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CSR Disclosure Quality and Properties of Analysts' Information Environment

Chee Yeow Lim[1*]

[1]School of Accountancy, Singapore Management University, 81 Victoria St, Singapore. E-mail: cheeyeowlim@smu.edu.sg

Abstract

Corporate Social Responsibility (CSR) has become increasingly important for managers, investors, regulators, and other external stakeholders worldwide. I investigate how the disclosure of CSR activities is associated with the precision of the common and private information in analysts' forecasts based on the Barron-Kim-Lim-Stevens (BKLS) model. Using an international sample of firms from 31 countries over the period 2008-2020 and measures of CSR disclosure from Bloomberg, I find that CSR disclosure is negatively and significantly associated with the precision of public information and positively and significantly associated with that of private information in analysts' forecasts. In cross-sectional analyses, I find that the relation between CSR disclosure and analysts' information environment is more pronounced in stakeholder-oriented governance mechanisms and when the information environment is poorer. This study extends the literature by showing that analysts rationally use more private than public information associated with CSR information.

Keywords: *Financial analysts, CSR disclosure, BKLS model, Stakeholder-oriented governance, Information environment*

1. Introduction

Corporate Social Responsibility (CSR)[1] and its reporting have been gaining importance among managers, investors, regulators, and scholars because of the growing public concerns regarding social and environmental issues (Porter and Kramer, 2006; Snider *et al*., 2003). Investors have begun to integrate CSR performance into their stock and bond selection decisions (Durand *et al*., 2019). In response, firms have begun to incorporate various CSR goals into their business models (Bénabou and Tirole, 2010; Hart and Zingales, 2017) and integrate their financial reporting with nonfinancial CSR disclosure to enhance their ability to create "long-term and shared stakeholder value" (Ballou *et al*., 2012). Based on a report issued by Klynveld Peat Marwick Goerdeler (KPMG, 2017), 78% of the world's largest companies include CSR information in their annual financial reports, with significant differences in CSR reporting practices across countries. Moreover, the recent coronavirus disease 2019 (Covid-19) pandemic has further emphasized the connection between sustainable development and financial performance.

* Corresponding author: Chee Yeow Lim, School of Accountancy, Singapore Management University. E-mail: cheeyeowlim@smu.edu.sg

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[1] In this paper, the terms Corporate Social Responsibility (CSR) and Environmental, Social, and Governance (ESG) are used interchangeably, similar to the approach taken in Gillan *et al.* (2021).

This study investigates whether the disclosure of CSR activities is associated with the properties of analysts' information environment. Financial analysts are the main information intermediaries in capital markets (Franke *et al.*, 2006; Healy and Palepu, 2001), and their earnings forecasts have a large impact on investment decisions (Frankel *et al.*, 2006; Lang and Lundholm, 1996). These analysts contribute to price discovery in the market through the analysis of a variety of information (Asquith *et al.*, 2005; Barron *et al.*, 2002; Palmon and Yezegel, 2012). Both public and private information are used by financial analysts to provide investors with information (Brown *et al.*, 2015). In a 2014 survey by Earnst and Young, financial analysts claimed that CSR information plays a vital role when they evaluate firm performance. Empirical studies have also shown that analysts use CSR information in developing reports for their clients (Eccles *et al.*, 2011; Nilsson *et al.*, 2008; Radley-Yeldar, 2012). Hence, financial analysts are likely to rely on CSR information when they generate both common and idiosyncratic information in their forecasts.

This study focuses on analysts' information environment for firms that disclose CSR information. Specifically, I investigate whether CSR disclosure is associated with more precise common and/or private information being reflected in analysts' forecasts. Following prior CSR studies (Baldini *et al.*, 2018; Christensen *et al.*, 2022; Grewal *et al.*, 2019; Via and Perego, 2020), I use Bloomberg's Environmental, Social, and Governance (ESG) disclosure ratings to measure the extent to which a firm discloses its CSR information. Moreover, I employ those measures developed by Barron *et al.* (1998), which exploit the observable properties of analysts' forecasts (squared forecast error and dispersion) to measure the precision of common and private information held by analysts.

The relation between CSR disclosure and the precision of common information in analysts' forecasts is ambiguous. On the one hand, prior studies have found that CSR information is a useful input in analysts' earnings forecasts. For example, Dhaliwal *et al.* (2012) reported that the accuracy of analysts' forecasts improves when firms issue CSR reports. To the extent that CSR disclosure is informative for them, I expect analysts to incorporate more public information in their forecasts, suggesting a positive relation between CSR disclosure and the precision of common information in these forecasts.

On the other hand, information asymmetry may actually increase with increased CSR disclosure. Unlike financial reporting, CSR reporting is less regulated, and thus, there is substantial variation in firms' CSR reporting practices. Consequently, managers have considerable discretion in whether to disclose CSR information and to use it to strategically conceal self-serving behaviors (Brammer and Millington, 2008; Cho *et al.* 2015; Di Giuli and Kostovetsky, 2014). Consequently, CSR disclosure quality becomes a concern when managers strategically disclose CSR information (Hobson and Kachelmeier, 2005; Holder-Webb *et al.*, 2009; Ingram and Frazier, 1980).

Previous empirical studies have found mixed evidence of the relation between CSR disclosure and firm performance (e.g., Dhaliwal *et al.*, 2011; Hughes *et al.*, 2001; Wiseman, 1982). Not surprisingly, the prior literature has also documented substantial disagreement in terms of how external users (such as professional CSR rating agencies) evaluate the performance of firms based on their reported CSR information. Such disagreement can arise due to a lack of a standardized framework for CSR reporting (Eccles *et al.*, 2011), different information sets and/or different interpretations of information by users (Cookson and Niessner, 2020), or different rating methodologies used by raters (Berg *et al.*, 2020; Chatterji *et al.*, 2016). In a recent study, Christensen *et al.* (2022) found that more CSR disclosure actually induces greater disagreement among rating agencies. Like professional rating firms, financial analysts are different in terms of their level of sophistication, knowledge, and professionalism (Fang and Yasuda, 2014); moreover, they might also differ in terms of their interpretation of the CSR information disclosed by firms. If this is the case, then analysts are expected to incorporate less public information, resulting in the lower precision of common information in their forecasts. Consequently, the association between CSR disclosure and the precision of public information is ultimately an empirical question.

However, I predict a positive association between CSR disclosure and the precision of private information. Because CSR information provides less precise signals about firm value, the demand for private information by investors to supplement noisy CSR information likely increases (Bhushan, 1989; Das *et al.*, 1998; Frankel *et al.*, 2006). The potential for analysts to identify mispriced securities through private information acquisition may be greater for firms with greater CSR disclosure. Prior studies have shown that analysts incorporate more private information in their forecasts when information uncertainty is high than when it is low. For example, Barron *et al.* (2002) and Lobo *et al.* (2012) found that analysts rely more heavily on idiosyncratic information when issuing forecasts for intangible-intensive firms and firms with low accrual quality. Thus, I expect analysts to incorporate more private information on firms with a greater amount of CSR disclosure.

I examine the relation between CSR disclosure and analysts' information environment using a large sample of 33,846 firm-year observations across 31 countries spanning the years 2008 to 2020. The evidence shows that CSR disclosure is negatively and significantly associated with the precision of public information and positively and significantly associated

with that of private information in analysts' forecasts. The finding suggests that because of the nature and complexity of CSR information, financial analysts rely less on common information and generate more idiosyncratic inputs when issuing forecasts. The main results are robust after being subjected to a battery of sensitivity tests, such as the use of alternative models and variable specifications and an instrumental variable approach to mitigate endogeneity concerns.

The effect of CSR disclosure on analysts' forecasts may not be uniform across countries with different governance mechanisms. Prior studies have indicated two broad systems—shareholder- versus stakeholder-oriented governance mechanisms. I examine whether the differences between these governance mechanisms moderate the relation between CSR disclosure and analysts' forecasts. The results show that the effect of CSR disclosure on the precision of common and private information in analysts' forecasts is less (more) pronounced in shareholder (stakeholder)-oriented governance systems. Finally, using both country- and firm-level measures of the information environment, I find that the effect of CSR disclosure on the precision of common and private information in analysts' forecasts is more pronounced when the information environment is weaker, a setting in which the benefits of CSR disclosure are likely to be greater.

This study contributes to the literature on financial analysts. Financial analysts are integral in capital markets and can produce information that exhibits individual-specific knowledge that is useful to capital market participants (Barron *et al.,* 2002; Lang and Lundholm, 1996). There is little evidence explicitly linking CSR disclosure to the precision of public and private information in analysts' forecasts. Prior studies have generally investigated how CSR disclosure affects analysts' forecast errors and dispersion, finding that CSR disclosure reduces them both (e.g., Dhaliwal *et al.,* 2012). However, empirical tests based on forecast accuracy and dispersion do not allow for inferences about the precision of the individual components of analysts' information, i.e., common and idiosyncratic information. Moreover, these prior studies have relied primarily on the issuance, rather than the content, of CSR reports, in drawing inferences. In contrast, I utilize CSR disclosure scores from *Bloomberg*, which provides greater cross-sectional variation in CSR disclosure quality and quantity. I rely on the Barron–Kim–Lim–Stevens (BKLS) model to capture the precision of common and private information, documenting that CSR disclosure reduces the precision of public information but increases that of private information in analysts' forecasts. This study therefore provides a richer picture of how CSR disclosure impacts the information environment of financial analysts. In doing so, this paper also contributes to the research on analysts' information processing by showing that analysts rationally use more private information when there is substantial disagreement regarding the interpretation of CSR information disclosed by firms. Additionally, this study complements prior studies (e.g., Dhaliwal *et al.,* 2012) by documenting that the precision of analysts' information set is more pronounced in stakeholder-oriented rather than shareholder-oriented governance mechanisms. Furthermore, the relation between CSR disclosure and the precision of analysts' information is more salient when the information environment is poorer.

The rest of this study is organized as follows. In section two, I discuss the related research on CSR disclosure and financial analysts and develop my predictions on how CSR disclosure relates to analysts' information environment. I describe the measures of the primary variables of interest and research design in section three, discuss the main results in section four, and discuss the results of cross-sectional analyses in section five. Finally, I provide the conclusions in section six.

2. Research Background and Hypotheses

2.1. Prior Research on CSR

According to prior research (e.g., Lins *et al.,* 2017), CSR is viewed as an activity that demonstrates "the commitment of a business to contribute to sustainable economic development, working with employees, their families, the local community, and society at large to improve the quality of life" (World Business Council for Sustainable Development). In addition to meeting their financial objectives, firms face growing internal and external pressures to improve their performance along various nonfinancial dimensions, including environmental impacts, social welfare, and fair labor practices (Bénabou and Tirole, 2010; Hart and Zingales, 2017). A growing number of investors are now incorporating and integrating CSR performance into their stock and bond investment decisions (Dhaliwal *et al.*, 2012; Durand *et al.*, 2019).[2] Consequently, CSR is employed as a popular tool with which corporations can build social capital and enhance stakeholder trust (Christensen *et al.,* 2021; Dhaliwal *et al.,* 2011; McWilliams and Siegel, 2001) and enhance the public perception of corporations' ability to create "long-term and shared stakeholder value" (Ballou *et al.,* 2012; Gamerschlag *et al.,* 2011).

Prior studies have shown that CSR activities and reporting are associated with numerous economic benefits. For example, CSR disclosures are associated with a lower cost of equity capital (Dhaliwal *et al.,* 2011), cost of debt (Barth

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[2]　For example, BlackRock CEO Larry Fink recently sent a letter to investors detailing his plans to incorporate ESG as a new investing standard (BlackRock, 2020).

et al., 2020), analyst forecast error (Dhaliwal *et al.,* 2012), credit risk (Stellner *et al.,* 2015), tax avoidance (Lanis and Richardson, 2015), illegal insider trading (Cui *et al.,* 2015) and with higher firm value (Ferrell *et al.,* 2016; Matsumura *et al.,* 2014), stock market returns (Flammer, 2015), accounting performance (Flammer, 2015; Lev *et al.,* 2010), financial reporting quality (Kim *et al.,* 2012), and future financial performance (Lys *et al.,* 2015).

However, public confidence in CSR disclosures has been muted (Adams and Evans, 2004; Dando and Swift, 2003). Unlike financial reporting, CSR reporting is less regulated, and thus, there is substantial variation in firms' CSR reporting practices, which provides managers with considerable discretion in terms of whether to strategically disclose CSR information; hence, stakeholders might be skeptical about the credibility of CSR reports (Cho and Patten, 2007; Cho *et al.,* 2015). Consistent with the symbolic view of CSR reporting, Cho *et al.* (2010) found that compared to good environmental performers, poor environmental performers are more likely to have optimistic and uncertain tones in their environmental disclosures ("greenwashing") and to tend to disclose more CSR-related information in response to social and political pressure (Cho and Patten, 2007; Patten, 2002; Wiseman, 1982). Some sustainability investments are also found to be inefficient because of managers' incentives to extract private benefits (Brammer and Millington, 2008; Cheng *et al.,* 2019) or to serve political beliefs and agendas (Di Giuli and Kostovetsky, 2014).

In summary, CSR can be used as a managerial tool to conceal self-serving behaviors, and therefore, the quality of its disclosure becomes a concern when managers strategically disclose such information (Hobson and Kachelmeier, 2005; Holder-Webb *et al.,* 2009; Ingram and Frazier, 1980).

2.2. Prior Research on Financial Analysts

Financial analysts are an integral part of capital markets and provide information that supplements corporate financial reports. The forecasts made by these analysts can contribute to the information environment of firms (Bushman *et al.,* 2004; Lang *et al.,* 2004), improve firms' financial reporting transparency (Irani and Oesch, 2013; Yu, 2008), and help investors interpret public information (Livnat and Zhang, 2012). Moreover, these analysts serve an important role in interpreting the information and contribute to price discovery in the market through the analysis of information (Asquith *et al.,* 2005; Barron *et al.,* 2002; Palmon and Yezegel, 2012). Several studies have shown that analysts' forecasts and recommendations affect stock prices (Chen *et al.,* 2015; Francis and Soffer, 1997; Jackson, 2005; Lys and Sohn, 1990).

Financial analysts rely on a variety of information, including CSR information, in making earnings forecasts. In a 2014 survey by Ernst & Young Global Limited (EY), financial analysts claimed that CSR information plays a vital role when evaluating firm performance, while in a survey by Radley-Yeldar (2012), some analysts described nonfinancial reports as extra financial information that allows investors to gain in-depth knowledge of the advantages and challenges associated with a firm's projects. Some empirical studies have also documented that financial analysts use CSR information in developing reports for their clients. For example, Eccles *et al.* (2011) reported that financial analysts consider emission data when making stock recommendations, and Ioannou and Serafeim (2015) showed that analysts' recommendations consider the Kinder, Lydenberg, Domini Research and Analytics (KLD) ratings provided by a commercial CSR rating agency.

In this study, I examine how CSR disclosure affects the information environment of financial analysts. In particular, I rely on the BKLS model developed by Barron *et al.* (1998) to infer the precision of the common and private information contained in analysts' forecasts. The details of the BKLS model are discussed in the research design section.

2.3. CSR Disclosure and Financial Analysts' Information Environment

Analysts' information set contains both public (i.e., common) and idiosyncratic (i.e., private) components (Chen and Jiang, 2006). The common information available to all analysts includes the content of audited financial statements and other nonfinancial information such as CSR information, while the private information includes that collected and generated by individual analysts through their own efforts; such information could, for example, be that obtained by corporate site visits, that providing insights into local conditions, or that cross-referencing managerial claims (Cheng *et al.,* 2016). The demand for private information is more pronounced in an environment where information asymmetry is greater, and thus, in such an environment, investors can derive greater benefits (Frankel *et al.,* 2006; Barron *et al.,* 2002; Barth *et al.,* 2001). In the following section, I discuss how CSR disclosure may affect the precision of public and private information in analysts' forecasts.

2.3.1. CSR Disclosure and the Precision of Public Information in Analysts' Forecasts

In forecasting a company's future earnings, analysts are likely to incorporate CSR information because this information is important in determining a company's past earnings and future risk, which in turn impact firm value (Berthelot *et al.,*

2012; Lackmann *et al.,* 2012). CSR, as nonfinancial information, can influence capital market decisions because it reduces information asymmetry between managers and external investors. Prior research has indicated that CSR information is value relevant for financial analysts. For example, Dhaliwal *et al.* (2011) showed that the initiation of voluntary CSR disclosure provides information to the market such that it reduces the firm's cost of capital and analyst divergence. Moreover, Dhaliwal *et al.* (2012) reported that the issuance of standalone CSR reports has a positive impact on analysts' forecast accuracy, especially for countries with a more opaque information environment. Additionally, Muslu *et al.* (2019) developed a disclosure score based on a textual analysis of CSR report narratives and found that higher disclosure quality is informative to investors and helps improve analysts' forecast accuracy. Collectively, the above studies suggest that nonfinancial CSR disclosures improve the quality and quantity of information in capital markets and enhance the value of analysts' services. Given these findings, I expect financial analysts to rely more on publicly disclosed CSR information, thus resulting in a higher precision of public information in their forecasts.

Conversely, the degree of information asymmetry may increase with more CSR disclosure. As explained earlier, managers have considerable discretion regarding whether to strategically disclose CSR information, and thus, the quality of such disclosure may be questionable (Cho and Patten, 2007; Cho *et al.,* 2015). Hence, the appropriateness of the use of CSR information to predict firm performance may be more nuanced. Some prior studies have found a positive relation between firms' CSR performance and the intensity of their CSR disclosure (e.g., Al-Tuwaijri *et al.,* 2004; Clarkson *et al.,* 2008; Dhaliwal *et al.,* 2011; Gao *et al.,* 2016; Gelb and Strawser, 2001), while other studies have found either a negative relation (Hughes*et al.,* 2001; Patten, 2002) or no association (Ingram and Frazier ,1980; Wiseman, 1982). Hence, it is unclear whether CSR disclosure unambiguously helps users, including financial analysts, assess firm performance.

Relatedly, recent research has also shown that users of CSR information, such as professional rating agencies (e.g., Morgan Stanley Capital International (MSCI), Thomson Reuters, and Sustainalytics), disagree as to how CSR information can be translated into performance. The ratings differ due to the lack of a standardized framework through which to report CSR information (Eccles *et al.,* 2011), different information sets and/or different interpretations of information (Cookson and Niessner 2020), different rating methodologies used by raters (Berg *et al.,* 2020; Chatterji *et al.,* 2016), or different social origins of rating agencies (Eccles and Stroehle, 2018). A recent study by Christensen *et al.* (2022) showed that disagreement among rating agencies arises from the CSR information disclosure of firms, finding that ESG disclosure worsens ESG rating disagreement and that raters disagree most when there is a great deal of publicly available information. Because financial analysts are different in terms of their sophistication, knowledge, and professionalism (Fang and Yasuda, 2014), like professional rating agencies, they might also differ in terms of their interpretation of that CSR information disclosed by firms. Hence, it is possible that financial analysts rely less on publicly available CSR information, which then leads to a lower precision of common information in their forecasts. Because of the ambiguous relation between CSR disclosure and the precision of the common information in analysts' forecasts, I state the following null hypothesis:

> H_1: *Higher CSR disclosure is not associated with the precision of the common information contained in analysts' earnings forecasts.*

2.3.2. CSR Disclosure and the Precision of Private Information in Analysts' Forecasts

The lack of commonly unified standards for CSR reporting has led to considerable differences in how CSR is measured and evaluated by different stakeholders, including financial analysts. For CSR disclosures, there is no shared understanding on those exact metrics that should be assessed to evaluate firms' CSR performance or how to interpret and judge their meaning about such performance, which, in turn, leads to differential expectations about a firm's CSR performance and different interpretations of subsequent information (Krüger and Nolte, 2016).

The opaque CSR information environment may motivate financial analysts to produce more private information in their forecasts, an assumption that is consistent with the prior literature suggesting that analysts provide more idiosyncratic information when information uncertainty is high. For example, Barth *et al.* (2001); (2002) found that analysts rely more heavily on idiosyncratic information when issuing forecasts for intangible-intensive firms, where information uncertainty is greater, compared to other firms. Moreover, Lehavy *et al.* (2011) found that analysts expend greater effort in generating forecasts for firms with less readable 10-K statements. Furthermore, Lobo *et al.* (2012) found that firms with low-quality accruals provide opportunities for analysts to add value by generating private information. Overall, this stream of the literature has suggested that the higher uncertainty associated with less informative accounting reports provides analysts with greater opportunities to profit from the development of private information.

As CSR information provides less precise signals about firm value, the demand for private information, to supplement noisy CSR information, likely increases. Financial analysts have incentives to produce private information by generating

new information or conducting more intensive analyses of public information to obtain a competitive advantage (Mohanram and Sunder, 2006). In addition, the potential for analysts to identify mispriced securities through private information acquisition may be greater for firms with greater CSR disclosure. This discussion suggests that both the demand for private information and its potential benefits for analysts are greater for firms with higher CSR disclosure.

Financial analysts can develop idiosyncratic insights that are not commonly shared due to their superior information processing skills (Kim and Verrecchia, 1994, 1997). To transform the information contained in CSR reports into specific forecasts of future earnings, analysts need to process these disclosures using their own (unique) knowledge and skills. Because analysts have heterogeneous backgrounds, knowledge, and skills, the pieces of information (about future earnings) that each analyst is able to extract from the same information source are likely to differ, causing analysts' earnings forecasts to contain relatively more private information. Based on the above discussion, I propose the following hypothesis:

> H_2: Higher CSR disclosure is associated with higher precision of the private information contained in analysts' earnings forecasts.

Although I make a directional prediction in H_2, it is also possible that the precision of idiosyncratic information may not be higher with greater CSR disclosure. CSR disclosure may increase the complexity of firms, leading to transparency problems that exacerbate information asymmetry (Balakrishnan *et al.,* 2019). Due to complexity, such as that associated with CSR disclosure, analysts may have a lesser ability to assimilate specific information in their forecasts or may choose not to assimilate specific information if the costs exceed the benefits (Plumlee, 2003). Hence, whether CSR disclosure is associated with the precision of private information in analysts' forecasts can be determined only empirically.

3. Research Design

3.1 Measuring CSR Disclosure

The measure of CSR disclosure (*Disc_ESG*) is obtained from the *Bloomberg* database, which has been widely used in prior literature (e.g., Baldini *et al,.* 2018; Christensen *et al.*, 2022; Grewal *et al.*, 2019; Via and Perego, 2020).[3] Eccles *et al.* (2011) showed that the ESG disclosure scores from *Bloomberg* are of greatest interest to the market on a global basis; these scores can be viewed as rating the quantity of ESG information a firm discloses to the public, which reflects firms' voluntary and mandatory disclosures available to all relevant parties. The higher the ESG disclosure score is, the more nonfinancial information is disclosed. The *Bloomberg* ESG disclosure scores range from 0.1, for companies that release a minimum quantity of ESG data, to 100, for those that release every data item gathered by *Bloomberg*.

Bloomberg annually constructs the ESG scores by gathering information from various sources, such as annual reports and websites, CSR reports, and other public sources, as well as through direct contact with firms, including through email exchanges, phone interviews, survey responses, and face-to-face meetings. Overall, the *Bloomberg* ESG scores consist of 247 ESG indicators, including carbon emissions, climate change effect, pollution, waste disposal, renewable energy, resource depletion, supply chain, political contributions, discrimination, diversity, community relations, human rights, cumulative voting, executive compensation, shareholder rights, takeover defense, staggered boards, and independence of the board of directors. *Bloomberg* also penalizes firms for the nondisclosure of these indicators. Each data point is weighted upon the importance for the company's respective sector by normalizing the final score based only on a selected set of fields applicable to the industry type. For example, "Total Power Generated" is counted in the disclosure score of utility companies only. The weighted disclosure score is normalized to range from zero (for companies that do not disclose any ESG data) to 100 for those companies that disclose every data point collected.

3.2. Measuring the Precision of Common and Private Information in Analysts' Forecasts

This study relies on Barron *et al.* (1998), who exploited the observable properties of analysts' forecasts (squared forecast error and dispersion) to infer the precision of the common and private information held by analysts. Forecast dispersion reflects only error from the idiosyncratic information on which individual analysts rely, while error in the mean forecast reflects primarily error in the common information on which all analysts rely. As such, the BKLS model provides a direct linkage between the properties of analysts' information and the observable characteristics of their forecasts, potentially allowing for more precise tests regarding the common and idiosyncratic information conveyed by analysts in their forecasts. While the precision of common information is largely determined independently of analysts' efforts,

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the precision of analysts' idiosyncratic information depends on the information gathering efforts made by those analysts who have decided to follow a firm (Barron *et al.,* 2008; Indjejikian, 1991; Kim and Verrecchia, 1994; Mohanram and Sunder, 2006).

The BKLS model has been used extensively in the previous literature (e.g., Altschuler *et al.*, 2015; Barron *et al.* , 2002, 2005, 2008, 2017, 2018; Botosan *et al.,* 2004; Byard and Shaw, 2003; Byard *et al.,* 2011; Han *et al.,* 2014; Keshk and Wang, 2018; Mohanram and Sunder, 2006) and demonstrates that the precision of public information (*PUBLIC*) and that of private information (*PRIVATE*) can be calculated as follows:

$$PUBLIC = \frac{SE - \left(\dfrac{D}{N}\right)}{\left[1 - \left(\dfrac{1}{N}\right)D + SE\right]^2}$$

$$PRIVATE = \frac{SE - \left(\dfrac{D}{N}\right)}{\left[1 - \left(\dfrac{1}{N}\right)D + SE\right]^2}$$

where *D* is the variance in analysts' earnings forecasts; *N* is the number of analysts' earnings forecasts; and *SE* is the analysts' earnings forecast squared error, which is measured by subtracting analysts' mean earnings forecast from their actual earnings. Earnings forecasts and actual earnings data are collected from the Institutional Brokers' Estimate System (*I/B/E/S*) summary file to compute *D, SE, a*nd *N*. Following prior studies (e.g., Byard and Shaw, 2003), I scale both the realized dispersion (*D*) and squared error in the mean forecast (SE) by the absolute value of actual annual earnings. I use the means of monthly observations in a year as the annual observations. Because the cross-sectional distributions of the BKLS variables are positively skewed, following prior studies (Barron *et al.*, 2002, 2008; Botosan *et al.,* 2004; Byard and Shaw, 2003), I percentile rank the variables annually. The values for the ranked variables, which are denoted as *RPUBLIC* and *RPRIVATE*, range from 1 to 100. The use of ranked data has the advantage that it assumes only a monotonic relationship between variables, thereby relaxing the linearity assumption. Moreover, this approach reduces the influence of outliers (Iman and Conover, 1979).

3.3. Empirical model

I estimate the following cross-sectional regression to test H_1 and H_2:

$$RPUBLIC \text{ (or } RPRIVATE) = \alpha_0 + \alpha_1 Disc\_ESG + \alpha_2 V + \alpha_3 W + Industry\_FE + Year\_FE + \varepsilon \qquad ...(1)$$

The dependent variable is the precision of public or private information as computed by the BKLS model. *Disc_ESG* is the measure of CSR disclosure. All variables in the model are measured in year t. A positive (negative) coefficient on *Disc_ESG* indicates that CSR disclosure increases (decreases) the precision of public and private information in analysts' forecasts. *V* is a vector of firm characteristics, and *W* is a vector of country characteristics. *Industry_FE* and *Year_FE* denote industry and year Fixed Effects (FEs), respectively.[4] The Appendix includes detailed definitions of all variables.

Firm-level controls that have been previously documented to be associated with the properties of analysts' information environment are selected. I control for firm size (*SIZE*), measured by the logarithm of total assets (in millions of US dollars). Larger firms have more forthcoming disclosure policies than do small and medium-sized firms (Lang and Lundholm, 1996) and are positively related to the precision of analysts' information (Lys and Soo, 1995). However, larger firms also tend to be more dispersed geographically and have more complex structures and operations (Bhushan, 1989). Such increased complexity may reduce the precision of analysts' forecasts. Hence, it is unclear how firm size relates to the overall precision of the public and private information in analysts' forecasts.

As in prior studies (Dhaliwal *et al*., 2012; Hope, 2003), I control for a firm's profitability using Return on Assets (*ROA*) and an indicator for loss-making firms (*LOSS*). Firms with lower ROA and those reporting a loss have greater overall information uncertainty and, hence, may affect the precision of analysts' forecasts. I include the market-to-book ratio (*MB*) to control for firm characteristics related to growth opportunities. Prior research found that the demand for

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[4]   Industry classification is defined as in Frankel *et al*. (2002).

additional information related to growth firms is likely to be greater (Barth *et al.*, 2001); however, it is not clear how this variable relates to the precision of public and private information in forecasts. I control for the magnitude and sign of earnings surprises because Barron *et al.* (2008) found that earnings surprises that are negative and large in magnitude are associated with the precision of analyst information. *SURP* is computed as the absolute value of the difference between the actual and mean forecasted earnings per share, deflated by stock price at the beginning of the fiscal year. *SIGN* is an indicator variable that equals one if *SURP* is negative and zero otherwise. I also control for the number of analysts (*ANALYST*) covering the firms and firms' financial reporting transparency proxied by the magnitude of discretionary accruals (*DACC*). Barron *et al.* (2008) showed that the precision of forecasts is affected when more analysts update their forecasts and that analysts face more information asymmetry when earnings are opaque (Byard and Shaw, 2003). I control for Big N auditor (*BIGN*) since firms committing to high-quality auditing services should lead to higher financial reporting quality (Behn *et al.*, 2008) and hence an improved information environment. Finally, I control for financial leverage and earnings volatility. A firm's information can relate to its leverage, but the effect on earnings forecasts is unclear. Agarwal and O'Hara (2007) showed that firms with weaker information environments are more likely to use debt than are those with stronger information environments. However, firms that borrow more face more oversight by financial markets, which can reduce the degree of agency conflict between managers and shareholders (Jensen and Meckling, 1976; Stulz, 1990), leading to less uncertainty in their information environments. Earnings variability affects analysts' information search incentives (Lang and Lundholm, 1996), as, on the one hand, it can negatively relate to analysts' information precision because it is more difficult to produce accurate information for firms with more volatile earnings, and on the other hand, the demand for information and thus information search by analysts could also be higher for these firms. Leverage is measured by total liabilities divided by total assets (*LEV*), while earnings volatility is measured by the standard deviation of ROA in the previous five years (*STDROA*).

Prior studies found that cross-country variations in analysts' forecasts are associated with country-level institutions. I control for the legal infrastructure that shapes firms' reporting incentives. Two variables are used to capture the legal environments: an indicator variable for common law (*COMMON*) and the regulatory quality index (*REGQ*) from Kaufmann *et al.* (2011). The regulatory quality index indicates the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. I also control for two different corporate governance factors, namely, antidirector rights and anti-self-dealing, from Djankov *et al.* (2008). The antidirector index (*ANTIDIR*) measures how strongly the legal system protects minority shareholders, particularly concerning their voting rights, while the anti-self-dealing index (*ANTISELF*) focuses on enforcement mechanisms, including litigation and disclosure surrounding self-dealing transactions. I control for whether firms adopt International Financial Reporting Standards (*IFRS*) because prior studies showed that such adoption improves analyst forecasts (Demmer *et al.*, 2019; Dhaliwal *et al.*, 2012; Horton *et al.*, 2013). Finally, I control for the stock market development (*SMDEV*) and economic growth (*GDPGR*) of a country, which may affect the information environment and, hence, analysts' forecasts (Chung *et al.*, 2004). *SMDEV* is measured by stock market capitalization as a percentage of Gross Domestic Product (GDP), and *GDPGR* is the rate of change in real GDP. Because the estimation is conducted on a pooled sample, standard errors are clustered by firm.[5] Industry, year, and country FEs are also included in the regressions. The inclusion of year and industry FEs controls for macroeconomic changes and industry-invariance unobservable attributes on analysts' forecasts, while the inclusion of country FEs helps address the concern that CSR disclosures may be related to unobservable country characteristics that explain analysts' forecast properties.

4. Results

4.1. Sample

CSR disclosure data are obtained from the *Bloomberg* database for the period 2008–2020, analysts' forecasts' data are obtained from the I/B/E/S summary file, and financial data are obtained from the *Compustat Global* database. The initial sample begins with 56 countries with CSR disclosure scores in the *Bloomberg* database and financial data in *Compustat Global*. Six countries are removed because the forecast data are not available in the I/B/E/S summary file. Nine countries are removed because the number of observations is less than 10 during the sample period, and an additional 10 countries are removed due to missing country-level institutional variables (such as *Antidirector* and *Anti-self-dealing*). These

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[5]   Petersen (2009) suggested that in the presence of cross-sectional and time-series dependence, one dependence effect can be addressed parametrically (e.g., including time [indicators] for cross-sectional dependence), and then, standard errors clustered on the other dependence effect (e.g., clustering by firms for time-series dependence) can be estimated. As there are more firm than year and industry observations, the use of year and industry indicators, along with firm clustering, leads to standard errors that are less biased.

sampling and data availability criteria result in a final sample of 31 countries and 33,846 firm-year observations. To mitigate the effects of extreme values, each continuous firm-level variable is winsorized at the 1% and 99% levels.

4.2. Descriptive Statistics

Table 1 reports the sample composition and mean characteristics for each of the 31 countries. The sample size for each country ranges widely, from 11 firm-year observations for Pakistan to 9,671 firm-year observations for Japan. As observed in Table 1, the CSR disclosure score, *Disc_ESG*, varies widely across countries. Australia, China, India, Israel, Pakistan, and the US have the lowest scores (less than 25), while Brazil, France, South Africa, and Spain have the highest scores (greater than 40). The rank variables for the precision of public and private information in analyst forecasts also exhibit wide variation. For example, the values for *RPUBLIC* are the lowest in Australia and New Zealand (less than 30) and the highest in Great Britain, India, and Switzerland (greater than 60). The values for *RPRIVATE* are the lowest in South Korea, Indonesia, and Japan (less than 30) and the highest in Australia, Israel, New Zealand, and the US (greater than 70). Table 2 presents the descriptive statistics for the variables used in the regression. The mean (median) *Disc_ESG* is 26.92 (23.14). As expected, the mean and median ranked variables for *RPUBLIC* and *RPRIVATE* are 50. The descriptive statistics for the other variables are shown in Table 2.

Table 1: Sample Composition and Mean Characteristics by Country										
Country	**N**	**Disc _ESG**	**RPUB LIC**	**RPRI VATE**	**SIZE**	**ROA**	**LOSS**	**MB**	**SURP**	**SIGN**	**ANALYST**
Argentina	32	36.42	37.31	48.75	8.64	0.05	0.09	1.49	0.07	0.66	1.14
Australia	2,059	22.48	27.53	70.05	6.51	0.02	0.28	3.16	0.04	0.65	2.00
Brazil	487	40.17	48.47	48.93	8.78	0.03	0.21	1.75	0.07	0.63	2.06
Canada	125	29.63	46.90	59.55	7.74	0.01	0.26	4.59	0.02	0.50	2.23
Chile	122	39.83	52.97	39.22	8.54	0.04	0.09	141.54	0.01	0.67	1.62
China	8,021	21.12	35.93	66.79	7.60	0.06	0.04	3.71	0.01	0.71	1.89
France	675	42.28	55.74	67.01	8.92	0.04	0.07	2.44	0.01	0.58	2.68
Germany	925	33.93	58.41	59.45	8.56	0.03	0.16	2.78	0.02	0.56	2.70
Great Britain	1,295	30.52	68.35	52.90	7.42	0.05	0.14	225.83	0.01	0.44	2.43
Hong Kong	1,152	28.56	40.11	67.14	8.42	0.06	0.05	4.79	0.02	0.63	2.35
India	3,058	22.20	64.21	42.64	6.96	0.07	0.09	5.80	0.02	0.63	2.19
Indonesia	315	29.51	57.97	26.39	7.57	0.08	0.10	90.61	0.03	0.67	2.33
Israel	113	24.05	43.62	75.89	7.72	0.05	0.12	8.48	0.00	0.44	1.75
Italy	153	37.87	38.03	66.78	8.84	0.03	0.13	4.42	0.03	0.62	2.45
Japan	9,671	28.30	59.02	27.21	7.78	0.04	0.09	1.75	0.04	0.55	1.79
Korea South	1,021	34.67	40.06	6.47	8.31	0.04	0.15	1.92	0.04	0.75	2.46
Malaysia	547	29.68	35.22	69.37	7.67	0.07	0.08	8.12	0.02	0.61	2.47
Mexico	171	34.17	55.39	57.48	8.58	0.06	0.07	2.62	0.02	0.57	1.97
New Zealand	67	25.31	22.45	73.30	7.39	0.05	0.10	3.90	0.01	0.57	1.94
Norway	281	27.89	54.36	42.72	7.67	0.00	0.34	8.05	0.08	0.67	2.34
Pakistan	11	24.76	54.91	51.91	6.98	0.09	0.00	2.47	0.02	0.27	1.31
Philippines	187	27.07	48.40	63.72	8.54	0.05	0.02	4.55	0.01	0.53	1.95
Poland	141	28.06	51.51	50.98	7.93	0.05	0.11	2.13	0.03	0.52	2.03
Russia	247	36.49	44.70	43.61	9.29	0.07	0.10	41.15	0.07	0.57	1.70
Singapore	229	25.50	34.76	65.66	8.38	0.05	0.10	2.18	0.06	0.69	2.34
South Africa	320	41.99	56.38	49.74	7.88	0.06	0.13	8.14	0.02	0.72	2.00

Table 1 (Cont.)

Country	N	Disc_ESG	RPUBLIC	RPRIVATE	SIZE	ROA	LOSS	MB	SURP	SIGN	ANALYST
Spain	212	49.84	44.70	65.38	9.26	0.03	0.13	9.62	0.03	0.56	2.82
Switzerland	418	36.23	60.96	59.10	8.58	0.05	0.12	12.23	0.01	0.54	2.54
Thailand	264	38.07	58.08	56.62	7.81	0.08	0.07	3.82	0.02	0.64	2.46
Turkey	197	37.61	46.06	59.28	7.93	0.07	0.05	1.65	0.03	0.48	2.11
USA	1,330	19.91	53.50	70.09	6.99	-0.04	0.39	5.66	0.05	0.49	2.08

Country	DACC	BIGN	LEV	STD ROA	COMMON	REGO	ANTI DIR	ANTI DEAL	IFRS	SM DEV	GDP GR	STAKE	CIFAR	OPACITY
Argentina	-2.44	0.97	0.55	0.02	0	-0.71	2	0.34	0.78	10.56	1.48	-	68	43.8
Australia	-2.61	0.84	0.42	0.08	1	1.83	4	0.76	1.00	100.23	2.44	1.58	80	20.8
Brazil	-3.22	0.87	0.62	0.04	0	-0.05	5	0.27	0.88	49.05	1.18	-1.92	56	40.4
Canada	-2.20	1.00	0.61	0.04	1	1.73	4	0.64	0.89	123.40	1.35	0.56	75	23.2
Chile	-1.09	0.94	0.55	0.02	0	1.38	4	0.63	0.98	96.89	2.41	-0.88	78	28.4
China	-3.41	0.23	0.47	0.03	0	-0.22	1	0.76	1.00	58.81	7.39	-	-	50.2
France	-3.77	0.59	0.60	0.02	0	1.16	3.5	0.38	1.00	76.99	0.99	1.12	78	36.8
Germany	-3.56	0.90	0.58	0.03	0	1.65	3.5	0.28	1.00	47.25	0.89	0.81	67	24.8
Great Britain	-3.25	0.95	0.57	0.05	1	1.72	5	0.95	1.00	111.56	0.91	0.47	85	18.8
Hong Kong	-3.25	0.93	0.46	0.03	1	2.01	5	0.96	1.00	1149.26	1.73	-1.11	73	20
India	-3.12	0.29	0.51	0.03	1	-0.33	5	0.58	0.00	83.14	5.71	-2.73	61	48.6
Indonesia	-3.26	0.03	0.47	0.04	0	-0.17	4	0.65	0.99	45.13	4.65	-	-	59.4
Israel	-3.10	0.03	0.49	0.04	1	1.24	4	0.72	1.00	68.67	3.62	-	74	30.4
Italy	-3.62	0.56	0.64	0.02	0	0.80	2	0.42	1.00	24.84	-1.16	-0.09	66	43.2
Japan	-3.60	0.00	0.46	0.02	0	1.23	4.5	0.50	0.87	92.60	0.12	-0.95	71	27.4
Korea South	-3.34	0.00	0.47	0.03	0	1.06	4.5	0.47	0.94	94.02	2.49	-1.57	68	37
Malaysia	-3.67	0.84	0.48	0.03	1	0.66	5	0.95	0.80	130.89	3.85	-1.76	79	34.8
Mexico	-3.10	0.45	0.47	0.02	0	0.28	3	0.17	0.76	35.86	1.08	-1.47	71	43.6
New Zealand	-3.85	0.76	0.44	0.04	1	1.96	4	0.95	1.00	46.74	2.70	0.64	80	-
Norway	-3.01	1.00	0.53	0.07	0	1.65	3.5	0.42	1.00	56.78	1.25	2.62	75	-
Pakistan	-2.88	0.45	0.70	0.03	1	-0.61	4	0.41	0.00	17.34	2.26	-	73	45.2
Philippines	-3.51	0.00	0.55	0.02	0	-0.06	4	0.22	0.88	76.67	4.95	-1.93	64	50.4
Poland	-3.27	0.79	0.48	0.03	0	0.96	2	0.29	1.00	30.93	3.16	-	-	40.8
Russia	-3.09	0.34	0.46	0.05	0	-0.42	4	0.44	0.89	37.78	1.24	-	-	46.4
Singapore	-3.56	0.92	0.50	0.03	1	2.04	5	1.00	1.00	218.14	3.85	-0.59	79	23.8
South Africa	-3.26	0.98	0.46	0.05	1	0.31	5	0.81	1.00	238.34	1.19	-1.42	79	33.6
Spain	-3.73	0.97	0.67	0.03	0	0.97	5	0.37	1.00	66.16	0.22	-0.42	72	33.8
Switzerland	-3.59	1.00	0.55	0.04	0	1.71	3	0.27	1.00	206.92	1.48	1.34	80	22.6
Thailand	-3.46	0.93	0.50	0.04	1	0.18	4	0.81	0.78	99.74	2.24	-1.96	66	35
Turkey	-3.43	0.22	0.51	0.03	0	0.21	3	0.43	1.00	25.22	5.04	-	58	43
USA	-2.03	0.83	0.51	0.09	1	1.40	3	0.65	1.00	140.69	1.57	-1.55	76	20.8

Note: This table provides the sample composition and selected mean characteristics by country. The detailed definitions of the variables are provided in the Appendix.

Table 2: Descriptive Statistics

Variables	N	Mean	Q 1	Median	Q 3	Stdev
Disc_ESG	33,846	26.915	15.702	23.140	37.190	14.091
PUBLIC	33,846	-0.920	-0.563	0.112	1.057	7.670
RPUBLIC	33,846	49.500	25.000	50.000	74.000	28.855
PRIVATE	33,846	9.649	0.038	2.562	11.659	18.162
RPRIVATE	33,846	49.500	25.000	50.000	74.000	28.855
SIZE	33,846	7.684	6.571	7.614	8.706	1.610
ROA	33,846	0.045	0.018	0.043	0.077	0.078
LOSS	33,846	0.112	0.000	0.000	0.000	0.315
MB	33,846	13.647	1.027	1.837	3.660	58.009
SURP	33,846	0.030	0.002	0.007	0.020	0.083
SIGN	33,846	0.611	0.000	1.000	1.000	0.487
ANALYST	33,846	2.041	1.407	2.048	2.615	0.736
DACC	33,846	-3.316	-4.090	-3.250	-2.485	1.435
BIGN	33,846	0.365	0.000	0.000	1.000	0.481
LEV	33,846	0.486	0.337	0.489	0.631	0.209
STDROA	33,846	0.035	0.010	0.020	0.038	0.047
COMMON	33,846	0.312	0.000	0.000	1.000	0.463
REGQ	33,846	0.761	-0.220	1.100	1.380	0.832
ANTIDIR	33,846	3.553	3.000	4.500	4.500	1.531
ANTIDEAL	33,846	0.621	0.499	0.579	0.763	0.185
IFRS	33,846	0.860	1.000	1.000	1.000	0.347
SMDEV	33,846	122.181	59.630	82.720	110.120	201.486
GDPGR	33,846	3.044	0.750	2.350	6.750	3.811
STAKE	24,769	-0.788	-1.550	-0.950	-0.420	1.260
CIFAR	25,122	71.630	68.000	71.000	76.000	6.609
OPACITY	33,498	35.227	27.400	27.400	50.200	11.973

Note: This table provides the descriptive statistics of the main variables used in this study. The detailed definitions of the variables are provided in Appendix.

4.3 Empirical Results

4.3.1 Tests for H_1

In this section, I report the results of the tests of H_1, which examines the association between CSR disclosure and the precision of public information in analysts' forecasts. Table 3 shows the results for H_1, where the dependent variable is

Table 3: Relation between CSR Disclosure and the Precision of Public Information in Analysts' Forecasts

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Disc_ESG	**-0.092**	**-0.121**	**-0.038**	**-0.092**	**-0.063**
	(-4.42)* **	**(-5.22)*** **	**(-1.68)***	**(-1.87)***	**(-3.38)*** **
SIZE	0.251	-0.308	-0.171	0.251	0.017
	(1.14)	(-1.25)	(-0.68)	(0.35)	(0.09)
ROA	3.755	8.984	0.666	3.755	14.047
	(0.94)	(1.95)*	(0.15)	(0.35)	(3.94)***
LOSS	-2.391	-1.322	-4.978	-2.391	-1.140
	(-3.63)***	(-1.68)*	(-7.56)***	(-0.75)	(-1.80)*
MB	0.061	0.079	0.062	0.061	0.010
	(10.56)***	(15.21)***	(10.70)***	(3.14)***	(1.61)
SURP	1.337	-26.253	-5.340	1.337	3.707
	(0.51)	(-12.33)***	(-2.21)**	(0.05)	(1.29)
SIGN	-2.547	-1.877	-4.181	-2.547	-1.145
	(-7.06)***	(-4.76)***	(-10.66)***	(-1.33)	(-3.35)***
ANALYST	6.869	7.014	5.238	6.869	7.646
	(17.36)***	(16.71)***	(11.48)***	(3.13)***	(21.15)***
DACC	-0.262	-0.491	-0.272	-0.262	-0.209
	(-1.90)*	(-3.50)***	(-1.75)*	(-1.14)	(-1.71)*
BIGN	-1.114	1.990	-2.084	-1.114	2.420
	(-1.72)*	(2.51)**	(-2.61)***	(-0.60)	(3.91)***
LEV	-1.739	1.038	-4.054	-1.739	-2.381
	(-1.49)	(0.86)	(-3.21)***	(-0.62)	(-2.25)**
STDROA	-16.037	-8.504	-29.315	-16.037	-0.481
	(-3.08)***	(-1.47)	(-5.02)***	(-1.07)	(-0.10)
COMMON	-0.280	-5.804	1.417	-0.280	
	(-0.23)	(-4.39)***	(0.88)	(-0.04)	
REGQ	-3.489	-8.223	-3.504	-3.489	0.725
	(-5.86)***	(-11.65)***	(-4.94)***	(-1.13)	(0.41)
ANTIDIR	3.646	7.036	2.936	3.646	
	(10.82)***	(17.89)***	(4.24)***	(1.82)*	
ANTISELF	-21.498	-31.780	-22.818	-21.498	
	(-8.44)***	(-10.10)***	(-5.69)***	(-2.06)**	
IFRS	-3.326	5.073	-3.921	-3.326	4.232
	(-3.39)***	(4.65)***	(-3.71)***	(-0.80)	(4.83)***
SMDEV	-0.002	0.001	-0.002	-0.002	-0.003
	(-1.47)	(0.43)	(-1.05)	(-0.32)	(-0.72)
GDPGR	-0.843	-0.620	-1.060	-0.843	-0.067
	(-7.73)***	(-4.89)***	(-8.33)***	(-1.66)	(-0.69)
Constant	34.772	32.516	41.978	34.772	22.678
	(10.14)***	(9.06)***	(7.72)***	(2.84)***	(3.11)***
Observations	33,846	33,846	25,825	33,846	33,846
R-squared	0.157	0.214	0.120	0.157	0.224
Year and Industry FEs	Yes	Yes	Yes	Yes	Yes
Country clustering	No	No	No	Yes	No
Country FEs	No	No	No	No	Yes

Note: This table reports the regression results of the relation between CSR disclosure and the precision of public information in analysts' forecasts. The dependent variable is RPUBLIC. Column 1 shows the results for the baseline regression. Column 2 shows the results using WLS regression. Column 3 shows the results after removing the Japanese and Chinese samples. Column 4 shows the results where standard errors are clustered by country. Column 5 shows the results including country FEs. The detailed definitions of all variables are provided in the Appendix. Coefficients on the year and industry indicator variables are not tabulated for brevity. The t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

RPUBLIC. I also estimate several alternative specifications to assess the robustness of the relation. In Column 1, I report the results of the baseline regression, as specified in Equation (1). In Column 2, I employ a Weighted Least Squares (WLS) approach so that each of the 31 countries receives equal weight in the regression estimation (Dittmar *et al*., 2003). Because Japanese and Chinese firms constitute a large proportion of the sample and, therefore, could have an undue influence on the results, I exclude them from the overall sample and report the results in Column 3. In Column 4, standard errors in the estimation are clustered by country rather than by firm. In Column 5, country FEs are included in the regression to control for any unobserved time-invariant country-level characteristics that could be correlated with the test and dependent variables. As indicated in Table 3, there is a robust negative and significant coefficient of *RPUBLIC* in all five columns, which is consistent with the contention that CSR disclosure reduces the precision of public information in analysts' forecasts. In terms of economic significance, a one percentage point increase in the disclosure score is associated with a 0.038 to 0.121 percentage point decline in the precision of common information in analysts' forecasts.

For the set of firm-level control variables, high-growth firms (*MB*) and firms with more analyst coverage (*ANALYST*) are associated with a higher precision of public information, while loss-making firms (*LOSS*), firms with a negative earnings surprise (*SIGN*), and firms with higher discretionary accruals (*DACC*) are associated with a lower precision of public information in forecasts. For country-level controls, I find that countries with higher antidirector provision (*ANTIDIR*) are associated with a higher precision of public information, while countries with higher regulatory quality (*REGQ*), anti-self-dealing (*ANTISELF*) and economic growth (*GDPGR*) are associated with a lower precision of public information in forecasts. There is mixed evidence on international financial reporting standard adoption (*IFRS*) and the precision of public information in analysts' forecasts.

Overall, the evidence in Table 3 indicates that higher CSR disclosure is negatively associated with the precision of the common information contained in analysts' earnings forecasts.

4.3.2. Tests for H_2

This section reports the results relating to H_2, which examines the association between CSR disclosure and the precision of private information in analysts' forecasts. As before, I estimate several alternative specifications to assess the robustness of the relation, the results of which are reported in Table 4. I find a robust positive and significant coefficient of *RPRIVATE* in all five columns, which is consistent with my prediction in H_2 that CSR disclosure is positively related to the precision of private information in analysts' forecasts. In terms of economic significance, a one percentage point increase in the disclosure score is associated with a 0.031to 0.080 percentage point increase in the precision of private information in analysts' forecasts.

For the set of firm-level control variables, I find that profitable firms (*ROA*) and firms audited by Big N auditors (*BIGN*) are associated with a higher precision of public information in analysts' forecasts. Conversely, large firms (*SIZE*), loss-making firms (*LOSS*), firms with large absolute earnings surprises (*SURP*), firms with negative earnings surprises (*SIGN*), firms with higher discretionary accruals (*DACC*), and firms with greater earnings volatility (*STDROA*) are associated with a lower precision of private information in analysts' forecasts. Regarding country-level controls, I find that common law countries (*COMMON*), countries with higher regulatory quality (*REGQ*), countries that have adopted IFRS (*IFRS*), and countries with a higher level of stock market development (*SMDEV*) are associated with a higher precision of private information, while countries with higher antidirector (*ANTIDIR*) and anti-self-dealing (*ANTISELF*) provisions are associated with a lower precision of private information in analysts' forecasts.

Overall, the evidence in Table 4 supports the prediction that higher CSR disclosure is positively associated with the precision of the private information contained in analysts' earnings forecasts.

4.3.3. Instrumental Variable (Two-Stage Least Squares (2SLS)) Estimation

As with most studies that examine the impact of CSR disclosure on economic outcomes, the results and inferences may be sensitive to selection bias or to omitted correlated variables that are potentially related to both CSR disclosure and analyst forecast properties. To mitigate potential endogeneity concerns, I employ instrumental variable (2SLS) estimation. Following prior studies (e.g., Breuer *et al*., 2018; El Ghoul *et al*., 2018), I use the initial CSR score when the firm enters the sample (*Initial_CSR*) and the country-industry average CSR score (*Initial_CSR_CountryIndustry*) in the first year of data. Both variables are likely to affect the current CSR score but are unlikely to directly affect the properties of analysts' forecasts in the current period. In the first stage, I regress *Disc_ESG* on the two instruments and other controls. I then replace *Disc_ESG* with the fitted value from the first-stage regression (*Pred_Disc_ESG*) to test the hypotheses.

The results of the first-stage regression are reported in Column 1 of Table 5. As expected, both instruments (*Initial_CSR* and *Initial_CSR_CountryIndustry*) are significantly and positively associated with CSR score. The results for the

Table 4: Relation between CSR Disclosure and the Precision of Private Information in Analysts' Forecasts

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Disc_ESG	**0.075**	**0.052**	**0.080**	**0.075**	**0.031**
	(3.60)*	**(2.57)**	**(3.44)***	**(1.94)*	**(1.87)*
SIZE	-1.336	-1.296	-1.420	-1.336	-1.181
	(-6.08)***	(-5.83)***	(-5.46)***	(-3.30)***	(-6.45)***
ROA	42.213	66.502	31.135	42.213	38.500
	(11.82)***	(15.33)***	(7.91)***	(3.19)***	(11.83)***
LOSS	-4.776	-3.231	-5.475	-4.776	-4.994
	(-8.61)***	(-5.56)***	(-9.02)***	(-3.57)***	(-9.72)***
MB	-0.009	-0.001	-0.011	-0.009	0.004
	(-1.78)*	(-0.11)	(-2.08)**	(-0.74)	(0.64)
SURP	-66.183	-57.866	-63.999	-66.183	-64.841
	(-22.81)***	(-19.14)***	(-22.81)***	(-8.50)***	(-23.00)***
SIGN	-4.991	-4.066	-4.261	-4.991	-5.085
	(-17.58)***	(-12.27)***	(-12.98)***	(-3.76)***	(-19.21)***
ANALYST	-0.567	-0.746	-0.084	-0.567	-0.378
	(-1.49)	(-2.11)**	(-0.18)	(-0.46)	(-1.19)
DACC	-0.393	-0.264	-0.426	-0.393	-0.192
	(-3.61)***	(-2.26)**	(-3.30)***	(-2.60)**	(-2.03)**
BIGN	8.120	2.953	10.434	8.120	0.906
	(12.96)***	(4.85)***	(13.30)***	(2.80)***	(1.68)*
LEV	1.976	1.647	2.975	1.976	0.032
	(1.70)*	(1.34)	(2.33)**	(1.24)	(0.03)
STDROA	-30.572	-54.664	-23.814	-30.572	-36.499
	(-6.75)***	(-10.17)***	(-4.66)***	(-2.97)***	(-9.11)***
COMMON	30.684	35.440	31.314	30.684	
	(29.45)***	(33.48)***	(21.47)***	(6.52)***	
REGQ	1.346	6.754	1.856	1.346	1.109
	(2.39)**	(12.11)***	(2.87)***	(0.53)	(0.85)
ANTIDIR	-12.098	-15.541	-9.773	-12.098	
	(-36.88)***	(-47.07)***	(-14.34)***	(-6.45)***	
ANTISELF	-22.153	-22.849	-29.412	-22.153	
	(-8.55)***	(-7.94)***	(-7.26)***	(-1.95)*	
IFRS	9.530	2.222	10.197	9.530	-1.218
	(10.14)***	(2.54)**	(10.21)***	(2.20)**	(-1.79)*
SMDEV	0.010	0.011	0.010	0.010	0.005
	(8.39)***	(8.13)***	(7.71)***	(2.47)**	(2.63)***
GDPGR	-0.103	-0.193	-0.102	-0.103	0.353
	(-1.09)	(-1.95)*	(-0.90)	(-0.22)	(4.88)***
Constant	107.928	112.659	108.489	107.928	67.410
	(21.99)***	(33.59)***	(12.45)***	(10.57)***	(7.20)***
Observations	33,846	33,846	25,825	33,846	33,846
R-squared	0.478	0.533	0.452	0.478	0.546
Year and Industry FEs	Yes	Yes	Yes	Yes	Yes
Country clustering	No	No	No	Yes	No
Country FEs	No	No	No	No	Yes

Note: This table reports the regression results of the relation between CSR disclosure and the precision of private information in analyst forecasts. The dependent variable is RPRIVATE. Column 1 shows the results for the baseline regression. Column 2 shows the results using WLS regression. Column 3 shows the results after removing the Japanese and Chinese samples. Column 4 shows the results where standard errors are clustered by country. Column 5 shows the results including country FEs. The detailed definitions of all variables are provided in the Appendix. Coefficients on the year and industry indicator variables are not tabulated for brevity. The t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 5: Relation between CSR Disclosure and Analysts' Information Environment: Controlling for Endogeneity

Dep Var =	(1) Disc_ESG	(2) RPUBLIC	(3) RPRIVATE
Pred_Disc_ESG		-0.115	0.096
		(-5.19)***	(5.49)***
Initial_CSR	0.686		
	(56.51)***		
Initial_CSR_CountryIndustry	0.056		
	(2.62)***		
SIZE	2.050	0.344	-1.419
	(20.35)***	(2.13)**	(-11.16)***
ROA	1.450	3.789	42.182
	(0.99)	(1.42)	(20.08)***
LOSS	0.180	-2.383	-4.783
	(0.63)	(-3.77)***	(-9.61)***
MB	0.001	0.061	-0.009
	(0.44)	(21.25)***	(-3.99)***
SURP	-0.405	1.374	-66.216
	(-0.43)	(0.70)	(-42.96)***
SIGN	0.198	-2.542	-4.996
	(1.72)*	(-8.19)***	(-20.47)***
ANALYST	1.572	6.921	-0.614
	(8.97)***	(25.94)***	(-2.92)***
DACC	-0.125	-0.263	-0.393
	(-2.31)**	(-2.48)**	(-4.71)***
BIGN	1.509	-1.037	8.052
	(5.25)***	(-2.54)**	(25.08)***
LEV	-1.782	-1.747	1.983
	(-3.20)***	(-2.14)**	(3.08)***
STDROA	-6.037	-16.046	-30.564
	(-3.14)***	(-4.20)***	(-10.16)***
COMMON	2.556	-0.322	30.722
	(5.26)***	(-0.47)	(56.46)***
REGQ	-2.954	-3.533	1.386
	(-12.65)***	(-10.00)***	(4.99)***
ANTIDIR	0.311	3.697	-12.143
	(1.87)*	(18.31)***	(-76.46)***
ANTISELF	-6.606	-21.554	-22.104
	(-5.43)***	(-14.77)***	(-19.25)***
IFRS	6.184	-3.207	9.424
	(17.57)***	(-4.36)***	(16.28)***
SMDEV	0.004	-0.002	0.010
	(5.79)***	(-2.59)***	(14.25)***
GDPGR	-0.501	-0.854	-0.093
	(-19.12)***	(-10.46)***	(-1.45)
Constant	-6.882		
	(-5.61)***		

Table 5 (Cont.)			
	(1)	**(2)**	**(3)**
Dep Var =	*Disc_ESG*	*RPUBLIC*	*RPRIVATE*
Observations	33,846	33,846	33,846
R-squared	0.658	0.147	0.461
Year and Industry FEs	Yes	Yes	Yes

Note: This table reports the regression results of the relation between CSR disclosure and the precision of public and private information in analysts' forecasts based on an instrumental variable (2SLS) approach. In Column 1, we report the results of the first-stage regression, where we regress *Disc_ESG* on *Initial_CSR* and *Initial_CSR_CountryIndustry* as instruments, and the other control variables in the main regression. In Column 2, we report the second-stage regression using the predicted value of Disc_ESG from the first stage, where the dependent variable is the precision of public information (*RPUBLIC*). In Column 3, we report the second-stage regression using the predicted value of Disc_ESG from the first stage, where the dependent variable is the precision of private information (*RPRIVATE*). The detailed definitions of all variables are provided in the Appendix. Coefficients on the year and industry indicator variables are not tabulated for brevity. The *t*-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

second-stage regression are reported in Columns 2 and 3. The predicted value of CSR disclosure from the first-stage regression is used to test H_1 and H_2. As shown in Column 2, the predicted value of CSR disclosure (*Pred_Disc_ESG*) is significantly and negatively associated with the precision of public information in analysts' forecasts, consistent with the evidence reported in Table 3. Similarly, in Column 3, *Pred_Disc_ESG* is significantly and positively associated with the precision of private information in analysts' forecasts, consistent with the prediction in H_2.

I also assess the appropriateness of the instruments. The Cragg–Donald Wald F statistic is 11,975.90, rejecting the null hypothesis that the instruments are weak. Moreover, I test for overidentification by calculating the Hansen *J*-statistic for the sample, which fails to reject the null hypothesis that all instruments are exogenous (J-statistic = 0.228 and 1.222, respectively, *p* value = 0.633 and 0.269 for H_1 and H_2). Based on this statistic, the instruments used in the 2SLS are likely to be valid. Overall, the results from the instrumental variable estimation mitigate concerns that the main results are driven by potential omitted correlated variable problems.

4.3.4. Additional Analysis

The BKLS report (1998) showed that the precision of public and private information in analysts' forecasts can be used to construct a consensus metric that measures the proportion of commonly held information about a firm. Specifically, consensus (*CONS*) can be computed as follows:

$$CONS = \frac{PUBLIC}{PUBLIC + PRIVATE}$$

For completeness, I also assess how CSR disclosure affects consensus in analysts' forecasts. The results, as reported in Table 6, indicate that CSR disclosure is negatively and significantly associated with consensus in analysts' forecasts. This observation is consistent with the main finding of there being a decrease in the precision of public information coupled with an increase in the precision of private information contained in analysts' forecasts.

In the main regression, I use the percentile rank of the precision of analysts' forecasts to test H_1 and H_2. As a robustness check, I use the level of the precision of public and private information to test the associations. The results for the level test are shown in Table 7, Panel A. Columns 1 and 2 show the results when the dependent variable is *PUBLIC,* while Columns 3 and 4 show those when the dependent variable is *PRIVATE*. Columns 1 and 3 show the baseline regression results, while Columns 2 and 4 show the results with country FEs. Consistent with the main finding, CSR disclosure is found to be negatively (positively) and significantly associated with the level of precision of the public (private) information contained in analysts' forecasts.

The aggregate score for ESG disclosure is used in testing the hypotheses. As a robustness check, I also use components of the ESG scores, namely, the scores for the environment (*Disc_E*), social (*Disc_S*), and governance (*Disc_G*) aspects, to test H_1 and H_2. The results, as reported in Panel B of Table 7, show that all three individual components of ESG are negatively (positively) associated with the precision of public (private) information in analysts' forecasts.

Table 6: Relation between CSR Disclosure and the Consensus in Analysts' Forecasts

	(1)	(2)	(3)	(4)	(5)
Disc_ESG	**-0.092**	**-0.093**	**-0.070**	**-0.092**	**-0.037**
	(-4.63)* **	**(-5.18)*** **	**(-3.19)*** **	**(-2.14)** **	**(-2.56)** **
SIZE	1.351	0.901	1.548	1.351	0.985
	(6.43)***	(4.60)***	(6.22)***	(2.58)**	(6.20)***
ROA	-0.616	-7.328	-2.866	-0.616	10.690
	(-0.19)	(-1.92)*	(-0.81)	(-0.14)	(4.09)***
LOSS	3.979	6.692	1.989	3.979	4.768
	(6.59)***	(10.60)***	(3.12)***	(2.16)**	(9.18)***
MB	0.023	0.027	0.026	0.023	-0.001
	(4.34)***	(6.09)***	(4.73)***	(1.43)	(-0.19)
SURP	76.987	66.465	71.614	76.987	76.347
	(24.05)***	(20.43)***	(23.70)***	(6.76)***	(25.27)***
SIGN	1.704	1.628	1.582	1.704	2.425
	(6.22)***	(5.28)***	(4.99)***	(2.02)*	(9.99)***
ANALYST	4.717	4.469	2.905	4.717	4.702
	(12.72)***	(13.62)***	(6.39)***	(2.10)**	(15.83)***
DACC	0.301	0.121	0.340	0.301	0.075
	(2.79)***	(1.14)	(2.66)***	(1.56)	(0.87)
BIGN	-8.897	-0.978	-12.109	-8.897	0.853
	(-13.73)***	(-1.92)*	(-14.79)***	(-2.48)**	(1.87)*
LEV	-1.742	-1.292	-2.006	-1.742	0.161
	(-1.61)	(-1.30)	(-1.68)*	(-0.76)	(0.19)
STDROA	-7.366	13.567	-14.442	-7.366	2.305
	(-1.54)	(2.80)***	(-2.66)***	(-0.73)	(0.65)
COMMON	-26.423	-34.163	-27.055	-26.423	
	(-23.45)***	(-29.87)***	(-17.29)***	(-3.22)***	
REGQ	0.718	-6.108	-0.439	0.718	0.899
	(1.11)	(-10.51)***	(-0.59)	(0.20)	(0.73)
ANTIDIR	11.596	15.843	8.139	11.596	
	(33.85)***	(44.42)***	(11.13)***	(4.59)***	
ANTISELF	12.655	4.915	23.877	12.655	
	(4.92)***	(1.56)	(5.69)***	(0.88)	
IFRS	-9.656	0.007	-10.877	-9.656	0.402
	(-9.49)***	(0.01)	(-10.47)***	(-1.83)*	(0.61)
SMDEV	-0.013	-0.011	-0.012	-0.013	-0.005
	(-10.82)***	(-8.72)***	(-9.22)***	(-2.28)**	(-2.38)**
GDPGR	-0.125	0.021	-0.182	-0.125	-0.054
	(-1.27)	(0.21)	(-1.52)	(-0.22)	(-0.80)
Constant	-14.889	-15.565	-9.085	-14.889	21.072
	(-3.40)***	(-4.79)***	(-1.07)	(-1.13)	(2.00)**
Observations	33,846	33,846	25,825	33,846	33,846
R-squared	0.506	0.603	0.451	0.506	0.603
Year and Industry FEs	Yes	Yes	Yes	Yes	Yes
Country clustering	No	No	No	Yes	No
Country FEs	No	No	No	No	Yes

Note: This table reports the regression results of the relation between CSR disclosure and the consensus in analysts' forecasts based on the BKLS model. The dependent variable is *RCONS*. Column 1 shows the results for the baseline regression. Column 2 shows the results using WLS regression. Column 3 shows the results after removing the Japanese and Chinese samples. Column 4 shows the results where standard errors are clustered by country. Column 5 shows the results including country FEs. The detailed definitions of all variables are provided in the Appendix. Coefficients on the year and industry indicator variables are not tabulated for brevity. The *t*-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Table 7: Additional Analysis

Panel A: Level of Precision of Public and Private Information in Analysts' Forecasts

	(1)	(2)	(3)	(4)
Dep Var =	*PUBLIC*	*PUBLIC*	*PRIVATE*	*PRIVATE*
Disc_ESG	-0.034	-0.029	0.065	0.061
	(-7.62)***	(-6.51)***	(5.04)***	(4.71)***
SIZE	-0.100	-0.169	0.323	0.271
	(-1.96)*	(-3.29)***	(1.96)**	(1.87)*
ROA	-2.720	-1.479	34.211	35.928
	(-2.69)***	(-1.49)	(12.80)***	(13.09)***
LOSS	0.128	0.280	-0.319	-0.452
	(0.98)	(2.16)**	(-0.93)	(-1.34)
MB	0.008	0.003	-0.006	0.004
	(7.90)***	(2.29)**	(-2.40)**	(1.47)
SURP	4.202	4.275	-14.209	-14.468
	(7.98)***	(7.93)***	(-10.48)***	(-10.57)***
SIGN	0.091	0.256	-2.521	-2.530
	(0.95)	(2.68)***	(-10.84)***	(-11.27)***
ANALYST	3.403	3.585	-5.151	-5.267
	(26.13)***	(26.25)***	(-17.26)***	(-17.45)***
DACC	-0.041	-0.055	0.095	0.076
	(-1.27)	(-1.77)*	(1.08)	(0.93)
BIGN	0.034	0.590	0.556	-0.133
	(0.21)	(3.21)***	(1.27)	(-0.30)
LEV	0.004	0.195	0.186	-0.108
	(0.01)	(0.68)	(0.23)	(-0.14)
STDROA	-0.971	0.391	-25.388	-29.860
	(-0.69)	(0.28)	(-7.07)***	(-8.25)***
COMMON	-1.997		15.822	
	(-6.10)***		(13.99)***	
REGQ	-0.531	0.496	2.776	0.099
	(-4.69)***	(1.14)	(8.96)***	(0.09)
ANTIDIR	0.871		-5.229	
	(10.76)***		(-20.06)***	
ANTISELF	-0.270		-11.001	
	(-0.50)		(-6.52)***	
IFRS	-0.821	-0.191	4.507	-0.963
	(-3.74)***	(-0.86)	(7.44)***	(-1.85)*
SMDEV	-0.000	-0.000	-0.001	0.001
	(-0.15)	(-0.16)	(-1.22)	(0.40)
GDPGR	-0.166	-0.067	0.040	0.263
	(-5.86)***	(-2.49)**	(0.57)	(4.32)***
Constant	-8.731	-8.751	33.985	17.721
	(-7.95)***	(-2.45)**	(12.76)***	(2.65)***
Observations	33,846	33,846	33,846	33,846
R-squared	0.130	0.144	0.197	0.218
Year and Industry FEs	Yes	Yes	Yes	Yes
Country FEs	No	Yes	No	Yes

Table 7 (Cont.)

Panel B: Individual Components of ESG Scores

Dep Var =	(1) *RPUBLIC*	(2) *RPUBLIC*	(3) *RPUBLIC*	(4) *RPRIVATE*	(5) *RPRIVATE*	(6) *RPRIVATE*
Disc_E	-0.066			0.042		
	(-4.17)***			(2.79)***		
Disc_S		-0.123			0.096	
		(-8.09)***			(6.63)***	
Disc_G			-0.181			0.136
			(-7.17)***			(6.37)***
SIZE	0.198	0.299	0.092	-1.238	-1.359	-1.191
	(0.90)	(1.41)	(0.44)	(-5.74)***	(-6.59)***	(-5.89)***
ROA	3.479	4.382	4.865	42.414	41.730	41.390
	(0.87)	(1.10)	(1.21)	(11.86)***	(11.74)***	(11.51)***
LOSS	-2.407	-2.343	-2.467	-4.760	-4.812	-4.717
	(-3.65)***	(-3.56)***	(-3.72)***	(-8.57)***	(-8.70)***	(-8.48)***
MB	0.060	0.063	0.062	-0.008	-0.011	-0.009
	(10.50)***	(10.80)***	(10.32)***	(-1.67)*	(-2.14)**	(-1.91)*
SURP	1.428	1.382	1.673	-66.215	-66.212	-66.425
	(0.55)	(0.53)	(0.62)	(-22.77)***	(-22.81)***	(-22.42)***
SIGN	-2.557	-2.445	-2.423	-4.982	-5.070	-5.083
	(-7.08)***	(-6.79)***	(-6.71)***	(-17.52)***	(-17.95)***	(-17.95)***
ANALYST	6.815	7.056	7.007	-0.496	-0.705	-0.657
	(17.24)***	(17.92)***	(17.70)***	(-1.30)	(-1.85)*	(-1.73)*
DACC	-0.274	-0.285	-0.341	-0.387	-0.376	-0.335
	(-1.98)**	(-2.07)**	(-2.54)**	(-3.56)***	(-3.44)***	(-3.08)***
BIGN	-1.198	-0.563	-0.740	8.227	7.703	7.861
	(-1.86)*	(-0.87)	(-1.14)	(13.14)***	(12.39)***	(12.35)***
LEV	-1.757	-1.691	-1.720	1.982	1.938	1.959
	(-1.51)	(-1.46)	(-1.47)	(1.70)*	(1.67)*	(1.69)*
STDROA	-15.853	-15.239	-14.634	-30.697	-31.195	-31.626
	(-3.05)***	(-2.95)***	(-2.86)***	(-6.78)***	(-6.92)***	(-7.00)***
COMMON	-0.709	-1.089	-2.845	30.931	31.308	32.596
	(-0.60)	(-0.94)	(-2.45)**	(29.40)***	(30.34)***	(30.45)***
REGQ	-3.427	-3.798	-3.770	1.276	1.580	1.545
	(-5.78)***	(-6.32)***	(-6.25)***	(2.27)**	(2.78)***	(2.69)***
ANTIDIR	3.692	3.796	4.520	-12.092	-12.207	-12.739
	(10.99)***	(11.54)***	(12.91)***	(-36.46)***	(-37.59)***	(-36.14)***
ANTISELF	-21.213	-20.638	-16.593	-22.375	-22.832	-25.845
	(-8.34)***	(-8.14)***	(-6.46)***	(-8.62)***	(-8.82)***	(-9.80)***
IFRS	-3.629	-3.186	-3.464	9.807	9.439	9.665
	(-3.74)***	(-3.24)***	(-3.54)***	(10.51)***	(10.05)***	(10.27)***
SMDEV	-0.002	-0.002	-0.002	0.010	0.010	0.010
	(-1.37)	(-1.50)	(-1.50)	(8.29)***	(8.42)***	(8.43)***
GDPGR	-0.832	-0.835	-0.650	-0.118	-0.111	-0.251
	(-7.63)***	(-7.72)***	(-6.11)***	(-1.25)	(-1.17)	(-2.67)***

Table 7 (Cont.)

Panel B: Individual Components of ESG Scores

Dep Var =	(1) RPUBLIC	(2) RPUBLIC	(3) RPUBLIC	(4) RPRIVATE	(5) RPRIVATE	(6) RPRIVATE
Constant	34.023	33.413	34.847	108.097	108.917	107.749
	(9.83)***	(9.88)***	(10.25)***	(21.95)***	(22.29)***	(22.05)***
Observations	33,846	33,846	33,846	33,846	33,846	33,846
R-squared	0.157	0.159	0.160	0.478	0.479	0.480
Year and Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes

Note: Panel A reports the regression results of the relation between CSR disclosure and the level of the precision of public and private information in analysts' forecasts. The dependent variable is RPUBLIC in Columns 1 and 2, while it is RPRIVATE in Columns 3 and 4. Panel B reports the regression results of the relation between individual components of the CSR score and analysts' information environment. The dependent variable is RPUBLIC in Columns 1 to 3, while it is RPRIVATE in Columns 4 to 6. CSR disclosure is proxied by DISC_E in Columns 1 and 4, by DISC_S in Columns 2 and 5, and by DISC_G in Columns 3 and 6. The detailed definitions of all variables are provided in the Appendix. Coefficients on the year and industry indicator variables are not tabulated for brevity. The t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

5. Cross-sectional Analyses

This study reports robust evidence that CSR disclosure is negatively (positively) associated with the precision of public (private) information in analysts' forecasts. In this section, I explore cross-sectional differences in corporate governance mechanisms and the information environment that may influence the relation between CSR disclosure and analysts' information environment. Specifically, I add a moderating variable (*Moderating_VAR*) and its interaction with *Disc_ESG* to Equation (1) and estimate the following cross-sectional regression:

$$RPUBLIC \text{ (or } RPRIVATE) = \alpha_0 + \alpha_1 Disc\_ESG + \alpha_2 Disc\_ESG \times Moderating\_VAR$$
$$+ \alpha_3 Moderating\_VAR + \alpha_4 V + \alpha_5 W + Industry\_FE + Year\_FE + \varepsilon \qquad \text{...(2)}$$

5.1. Shareholder Versus Stakeholder-Oriented Governance Mechanisms

There are two broad types of corporate governance mechanisms that may shape the importance of CSR disclosure. The first is the shareholder-oriented system, where a firm is viewed as a legal instrument for shareholders to maximize their investment returns, whereas demands from other stakeholders are subordinate to shareholder interests (Aguilera and Jackson, 2010). This system relies on high-powered incentives and external control systems to discipline managers and align their interests with those of shareholders (Kochhar and David, 1996). The market-driven financial system counterbalances the many risks associated with insider power and facilitates access to finance as well as the protection of investor assets. Firms engage in CSR activities only if it improves competitiveness and shareholder value. CSR is viewed as a costly diversion of scarce resources (Friedman, 1970) because CSR policies can be used by managers to extract private benefits, such as improving their personal reputation (Barnea and Rubin, 2010; Brown *et al.*, 2006; Chahine *et al.*, 2019) and increasing their power within the firm (Cespa and Cestone, 2007; Surroca and Tribó, 2008). Consequently, CSR disclosures may matter less to shareholder-oriented systems because there are many other institutional mechanisms in place to monitor and evaluate firm performance (Ball, 2001; Prado-Lorenzo and Garcia-Sanchez, 2010).

The second type of governance system is stakeholder oriented and characterized by a legal and regulatory framework that protects stakeholders rather than shareholders (Letza *et al.*, 2004; Roe, 2003). In this system, stakeholders (e.g., employees, consumers, and communities) have a greater influence on firms' operations and performance than do shareholders. CSR is viewed as having a positive impact on firm value by taking stakeholder interests into account (Freeman, 1984). Managers employ CSR to fulfill their ethical obligations toward their stakeholders and expect the positive effects associated with CSR to enhance firm competitiveness (Whitehouse, 2006). In such a system, stakeholders demand more information about firms' CSR activities and performance (Van der Laan Smith *et al.*, 2005). Consequently, CSR disclosures in more stakeholder-oriented countries provide more valuable information about CSR activities (Van der Laan Smith *et al.*, 2005). Consistent with this argument, Dhaliwal *et al.* (2012) found that the relation between CSR disclosure and analysts' forecasts is more pronounced in countries that are more stakeholder oriented.

Based on the above discussion, I conjecture that the relation between CSR disclosure and analysts' forecasts is *less* pronounced in shareholder-oriented governance mechanisms but *more* pronounced in stakeholder-oriented governance mechanisms. I use four country-level proxies to measure the extent of investor- or stakeholder-oriented governance mechanisms. The first proxy is legal origin, denoted as *COMMON*, which is coded as one if the legal origin is common law and zero if the legal origin is code law. Common law countries have a strong shareholder orientation, whereas civil law countries are strongly associated with a stakeholder orientation (Allen *et al.,* 2015; La Porta *et al.,* 2008; Magill *et al.,* 2015). The second proxy is the anti-self-dealing index (*ANTISELF*) developed by Djankov *et al.* (2008) as the legal protection proxy. This index scores the legal protection provided for minority shareholders against expropriation by corporate insiders. The third proxy is the regulatory quality index (*REGQ*) from Kaufmann *et al.* (2011), the indicators of which have been used in prior studies to measure the extent to which institutions enforce investors' rights (Arouri and Pijourlet, 2017; Drobetz *et al.,* 2010). The final proxy is *STAKE*, which is developed by Dhaliwal *et al.* (2012) to measure a country's stakeholder orientation. *STAKE* is a principal component of variables capturing the legal environment of a country in protecting labor rights, the existence of mandatory disclosure requirements for CSR, and public awareness of CSR issues at the country level. Higher values of *STAKE* indicate greater stakeholder orientation.

To facilitate the interpretation of greater shareholder- or stakeholder-oriented governance mechanisms, I create indicator variables *DANTISELF*, *DREGQ*, and *DSTAKE*, which equal one if a country's measure is in the top tercile of the sample and zero otherwise. I expect CSR disclosure to be more salient in countries where the governance mechanism is less shareholder-oriented and more stakeholder-oriented. Hence, the coefficient on the interaction between *Disc_DISC* and *COMMON*, *DANTISELF*, and *DREGQ* is expected to be positive, and that on the interaction between *Disc_DISC* and *SKATE* is expected to be negative when the dependent variable is the precision of public information in analysts' forecasts (*RPUBLIC*). I expect the opposite signs for these interaction terms when the dependent variable is the precision of private information in analysts' forecasts (*RPRIVATE*).

The results are reported in Table 8. Consistent with my expectations, the negative association between CSR disclosure and *RPUBLIC* is significantly more pronounced in countries with weaker shareholder protection proxied by *COMMON*, *DANTISELF*, and *DREGQ* and in countries with greater stakeholder protection proxied by *STAKE*. I also find the expected results when the dependent variable is *RPRIVATE*. Overall, these findings are consistent with CSR disclosure being more important when general shareholder protection is weaker and when stakeholder protection is stronger.

5.2. Information Environment

High-quality information plays a crucial role in reducing information asymmetry and mitigating potential agency conflict (Bushman *et al.,* 2004). Prior studies documented that disclosure policies affect analyst forecast properties (Beyer *et al.,* 2010; Byard and Shaw, 2003; Hope, 2003; Lang and Lundholm, 1996; Lehavy *et al.,* 2011). The incremental value of disclosure is likely to be higher when there is greater information asymmetry between managers and outsiders and between informed and uninformed investors. When a firm's information opacity is high, there is greater reliance by investors on information intermediaries, such as financial analysts, to assess the firm's financial performance (DeFond and Hung, 2003; Dhaliwal *et al.,* 2012).

Consistent with the above argument, Dhaliwal *et al.* (2012) and Dhaliwal *et al.* (2014) found that the association between analyst forecast error and CSR disclosure is significantly more negative in firms and countries with greater financial opacity. This finding suggests that CSR disclosure serves as a substitutive information source for financial disclosure in analysts' forecasting processes. I therefore conjecture that the impact of CSR disclosure on the analyst information environment is more salient in a less transparent and poorer information environment where stakeholders are more likely to rely on the disclosures made by firms when they assess CSR activities and their associated reporting and performance.

I use four proxies for the quality and richness of the information environment. The first proxy is the disclosure index (*CIFAR*) developed by the Center for International Financial Analysis and Research and used by Hope (2003), among others. Each country is given a score ranging from zero to ninety, with higher scores indicating a richer information environment. The second proxy is the opacity index (*OPACITY*) created by Kurtzman *et al.* (2004), which measures the degree to which there is a lack of clear, accurate, easily discernible and widely accepted practices governing the relationships among businesses, investors and governments. Higher scores indicate higher opacity and hence a poorer information environment. The third proxy is an indicator for Big N (*BIGN*) because prior research finds that Big N auditors provide higher-quality financial audits and increase firms' information environment (e.g., Becker *et al.,* 1998; Behn *et al.,* 2008). The final proxy is firms' profitability measured by ROA. Baker and Wurgler (2006; 2007) suggested that

Table 8: Relation between CSR Disclosure and Analysts' Information Environment: Conditional on Investor- and Stakeholder-oriented Governance Mechanisms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Modvar =	COMMON	RANTISELF	RREGQ	RSTAKE	COMMON	RANTISELF	RREGQ	RSTAKE
Dep Var =	RPUBLIC	RPUBLIC	RPUBLIC	RPUBLIC	RPRIVATE	RPRIVATE	RPRIVATE	RPRIVATE
Disc_ESG	-0.154	-0.147	-0.146	-0.102	0.111	0.124	0.117	0.009
	(-6.63)***	(-6.62)***	(-6.24)***	(-4.23)***	(4.69)***	(5.32)***	(4.76)***	(0.36)
Disc_ESG* Modvar	0.210	0.304	0.193	-0.392	-0.123	-0.217	-0.121	0.083
	(6.07)***	(8.41)***	(6.35)***	(-10.39)***	(-3.60)***	(-6.10)***	(-4.04)***	(2.16)**
Modvar	-5.511	-12.797	-5.488	22.399	33.005	3.451	4.839	11.034
	(-4.01)***	(-8.61)***	(-4.86)***	(13.30)***	(26.47)***	(2.61)***	(4.71)***	(7.46)***
SIZE	0.282	0.228	0.219	-0.386	-1.301	-1.418	-1.249	-1.196
	(1.30)	(1.04)	(1.01)	(-1.56)	(-5.99)***	(-6.50)***	(-5.75)***	(-4.54)***
ROA	2.771	4.461	6.456	5.156	42.957	42.369	41.277	25.517
	(0.71)	(1.11)	(1.64)	(1.23)	(12.09)***	(11.88)***	(11.66)***	(6.32)***
LOSS	-2.350	-2.179	-2.222	-4.188	-4.845	-4.721	-4.939	-6.127
	(-3.61)***	(-3.32)***	(-3.39)***	(-6.37)***	(-8.80)***	(-8.55)***	(-9.01)***	(-10.21)***
MB	0.060	0.056	0.059	0.083	-0.008	-0.018	-0.009	-0.034
	(10.95)***	(9.06)***	(10.60)***	(13.86)***	(-1.76)*	(-3.58)***	(-1.86)*	(-6.68)***
SURP	1.582	0.000	1.652	-7.947	-67.210	-68.261	-67.046	-62.962
	(0.60)	(0.00)	(0.62)	(-3.20)***	(-23.26)***	(-23.89)***	(-23.29)***	(-22.90)***
SIGN	-2.545	-2.592	-2.390	-3.814	-4.926	-5.104	-4.985	-4.517
	(-7.21)***	(-7.28)***	(-6.78)***	(-10.03)***	(-17.60)***	(-18.14)***	(-17.82)***	(-14.24)***
ANALYST	6.813	7.076	6.678	5.164	-0.510	-0.322	-0.456	-0.370
	(17.53)***	(18.22)***	(17.35)***	(11.05)***	(-1.35)	(-0.84)	(-1.21)	(-0.78)
DACC	-0.275	-0.249	-0.289	-0.464	-0.401	-0.390	-0.393	-0.241
	(-2.03)**	(-1.86)*	(-2.15)**	(-3.00)***	(-3.71)***	(-3.53)***	(-3.65)***	(-1.80)*
BIGN	-1.274	-0.258	-1.316	0.329	8.187	9.748	8.016	7.093
	(-2.00)**	(-0.42)	(-2.10)**	(0.40)	(13.18)***	(15.51)***	(13.01)***	(8.54)***
LEV	-1.479	-0.564	-1.156	-4.279	1.751	3.041	1.654	2.086
	(-1.29)	(-0.49)	(-1.01)	(-3.37)***	(1.51)	(2.66)***	(1.44)	(1.63)
STDROA	-14.383	-13.766	-15.134	-19.377	-29.856	-26.385	-29.683	-25.878
	(-2.83)***	(-2.67)***	(-2.96)***	(-3.60)***	(-6.65)***	(-5.88)***	(-6.64)***	(-5.34)***
COMMON		-6.473	-1.364	4.298		25.049	30.009	26.312
		(-6.71)***	(-1.18)	(1.97)**		(31.09)***	(29.14)***	(13.36)***
REGQ	-3.108	-3.574		0.141	1.385	1.136		-3.250
	(-5.42)***	(-6.06)***		(0.14)	(2.53)**	(1.94)*		(-3.36)***
ANTIDIR	3.641	3.883	3.226	2.422	-12.124	-11.204	-12.006	-9.646
	(11.04)***	(10.79)***	(10.50)***	(2.80)***	(-37.28)***	(-33.94)***	(-39.46)***	(-12.13)***
ANTISELF	-23.116		-19.730	-29.317	-19.396		-20.767	-15.704
	(-9.23)***		(-8.14)***	(-5.36)***	(-7.50)***		(-8.15)***	(-2.90)***

Table 8 (Cont.)

Modvar = Dep Var =	(1) *COMMON* *RPUBLIC*	(2) *RANTISELF* *RPUBLIC*	(3) *RREGQ* *RPUBLIC*	(4) *RSTAKE* *RPUBLIC*	(5) *COMMON* *RPRIVATE*	(6) *RANTISELF* *RPRIVATE*	(7) *RREGQ* *RPRIVATE*	(8) *RSTAKE* *RPRIVATE*
IFRS	-3.826	-4.988	-7.094	-3.102	8.336	6.409	8.904	8.714
	(-4.23)***	(-5.54)***	(-8.78)***	(-3.08)***	(9.45)***	(7.28)***	(11.45)***	(9.12)***
SMDEV	-0.003	-0.004	-0.005	-0.008	0.010	0.007	0.011	0.018
	(-1.70)*	(-2.09)**	(-3.17)***	(-4.37)***	(8.36)***	(5.22)***	(8.94)***	(12.35)***
GDPGR	-0.779	-0.764	-0.494	-0.793	-0.215	-0.393	-0.285	-0.528
	(-7.47)***	(-7.18)***	(-5.29)***	(-5.93)***	(-2.31)**	(-4.20)***	(-3.43)***	(-4.53)***
Constant	35.246	24.992	32.910	45.733	103.482	89.946	104.590	108.117
	(10.05)***	(7.82)***	(9.28)***	(8.20)***	(20.75)***	(20.28)***	(20.58)***	(12.95)***
Observations	34,767	34,767	34,767	25,496	34,767	34,767	34,767	25,496
R-squared	0.160	0.158	0.158	0.145	0.475	0.471	0.474	0.473
Year and Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table reports the regression results of the role of investor- and stakeholder-oriented governance mechanisms. Four proxies, COMMON, RANTISELF, RREGQ, and RSTAKE, are used to proxy for the extent of investor- and stakeholder-oriented governance mechanisms. The dependent variable is RPUBLIC in Columns 1 to 4, while it is RPRIVATE in Columns 5 to 8. The detailed definitions of all variables are provided in the Appendix. Coefficients on the industry and year indicator variables are not tabulated for brevity. The t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

firms with low profitability are more difficult to value because of their greater information asymmetry, making biases more insidious and valuation mistakes more likely.

As before, I use indicators to measure the information environment at the country and firm levels. *DCIFAR* equals one if a country's measure is in the top tercile of the sample and zero otherwise. *DOPACITY* and *LowProfit* are indicator variables that are equal to one if *OPACITY* and *ROA* are in the bottom tercile of the sample and zero otherwise. CSR disclosure is more salient when the information environment is poorer. Hence, I expect the coefficient on the interaction between *Disc_DISC* and *DCIFAR/BIGN* to be positive and that on the interaction between *Disc_DISC* and *DOPACITY/ LowProfit* to be negative when the dependent variable is the precision of public information in analysts' forecasts (*RPUBLIC*). I expect the opposite signs for these interaction terms when the dependent variable is the precision of private information in analysts' forecasts (*RPRIVATE*).

I report the results in Table 9. Consistent with my expectations, the negative association between CSR disclosure and *RPUBLIC* is significantly more pronounced in countries and firms with a porter information environment proxied by *DCIFAR* and *DOPACITY*, *BIGN*, and *LowProfit*. I also find evidence that the positive association between CSR disclosure and *RPRIVATE* is significantly more pronounced when the information environment is poorer. Overall, these findings suggest that CSR disclosure is more salient when the information environment is poorer.

6. Conclusion

CSR has increased in importance among managers, investors, regulators and scholars in recent years. However, skepticism about the credibility of voluntary CSR disclosure has arisen because of firms' incentives to selectively disclose CSR information strategically and opportunistically. Financial analysts are the main information intermediaries in capital markets who rely on both financial and nonfinancial information in forecasting firms' earnings. This study investigates how the disclosure of CSR activities is associated with the precision of the common and private information in analysts' forecasts based on the BKLS model.

Using a large sample of 33,846 firm-year observations from 31 countries spanning 2008 to 2020 and using measures of CSR disclosure from *Bloomberg*, the study finds strong and robust evidence that CSR disclosure is negatively and

Table 9: Relation between CSR Disclosure and Analysts' Information Environment: Conditional on Information Environment

Modvar = Dep Var =	(1) DCIFAR RPUBLIC	(2) DOPACITY RPUBLIC	(3) BIGN RPUBLIC	(4) LowProfit RPUBLIC	(5) DCIFAR RPRIVATE	(6) DOPACITY RPRIVATE	(7) BIGN RPRIVATE	(8) LowProfit RPRIVATE
Disc_ESG	-0.131	-0.091	-0.152	-0.037	0.081	0.073	0.011	0.034
	(-5.40)***	(-4.01)***	(-6.23)***	(-1.58)	(3.18)***	(3.17)***	(0.46)	(1.48)
Disc_ESG* Modvar	0.356	-0.084	0.135	-0.161	-0.081	0.037	-0.178	0.098
	(9.27)***	(-2.34)**	(4.37)***	(-6.39)***	(-2.12)**	(1.05)	(-5.61)***	(3.93)***
Modvar	-19.176	8.059	-4.998	-0.453	16.286	-4.154	3.169	-14.606
	(-9.73)***	(4.10)***	(-4.64)***	(-0.55)	(8.68)***	(-2.12)**	(3.15)***	(-18.90)***
SIZE	0.004	0.386	0.306	0.555	-1.525	-1.300	-1.266	-0.752
	(0.01)	(1.79)*	(1.41)	(2.55)**	(-5.96)***	(-5.96)***	(-5.90)***	(-3.52)***
ROA	-0.898	3.518	2.911		30.268	43.789	41.286	
	(-0.21)	(0.89)	(0.74)		(7.76)***	(12.27)***	(11.64)***	
LOSS	-4.563	-2.227	-2.373	0.207	-5.947	-4.771	-4.904	-2.444
	(-6.93)***	(-3.39)***	(-3.64)***	(0.35)	(-9.97)***	(-8.63)***	(-8.98)***	(-5.00)***
MB	0.073	0.056	0.060	0.058	-0.021	-0.007	-0.010	-0.010
	(13.10)***	(9.97)***	(10.72)***	(10.43)***	(-4.20)***	(-1.35)	(-2.10)**	(-2.09)**
SURP	-6.237	0.987	1.773	1.545	-64.696	-67.463	-65.958	-68.222
	(-2.51)**	(0.37)	(0.68)	(0.60)	(-22.93)***	(-22.31)***	(-22.86)***	(-23.79)***
SIGN	-4.155	-2.513	-2.550	-1.850	-4.365	-4.897	-4.975	-3.850
	(-10.84)***	(-7.03)***	(-7.21)***	(-5.21)***	(-13.64)***	(-17.36)***	(-17.78)***	(-13.79)***
ANALYST	4.853	6.438	6.883	6.306	0.322	-0.380	-0.403	-1.340
	(10.85)***	(16.54)***	(17.63)***	(16.09)***	(0.70)	(-1.00)	(-1.07)	(-3.56)***
DACC	-0.297	-0.256	-0.282	-0.306	-0.452	-0.419	-0.406	-0.442
	(-1.92)*	(-1.89)*	(-2.10)**	(-2.29)**	(-3.43)***	(-3.83)***	(-3.75)***	(-4.15)***
BIGN	-1.128	-0.779		-1.316	8.233	7.872		8.142
	(-1.44)	(-1.22)		(-2.08)**	(10.65)***	(12.46)***		(13.36)***
LEV	-4.720	-2.019	-1.629	0.324	2.983	2.025	1.778	4.204
	(-3.76)***	(-1.76)*	(-1.42)	(0.28)	(2.39)**	(1.74)*	(1.55)	(3.86)***
STDROA	-17.657	-13.362	-14.851	-15.530	-30.168	-30.626	-28.077	-32.413
	(-3.11)***	(-2.59)***	(-2.91)***	(-3.09)***	(-6.04)***	(-6.74)***	(-6.28)***	(-7.61)***
COMMON	4.945	-0.682	-0.649	-0.945	25.109	30.368	29.948	29.818
	(2.54)**	(-0.59)	(-0.57)	(-0.83)	(14.12)***	(29.41)***	(29.50)***	(29.87)***
REGQ	-2.693	-0.682	-3.117	-3.236	0.527	0.182	1.806	1.476
	(-3.14)***	(-0.84)	(-5.35)***	(-5.61)***	(0.65)	(0.23)	(3.22)***	(2.65)***
ANTIDIR	0.602	4.601	3.734	3.724	-7.400	-12.620	-12.025	-12.010
	(0.69)	(12.82)***	(11.26)***	(11.31)***	(-9.42)***	(-35.56)***	(-36.94)***	(-37.53)***
ANTISELF	-16.732	-22.312	-20.113	-19.204	-35.979	-19.980	-20.081	-18.467
	(-3.54)***	(-8.87)***	(-8.16)***	(-7.79)***	(-7.73)***	(-7.56)***	(-7.86)***	(-7.34)***
IFRS	-1.480	-0.598	-3.860	-4.086	5.682	6.802	8.177	7.357
	(-1.49)	(-0.60)	(-4.26)***	(-4.53)***	(6.00)***	(7.03)***	(9.15)***	(8.32)***
SMDEV	-0.000	-0.004	-0.003	-0.003	0.008	0.011	0.009	0.009
	(-0.23)	(-2.51)**	(-1.80)*	(-2.00)**	(6.30)***	(8.61)***	(7.67)***	(7.39)***
GDPGR	-1.053	-1.201	-0.813	-0.857	-0.068	-0.009	-0.156	-0.206
	(-8.22)***	(-11.01)***	(-7.76)***	(-8.21)***	(-0.57)	(-0.09)	(-1.67)*	(-2.25)**
Constant	52.569	27.551	32.886	29.299	98.235	107.316	105.561	105.592
	(9.60)***	(7.86)***	(9.27)***	(8.20)***	(12.43)***	(21.53)***	(21.17)***	(23.08)***

Table 9 (Cont.)

Modvar = Dep Var =	(1) *DCIFAR* *RPUBLIC*	(2) *DOPACITY* *RPUBLIC*	(3) *BIGN* *RPUBLIC*	(4) *LowProfit* *RPUBLIC*	(5) *DCIFAR* *RPRIVATE*	(6) *DOPACITY* *RPRIVATE*	(7) *BIGN* *RPRIVATE*	(8) *LowProfit* *RPRIVATE*
Observations	25,860	34,411	34,767	34,767	25,860	34,411	34,767	34,767
R-squared	0.135	0.161	0.159	0.164	0.467	0.475	0.476	0.491
Year and Industry FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table reports the regression results of the role of the information environment in affecting the relation between CSR disclosure and analysts' forecasts. Four proxies, *DCIFAR, DOPACITY, BIGN,* and *LowProfit*, are used to proxy for the information environment. The dependent variable is *RPUBLIC* in Columns 1 to 4, while it is *RPRIVATE* in Columns 5 to 8. The detailed definitions of all variables are provided in the Appendix. Coefficients on the year and industry indicator variables are not tabulated for brevity. The t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

significantly associated with the precision of public information and positively and significantly associated with the precision of private information in analysts' forecasts after controlling for those firm- and country-level factors that have been documented to be associated with analysts' forecasts. The results continue to hold under a battery of sensitivity tests, including using an instrumental variable approach to mitigate endogeneity concerns, and several other specifications. In cross-sectional analyses, this study finds that the relation between CSR disclosure and analysts' information environment is more pronounced in stakeholder-oriented governance mechanisms and when the information environment is poorer.

This study complements the prior research that focused almost exclusively on how CSR disclosure affects analysts' forecast errors and dispersion (e.g., Dhaliwal *et al.,* 2012). The current study contributes to the literature by explicitly examining the link between CSR disclosure and the precision of public and private information in analysts' forecasts and provides evidence that analysts rationally use more private information when there is substantial disagreement concerning the interpretation of the CSR information disclosed by firms (Christensen *et al.,* 2022).

Acknowledgment

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Appendix

Variable Definition		
Disc_ESG	=	Overall disclosure index for ESG reported by the *Bloomberg* database. Its value ranges from 0 to 100, with a higher value indicating better ESG disclosure
PUBLIC	=	Precision of the public information from the BKLS model
RPUBLIC	=	Percentile rank of *PUBLIC*
PRIVATE	=	Precision of the private information from the BKLS model
RPRIVATE	=	Percentile rank of *PRIVATE*
CONS	=	Precision of the analyst consensus from the BKLS model
RCONS	=	Percentile rank of *RCONS*
SIZE	=	Logarithm of total assets in US dollars
ROA	=	ROA, computed as income before extraordinary items divided by total assets
LowProfit	=	Indicator variable that equals one if ROA is in the bottom tercile of the sample and zero otherwise
LOSS	=	Indicator variable that equals one if the firm is reporting a loss and zero otherwise
MB	=	Market value of equity dividend by book value of equity
SURP	=	Absolute value of the difference between the actual and mean forecasted earnings per share, deflated by stock price at the beginning of the fiscal year
SIGN	=	Indicator variable that equals one if *SURP* is negative and zero otherwise
ANALYST	=	Logarithm of the mean number of analysts covering the firm
DACC		Logarithm of the absolute performance-matched discretionary accruals as in Kothari et al. (2005)
BIGN	=	Indicator variable that equals one if the firm's auditor is a Big N auditor and zero otherwise
LEV	=	Total liabilities divided by total assets
STDROA	=	Standard deviation of ROA in the previous five years
COMMON	=	Indicator variable that equals one for common law countries and zero otherwise
REGQ	=	Regulatory quality, which measures the ability of the government to implement sound policies and regulations that promote private sector development. Its value ranges from –2.5 to 2.5, with higher values corresponding to higher levels of regulatory quality (data from Kaufmann et al. (2011))
DREGQ	=	Indicator variable that equals one if *REGQ* is in the top tercile of the sample and zero otherwise
ANTIDIR	=	Measure of the legal protection afforded to corporate shareholders, as reported in Djankov et al. (2008)
ANTISELF		Measure of private control of self-dealing by controlling shareholders, as reported in Djankov et al. (2008)
DANTISELF	=	Indicator variable that equals one if *ANTISELF* is in the top tercile of the sample and zero otherwise
IFRS	=	Indicator variable equals one if the country adopts IFRS in a year and zero otherwise
SMDEV	=	Stock market capitalization as a percentage of GDP (available at https://www.theglobaleconomy.com/download-data.php)
GDPGR	=	Rate of growth in real GDP for the year (available at https://www.theglobaleconomy.com/download-data.php)
STAKE	=	Principal component of the variables capturing the legal environment of a country in protecting labor rights, the existence of mandatory disclosure requirements for CSR, and the public awareness of CSR issues at the country level. Higher values indicate greater stakeholder orientation (data from Dhaliwal et al. (2012))
DSTAKE	=	Indicator variable that equals one if *STAKE* is in the top tercile of the sample and zero otherwise
CIFAR	=	Disclosure index (CIFAR) developed by the Center for International Financial Analysis and Research. Each country is given a score ranging from zero to ninety, with higher scores indicating higher disclosure quality
DCIFAR	=	Indicator variable that equals one if *CIFAR* is in the top tercile of the sample and zero otherwise
OPACITY	=	Opacity index created by Kurtzman et al. (2004), which measures the degree to which there is a lack of clear, accurate, easily discernible and widely accepted practices governing the relationships among businesses, investors and governments, with higher scores indicating higher opacity
DOPACITY	=	An indicator variable that equals one if *OPACITY* is in the top tercile of the sample and zero otherwise