomerate is controlled by a controlling shareholder (or a founder-family).

In sum, we test a positive valuation effect of CSR performance in Korea by adopting model (2) and expect to find a significantly positive coefficient on the ESG score. Then, we examine a stronger valuation effect of CSR in firms belong to environmentally sensitive industries by employing model (3)

and expect to find a positive coefficient on the interaction term of ESG score and the dummy variable for an environmentally sensitive firm. Finally, we examine a greater valuation effect of CSR in *chaebol* by using the model (4) and expect a positive coefficient on the interaction term of ESG score and the dummy variable for *chaebol* affiliates.

5. Data

We use two types of data in our study. The first is the financial information required by Ohlson's [5] model; the second is the information for each firm's social responsibility performance. The financial information includes book value per share, market price per share, and earnings per share of each firm in line with Barth and Clinch [33]. We measure every financial variable at the end of each fiscal year. This set of financial information is obtained from WISEfn database.

We adopt the quantified total ESG score and each category of the ESG scores as a proxy for CSR performance. The Korean Corporate Governance Service (KCGS) publishes the ESG scores, which evaluate a firm's environmental, social, and corporate governance practices. The KCGS evaluates environmental performance of a corporation based on the following categories: management practice in response to climate change, clean production, emission of pollutants, green marketing, and production of environmentally friendly goods. A firm's social performance is evaluated by considering sustainable management, business ethics, job security, working condition for workforces, its relationship with labor union, and human resource development. A firm's governance score is calculated by taking account of protection of stakeholder right, information disclosure quality, the board structure, managerial compensation structure, auditing quality and distribution policy. The total ESG score is defined as the sum of environmental, social, and governance scores.

There are two major advantages of this database. First, it is one of the most recent scores developed to explicitly capture multiple aspects of a firm's CSR performance. The three ESG factors are measured separately, so researchers can distinguish each factor's performance. Second, our dataset has a wider coverage of the Korean stock market than other studies do. KCGS is an institute that evaluates the governance structures and CSR activities of each firm in Korea, and it has been providing ESG information on a large set of firms in the Korean market with confidence. This is a great advantage over the previously-used KEJI index, which only covers 200 firms per year that are usually large-sized firms. International data-collecting institutions provide smaller sample coverage as well. Considering this enlarged sample coverage, we expect our study to better represent the Korean stock market.

It is also noteworthy that this paper directly employs the score variable of ESG rather than a binary or categorical variable, in contrast to extant studies. In fact, KCGS previously disclosed only the ratings of CSR performances of each firm without detailed scores. The grade-based system has limitations, so empirical studies do not generally use ESG scores, as researchers cannot discern the difference in CSR performance within a specific grade. For example, Lee and Kim [22] used the KCGS dataset to analyze the value relevance of ESG performance in the Korean stock market, but they only adopted a five-level grade system for the evaluation of a firm's CSR practice.

We now elaborate each component of ESG, as noted in Section 2.1. First, the environmental performance score addresses the firm's commitment toward and effectiveness in limiting emissions, total waste, and consumption of material and energy. The score represents the capability of a firm to minimize the environmental cost and burden of its stakeholders and customers during production and operating through more eco-efficient solutions. Second, the social performance score measures the firm's practice of good citizenship, which includes quality goods and services that integrate customer health, privacy, and safety, as well as promotes satisfaction in job, work environment, diversity, equal opportunities, and so forth. Lastly, the governance performance score measures the firm's dedication to follow corporate governance practices with equal treatment of shareholders, as well as transparency in its decision-making processes [4,22].

Our sample construction procedure can be described as follows. We initially include every corporation that has been evaluated by KCGS in our sample. Our dataset consists of firms listed on the

Korea Stock Exchange, that is, every KOSPI and some KOSDAQ firms. We then classify the firms based on the Global Industry Classification Standard (GICS). We then excluded the corporations that belong to the financial sector (i.e., industry groups, such as banks, insurance, etc.). The book value of the financial sector is qualitatively different from ordinary industries, because the portion of fixed capital and inventory stock is quite small in the financial sector. Hence the book value per share may affect the market value of a firm, significantly different in the financial sector, and may lead to statistical biases in the estimations. Our final sample comprised ESG ratings of 705 firms for the period between 2010 and 2015 (3876 firm-year observations). The sample period is deliberately chosen because only a letter scaling ESG score is available before 2010.

For the analysis of model (3), we define the business sectors related to energy, material, and utility sectors as environmentally sensitive industries using the GICS. The energy sector refers to energy equipment and services, as well as oil, gas and consumable fuel industries; the material sector includes chemicals, construction materials, containers and packaging, and metals and mining industries; and the utility sector includes producers of electric, gas, water, renewable electricity, and so forth. In sum, 190 firms and 1063 observations from our sample belong to environmentally sensitive industries.

We identify specific business groups as large *chaebols* based on the Financial Supervisory Service of Korea report for the years of 2010 to 2015. According to the Financial Supervisory Service of Korea, a large conglomerate or *chaebol* is a business group with total assets over ₩2 trillion, and is owned and run by a specific controlling shareholder or a founder-family. In model (4), we consider an indicator variable that equals 1 if the firm-year observation belongs to a *chaebol*. In the entire sample, 212 firms are affiliates comprising 1060 observations.

Table 1 presents the summary statistics of the ESG scores along with the descriptive statistics for the financial information variables and ESG scores. The table includes the mean, standard deviation, min, 1st quartile, 3rd quartile, and the minimum and maximum values. Note that every financial variable is scaled to ₩1000. We winsorize every financial variable at the 1% level in each tail, while we measure ESG scores annually and individually. The ESG variables take nonnegative values. “ESG” in the last row of the table indicates the total ESG score, that is, the sum of the environment, the social, and the governance scores.

Table 1. Descriptive Statistics.

	Mean	Std. Dev.	Min	1st Qnt.	Median	3rd Qnt.	Max
Price	44.05	105.49	0.45	3.28	10.45	36.30	811.88
BVPS	55.50	133.19	0.39	4.23	11.81	45.44	974.18
EPS	2.07	9.81	−49.83	0.01	0.52	2.51	49.05
ENV	100.80	66.56	0.00	40.00	102.35	145.00	279.80
SOC	89.80	50.49	0.00	57.00	77.00	107.00	280.00
GOV	92.34	29.31	0.00	73.00	92.00	108.00	232.00
ESG	282.94	117.83	44.00	198.00	272.65	339.00	713.00

NOTE: Price, BVPS, and EPS are measured in ₩1000; Qnt: quartile.

As shown in Table 1, the average ESG scores of the firms in our sample are 100.80 for environmental performance, 89.80 for social performance, and 92.34 for corporate governance performance for 2010–2015. These three scores have almost equal importance in shaping the total ESG score. The Korean firms have the best score in environment performance on average 100.80. The standard deviation of the environmental score is also the highest at 66.56, which implies a substantial variation in environmental practices. The social score has the lowest average value 89.80, and its standard deviation is 50.49. The corporate governance performance score has a mean value of 92.34, and its standard deviation is the lowest at 29.31. The corporate governance score shows less significant variations.

Table 2 represents correlation coefficients among our variables of interests. The p -value corresponding to each coefficient is also reported in parenthesis. The table demonstrates that the three ESG scores do not highly correlate to each other. One exception is the correlation between environmental score and social score, which is relatively high (0.70). Such a high correlation indicates that a firm with good environmental practice tends to be a firm with good social performances. However, the corporate governance score has relatively small correlation coefficients with the environmental and social practices at 0.17 and 0.23 respectively. This weak correlation suggests that managers have different attitude in improving corporate governance structure from in enhancing environmental and social performances. Since the total ESG score is the variable combining the environmental performance, social performance, and corporate governance scores, it highly correlates to the social and environmental scores—0.91 and 0.88, respectively. The total score also shows a relatively small correlation coefficient with the corporate governance score; the correlation coefficient is 0.44. This small correlation is consistent with relatively weak correlations between governance scores and environmental/social scores. To avoid potential multicollinearity problems in the estimations, we do not consider all score variables at once in our estimation.

Table 2. Correlation Coefficients.

	Price	BVPS	EPS	ENV	SOC	GOV	ESG
Price	1.00 (0.00)						
BVPS	0.77 (0.00)	1.00 (0.00)					
EPS	0.54 (0.00)	0.39 (0.00)	1.00 (0.00)				
ENV	0.24 (0.00)	0.18 (0.00)	0.09 (0.00)	1.00 (0.00)			
SOC	0.32 (0.00)	0.23 (0.00)	0.16 (0.00)	0.70 (0.00)	1.00 (0.00)		
GOV	0.07 (0.00)	0.04 (0.01)	0.06 (0.00)	0.17 (0.00)	0.23 (0.00)	1.00 (0.00)	
ESG	0.29 (0.00)	0.21 (0.00)	0.13 (0.00)	0.91 (0.00)	0.88 (0.00)	0.44 (0.00)	1.00 (0.00)

6. Empirical Results and Discussion

Table 3 presents the estimation results on the value relevance of CSR practices in the Korean stock market. We carry out the regressions following models (1) and (2) as proposed in the above section. Model (1) is the Ohlson [5] valuation model specified by Barth and Clinch [33]; we only consider the financial information, and not the CSR information, of the firm. We include the ESG scores of the firm in model (2) to examine the value relevance of CSR. These models include book value per share, earnings per share, and the set of ESG scores as independent variables. The estimated coefficients β , and corresponding t-values (in parenthesis) are documented in the table.

We find that the coefficients of all the ESG score variables have positively significant values, in line with Miralles-Quirós et al. [2] and others. For instance, the coefficient on the total ESG score is significantly positive at 0.1027 in the last column of Table 3, implying the positive valuation effect of CSR practice in the Korean firms. This finding is also well aligned with the value-enhancing theory, indicating a positive CSR–value relationship.

Note that the governance performance score is relatively less significant than other ESG performance variables. The t-value for the coefficient on governance score is 1.78 and the coefficient is only significant at 10% level. For all other coefficients on the ESG scores, the corresponding t-values are greater than 4. We will discuss the economic reason behind these statistical differences later in this section, by examining the effect of *chaebol* affiliates separately.

The expected level of CSR practice required for each firm might be different depending on the variation of business and economic environments [6,27]. Thus, it is important to test whether the CSR–valuation relationship could be different across specific categorizations of business groups or industries. For this purpose, we first consider the CSR–valuation relationship in environmentally sensitive industries. Here, firms generally have to meet higher level of CSR requirements, as well as restrictions by regulators and other interested parties [2,26]. Accordingly, we predict that firms

belonging to this industry faces a greater valuation effect of CSR practices, as compared to an average Korean firm.

To test the hypothesis, in Table 4, we separate the valuation effect of CSR on environmentally sensitive industries and all other industries by following the approach of Miralles-Quirós et al. [2]. To be specific, our estimation includes an interaction term of the ESG variables and a dummy variable for environmentally sensitive industries, as proposed in model (3). The dummy variable takes the value of 1 if a firm belongs to environmentally sensitive industries and 0 otherwise. The environmentally sensitive industries comprise the energy, material, and utility sectors, based on the GICS categorization. We conduct four empirical estimations: the first three models include the environmental, the social, and the governance scores, respectively, while the last one uses the total ESG score. These models include book value per share and earnings per share as independent variables. The estimated coefficients β and corresponding t-values (in parenthesis) are reported as well.

Table 3. The effect of corporate social responsibility (CSR) practice on firm value.

Book Value per Share	0.5278 *** (10.38)	0.5146 *** (9.95)	0.5081 *** (9.60)	0.5274 *** (10.34)	0.5107 *** (9.74)
Earnings per Share	3.0224 *** (5.42)	3.0005 *** (5.48)	2.9072 *** (5.39)	3.0102 *** (5.41)	2.9481 *** (5.43)
Environmental Score		0.1538 *** (4.79)			
Social Score			0.2604 *** (4.53)		
Governance Score				0.0885 * (1.78)	
Total ESG Score					0.1027 *** (4.62)
Intercept	8.4979 *** (4.32)	−6.2257 ** (−2.32)	−13.5531 *** (−3.29)	0.3803 (0.09)	−19.4666 *** (−3.68)
Observations	3876	3876	3876	3876	3876
R ²	0.667	0.677	0.682	0.668	0.680
Adjusted R ²	0.667	0.676	0.682	0.668	0.680
F statistics	105.326 ***	89.873 ***	83.282 ***	69.813 ***	84.995 ***

NOTE: The numbers refer to the estimated coefficients, β . The numbers in parentheses refer to corresponding t-values. The symbols of ***, **, and * represent that the *p*-values are smaller than 1%, 5%, and 10%, respectively. Every financial variable is scaled by ₩1000. Dependent variables are the market price of shares.

Table 4. The effect of CSR practice on firm value: Environmentally sensitive industry.

Book Value per Share	0.5160 *** (10.12)	0.5123 *** (9.89)	0.5306 *** (10.57)	0.5137 *** (9.98)
Earnings per Share	3.0033 *** (5.54)	2.9217 *** (5.48)	3.0298 *** (5.49)	2.9588 *** (5.51)
Environmental Score	0.1971 *** (5.06)			
Environmental Score × Sensitive Industries	−0.1286 *** (−3.46)			
Social Score		0.2935 *** (4.76)		

Table 4. Cont.

Social Score × Sensitive Industries	−0.1669 *** (−3.17)			
Governance Score	0.1230 ** (2.37)			
Governance Score × Sensitive Industries	−0.1604 *** (−3.40)			
Total ESG Score	0.1181 *** (4.86)			
Total ESG Score × Sensitive Industries	−0.0550 *** (−3.51)			
Intercept	−6.6837 ** (−2.49)	−12.8020 *** (−3.17)	0.9656 (0.22)	−19.5995 *** (−3.72)
Observations	3876	3876	3876	3876
R ²	0.6812	0.6870	0.6722	0.6851
Adjusted R ²	0.6809	0.6867	0.6719	0.6848
F statistics	69.6374 ***	65.9738 ***	60.3354 ***	66.8794 ***

NOTE: The numbers refer to the estimated coefficients, β . The numbers in parentheses refer to corresponding t-values. The symbols of ***, **, and * represent that the p -values are smaller than 1%, 5%, and 10%, respectively. Every financial variable is scaled by ₩1000. Dependent variables are the market prices of shares. Energy, material, and utility sectors following the GICS are identified as environmentally sensitive industries.

Table 4 shows the regression results for the valuation effect of CSR for environmentally sensitive industries. The table clearly shows that every interaction term has a negative and significant coefficient, while the coefficients of the ESG score variables are significantly positive. For example, the coefficient on the interaction variable between the total ESG score and the environmentally sensitive industries is significantly negative at -0.0550 . The positive valuation effect is almost half for the environmentally sensitive industries compared to all other industries ($0.1181-0.0550$), if we consider the total ESG score. In other words, the value-enhancing effect decreases in environmentally sensitive industries, inconsistent with the second empirical prediction.

It is also noteworthy that even a negative valuation effect of CSR is observed for the environmentally sensitive industries. The negative influence of the interaction term (-0.1604) is greater than the positive average impact of the governance score variable (0.1230), when we examine the corporate governance score. To put it another way, the firms with better governance practices have lower stock prices in the environmentally sensitive industries. This negative valuation effect is inconsistent with the value-enhancing theory, but does correspond to the shareholder expense theory, which highlights the cost-generating aspect of CSR practices.

The findings in Table 4 do not align with the extant empirical findings. Most importantly, our findings contrast Miralles-Quirós et al. [2], who show a larger positive valuation effect of CSR in the environmentally sensitive industries by analyzing the sample of Brazilian firms. Furthermore, the negative effect of corporate governance practice on firm valuation in the environmentally sensitive industries is not well aligned with the extant studies in the Korean markets. For example, Kim and Cho [21] show the positive valuation effect of CSR performance in the Korean market. Lee and Kim [24] also confirm the positive valuation effect.

This finding might be partly associated with the attitude of Korean people toward environmental issues. As described earlier, the emission of air pollutants from industrializing China or other Asian countries ignited recent environmental issues in the Korean market. In other words, Korean people have tried to figure out factors outside of the country to deal with the pollution problems and have paid limited attention toward domestic reasons behind recent air pollution problems. Such limited

attention may drive the investors to not highly value the CSR practice of environmentally sensitive industries in the Korean market.

The distinctive valuation effect of environmental/social scores and governance scores in the environmentally sensitive industries may rely on qualitative differences among the measurements of these scores. All of these three score measures basically evaluate how a firm acts on behalf of its stakeholders. However, the governance score mainly focuses on the practice of a firm toward its shareholders but the environmental/social scores evaluate its practice toward the other groups of stakeholders such as customer, supplier, workers, communities, etc. The other groups of stakeholders may play more significant roles in pressuring CEOs to act for their interests in the environmentally sensitive industries, leading to the positive valuation of environmental/social performance in the industries. Such a greater influence of the other stakeholders implies a relatively less significant role of shareholders, probably driving to the statistically insignificant CSR-valuation relationship in the environmentally sensitive industries.

Next, we examine the role of large family owned conglomerates in Korea, *chaebols* in shaping the CSR-valuation effect. As noted in Sections 1 and 3, *chaebols*, which have historically led development, have been facing increasing criticism because of unethical business practices and political scandals. Thus, investors now expect a higher degree of CSR activities from such business groups, and in particular, demand better corporate governance practices in these firms. We can thus predict that such firms' active and spontaneous implementation of CSR policies leads to a more substantial enhancement of their share prices, as compared to an average Korean firm. We also expect this effect to be stronger when we evaluate the corporate governance practice of the *chaebol* affiliates.

To test the hypothesis, in Table 5, we distinguish the valuation effect of CSR on *chaebols* from other firms in the spirit of Miralles-Quirós et al. [2]. Our estimation includes an interaction term of ESG performance and a dummy variable for *chaebols*, as proposed in model (4). The dummy variable takes the value of 1 if a firm is an affiliate of a *chaebol* and 0 otherwise. According to the Financial Supervisory Service of Korea, *Chaebols* are defined as large business groups controlled by a founder-family or a controlling shareholder, with total assets over ₩2 trillion. We conduct four empirical estimations: the first three models include the environmental, the social, and the governance scores, respectively, while the last one uses the total ESG score. These models include book value per share and earnings per share as control variables. Table 5 reports the estimated coefficients, β and corresponding t-values in parenthesis.

Table 5 estimates the valuation effects of socially responsible practices carried out by *chaebols*. This table presents interesting results. First, it shows that investors value CSR activities by *chaebols* more highly compared to an average firm, which is in line with our prediction. In fact, all the coefficients on the interaction terms are positive. For instance, the coefficient on the interaction dummy using the total ESG score is 0.0410, which is statistically significant and positive.

Second, this positive effect is prominent in the examination of the governance score, consistent with our conjecture. To be specific, the coefficient of the interaction term in the governance regression has the largest value at 0.2036 across all of the four models. Surprisingly, the valuation effect of the corporate governance score is even negative on average (−0.0354), while it is statistically insignificant. In other words, investors in the Korean financial market do not significantly value corporate governance practices for ordinary firms, whereas they do call it into question for firms with *chaebol* affiliates, which are suspected of having substantial owner risk problems. A corporation's current governance structure, i.e., *chaebol* affiliates, seems to affect the valuation effect of CSR practice in the Korean market. Such a more significant valuation effect of CSR in *chaebol* affiliates provides economic backgrounds for the previous and additional government interventions in reforming the structure of *chaebol*, especially with regard to their corporate governance structures.

Finally, we conduct a robustness check based on extant studies that highlight the significant role of a firm's total assets and leverage ratio in shaping share prices. This robustness check is conducted to check the positive valuation effect of CSR activity in the Korean financial market as in Table 3.

Like Miralles-Quirós et al. [2], we perform a robustness test by adding the two additional control variables. The size variable is the natural logarithm of the total volume of assets, while the leverage ratio is defined as the ratio of total debts to total assets of the firm.

Table 5. The effect of CSR practice on firm value: *Chaebols*.

Book Value per Share	0.5007 *** (9.44)	0.5046 *** (9.47)	0.5108 *** (9.76)	0.5027 *** (9.45)
Earnings per Share	2.9742 *** (5.47)	2.9076 *** (5.39)	2.9832 *** (5.40)	2.9399 *** (5.43)
Environmental Score	0.0573 ** (2.23)			
Environmental Score × Family Firms	0.1447 *** (3.69)			
Social Score		0.1884 *** (2.62)		
Social Score × Family Firms		0.0682 (1.23)		
Governance Score			−0.0354 (−0.85)	
Governance Score × Family Firms			0.2036 *** (4.05)	
Total ESG Score				0.0600 *** (2.76)
Total ESG Score × Family Firms				0.0410 ** (2.56)
Intercept	−1.3514 (−0.57)	−9.4339 ** (−2.04)	7.1557 * (1.76)	−11.1894 ** (−2.24)
Observations	3876	3876	3876	3876
R ²	0.6825	0.6827	0.6750	0.6825
Adjusted R ²	0.6821	0.6824	0.6746	0.6821
F statistics	70.5482	64.0423	65.5003	66.3197

NOTE: The numbers refer to the estimated coefficients, β . The numbers in parentheses refer to corresponding t-values. The symbols of ***, **, and * represent that the *p*-values are smaller than 1%, 5%, and 10%, respectively. Every financial variable is scaled by ₩1000. Dependent variables are the market price of shares. The variable of family firms identifies the members of large *chaebols*.

Table 6 presents the result of our robustness checks. It reports the estimated coefficients, β and corresponding t-values (in parenthesis) by additionally considering other firm characteristics. The coefficients on the proxy variables for CSR practices are positive even after controlling for these two additional firm characteristics. In the regressions of the environmental, social, and total ESG scores, the coefficients are statistically significant as well. For instance, in the case of the total ESG score, the estimated coefficient is positively significant at 0.940. In the regression, the coefficients on the book value per share and earnings per share variables remain almost unchanged, even after the inclusion of other two control variables. These findings generally confirm the positive valuation effect of CSR activities in the Korean financial market, as reported in Table 3.

Table 6. The effect of environmental, social, and corporate governance (ESG) performance on firm value: Robustness test.

Book Value per Share	0.5048 *** (9.27)	0.5089 *** (9.37)	0.5044 *** (9.13)	0.5076 *** (9.34)
Earnings per Share	2.9788 *** (5.41)	2.9502 *** (5.41)	2.9830 *** (5.38)	2.9660 *** (5.41)
Size	2.7892 * (1.72)	−0.3668 (−0.19)	5.1133 *** (3.32)	0.9273 (0.52)
Leverage	0.0185 (0.22)	0.0614 (0.74)	0.0561 (0.66)	0.0384 (0.47)
Environmental Score	0.1214 *** (3.58)			
Social Score		0.2624 *** (3.61)		
Governance Score			0.0378 (0.83)	
Total ESG Score				0.0940 *** (3.60)
Intercept	−59.2381 ** (−2.01)	−9.4141 (−0.28)	−98.9060 *** (−3.39)	−37.2979 (−1.23)
Observations	3876	3876	3876	3876
R ²	0.6778	0.6821	0.6736	0.6802
Adjusted R ²	0.6773	0.6817	0.6732	0.6797
F statistics	62.8945 ***	61.1431 ***	59.9768 ***	61.5314 ***

NOTE: The numbers refer to the estimated coefficients, β . The numbers in parentheses refer to corresponding t-values. The symbols of ***, **, and * represent that the p-values are smaller than 1%, 5%, and 10%, respectively. Every financial variable is scaled by ₩1000. Dependent variables are market price of shares. Size is the natural logarithm of total assets of each firm. Leverage ratio is the ratio of total debts to total assets for each firm.

Interestingly, the coefficient on governance score is positive but becomes statistically insignificant in Table 6. This result seems to be closely associated with the role of *chaebols*, as reported in Table 5. *Chaebol* affiliates tend to have large size firms. Table 6 shows that the size variable has statistically significant explanatory power in the valuation. In other words, the size variable partly captures the characteristics of *Chaebol* affiliates, which potentially influences the estimated coefficient on the governance score. This finding is also in line with a weaker valuation effect of governance practice for ordinary firms in the Korean financial market, as reported in Table 5.

7. Conclusions

The relationship between CSR and firm value is still an unresolved issue in the literature. Nevertheless, a growing number of studies have indicated that firms' CSR activities drive a positive effect on the market value of a firm. The value enhancing theory argues that CSR investments can promote the market value of a firm, both directly and indirectly, but the test on this theory so far has been conducted on developed markets, rather than on developing markets, such as Korea's. Our work was thus motivated by the lack of comprehensive study on the value relevance of CSR in developing countries. The Korean market also experiences rising business issues related to air pollutions and *chaebols*. These emerging issues provide a unique condition, which allows us to test interesting research questions—the relevance between CSR-valuation effects and business environments. We investigated the association between CSR and the market value of firms listed on the Korean financial market. The ESG score provided by KCGS is directly adopted in our study. This ESG score is considered the most comprehensive and multi-dimensional CSR measure in the study of the Korean financial market.

To evaluate the valuation effect of CSR, we not only employed the total ESG score, but also considered three factors—environmental, social, and corporate governance—as criteria to measure the CSR performance of a firm. Our result shows that investors positively value CSR practices carried out by Korean firms, which is in line with the recent empirical evidence on the value-enhancing capabilities of CSR. Yet, we also found that a firm's CSR practice does not have homogeneous valuation effects. Unlike extant studies, in our study, the valuation effect of CSR is weaker for environmentally sensitive industries in the Korean financial market. Moreover, in line with the recent demand for governance reformation of *chaebols*, the positive valuation effect of CSR is stronger for these business groups. Especially, we found that the valuation effect of corporate governance practice is strongly positive for *chaebols*, but negative or insignificant for ordinary Korean firms.

This study contributes to the extant literature in a number of aspects. According to our findings, the positive valuation effect of CSR holds for a developing country. We thus address the scarcity of research that examines this effect in developing markets. The weaker valuation effect of CSR practice in environmentally sensitive industries is inconsistent with evidence from extant studies. This suggests that the categorization of “environmentally sensitive industry” may not be a dominant determinant in shaping the CSR-valuation relationship. Further, our investigation of *chaebols* in Korea emphasizes the potential importance of corporate governance structure in shaping CSR-valuation effects. The interaction between corporate governance structure, e.g., *chaebol* affiliates, and the effect of CSR has been largely unexamined in the literature as well.

Note that a positive CSR-valuation effect provides substantial policy and welfare implications in emerging markets. The adoption of CSR has been largely enforced by governments in these countries. Private firms in emerging markets have largely focused on profit maximizations and have limited incentives to perform CSR practice beyond the requirements imposed by their governments. However, such a positive valuation effect points out that firms have incentives to engage voluntarily in CSR practices. This voluntary engagement may help privately resolving social issues such as poverty, corruption and human rights in emerging markets, which may increase social welfare of these countries substantially.

Furthermore, the strong valuation effect of CSR in *chaebol* affiliates provides economic reason for the intervention of Korean government in changing their corporate governance structure. In fact, the Korean government have tried to reform the corporate governance structure of these firms by restricting circular equity investments or requiring the improvement of objectivity in board structures. The strongly positive valuation effect suggests that such government interventions are not unnecessary ones and potentially protect the value of shareholders.

Finally, we conclude by highlighting the limitations of our study. While we found a weaker valuation effect of CSR in environmentally sensitive industries, we did not thoroughly examine the economic factors thereof. Additional empirical research or new theories might explain this finding, while we propose the attitude of Korean people toward air pollution issue as a potential reason. We also found that the valuation effects of social/environmental scores and governance. We tried to explain this finding based on the qualitatively distinctive aspects of three measures of CSR, which should be also tested in future studies. In terms of the estimation methodology, our study still does not overcome the problems of reverse-causality, as Hart and Ahuja [34] note. Our work mitigates the estimation bias from sample selection because we adopt the ESG score, which covers a large set of sample firms in the Korean financial market. Yet, our estimation methodology does not fully control other potential biases, such as omitted variable biases. These issues need to be addressed in future studies.

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