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Investor- versus Multi-stakeholder Orientation: The Influence of CSR Framework Adoption on Information Asymmetry

This study examines how firms' adoption of corporate social responsibility frameworks (CSRFs) that follow different user orientation approaches affects information asymmetry in capital markets. We draw on novel hand-collected adoption data from seven established CSRFs for a sample of STOXX Europe 600 firms from 2017–2020. Our findings reveal that CSRFs that primarily target investors are associated with lower information asymmetry, whereas those that target a broad group of stakeholders are not. In particular, we find that capital markets place importance on firms' common reporting practice of adopting multiple investor-oriented CSRFs simultaneously. Our analysis finds that the climate-change-focused CSRFs are the primary forces behind reducing information asymmetry. Our results have important implications for the current standard-setting initiatives of the European Financial Reporting Advisory Group and the International Sustainability Standards Board as well as for firms adopting CSRFs.

Key words: CSR frameworks; CSR reporting; CSR standards; Information asymmetry; Materiality; Standard-setting.

The demand for standardized and comparable corporate social responsibility (CSR)[1] information has increased substantially in recent decades (Grewal and Serafeim, 2020; Christensen *et al.*, 2021). In this context, standard-setters such as

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[1] We use CSR reporting as a synonym for environmental, social, and governance (ESG) reporting, non-financial reporting, and sustainability reporting. As the CSR reporting landscape, and especially the CSR landscape, is characterized by the use of numerous acronyms, a glossary is provided in Appendix A. Further, we provide a concise description of all CSR frameworks covered in this study in Appendix B.

the Global Reporting Initiative (GRI) or the Sustainability Accounting Standards Board (SASB) developed CSR frameworks (CSRFs)[2] that provide guidance on specific disclosures that are considered relevant for the intended users. Owing to the different information needs of CSR reporting users, there is no consensus thus far for a single international CSRF. However, there is an emerging trend towards the consolidation of the CSRF landscape, highlighted by the recent involvement of the European Commission in collaboration with the European Financial Reporting Advisory Group (hereafter EC/EFRAG) and the International Sustainability Standards Board (ISSB), established by the International Financial Reporting Standards (IFRS) Foundation, to create international standards (Giner and Luque-Vílchez, 2022; Stolowy and Paugam, 2023; Wagenhofer, 2023). Interestingly, both initiatives follow 'fundamentally different approaches' (Adams, 2021). The ISSB follows a narrow approach by 'giving investors what they want' (Christensen *et al.*, 2021), that is, CSR information that could potentially have financial consequences and would therefore affect the enterprise value of the reporting firm. The EC/EFRAG addresses the information needs of a broad range of stakeholder groups by requiring firms to report not only on CSR matters that could potentially have financial consequences for the firm, but on CSR matters that pertain to the impacts of a firm's activities on the environment and society (EFRAG, 2022). It is worthwhile noting that while the ISSB and EC/EFRAG are about to consolidate the CSRF landscape, both initiatives rely on established CSRFs. In particular, the ISSB builds on CSRFs that are oriented towards investors, while the EC/EFRAG cooperates with CSRFs that are oriented towards multiple stakeholders.

While the effectiveness of an investor- vs. a multi-stakeholder-oriented approach is controversially debated in both academia (e.g., Abhayawansa, 2022; Giner and Luque-Vílchez, 2022; Stolowy and Paugam, 2023) and practice (e.g., KPMG, 2022; PwC, 2022), empirical evidence on their informational consequences is limited (Grewal and Serafeim, 2020; Cooper and Michelon, 2022). Our study aims to inform the current debate by examining how firms' adoption of CSRFs that follow different user-orientation approaches contributes to mitigating information asymmetries in capital markets, one of the main goals of CSR reporting regulation (e.g., European Parliament and Council of the EU (2014), recitals 1 and 3).

Considering the multiplicity of established CSRFs, existing CSRF studies that primarily focus on one framework (Zhou *et al.*, 2017; Schiemann and Sakhel, 2019) provide only limited evidence to inform the current debate (Grewal and Serafeim, 2020; Cooper and Michelon, 2022). While these studies find that capital markets only care about financially relevant CSR disclosures, they do not investigate approaches followed by other CSRFs. Taking into account practical difficulties faced by standard-setters in assessing a potential financial impact of CSR matters and given that a growing number of investors may have non-monetary preferences, Christensen *et al.* (2021) conclude that while investor- and

[2] We follow the European Union (EU) and use the term 'CSR frameworks' to refer to CSR disclosure frameworks and CSR disclosure standards. We use the terms 'frameworks' and 'standards' as synonyms for constructs that provide specific disclosure requirements.

multi-stakeholder-oriented approaches may be fundamentally different at the conceptual level, they may be less distinct in practice and in their consequences. Thus, whether capital markets differentiate between firms' adoption of investor- and multi-stakeholder-oriented CSRF remains an open empirical question.

In our analyses we exploit the widespread adoption of established CSRFs among European firms (European Commission, 2021; European Securities and Markets Authority, 2022) following the European Union's Non-Financial Reporting Directive (EU NFRD). While not mandatory, the adoption of CSRFs is encouraged by the EU NFRD to reduce administrative burden and improve the relevance and comparability of disclosures (European Parliament and Council of the EU, 2014). To exploit this setting, where firms are required by the EU NFRD to report on CSR issues but have the discretion to adopt one or multiple CSRFs, we use a novel hand-collected dataset of CSRF adoption rates for firms listed on the STOXX Europe 600 Index, covering financial years 2017 (the first year of application of the EU NFRD) to 2020. We focus on five investor-oriented and two multi-stakeholder-oriented CSRFs from international standard-setters most commonly adopted in Europe. To proxy for information asymmetry in capital markets, we use bid–ask spreads as our primary measure (Leuz and Verrecchia, 2000; Muller *et al*., 2011).

We find that capital markets differentiate between investor- and multi-stakeholder-oriented approaches because only the adoption of CSRFs that primarily target investors is associated with lower information asymmetry, whereas the adoption of CSRFs that target a broad range of stakeholder is not. Considering that most firms do not exclusively rely on a single CSRF but adopt multiple CSRFs simultaneously (European Commission, 2021; European Securities and Markets Authority, 2022), our results suggest that the adoption of multiple investor-oriented CSRFs is associated with lower information asymmetry, while the adoption of multiple multi-stakeholder-oriented CSRFs is not. From a capital market perspective, our results therefore support the ISSB's investor-oriented approach. Analysing individual CSRFs suggests that the climate-change-focused CSRFs are particularly relevant for mitigating information asymmetry. We generally find consistent results in a series of robustness tests that address potential endogeneity concerns and the possibility of measurement errors in our variables of interest.

Our study makes the following contributions to the literature. First, we provide empirical evidence to inform the current debate on different approaches followed by recent standard-setting initiatives of the EC/EFRAG and the ISSB. We respond to Cooper and Michelon's (2022) call for further research on the consequences of different CSR reporting approaches, Grewal and Serafeim's (2020) call to investigate the usefulness of different voluntary CSRFs to capital markets, and Stolowy and Paugam's (2023) call to examine the effects of firms adopting multiple CSRFs simultaneously. Second, while there are studies that examine the capital market effects of selected disclosure requirements of single CSRFs (e.g., Zhou *et al*., 2017; Schiemann and Sakhel, 2019), this is the first study to consider the *simultaneous* adoption of multiple CSRFs. Moreover, our dataset allows us to isolate the usefulness of individual CSRFs in mitigating

information asymmetry, while controlling for the confounding effects of other CSRFs adopted by a firm. Third, unlike studies that employ CSR performance measures (Cho *et al.*, 2013; Cui *et al.*, 2018), we investigate the liquidity consequences of a CSR reporting practice, a field in which the existing literature is particularly scarce (Grewal and Serafeim, 2020; Christensen *et al.*, 2021; Grewal *et al.*, 2021).

INSTITUTIONAL SETTING

CSRF User Orientation and Materiality Concepts

Guided by the intended users' role in decision-making, a CSRF's materiality conception is the key principle that determines the content that adopting firms are required to report on (Corporate Reporting Dialogue, 2019; Cooper and Michelon, 2022). Although CSRFs follow different approaches in defining and applying CSR materiality, one can summarize these approaches by discussing the respective CSRF's user orientation (Clark, 2021; Cooper and Michelon, 2022; Fiandrino *et al.*, 2022): a narrow investor-oriented approach that exclusively focuses on the information needs of investors versus a broad multi-stakeholder-oriented approach that addresses the information needs of a broad range of stakeholder groups.

The materiality conceptions of investor-oriented CSRFs (referred to as *financial materiality*) reflect the approach of financial reporting standards by exclusively covering CSR matters deemed relevant to investors' investment decisions, that is, those that potentially have a financial impact on the reporting firm (Christensen *et al.*, 2021).[3] For example, in its original conceptual framework, the SASB adopted the definition established in US securities laws and defined information as material if there is 'a substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having significantly altered the "total mix" of information made available' (SASB, 2017). Similarly, the ISSB defines information as material if 'omitting, misstating or obscuring that information could reasonably be expected to influence decisions that primary users of general purpose financial reports make on the basis of those reports' (ISSB, 2023). Consequently, investor-oriented CSRFs exclusively cover matters considered relevant to investment decisions, while any information that does not affect investment decisions is regarded as non-material (Reimsbach *et al.*, 2020).

The crucial difference in the materiality approaches of multi-stakeholder-oriented CSRFs lies in the definition of the intended users. Multi-stakeholder-oriented CSRFs require firms to report information relevant to decisions made by one or more stakeholder groups (Reimsbach *et al.*, 2020). This approach, referred

[3] See Clark (2021) for an overview of definitions of materiality by the International Accounting Standards Board (IASB), the United States Securities and Exchange Commission (US SEC) and the Financial Accounting Standards Board (FASB).

to as *double materiality*, goes beyond reporting CSR matters that have financial consequences for a firm (i.e., financial materiality) by requiring a firm to also report on the environmental and societal impacts caused by its activities (referred to as impact materiality) (Christensen *et al*., 2021; Cooper and Michelon, 2022). For example, if a firm utilizes plastic packaging for its products, this is not associated with financially material production costs. However, the resulting plastic waste might have a material environmental impact and would therefore be considered under the double materiality approach (Christensen *et al*., 2021). As the double materiality approach comprises information that may or may not have financial consequences for a firm, at least a subset of disclosures will be of relevance for investors (Adams and Abhayawansa, 2022; Cooper and Michelon, 2022).

It is worth noting that although CSRFs follow different approaches in defining and applying CSR materiality, there is an overlap regarding disclosure requirements, and several alignment initiatives show that most CSRFs can be applied in a complementary and additive manner (Corporate Reporting Dialogue, 2019; SASB, 2020). However, in order to strengthen their institutional position, there is inherent competition among standard-setters in terms of firm adoption rates (Laine *et al*., 2022).

Regulatory Background

CSRF adoption is widespread among firms in the EU (European Commission, 2021; European Securities and Markets Authority, 2022) following the EU NFRD.[4] Since the financial year 2017, large public interest entities have been required to prepare a non-financial statement in accordance with the EU NFRD. This statement should include information on environmental, social, and employee matters, human rights, anti-corruption and bribery, and be based on a firm's CSR materiality assessment. The EU follows a principles-based approach and does not prescribe specific disclosure items, but encourages firms to rely on national, EU-based, or international CSRFs to minimize administrative burden and improve the relevance and comparability of disclosures (European Parliament and Council of the EU, 2014; European Commission, 2017).[5]

The CSRF reporting landscape in Europe is likely to change with the European Union's Corporate Sustainability Reporting Directive (EU CSRD), which modernizes the reporting requirements of the EU NFRD and will be applicable

[4] The EU NFRD has been implemented by all states of the European Economic Area, which comprises all EU countries as well as Iceland, Liechtenstein, and Norway (the UK was part of the EU until the end of our sample period on 31 December 2020).

[5] Our sample of firms listed in the STOXX Europe 600 Index includes 51 firms headquartered in Switzerland. Although these firms had no legal obligation to disclose CSR information during the sample period, voluntary CSR reporting and CSRF adoption is well-established in Switzerland (KPMG, 2020, 2021; Baker McKenzie, 2022). Moreover, since 2017, the Directive Corporate Governance of the SIX Swiss Exchange encourages firms to issue a CSR report in accordance with pre-defined, internationally recognized CSRFs (Eberle, 2018). Therefore, we include Swiss firms that report on CSR matters according to LSEG (Refinitiv Eikon) in our main analysis.

for the first time for firms' financial year 2024 (European Commission, 2023). Firms subject to the EU CSRD will have to adopt the new European Sustainability Reporting Standards (ESRS) developed by the EFRAG, giving the ESRS a clear advantage over the IFRS Sustainability Disclosure Standards developed by the ISSB (Giner and Luque-Vílchez, 2022). However, although the ISSB lacks the legal power to impose its standards, the IFRS Foundation (more specifically, the IASB) has been successful in promoting the IFRS and aims to achieve a similar outcome for its IFRS Sustainability Disclosure Standards (Stolowy and Paugam, 2023). Even though the new regulatory requirements and standard-setting initiatives are about to change the CSRF reporting landscape, studying the current landscape allows important insights as the EC/EFRAG and ISSB initiatives rely on established CSRFs with a multi-stakeholder and an investor orientation, respectively.

We focus on the CSRFs that are outlined in the EU NFRD and its accompanying guidelines (European Commission, 2017, 2019) and are most commonly adopted by European firms (European Commission, 2021; European Securities and Markets Authority, 2022).[6] We provide a concise description, including the intended users of all CSRFs covered in our study in Appendix B and refer to Bose (2020), Cooper and Michelon (2022), and Laine *et al.* (2022) for more detailed overviews.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Literature Review

Regarding investor-oriented CSRFs, existing studies only examine the capital market effects of individual CSRFs and their selected disclosure requirements. For example, Schiemann and Sakhel (2019) focus on a specific part of the CDP questionnaire and find lower bid–ask spreads for firms that disclose climate-related physical risks. Zhou *et al.* (2017) examine the alignment with the International Integrated Reporting Council's (IIRC) framework for firms listed on the Johannesburg Stock Exchange and find lower analyst forecast errors and a reduction in the cost of equity capital for certain reporting firms as their level of alignment increases. Focusing on reports that incorporate SASB-relevant disclosures, Burzillo *et al.* (2022) conclude that those reports do not provide

[6] As our study focuses on the reporting effects of CSR disclosures, we only cover CSR disclosure frameworks and standards, that is, frameworks and standards that provide specific requirements for what should be disclosed. Therefore, we do not include guidelines or guiding principles such as the OECD Guidelines for Multinational Enterprises, the International Organisation for Standardisation's ISO 26000, Guiding Principles on Business and Human Rights, or the International Labour Organization's Tripartite Declaration of principles concerning multinational enterprises and social policy. Moreover, we do not include national frameworks such as the Sustainability Code of the German Council for Sustainable Development or Union-based frameworks such as the Eco-Management and Audit Scheme (EMAS).

decision-useful information to investors as they do not find statistically significant stock price reactions around their releases.

In addition, a number of studies employ the SASB's materiality map to identify financially material/non-material CSR disclosures. For example, Grewal *et al.* (2021) find that a firm's score of SASB material disclosures (constructed by classifying a firm's Bloomberg ESG metrics into financially material/non-material in accordance with the SASB materiality map) is positively associated with stock price informativeness, while a score of SASB non-material disclosures is not. In a related study, Schiehll and Kolahgar (2021) obtain similar results by combining a frequency measure of CSR-related keywords with the SASB materiality map. Both studies highlight the importance of distinguishing between different materiality definitions of CSR information to avoid misleading conclusions when investigating CSR disclosure effects. However, while these studies use the SASB materiality map to identify financially material/non-material disclosures, they do not examine whether a firm actually adopts the SASB standards or not.

Regarding multi-stakeholder-oriented CSRFs, there are only studies that use the adoption of the GRI framework as a control variable, such as Grewal *et al.* (2021) and Schiehll and Kolahgar (2021). These studies do not find any statistically significant association with stock prices.

Hypotheses Development

From a transparency perspective, CSRFs provide firms with templates for identifying CSR matters considered relevant by the respective standard-setter (Laine *et al.*, 2022, p. 92). Adopting an investor-oriented CSRF should therefore enhance a firm's scope of disclosures that are considered relevant by capital market participants. Moreover, CSRFs that are specific in terms of disclosure requirements and measurement methods have the potential to limit boilerplate language and therefore improve the quality of disclosures (Christensen *et al.*, 2021). Thus, building on insights from corporate disclosure literature, adopting investor-oriented CSRFs should reduce information asymmetry to the extent that this reporting practice enhances CSR disclosures that are regarded as relevant by investors (Healy and Palepu, 2001; Leuz and Wysocki, 2016).

CSRFs standardize reported information and thereby improve the comparability of disclosures (Bose, 2020; Laine *et al.*, 2022). Thus, relative to non-adoption, the adoption of investor-oriented CSRFs should reduce capital market participants' information-processing costs, which leads to improved liquidity and reduced information asymmetries (Blankespoor *et al.*, 2020). However, as CSRFs have network externalities (Dye and Sunder, 2001; Jamal and Sunder, 2014), firms' common reporting practice of adopting multiple CSRFs raises the question of whether CSRF adoption improves comparability of disclosures. However, as peer firms have strong incentives to adopt a similar set of CSRFs (Benston *et al.*, 2006, p. 242), even the practice of adopting multiple CSRFs should improve within-industry comparability across firms. CSRF adoption can also increase cross-industry comparability across firms that adopt the same set of CSRFs. It can also

increase cross-industry comparability when there are overlapping disclosures across firms that adopt different sets of CSRFs. Taken together, these arguments suggest that the adoption of investor-oriented CSRFs increases the transparency of CSR disclosures for capital market participants and thus reduces information asymmetry.

However, due to the voluntary nature of CSRF adoption, missing enforcement mechanisms, and inherent reporting discretion, firms may withhold critical information, use boilerplate language, or only partially disclose information required by a CSRF (Christensen *et al.*, 2021; Grewal *et al.*, 2021). To the extent that firms do not fully adopt a CSRF or adopt a CSRF in a symbolic way, this should not mitigate information asymmetry in capital markets (Daske *et al.*, 2013). Moreover, the adoption of multiple CSRFs, a potential source of extensive CSR reporting (European Commission, 2021), could increase complexity (Stolowy and Paugam, 2023), leading to higher information-processing costs and, ultimately, incomplete information revelation (Clarkson *et al.*, 2020).

From a signalling perspective, we argue that adopting an investor-oriented CSRF is a strong signal to capital market participants that reduces information asymmetry. Signalling theory helps to explain how firms can use CSRFs to communicate information about latent and unobservable quality characteristics to external stakeholders to reduce information asymmetry (Conelly *et al.*, 2011; Friske *et al.*, 2023). In particular, a firm could adopt investor-oriented CSRFs to signal its commitment to enhanced disclosure levels to capital market participants (Clarkson *et al.*, 2013, 2019). This signal is credible because adopting a CSRF is associated with substantial costs[7] and limits a firm's discretion not to report unfavourable CSR issues (Kim and Shi, 2012; Friske *et al.*, 2023). However, even though a signal may be credible, its effectiveness depends on the characteristics of the receiver (Conelly *et al.*, 2011). As investor-oriented CSRFs are tailored to the information needs of capital market participants, adopting such CSRFs should be an effective signal to show a firm's commitment to meeting their information needs.[8]

Based on the discussions above, the reasons to expect a negative relationship between the adoption of investor-oriented CSRFs and information asymmetry are more persuasive from both transparency and signalling perspectives. Thus, we state the following hypothesis:

H1: The adoption of investor-oriented CSRFs is associated with lower information asymmetry.

From a transparency perspective, even though multi-stakeholder-oriented CSRFs do not explicitly focus on investors, there are arguments that those CSRFs

[7] See European Commission (2021) for survey results on administrative and incremental costs that are associated with the adoption of CSRFs.

[8] In its 2020 annual CEO letter, BlackRock urges portfolio firms to adopt investor-oriented CSRFs to fulfill investors' information needs. This supports our argument that the adoption of such CSRFs is an effective signal to capital market participants.

help to lower information asymmetry in capital markets. The double materiality approach followed by multi-stakeholder-oriented CSRFs requires firms to report not only on CSR matters that could potentially have financial consequences for the firm, but on CSR matters that pertain to the impacts of a firm's activities on the environment and society. The financial and double materiality approaches are not mutually exclusive. The double materiality approach comprises information with and without financial impacts for the reporting firms (Christensen *et al.*, 2021; Abhayawansa, 2022), while the materiality of CSR disclosures is dynamic and evolves over time, that is, certain CSR matters that might have not been financially material at the time of creation of a CSRF may have become financially material in the meantime (International Organization of Securities Commissions, 2021; Giner and Luque-Vílchez, 2022). Therefore, at least a subset of the disclosures required by multi-stakeholder-oriented CSRFs should be relevant for investors.

Moreover, the concept of financial materiality assumes that investors only care about CSR matters with financial impacts when making investment decisions (Christensen *et al.*, 2021). However, as investors are a heterogeneous group, certain types of investors may have information needs that go beyond monetary returns (Cohen *et al.*, 2015; Hart and Zingales, 2017; Adams and Abhayawansa, 2022).

From a signalling perspective, we expect that the adoption of a multi-stakeholder-oriented CSRF will be a less effective signal to capital market participants than the adoption of an investor-oriented CSRF. In particular, as multi-stakeholder-oriented CSRFs explicitly address the information needs of different stakeholder groups, investors may not feel directly addressed and will not look for this signal. In this case, the signalling process does not work and therefore does not reduce information asymmetry (Conelly *et al.*, 2011). However, findings by Guiral *et al.* (2020) suggest that investors behave irrationally when processing certain types of financially non-material CSR information (i.e., by employing a heuristic rather than a systematic approach), implying that firms can strategically extend the disclosure of such non-material CSR matters to positively influence investors' perceptions.

Together, the arguments presented above suggest that the distinction between an investor- and a multi-stakeholder-oriented approach may be less distinct in practice and in consequentially than they appear at the conceptual level (Christensen *et al.*, 2021; Giner and Luque-Vílchez, 2022). Although we expect the effect to be less pronounced than for investor-oriented CSRFs, we expect that the adoption of multi-stakeholder-oriented CSRFs will also help mitigate information asymmetry. We therefore state the following hypothesis:

H2: The adoption of multi-stakeholder-oriented CSRFs is associated with lower information asymmetries.

METHOD

Sample Selection

We test our hypotheses on a sample of firms listed on the STOXX Europe 600 Index as of December 2020. Our sample period starts with financial year 2017 as this was the first year of application of the EU NFRD. Our sample period ends with financial year 2020 as we require one additional year for our forward-looking information asymmetry variable and need to manually collect all relevant reporting outlets. For the initial population of 2,400 firm-year observations for the STOXX Europe 600 Index for 2017–2020, we collected annual reports, stand-alone CSR reports, and related corporate reporting outlets from the firms' websites to compile our dataset.[9] We excluded 16 observations of firms headquartered outside the European Economic Area and Switzerland, as well as 317 observations of firms that did not meet the size criteria of the EU NFRD[10] or did not report any CSR information in the respective year according to LSEG (Refinitiv Eikon). Owing to missing firm-level data, we lost another 24 firm-year observations. This resulted in a final sample of 547 firms with 2,043 firm-year observations. Table 1 outlines the sample selection process.

CSRF Measures

For our statistical analyses, we introduced two indices based on the user orientation of the collected CSRFs. *Investor_Index* is the number of investor-oriented CSRFs adopted by a firm in the respective year, relative to the total number of investor-oriented CSRFs considered in our paper. We consider the following five CSRFs to be investor-oriented: CDP, Climate Disclosure Standards Board (CDSB), IIRC, SASB, and Task Force on Climate-related Financial Disclosures (TCFD). *Stakeholder_Index* is the number of multi-stakeholder-oriented CSRFs adopted by a

TABLE 1

SAMPLE SELECTION

Initial population of firm-year observations for STOXX Europe 600 Index (2017–2020)	2,400
(–) Observations of firms headquartered outside the European Economic Area or Switzerland	16
(–) Observations of firms that do not fulfil the size criteria of the EU NFRD or that do not report any CSR information according to LSEG (Refinitiv Eikon)	317
(–) Observations with missing main variables	24
(=) Final sample	**2,043**

[9] Firms commonly do not use a single CSR reporting outlet. For example, Daimler Group published an annual report, a CSR report, and a GRI index report, and a SASB disclosure report for the financial year 2020.

[10] To determine whether a firm must adhere to the EU NFRD and is obliged to disclose CSR information, we used state-specific size thresholds with respect to a firm's average number of employees, balance sheet total, and net turnover (CSR Europe and GRI, 2017).

firm in the respective year, relative the total number of multi-stakeholder CSRFs considered in our paper. We consider the following two CSRFs as multi-stakeholder-oriented: GRI and United Nations Global Compact (UNGC). Our classification of these CSRFs into investor-oriented and multi-stakeholder-oriented is based on the user-orientation approach outlined on the respective standard-setters' websites and in prior literature (La Torre *et al.*, 2018; Breijer and Orij, 2022; Cooper and Michelon, 2022). The construction of our two indices was motivated by firms' common reporting practice of adopting multiple CSRFs simultaneously (European Commission, 2021; European Securities and Markets Authority, 2022).

To identify the adoption of individual CSRFs on a firm level, we followed two manual approaches depending on the CSRF under investigation:[11]

1. To identify whether a firm adopted the CDSB, GRI, IIRC, SASB, or TCFD framework, we employed computer-based textual analysis (Loughran and McDonald, 2016). First, we extracted relevant text sections in the respective reporting outlets using a CSRF-related keyword search (see Appendix B).[12] Second, we manually examined the resulting text sections to determine whether a firm adopted the respective framework. We classified a firm as a CSRF adopter if at least one of its reporting outlets included: (i) a separate section dedicated to the respective CSRF; (ii) a cross-reference table to indicate the location of CSRF-aligned disclosures; or (iii) metrics, narrative disclosures, or elements that were marked as being in line with the respective CSRF. As we examined the reporting effects, we limited the impact of firms that adopted CSRFs in a somewhat symbolic way, and did not classify a firm as an adopter if the firm solely indicated that it used a certain CSRF in its CSR materiality assessment process or if it simply stated that its reporting was aligned with the respective CSRF without indicating which sections or disclosure elements were aligned with it. In addition to reporting outlets, we checked whether a firm provided relevant disclosures on its website.[13]
2. We followed a different identification approach for the CDP or UNGC frameworks because they require special disclosure formats. The CDP uses an online questionnaire format and provides a website showing all corporate responses to the CDP questionnaires since 2010 (CDP, 2022b). We used the CDP's corporate response data to classify a firm as an adopter of the CDP if it had submitted the climate change questionnaire for the respective financial

[11] We manually collected firm-level information on the adoption of CSRFs as financial data providers only cover selected CSRFs. In addition, lists of adopting firms provided by standard-setters are often incomplete (European Commission, 2021).

[12] We selected search terms based on the full name and abbreviations of the respective CSRF and the associated standard-setting organization (Breijer and Orij, 2022).

[13] We validated the results of our identification approach with the SASB reporters list (although those lists are often incomplete), the LSEG (Refinitiv Eikon) GRI variable (although LSEG (Refinitiv Eikon) uses a slightly different GRI definition), and the LSEG (Refinitiv Eikon) UNGC variable and generally found a high consistency, indicated by statistically significant Pearson correlation coefficients of 0.76 (SASB), 0.81 (GRI), and 0.86 (UNGC) respectively.

year and made the response publicly available (Ott *et al.*, 2017). The UNGC requires adopting firms to upload a Communication on Progress (CoP) report to the organization's website. We used the UNGC participants' overview (UNGC, 2022a) and classified a firm as an adopter if it was listed as having published a CoP report for the respective fiscal year. In contrast to adopter lists provided by other standard-setters, the lists provided by the CDP and UNGC should give a full picture of adopting firms, as firms are required to disclose the respective reporting outlets on the organizations' websites.

At the individual CSRF level, we introduced indicator variables (*CDP*, *CDSB*, *IIRC*, *SASB*, *TCFD*, *GRI*, *UNGC*) that equal one if we identified the firm as an adopter of the respective CSRF in the respective financial year, and zero otherwise.

Variables and Model Description

We used bid–ask spreads as our primary measure of information asymmetry. By levelling the playing field among informed and uninformed buyers and sellers, corporate disclosures can mitigate adverse selection costs, which should be reflected in smaller bid–ask spreads (Callahan *et al.*, 1997; Leuz and Verrecchia, 2000).

To test our hypotheses, we estimated the following lead–lag regression model to address potential reverse causality concerns:

$$\begin{aligned} BidAsk_{i,t+1} = {} & \alpha_0 + \alpha_1 Investor\_Index_{i,t} + \alpha_2 Stakeholder\_Index_{i,t} + \alpha_3 RetVar_{i,t} \\ & + \alpha_4 ShareTurn_{i,t} + \alpha_5 Price_{i,t} + \alpha_6 Size_{i,t} + \alpha_7 ROA_{i,t} + \alpha_8 DJSI_{i,t} \\ & + \alpha_9 Lev_{i,t} + \alpha_{10} MTB_{i,t} + \alpha_{11} InstOwn_{i,t} + Country\ FE + Industry\ FE \\ & + Year\ FE + \varepsilon_{i,t} \end{aligned} \tag{1}$$

$BidAsk_{i,t+1}$ denotes the logarithm of firm *i*'s median daily relative bid–ask spread, which we measured over the 365 days period following firm *i*'s earnings announcement date of financial year *t*.[14] Our variables of interest are $Investor\_Index_{i,t}$ and $Stakeholder\_Index_{i,t}$.

We selected control variables based on previous studies examining liquidity-based information asymmetries in the context of CSR reporting (Gao *et al.*, 2016; Schiemann and Sakhel, 2019; Kimbrough *et al.*, 2022) or financial reporting

[14] We chose this date to ensure that the earnings information of a firm's last financial year was publicly available at the starting point of computation. Our setting prevented us from using shorter-term measurement windows of bid–ask spreads—for example, Muller *et al.* (2011) and Schiemann and Sakhel (2019) use one-month windows—as firms typically rely on multiple outlets to report on CSR information that are not published on the same date. Moreover, publication dates of CSR reporting outlets are not available in financial databases and manual identification is often not possible (Burzillo *et al.*, 2022; Altendorfer, 2024). We therefore measured bid–ask spreads over a 365-day period.

standards (Leuz and Verrecchia, 2000; Muller *et al*., 2011; Daske *et al*., 2013). We included the logarithm of a firm's standard deviation of daily stock returns ($RetVar_{i,t}$), the logarithm of a firm's annual US dollar trading volume divided by its market value of common equity ($ShareTurn_{i,t}$), and a firm's annual median of the logarithm of the daily stock prices ($Price_{i,t}$) to control for a firm's stock attributes. Moreover, we included the logarithm of a firm's market capitalization ($Size_{i,t}$) to control for its general information environment, a firm's return on assets ($ROA_{i,t}$) to control for its financial performance, a dummy variable indicating a firm's membership in the Dow Jones Sustainability Index ($DJSI_{i,t}$,) to control for its CSR performance, a firm's ratio of long-term debt to total assets ($Lev_{i,t}$) to control its capital structure, a firm's market-to-book ratio ($MTB_{i,t}$) to control for its growth opportunities, and the percentage owned by institutional investors ($InstOwn_{i,t}$) to control for its ownership structure. We clustered standard errors by firm and included year fixed effects as well as country and industry fixed effects (based on two-digit SIC codes) to account for unobserved time-invariant industry and country characteristics. The variable definitions are provided in Appendix C.

EMPIRICAL RESULTS

Descriptive Statistics and Correlations

Panel A of Table 2 presents descriptive statistics for the variables employed in our main analyses. The mean values of *Investor_Index* (0.246) and *Stakeholder_Index* (0.617) imply that sample firms adopt on average 1.23 (5 × 0.246) investor-oriented CSRFs and 1.23 (2 × 0.617) multi-stakeholder-oriented CSRFs.[15] Untabulated statistics show that the average number of investor-oriented CSRFs adopted has more than doubled during the sample period (from 0.86 in 2017 to 1.80 in 2020), while the average number of multi-stakeholder-oriented CSRFs adopted increased only moderately (from 1.20 in 2017 to 1.30 in 2020). Similar to Bochkay *et al*. (2022), untabulated statistics show that the adoption of a particular CSRF is sticky, that is, adopting a CSRF is a persistent choice for most firms. Untabulated statistics also show cross-country variance in the relevance of different CSRFs. For example, compared to investor-oriented CSRFs, multi-stakeholder-oriented

[15] At the individual level, the CDP (70.2%), GRI (64.2%), and UNGC (59.1%) are the most widely adopted CSRFs while the CDSB is adopted in 1.2% of all firm years. The number of observations in which firms adopt the TCFD (26.4%), IIRC (14.2%), and SASB (10.9%) frameworks remains low on average but increased considerably in 2019 and 2020, especially for TCFD and SASB. Individual CSRF adoption statistics are in a similar range as in prior studies (European Commission, 2021; European Securities and Markets Authority, 2022). Untabulated statistics show that sample firms adopted at least one CSRF in 88.2%, at least one investor-oriented CSRF in 75.6%, and at least one multi-stakeholder-oriented CSRF in 76.4% of all firm years. Moreover, sample firms adopted both investor-oriented and multi-stakeholder-oriented CSRF in 63.8% of all firm years.

TABLE 2

SAMPLE DESCRIPTIONS

Panel A: Descriptive statistics

Variable	Mean	STD	Min.	Q1	Median	Q3	Max.	N
Outcome variable								
BidAsk	–2.806	0.590	–4.157	–3.219	–2.815	–2.410	–1.370	2,043
Main variables of interest								
Investor_Index	0.246	0.201	0.000	0.200	0.200	0.400	1.000	2,043
Stakeholder_Index	0.617	0.403	0.000	0.500	0.500	1.000	1.000	2,043
Investor-oriented CSR frameworks								
CDP	0.702	0.458	0	0	1	1	1	2,043
CDSB	0.012	0.110	0	0	0	0	1	2,043
IIRC	0.142	0.349	0	0	0	0	1	2,043
SASB	0.109	0.311	0	0	0	0	1	2,043
TCFD	0.264	0.441	0	0	0	1	1	2,043
Multi-stakeholder-oriented CSR frameworks								
GRI	0.642	0.480	0	0	1	1	1	2,043
UNGC	0.591	0.492	0	0	1	1	1	2,043
Control variables								
RetVar	0.537	0.383	–0.166	0.246	0.485	0.818	1.509	2,043
ShareTurn	–0.500	0.556	–2.046	–0.834	–0.480	–0.140	0.913	2,043
Price	3.375	1.300	0.452	2.525	3.360	4.302	7.081	2,043
Size	23.242	1.020	21.329	22.497	23.110	23.913	25.878	2,043
ROA	0.057	0.069	–0.123	0.013	0.044	0.084	0.343	2,043
DISI	0.229	0.420	0	0	0	0	1	2,043
Lev	0.248	0.156	0.000	0.126	0.239	0.353	0.671	2,043
MTB	4.121	6.067	–3.777	1.303	2.428	4.463	44.446	2,043
InstOwn	0.458	0.208	0.045	0.308	0.434	0.615	0.928	2,043

Panel B: Pearson correlations

Variable		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
BidAsk	(1)	1.00																		
Investor_Index	(2)	**–0.38**	1.00																	
Stakeholder_Index	(3)	**–0.12**	**0.40**	1.00																
CDP	(4)	**–0.31**	**0.48**	**0.29**	1.00															
CDSB	(5)	–0.05	**0.22**	**0.10**	**0.06**	1.00														
IIRC	(6)	**–0.14**	**0.53**	**0.22**	**0.14**	**0.07**	1.00													
SASB	(7)	**–0.25**	**0.58**	**0.18**	**0.10**	0.05	**0.09**	1.00												
TCFD	(8)	**–0.30**	**0.74**	**0.24**	**0.20**	**0.09**	**0.20**	**0.40**	1.00											
GRI	(9)	**–0.09**	**0.32**	**0.83**	**0.19**	**0.08**	**0.20**	**0.18**	**0.18**	1.00										
UNGC	(10)	**–0.11**	**0.35**	**0.84**	**0.30**	**0.08**	**0.16**	**0.12**	**0.21**	**0.38**	1.00									
RetVar	(11)	0.00	**0.15**	**–0.06**	–0.05	–0.02	–0.05	**0.33**	**0.22**	–0.05	–0.05	1.00								

(Continues)

TABLE 2

CONTINUED

Panel B: Pearson correlations

Variable		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
ShareTurn	(12)	**−0.30**	**0.09**	0.03	**0.10**	−0.02	0.06	**0.06**	0.05	0.05	0.00	**0.26**	1.00							
Price	(13)	**0.13**	**−0.07**	0.05	−0.04	−0.02	−0.03	−0.01	**−0.10**	**0.08**	0.01	**−0.17**	**−0.21**	1.00						
Size	(14)	**−0.57**	**0.33**	**0.32**	**0.25**	**0.07**	**0.12**	**0.21**	**0.25**	**0.24**	**0.30**	**−0.21**	**−0.19**	**0.23**	1.00					
ROA	(15)	**0.12**	**−0.23**	**−0.19**	**−0.12**	−0.03	**−0.08**	**−0.14**	**−0.23**	**−0.15**	**−0.17**	**−0.12**	**−0.12**	**0.21**	**−0.08**	1.00				
DJSI	(16)	**−0.29**	**0.32**	**0.29**	**0.24**	**0.09**	**0.26**	**0.13**	**0.16**	**0.20**	**0.28**	**−0.12**	**0.11**	0.01	**0.33**	**−0.09**	1.00			
Lev	(17)	−0.03	**0.12**	**0.07**	0.06	0.03	**0.11**	**0.07**	**0.09**	**0.09**	0.03	0.01	0.04	**−0.07**	0.00	**−0.13**	0.04	1.00		
MTB	(18)	**0.08**	**−0.14**	**−0.15**	**−0.12**	−0.03	**−0.08**	−0.05	**−0.11**	**−0.14**	**−0.11**	**0.09**	**−0.12**	**0.17**	0.01	**0.43**	**−0.12**	0.00	1.00	
InstOwn	(19)	**−0.11**	−0.06	**−0.26**	**0.08**	−0.05	**−0.13**	−0.01	−0.03	**−0.23**	**−0.20**	0.04	**0.26**	**−0.24**	**−0.27**	**0.06**	**−0.07**	0.01	0.01	1.00

This table presents descriptive statistics (Panel A) and Pearson correlations (Panel B) for the variables used in the main analyses. A glossary of CSRF acronyms is provided in Appendix A. Variable definitions are provided in Appendix C. All continuous variables are winsorized at the 1st and 99th percentile, respectively. Bold numbers indicate statistical significance at the 0.01 level, based on two-tailed tests.

CSRFs show lower adoption rates in the UK, but higher adoption rates in Germany and Sweden. Overall, the descriptive results indicate a high degree of heterogeneity in firms' reporting practices with respect to the adoption of investor- and multi-stakeholder-oriented CSRFs.

Panel B of Table 2 presents the Pearson correlations. Statistically significant ($p < 0.01$) and negative correlation coefficients between *BidAsk* and *Investor_Index* and *Stakeholder_Index* provide preliminary support that investor-oriented and multi-stakeholder-oriented CSRFs are associated with lower information asymmetry. Absolute correlation coefficients among control variables are all smaller than 0.5, and therefore do not indicate any concerns for problems of multicollinearity.

Regression Results

Table 3 presents the ordinary least squares (OLS) regression results of equation (1). We find negative and statistically significant coefficients for *Investor_Index* (–0.188, $p < 0.01$) and statistically insignificant coefficients for *Stakeholder_Index* (0.030, $p > 0.1$). This supports Hypothesis 1 as it indicates that the adoption of investor-oriented CSRFs is associated with lower bid–ask spreads. However, it does not support Hypothesis 2 as we do not find statistical evidence that the adoption of multi-stakeholder-oriented CSRFs is associated with lower bid–ask spreads. The results further suggest that information asymmetries decrease with the relative number of investor-oriented CSRFs adopted by a firm, but not with the relative number of multi-stakeholder-oriented CSRFs adopted.[16] The adjusted R^2 and the signs of all statistically significant control variables are similar to those of previous cross-sectional studies on information asymmetry.

Overall, our results emphasize the need to distinguish between investor-oriented and multi-stakeholder-oriented CSRFs, because we find negative and statistically significant coefficients only for firms that adopt investor-oriented CSRFs.

The association between individual CSRFs and information asymmetry Our dataset allows us to disentangle the association by isolating the effects of individual CSRFs and controlling for the confounding effects of other CSRFs adopted by a firm. Therefore, we estimate equation (1) and replace *Investor_Index* and *Stakeholder_Index* with the individual CSRF indicator variables. The results are presented in Table 4. As expected, all coefficients of investor-oriented CSRF indicators are negative (except *CDSB*); however, only the coefficients of *CDP* and *TCFD* are statistically significant. A key distinction criterion of both the CDP and

[16] To test whether the simultaneous adoption of CSRFs that follow different user orientation approaches dilutes the negative association of investor-oriented CSRFs and information asymmetry (Stolowy and Paugam, 2023), we introduce the interaction term *Investor_Index*Stakeholder_Index*. Untabulated results show that the coefficient of *Investor_Index* is lower in magnitude for firms that only adopt investor-oriented CSRFs. The interaction term *Investor_Index*Stakeholder_Index* is positive, but statistically insignificant.

TABLE 3

ASSOCIATION BETWEEN INVESTOR-/MULTI-STAKEHOLDER-ORIENTED CSRF ADOPTION AND BID–ASK SPREADS

	$BidAsk_{t+1}$
Investor_Index	–0.188***
	(–2.943)
Stakeholder_Index	0.030
	(0.935)
RetVar	0.119***
	(2.868)
ShareTurn	–0.369***
	(–15.102)
Price	0.045***
	(3.553)
Size	–0.360***
	(–29.169)
ROA	–0.020
	(–0.140)
DJSI	–0.015
	(–0.644)
Lev	–0.048
	(–0.675)
MTB	0.001
	(0.421)
InstOwn	–0.048
	(–0.809)
Constant	5.381***
	(18.950)
Country fixed effects	Yes
Industry fixed effects	Yes
Year fixed effects	Yes
N	2,043
Adj. R^2	0.764

This table presents the results of a multivariate analysis of bid–ask spreads regressed on *Investor_Index*, *Stakeholder_Index*, and control variables. Variable definitions are provided in Appendix C. All continuous variables are winsorized at the 1st and 99th percentile, respectively. All *t*-statistics are in parentheses and are based on standard errors clustered by firm. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively, based on two-tailed tests.

TCFD frameworks is their focus on climate-change-related disclosures.[17] Among other CSR disclosures, these might be the most important for capital markets because climate change probably has been the most critical factor in assessing the robustness of a firm's business model and its long-term prospects (BlackRock, 2020). Our findings therefore align with Schiemann and Sakhel

[17] The TCFD takes a forward-looking approach that requires the disclosure of climate-related risks, opportunities, and the resulting financial impacts as well as forward-looking scenario analysis (TCFD, 2022). The CDP started as a platform to measure the environmental impact of corporate activity. It then aligned its climate change questionnaire with the TCFD in 2018 (CDP, 2022a). The CDSB also focuses on environmental and climate-change-related information. However, as few firms adopted the CDSB framework in our sample, the coefficient cannot be interpreted in a meaningful manner.

TABLE 4

ADDITIONAL ANALYSIS: ASSOCIATION BETWEEN ADOPTION OF INDIVIDUAL CSRFS AND BID–ASK SPREADS

	$BidAsk_{t+1}$
CDP	–0.062**
	(–2.553)
CDSB	0.057
	(0.767)
IIRC	–0.023
	(–0.751)
SASB	–0.021
	(–0.760)
TCFD	–0.040**
	(–2.100)
GRI	0.001
	(0.019)
UNGC	0.033
	(1.216)
RetVar	0.112***
	(2.716)
ShareTurn	–0.367***
	(–15.022)
Price	0.047***
	(3.612)
Size	–0.361***
	(–29.364)
ROA	–0.037
	(–0.264)
DJSI	–0.017
	(–0.729)
Lev	–0.046
	(–0.651)
MTB	0.001
	(0.471)
InstOwn	–0.048
	(–0.810)
Constant	5.415***
	(19.115)
Country fixed effects	Yes
Industry fixed effects	Yes
Year fixed effects	Yes
N	2,043
Adj. R^2	0.764

This table presents the results of a multivariate analysis of bid–ask spreads regressed on individual CSRF indicator variables and control variables. A glossary of CSRF acronyms is provided in Appendix A. Variable definitions are provided in Appendix C. All continuous variables are winsorized at the 1st and 99th percentile, respectively. All *t*-statistics are in parentheses and are based on standard errors clustered by firm. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively, based on two-tailed tests.

(2019), who focus on the climate risk aspect of the CDP questionnaire and demonstrate that information asymmetries are generally lower for firms that disclose climate-related physical risks.

Moreover, the coefficients of multi-stakeholder-oriented CSRFs are statistically insignificant, which indicates that those CSRFs are not associated with information asymmetry.

ROBUSTNESS OF RESULTS

Analyses to Address Endogeneity Concerns

We acknowledge that our regression results may be subject to potential endogeneity concerns. In our setting, firms can self-select into the group of CSRF adopters (or a specific CSRF) by considering the potential effect on information asymmetries when deciding whether to adopt a (specific) CSRF. Moreover, omitted variables and reverse causality present potential threats to the interpretation of our results. Consequently, we conduct a series of tests to address these concerns.

First, to address a potential self-selection bias due to observable time-variant differences, we run our main regression model on entropy-balanced samples (Hainmueller, 2012; McMullin and Schonberger, 2020). In particular, we introduce three indicator variables—*CSRF*, *Investor_CSRF*, and *Stakeholder_CSRF*)[18]—to define treatment and control groups and perform entropy balancing on covariate means and variances including the full set of stock attributes and firm characteristics used in equation (1). The results in Panel A of Table 5 are very similar to our main results.

Second, to address a potential self-selection bias due to unobservable differences, we conduct a Heckman (1979) two-step procedure. In the first step, we model a firm's decision to adopt at least one CSRF employing the same set of firm-level variables used in equation (1), as these are key determinants of voluntary CSR reporting (Baldini *et al.*, 2018; Christensen *et al.*, 2021). As our exogenous variable, we use $CSRComm_{i,t-1}$, a dummy variable indicating the presence of a CSR committee.[19] CSR committees make CSR-related recommendations to the board of directors and assist board members, and empirical findings indicate that they influence firms' CSR reporting decisions (Fuente *et al.* 2017; Velte and Stawinoga, 2020). While CSR committees potentially influence firms' CSR reporting decisions, they are not involved in any external firm communication. We argue that CSR committees only indirectly influence information asymmetry in capital markets through their CSR reporting decisions; therefore, we claim that *CSRComm* satisfies

[18] *CSRF* is an indicator variable that equals one if a firm adopts at least one CSRF in the respective financial year, and zero otherwise. Similarly, *Investor_CSRF* (*Stakeholder_CSRF*) is an indicator variable that equals one if a firm adopts at least one investor-oriented (multi-stakeholder-oriented) CSRF.

[19] We lag *CSRComm* by one year as adopting a new CSRF arguably takes a considerable amount of time.

TABLE 5

ANALYSES TO ADDRESS POTENTIAL ENDOGENEITY CONCERNS

Panel A: Entropy balanced samples

	(1)	(2)	(3)
	$BidAsk_{t+1}$	$BidAsk_{t+1}$	$BidAsk_{t+1}$
Investor_Index	–0.163**	–0.199***	–0.251***
	(–2.181)	(–2.829)	(–3.221)
Stakeholder_Index	–0.003	0.050	0.040
	(–0.093)	(1.446)	(1.367)
RetVar	0.100**	0.127***	0.212***
	(2.011)	(2.812)	(3.572)
ShareTurn	–0.322***	–0.388***	–0.410***
	(–10.848)	(–12.595)	(–15.338)
Price	0.038**	0.049***	0.043***
	(2.179)	(3.809)	(2.802)
Size	–0.351***	–0.373***	–0.379***
	(–22.376)	(–27.967)	(–25.273)
ROA	–0.027	–0.075	0.025
	(–0.135)	(–0.468)	(0.100)
DJSI	–0.013	–0.025	0.010
	(–0.505)	(–1.004)	(0.357)
Lev	–0.043	–0.049	–0.013
	(–0.347)	(–0.647)	(–0.128)
MTB	0.000	0.002	0.002
	(0.249)	(0.912)	(1.348)
InstOwn	–0.235**	–0.058	–0.051
	(–2.209)	(–0.873)	(–0.616)
Constant	5.428***	5.508***	5.742***
	(13.726)	(18.172)	(15.907)
Country fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Entropy balancing variable	*CSRF*	*Investor_CSRF*	*Stakeholder_CSRF*
N	2,043	2,043	2,043
Adj. R^2	0.788	0.800	0.793

Panel B: Heckman (1979) two-stage regressions

	(1)	(2)
	$CSRF_t$	$BidAsk_{t+1}$
Investor_Index		–0.190**
		(–2.510)
Stakeholder_Index		0.016
		(0.426)
RetVar	–0.840***	0.161***
	(–2.964)	(3.091)
ShareTurn	0.160	–0.371***
	(1.138)	–13.586)
Price	–0.119	0.046***
	(–1.304)	(2.904)
Size	0.272***	–0.368***
	(2.858)	(–26.305)
ROA	–1.140	0.106
	(–1.044)	(0.668)
DJSI	1.048***	–0.028
	(3.919)	(–0.930)

(Continues)

TABLE 5

CONTINUED

Panel B: Heckman (1979) two-stage regressions

	(1)	(2)
	$CSRF_t$	$BidAsk_{t+1}$
Lev	0.157	0.034
	(0.286)	(0.428)
MTB	–0.019	0.001
	(–1.304)	(0.338)
InstOwn	0.991**	–0.074
	(2.432)	(–1.036)
CSRComm	0.651***	
	(4.073)	
IMR		–0.046
		(–0.833)
Constant	–6.935***	5.713***
	(–3.129)	(16.115)
Country fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
N	1,508	1,508
Adj. R^2		0.766
Pseudo R^2	0.337	

Panel C: Difference-in-differences approach

	$BidAsk_{t+1}$
Investor_Index	–0.151*
	(–1.785)
Stakeholder_Index	–0.032
	(–0.914)
POST	0.072*
	(1.667)
*Investor_Index*POST*	–0.086
	(–0.975)
*Stakeholder_Index*POST*	0.129***
	(3.848)
Control variables	Yes
Country fixed effects	Yes
Industry fixed effects	Yes
Year fixed effects	Yes
N	2,043
Adj. R^2	0.766

This table presents analyses to address potential endogeneity concerns. Panel A reports the results of our main multivariate analysis after entropy balancing our sample using *CSRF* (column (1)), *Investor_CSRF* (column (2)), and *Stakeholder_CSRF* (column (3)) to define treatment and control groups. Panel B presents the results of the Heckman (1979) two-stage estimation procedure. Column (1) reports results of the probit regression of the choice to adopt a CSRF. Column (2) reports the results of our main multivariate analysis including the inverse Mills ratio (*IMR*) obtained from column (1) as an additional variable. Panel C presents the results of the difference-in-differences analysis of bid–ask spreads regressed on *Investor_Index*, *Stakeholder_Index*, and control variables. Variable definitions are provided in Appendix C. All continuous variables are winsorized at the 1st and 99th percentile, respectively. All *t*-statistics are in parentheses and are based on standard errors clustered by firm. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively, based on two-tailed tests.

both the relevance and exclusion restriction (Lennox *et al.*, 2012). Panel B of Table 5 presents the results of the probit regressions in column (1) and the results of the re-estimated main regression specifications, including the inverse Mills ratio (*IMR*) obtained from the probit regression model in column (2). We lose 535 observations within our first probit regression model, resulting in a reduced sample of 1,508 firm-year observations as certain industries and countries do not exhibit any variation in *CSRF*; thus, the outcomes of the probit regression models are perfectly predicted. As expected, *CSRComm* satisfies the relevance condition demonstrated by a statistically significant and positive coefficient (0.651, $p < 0.01$). In the second-stage model, our variables of interest have the same signs and similar significance levels as in our OLS regressions.

Third, to control for potential omitted variable bias, we include three additional variables in our regression model that have proven associations with information asymmetry proxies (Muller *et al.*, 2011; Daske *et al.*, 2013). However, we do not include them in our main regression model owing to potential multicollinearity issues or losses in observations. We include controls for a firm's information environment, its financial disclosure quality, and differences in equity market characteristics in which a firm trades.[20] The untabulated regression results show that our variables of interest have similar levels of significance and magnitude compared with our main analysis.

Fourth, to account for the possibility that some unobservable, time-invariant variables are driving our regression results, we replace country, industry, and year fixed effects with firm fixed effects in equation (1). Despite our relatively small sample size, we find directionally consistent results with lower *t*-statistics for *Investor_Index* and a statistically insignificant coefficient for *Stakeholder_Index* (untabulated).

Fifth, in addition to the lead–lag approach used in our main analysis, we conduct a difference-in-differences analysis to further address potential reverse causality concerns. In particular, we conduct an event study using the 2020 BlackRock annual CEO letter as an event that induced capital markets to reassess the usefulness of CSRFs in mitigating information asymmetry. Recent studies provide empirical evidence that BlackRock's annual letters, in which CEO Larry Fink outlines BlackRock's investment philosophy and expectations regarding portfolio firms' corporate governance and CSR-related disclosures, influence portfolio firms' disclosure decisions (Pawliczek *et al.*, 2021) and urge capital markets to react to them (Bassen *et al.*, 2021).

For our event study, we use the 2020 BlackRock letter, which highlights the importance of climate risks in investment decisions and advocates for a 'more widespread and standardized adoption' of CSR-related disclosures (BlackRock, 2020). In particular, BlackRock urges portfolio firms to '(1) publish a disclosure in line with

[20] We include the logarithm of the number of analysts covering a firm to control for the firm's information environment, the absolute value of abnormal accruals as a proxy for earnings management to control for a firm's financial disclosure quality, and the country-average bid–ask spread to control for potential differences in equity market characteristics in which a firm trades.

industry-specific SASB guidelines (…) or disclose a similar set of data in a way that is relevant to [a firm's] particular business; and (2) disclose climate-related risks in line with the TCFD's recommendations' (BlackRock, 2020, 'Improved Disclosure for Shareholders' section) by the end of 2020 to improve their disclosures for investors.

Given BlackRock's influence on capital markets, we expect that the 2020 letter urges portfolio firms to adopt the SASB or TCFD framework, and capital markets to reassess the usefulness of CSRFs in providing investor-relevant information. Considering that capital markets differentiate between investor- and multi-stakeholder-oriented CSRFs, we expect contrasting market reactions for investor- and multi-stakeholder-oriented CSRF adopters, that is, either the level of information asymmetry of investor-oriented CSRF adopters decreases, and/or the level of information asymmetry of multi-stakeholder-oriented CSRF adopters increases following the 2020 BlackRock letter.

Therefore, we run a difference-in-differences model where the variable $POST_{i,t}$ indicates whether a firm-year observation occurred after BlackRock's announcement on 14 January 2020. As we start the computation of $BidAsk_{i,t+1}$ following firm i's earnings announcement date of financial year t, we set $POST_{i,t}$ equal to one if firm i's computation of *BidAsk* for financial year t starts on or after 14 January 2020.

In Panel C of Table 5, we find negative and statistically significant coefficients for *Investor_Index* and statistically non-significant coefficients for *Stakeholder_Index*. We find a statistically non-significant coefficient for *Investor_Index**POST* (–0.086, $p > 0.1$), indicating that the 2020 BlackRock letter does not result in a capital-market-wide reassessment of the usefulness of investor-oriented CSRFs. However, a positive and statistically significant coefficient for *Stakeholder_Index**POST* (0.129, $p < 0.01$) indicates that capital markets reassess the usefulness of multi-stakeholder-oriented CSRFs in mitigating information asymmetry.[21] Taken together, these results support our finding that the adoption of multi-stakeholder-oriented CSRFs does not mitigate information asymmetry in capital markets, while partially reinforcing a causal interpretation of the relationship between CSRF adoption and information asymmetry.

Sensitivity To Alternative Information Asymmetry Measures and Measurement Periods

First, we replace our dependent variable $BidAsk_{i,t+1}$ in equation (1) with $PriceImpact_{i,t+1}$ and $Volume_{i,t+1}$ to test whether our results are sensitive to

[21] We perform several sensitivity tests to ensure the robustness of our results. First, we test an alternative measure $POST2_{i,t}$, which is equal to one if firm i's daily computation of $BidAsk_{i,t+1}$ starts maximum 180 days prior to 14 January 2020 to ensure that at least 50% of daily observations in the computation period are affected by BlackRock's announcement on 14 January 2020. Second, we exclude firm-year observations in the *POST* period if a firm newly adopts any CSRF following BlackRock's letter to ensure that the effects of *Investor_Index**POST* and *Stakeholder_Index**POST* can be attributed to a market-wide reassessment of CSRFs, rather than being confounded by first-time disclosure effects of newly adopted CSRFs. The untabulated results show that coefficients and significance levels are qualitatively similar for both sensitivity tests.

different liquidity-based proxies of information asymmetry. For a detailed definition of the variables, refer to Appendix C. In Panel A of Table 6, we find directionally consistent and statistically significant coefficients for *Investor_Index* (i.e., negative coefficients for *PriceImpact* and positive coefficients for *Volume*) and statistically non-significant coefficients for *Stakeholder_Index*. Overall, the results indicate that our inferences are robust for alternative information asymmetry proxies.

Second, we use an alternative measurement period for *BidAsk* because identifying the publication date of CSR reporting outlets is often difficult (Burzillo *et al*., 2022; Altendorfer, 2024), and we are unable to use a more focused measurement period (Muller *et al*., 2011; Schiemann and Sakhel, 2019). To test our result's sensitivity to alternative measurement starting points, we measure $BidAsk_{i,t+1}$ (i) over the 365-day period following firm *i*'s financial year-end *t* (Kimbrough *et al*., 2022), (ii) from month +3 through month +15 relative to firm *i*'s financial year-end *t* (Kajüter and Nienhaus, 2017), and (iii) from month –2 through month +10 relative to firm *i*'s financial year-end *t* (Daske *et al*., 2013).[22] The untabulated results show that our inferences remain robust with respect to alternative measurement periods.

Sensitivity to Alternative CSRF Variables

Next, we test whether the findings are influenced by narrower or broader definitions of *Investor_Index* and *Stakeholder_Index*. For the narrower definition, we exclude firms that do not transparently report all disclosure requirements of the respective CSRF in one location. Panel B of Table 6 shows that the absolute value of *Investor_Index_narrow* is very similar to *Investor_Index* in Table 3. This indicates that our main results are not driven by firms with incomplete CSRF disclosures. For our broader CSRF indicator variable definition, we also consider if the firm indicates that it uses the respective CSRFs for CSR materiality assessment purposes or if the firm states that its reporting is aligned with the respective CSRF. In line with our expectations, Panel B of Table 6 shows that the absolute value of *Investor_Index_broad* is lower in column (2) compared with *Investor_Index* in Table 3. This indicates that the negative association between the adoption of investor-oriented CSRFs and information asymmetry is less pronounced for firms that use the respective CSRF in some way but do not transparently report the disclosures required by the CSRF.

Subsample Tests

To further substantiate the robustness of our findings, we conduct a series of subsample tests.

First, we test whether our findings hold when excluding firms that do not adopt any CSRF. Panel C of Table 6 shows the results. When restricting the

[22] We alter measurement periods for $RetVar_{i,t}$, $ShareTurn_{i,t}$, and $Price_{i,t}$, respectively. All other variables are measured at financial year-end.

TABLE 6

OTHER ROBUSTNESS TESTS

Panel A: Sensitivity to alternative information asymmetry measures

	$PriceImpact_{t+1}$	$Volume_{t+1}$
Investor_Index	–0.315***	0.181***
	(–4.820)	(3.070)
Stakeholder_Index	–0.017	0.019
	(–0.492)	(0.548)
Control variables	Yes	Yes
Country fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
N	2,043	2,043
Adj. R^2	0.894	0.910

Panel B: Sensitivity to alternative CSRF measures

	(1)	(2)
	$BidAsk_{t+1}$	$BidAsk_{t+1}$
Investor_Index_narrow	–0.186***	
	(–2.767)	
Stakeholder_Index_narrow	0.032	
	(1.012)	
Investor_Index_broad		–0.154***
		(–2.634)
Stakeholder_Index_broad		0.008
		(0.242)
Control variables	Yes	Yes
Country fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
N	2,043	2,043
Adj. R^2	0.764	0.763

Panel C: Subsample test

	(1)	(2)	(3)	(4)	(5)	(6)
Subsample	*Stakeholder_Index* > 0	*Stakeholder_Index* = 0.5	*Stakeholder_Index* = 1	*Investor_Index* > 0	*Investor_Index* = 0.2	*Investor_Index* = 0.4
	$BidAsk_{t+1}$	$BidAsk_{t+1}$	$BidAsk_{t+1}$	$BidAsk_{t+1}$	$BidAsk_{t+1}$	$BidAsk_{t+1}$
Investor_Index	–0.140**	–0.063	–0.176**			
	(–2.161)	(–0.460)	(–2.379)			
Stakeholder_Index				0.049	0.048	0.105
				(1.350)	(1.005)	(1.564)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	1,561	603	958	1,544	881	410
Adj. R^2	0.786	0.745	0.824	0.760	0.736	0.773

This table presents the results of our main analysis using alternative dependent variables (*PriceImpact*, *Volume*) (Panel A), narrower and broader definitions of *Investor_Index* and *Stakeholder_Index* (Panel B), and subsamples (Panel C). Variable definitions are provided in Appendix C. All continuous variables are winsorized at the 1st and 99th percentile, respectively. All *t*-statistics are in parentheses and are based on standard errors clustered by firm. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively, based on two-tailed tests.

sample to firms that adopt at least one multi-stakeholder-oriented CSRF (i.e., *Stakeholder_Index* > 0) in column (1), we find a negative and statistically significant coefficient of *Investor_Index* (–0.140, $p < 0.05$), which reinforces our main findings. We find directionally consistent results when further restricting our sample to firms that adopt exactly one multi-stakeholder-oriented CSRF (i.e., *Stakeholder_Index* = 0.5) in column (2) and exactly two multi-stakeholder-oriented CSRFs (i.e., *Stakeholder_Index* = 1) in column (3). When restricting our sample to firms that adopt at least one investor-oriented CSRF (i.e., *Investor_Index* > 0) in column (4), exactly one investor-oriented CSRF (i.e., *Investor_Index* = 0.2) in column (5) and exactly two investor-oriented CSRF (i.e., *Investor_Index* = 0.4) in column (6), we find positive but statistically non-significant coefficients for *Stakeholder_Index*, which is consistent with our main findings.[23]

Second, we test whether our findings are driven by firms from the financial or real estate sector.[24] We therefore exclude financial and real estate firms (i.e., firms with a SIC code between 6000 and 6799) from our sample and find (in untabulated results) that our variables of interest remain in the same range while being statistically significant.

Third, we test whether our findings are driven by firms headquartered in Switzerland. We do not exclude Swiss firms in our main analysis, although those firms are not legally obliged to disclose CSR information during the sample period. The untabulated results show that our results do not change when we exclude those firms.

CONCLUSION

This study extends the CSR literature by investigating how the adoption of CSRFs with different user orientation approaches contributes to mitigating information asymmetry in capital markets. We find negative and statistically significant associations only for investor-oriented CSRFs. Our findings are particularly interesting because several theoretical and practical arguments suggest that while investor- and multi-stakeholder-oriented approaches may be fundamentally different at the conceptual level, they may be less distinct in practice and in their

[23] Restricting our sample to *Investor_Index* = 0.6, *Investor_Index* = 0.8, and *Investor_Index* = 1 (not tabulated) reduces the number of observations but yields consistent results.

[24] While the CSRFs covered in our main analyses can be adopted by firms across all industries, several organizations provide specific CSRFs for financial institutions (e.g., the Principles for Responsible Investment (PRI) Reporting Framework (PRI Association, 2022) for institutional investors, or the EPRA Sustainability Best Practices Recommendations Guidelines (European Public Real Estate Association, 2017) for listed real estate companies). Although these specific CSRFs are largely aligned with others, the CSRFs covered in our main analyses may be less relevant in these sectors.

consequences (Christensen *et al.*, 2021; Giner and Luque-Vílchez, 2022). Isolating the effects of individual CSRFs shows that those with a focus on climate-change-related disclosures are particularly relevant for mitigating information asymmetry. Moreover, we show that capital markets care about firms' common reporting practice of adopting multiple CSRFs simultaneously, however, only about the adoption of multiple investor-oriented CSRFs.

Our study provides comprehensive empirical insights to inform the controversial debate on the 'fundamentally different approaches' (Adams, 2021) followed by recent standard-setting initiatives. From a capital market perspective, our results encourage the ISSB's focus on investors by requiring firms to report on those CSR matters that could reasonably be expected to affect the entity's prospects (ISSB, 2023). Therefore, a promising path could be the building blocks approach proposed by the ISSB, which would be based on a global baseline of investor-oriented CSR disclosures in line with the IFRS Sustainability Disclosure Standards, while providing flexibility for reporting broader multi-stakeholder-oriented CSR matters as required by jurisdictional initiatives or the GRI (IFRS Foundation, 2022a). From a preparer's perspective, our results suggest that CSRF-adopting firms should be aware that not all CSRFs are suited to reducing information asymmetry in capital markets.

Our study has some limitations that open avenues for future research. First, similar to other studies examining the consequences of voluntary disclosure decisions, CSRF adoption in a voluntary setting is subject to potential endogeneity concerns. Conducting a series of robustness checks, we acknowledge that none of our tests alone can completely rule out endogeneity. However, taken together, they increase our confidence that our results are not driven by self-selection, omitted variables, or reverse causality. Second, descriptive evidence indicates that firms do not necessarily adopt a CSRF to the full extent (European Commission, 2021). Therefore, even though we test the sensitivity of our results by comparing them with alternative definitions of our CSRF variables, our CSRF measures might be too simplistic and, therefore, potentially underestimate (overestimate) the effect of full (partial) CSRF adoption. Third, owing to the multi-dimensional nature of CSR matters, potential users of CSR reporting are not limited to investors but comprise a broad group of stakeholders (Andrew and Baker, 2020; Christensen *et al.*, 2021). It should be noted that our findings do not allow us to draw any inferences on the usefulness of CSRFs for goals other than informing investors.

Despite these caveats, our study enhances our understanding of how CSRFs that follow different user-orientation approaches contribute to mitigating information asymmetries in capital markets, one of the main goals of CSR reporting regulations.

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APPENDIX A
GLOSSARY

Investor-oriented CSR frameworks	
CDP	CDP, formerly the Carbon Disclosure Project
CDSB	Climate Disclosure Standards Board
IIRC	International Integrated Reporting Council
SASB	Sustainability Accounting Standards Board
TCFD	Task Force on Climate-related Financial Disclosures
Multi-stakeholder-oriented CSR frameworks	
GRI	Global Reporting Initiative
UNGC	United Nations Global Compact
Other CSR-related acronyms	
CoP	Communication on Progress
CSR	Corporate social responsibility
CSRF	Corporate social responsibility framework
ESG	Environmental, social, and governance
ESRS	European Sustainability Reporting Standards
EU CSRD	European Union Corporate Sustainability Reporting Directive
EU NFRD	European Union Non-financial Reporting Directive
ISO 26000	International Organization for Standardization 26000
ISSB	International Sustainability Standards Board
OECD	Organisation for Economic Co-operation and Development

APPENDIX B
CSR FRAMEWORK DESCRIPTIONS AND SEARCH TERMS

Framework	Description	Data source	Search terms
Investor-oriented CSR frameworks			
CDP	Founded in 2000, the CDP provides a questionnaire-based disclosure platform for companies to report risks and opportunities related to climate change, water security, and deforestation to their investors (CDP, 2022c)	CDP corporate response data	Not applicable
CDSB[25]	First released in 2011, the Climate Disclosure Standards Board framework provides guiding principles and reporting requirements for the disclosure of environmental and climate change information in mainstream company reports for the benefit of investors (CDSB, 2022)	Firms' reporting outlets	Climate Disclosure Standards Board, CDSB, Climate Change Reporting Framework, CCRF
IIRC[26]	First published in 2013, the International Integrated Reporting Framework by the International Integrated Reporting Council provides principles to accelerate the adoption of integrated reporting and improve the quality of information available to providers of financial capital (IFRS Foundation, 2022b)	Firms' reporting outlets	International Integrated Reporting Council, IIRC, Integrated Reporting Framework, <IR>
SASB	Founded in 2011, the Sustainability Accounting Standards Board Standards guide the disclosure of industry-specific, financially material environmental, social and governance issues by companies to their investors (IFRS Foundation, 2022c)	Firms' reporting outlets	Sustainability Accounting Standards Board, SASB
TCFD	Established in 2015, the Task Force on Climate-related Financial Disclosures releases recommendations related to climate change risks that companies should disclose to support investors, lenders, and insurance underwriters in appropriately assessing and pricing these risks (TCFD, 2022)	Firms' reporting outlets	Task Force on Climate-Related Financial Disclosures, TCFD

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Framework	Description	Data source	Search terms
Multi-stakeholder-oriented CSR frameworks			
GRI	Founded in 1997, the Global Reporting Initiative provides global standards for CSR reporting covering topics that are relevant to many stakeholders including investors, policymakers, capital markets, and civil society (GRI, 2022)	Firms' reporting outlets	Global Reporting Initiative, GRI
UNGC	Launched in 2000, the United Nations Global Compact provides 10 principles in the area of human rights, labour, environment, and anti-corruption that should be incorporated into a company's strategy, policies, and procedures to establish a culture of integrity in order to uphold the basic responsibilities to people and planet (UNGC, 2022b)	UNGC participants page (UNGC, 2022a)	Not applicable

[25]On 31 January 2022, the CDSB was consolidated into the IFRS Foundation.
[26]In June 2021, the IIRC and SASB merged into the Value Reporting Foundation which in turn was consolidated into the IFRS Foundation in August 2022.

APPENDIX C
VARIABLE DEFINITIONS

Variable name	Description	Source
Information asymmetry variables		
$BidAsk_{i,t+1}$	Logarithm of the median daily bid–ask spread, computed as the closing ask price minus the closing bid price divided by the average of the closing ask and bid price, multiplied by 100. Measurement period: 365 days period following firm *i*'s earnings announcement date of financial year *t*	LSEG (Refinitiv Eikon)
$PriceImpact_{i,t+1}$	Logarithm of the median daily (Amihud, 2002) illiquidity measure, computed as the daily absolute stock return divided by the daily US dollar trading volume. Measurement period: 365 days period following firm *i*'s earnings announcement date of financial year *t*	LSEG (Refinitiv Eikon)
$Volume_{i,t+1}$	Logarithm of the median daily US dollar trading volume. Measurement period: 365 days period following firm *i*'s earnings announcement date of financial year *t*	LSEG (Refinitiv Eikon)
CSR framework variables		
$CSRF_{i,t}$	Indicator that equals one if firm *i* adopts at least one CSR framework (i.e., CDP, CDSB, GRI, IIRC, SASB, TCFD, UNGC) in financial year *t*, and zero otherwise. Firms are classified as CDSB/GRI/IIRC/SASB/TCFD adopters if at least one of the firms' reporting outlets includes (i) a separate CSRF section, (ii) a CSRF cross-reference table, or (iii) disclosures that are marked in line with the respective CSRF	Firms' reporting outlets
$Investor\_CSRF_{i,t}$	Indicator that equals one if firm *i* adopts at least one investor-oriented CSRF (i.e., CDP, CDSB, IIRC, SASB, TCFD) in financial year *t*, and zero otherwise. Firms are classified as CDSB/IIRC/SASB/TCFD adopters if at least one of the firms' reporting outlets includes (i) a separate CSRF section, (ii) a CSRF cross-reference table, or (iii) disclosures that are marked in line with the respective CSRF	Firms' reporting outlets
$Investor\_Index_{i,t}$	The number of investor-oriented CSRFs adopted by a firm (i.e., CDP, CDSB, IIRC, SASB, TCFD) divided by five (i.e., the total number of investor-oriented CSRFs considered in our paper). Firms are classified as CDSB/IIRC/SASB/TCFD adopters if at least one of the firms'	Firms' reporting outlets

(Continues)

Variable name	Description	Source
	reporting outlets includes (i) a separate CSRF section, (ii) a CSRF cross-reference table, or (iii) disclosures that are marked in line with the respective CSRF	
$Investor\_Index\_broad_{i,t}$	Definition similar to $Investor\_Index_{i,t}$. In addition to criteria (i)–(iii), the broader definition classifies firms as CDSB/IIRC/SASB/TCFD adopters if (iv) the firm indicates that it uses the respective CSRFs for CSR materiality assessment purposes or if (v) the firm states that its reporting is aligned with the respective CSRF (without indicating which sections or disclosures are aligned)	Firms' reporting outlets
$Investor\_Index\_narrow_{i,t}$	Definition similar to $Investor\_Index_{i,t}$. The narrower definition classifies firms as CDSB/IIRC/SASB/TCFD adopters only if at least one of the firms' reporting outlets includes (i) a separate CSRF section or (ii) a CSRF cross-reference table	Firms' reporting outlets
$Stakeholder\_CSRF_{i,t}$	Indicator that equals one if firm i adopts at least one multi-stakeholder-oriented CSRF (i.e., GRI, UNGC) in financial year t, and zero otherwise. Firms are classified as GRI adopters if at least one of the firms' reporting outlets includes (i) a separate GRI section, (ii) a GRI cross-reference table, or (iii) disclosures that are marked in line with the GRI	Firms' reporting outlets
$Stakeholder\_Index_{i,t}$	The number of multi-stakeholder-oriented CSRFs adopted by a firm (i.e., GRI, UNGC) divided by two (i.e., the total number of multi-stakeholder-oriented CSRFs considered in our paper). Firms are classified as GRI adopters if at least one of the firms' reporting outlets includes (i) a separate GRI section, (ii) a GRI cross-reference table, or (iii) disclosures that are marked in line with the GRI	Firms' reporting outlets
$Stakeholder\_Index\_broad_{i,t}$	Definition similar to $Stakeholder\_Index_{i,t}$. In addition to criteria (i)–(iii), the broader definition classifies firms as GRI adopters if (iv) the firm indicates that it uses the GRI for CSR materiality assessment purposes or if (v) the firm states that its reporting is aligned with the GRI (without indicating which sections or disclosures are aligned)	Firms' reporting outlets
$Stakeholder\_Index\_narrow_{i,t}$	Definition similar to $Stakeholder\_Index_{i,t}$. The narrower definition classifies firms as GRI adopters only if at least one of the firms' reporting outlets includes (i) a separate GRI section or (ii) a GRI cross-reference table	Firms' reporting outlets

(Continues)

Variable name	Description	Source
Investor-oriented CSR frameworks		
$CDP_{i,t}$	Indicator that equals one if firm *i*'s response to the CDP climate change questionnaire for financial year *t* is publicly available, and zero otherwise	CDP corporate response data
$CDSB_{i,t}$	Indicator that equals one if firm *i* adopts the CDSB framework in financial year *t*, and zero otherwise	Firms' reporting outlets
$IIRC_{i,t}$	Indicator that equals one if firm *i* adopts the IIRC framework in financial year *t*, and zero otherwise	Firms' reporting outlets
$SASB_{i,t}$	Indicator that equals one if firm *i* adopts the SASB framework in financial year *t*, and zero otherwise	Firms' reporting outlets
$TCFD_{i,t}$	Indicator that equals one if firm *i* adopts the TCFD framework in financial year *t*, and zero otherwise	Firms' reporting outlets
Multi-stakeholder-oriented CSR frameworks		
$GRI_{i,t}$	Indicator that equals one if firm *i* adopts the GRI framework in financial year *t*, and zero otherwise	Firms' reporting outlets
$UNGC_{i,t}$	Indicator that equals one if firm *i* publishes a UNGC communication on progress report for financial year *t*, and zero otherwise	UNGC participants page
Control variables		
$RetVar_{i,t}$	Logarithm of the standard deviation of daily stock returns. Measurement period: 365-day period following firm *i*'s earnings announcement date of financial year *t*–1	LSEG (Refinitiv Eikon)
$ShareTurnover_{i,t}$	Logarithm of the annual US dollar trading volume divided by the market value of common equity. Measurement period: 365-day period following firm *i*'s earnings announcement date of financial year *t*–1	LSEG (Refinitiv Eikon)
$Price_{i,t}$	Annual median of the logarithm of the daily stock price. Measurement period: 365-day period following firm *i*'s earnings announcement date of financial year *t*–1.	LSEG (Refinitiv Eikon)
$Size_{i,t}$	Logarithm of the market value of common equity, computed as the stock price times the number of shares outstanding (in US dollar), of firm *i* measured at financial year-end *t*	LSEG (Refinitiv Eikon)
$ROA_{i,t}$	Ratio of income before extraordinary items to total assets of firm *i* at financial year-end *t*	LSEG (Refinitiv Eikon)
$DJSI_{i,t}$	Indicator that equals one if firm *i* is included in the Dow Jones Sustainability Index in financial year *t*, and zero otherwise	S&P Dow Jones Indices
$Lev_{i,t}$	Ratio of long-term debt to total assets of firm *i* at financial year-end *t*	LSEG (Refinitiv Eikon)
$MTB_{i,t}$	Ratio of the market value of common equity to the book value of common equity of firm *i* at financial year-end *t*	LSEG (Refinitiv Eikon)
$InstOwn_{i,t}$	Percentage of shares of firm *i* held by institutional investors at financial year-end *t*	LSEG (Refinitiv Eikon)

(Continues)

Variable name	Description	Source
$CSRComm_{i,t}$	Indicator that equals one if firm *i* has a board-level or senior management committee responsible for decision-making on CSR strategy in financial year *t*, and zero otherwise	LSEG (Refinitiv Eikon)
$POST_{i,t}$	Indicator that equals one if firm *i*'s computation of $BidAsk_{i,t}$ for financial year *t* starts on or after BlackRock's announcement on 14 January 2020	LSEG (Refinitiv Eikon)