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Title:
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Date:
2023-09

Citation:
Ferguson, P. J., Hronsky, J. & Pinnuck, M. (2023). Who pays attention to sustainability reports and why? Evidence from Google search activity. Accounting and Finance, 63 (3), pp.3519-3551. https://doi.org/10.1111/acfi.13045.

Persistent Link:
https://hdl.handle.net/11343/345052

DOI: 10.1111/acfi.13045

RESEARCH ARTICLE

ACCOUNTING & FINANCE afaanz WILEY

Who pays attention to sustainability reports and why? Evidence from Google search activity

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Abstract

We introduce country-level Google search activity as a direct measure of the level of stakeholder attention directed towards sustainability reports. We validate this measure by establishing that search activity for sustainability reports is correlated with temporal patterns in firms' supply of these reports. To frame the economic magnitude of this search behaviour, we then show that the level of attention directed towards sustainability reports is very low compared to the level of attention directed towards financial and accounting information. Next, we examine two related research questions. First, we identify *who* pays attention to sustainability reports. We find, consistent with the environmental Kuznets curve, that attention towards sustainability reports is strongly associated with economic development. Consistent with findings in prior research that suggest citizens in stakeholder-oriented countries have stronger preferences for firms to act prosocially, we also find that search activity for sustainability reports relative to search activity for financial performance metrics is greater in civil law countries than in common law countries. Finally, we then explore the question of *why* individuals pay attention to sustainability reports and find evidence that suggests sustainability reports are used for two primary purposes: evaluating the societal impacts of firms' actions; and, firm valuation.

KEYWORDS
corporate social responsibility reporting, Internet search, legal origins, sustainability reporting

JEL CLASSIFICATION
D22, D62, D83

1 | INTRODUCTION

> My basic theory of environmental, social and governance investing is that a lot of investors have a strong desire to be told that their investments are good for the world, but a pretty weak desire to look into it any further than that.
>
> Levine, 2020 'Money Stuff', *Bloomberg*, 7 April

Across many countries, the number of firms that issue stand-alone sustainability reports has increased significantly over the last decade (Deloitte, 2019; Morgan Stanley, 2018).[1] In response to this behaviour, a sizeable literature has emerged that examines firms' incentives to supply these reports (Christensen et al., 2018; Simnett et al., 2009). Despite managers incurring considerable costs to prepare these disclosures (KPMG, 2013), there is, however, very little direct evidence in the corporate social responsibility (CSR) literature indicating whether or not investors and stakeholders actively seek out and use sustainability reports. In light of this gap in the literature, we pursue two objectives in this paper. First, we introduce and validate country-level Google search activity as a *direct* measure of the level of investor and stakeholder attention directed towards sustainability reports. Second, we use this measure to examine two related research question: *Who* pays attention to sustainability reports? And, *why* do these individuals do so?

By documenting the association between CSR performance and firm valuation, a significant stream of the CSR literature *indirectly* examines whether investors use sustainability reports. However, the findings from this body of research are largely inconclusive (Christensen et al., 2018; Ioannou & Serafeim, 2015; Margolis et al., 2009).[2] In addition to the usual joint-hypothesis problem associated with the types of market-based tests employed by these studies (Fama, 1991), this literature is subject to a number of other methodological limitations. Waddock and Graves (1997) discuss at length issues with measurement error that arise when using archival data to measure a multi-dimensional construct such as CSR performance. Christensen et al. (2018) and Margolis et al. (2009) also raise concerns about endogeneity—for example, doing good by doing well versus doing good after doing well—in studies that use observational research designs to examine the relationship between CSR performance and firm valuation.

A number of papers have employed survey methods to more directly get at the question of whether investors use sustainability reports (Krueger et al., 2020; Searcy & Elkhawas, 2012). For example, in a recent study, Amel-Zadeh and Serafeim (2018) collect survey evidence from a sample of senior investment professionals from mainstream- investment organisations (i.e., non-SRI funds) to provide insights into why and how investors use reported CSR information. While offering useful information, these papers nonetheless rely on stated rather than revealed preferences—a common criticism of survey-based studies in general (Beshears et al., 2008; Samuelson, 1948).[3] As such, whether investors act as they say they do on issues related to sustainability remains an open question. Burzillo et al. (2022) examine the stock market reaction to the release of corporate sustainability reports and are unable to find evidence that CSR reports provide a significant amount of information to investors.

The investor-centric focus of these studies—and the CSR literature more broadly—is a further limitation of this body of research. Given the wealth of data available in accounting and finance on the behaviour of investors (e.g., prices, trading volumes), the focus on investors in the literature is

[1]In this paper we use the broad term 'sustainability' to refer to corporate activities and policies that assess, manage and govern a firm's responsibilities for and its impacts on society and the environment (Christensen et al., 2018). An alternative term is 'corporate social responsibility' or 'CSR'.

[2]Some papers find that CSR performance is positively associated with firm valuation (Ferrell et al., 2016; Krüger, 2015). However, an even larger number of papers that examine this topic fail to find any sort of relationship between these constructs (Margolis et al., 2009).

[3]Unless elicited using an incentive-compatible mechanism, survey responses may be distorted by researcher demand effects or signalling (Carson & Groves, 2007). This is a particular concern when dealing with political or social topics (e.g., environmental and social issues), where, for fear of opposition or condemnation, respondents may be hesitant to reveal their 'true' beliefs or preferences (Stephens-Davidowitz, 2014).

understandable. However, as Roberts (1992) argues, CSR disclosure is directed towards a broad set of *stakeholders*—for example, customers, suppliers, regulators—of whom investors are only an (important) subset.[4] As recognised in Christensen et al. (2018, p. 73), '(stakeholders') interests are not necessarily quantifiable in monetary terms, and, in studying the effects of CSR reports, one cannot refer to the economic constructs typically used in disclosure research (e.g., firm value, bid-ask spreads, stock returns)'. Taken alongside the broader limitations of the CSR literature, this comment suggests there is a clear need for studies that look to novel data sources to develop a better understanding of, if and why a broad range of decisionmakers seek out and use sustainability reports.

To address this gap in the literature, we examine country-level Internet search activity for sustainability reports. Da et al. (2011)—the first study in economics and finance to employ data on Google search activity—argues aggregate Internet search activity is an appealing measure of attention for several reasons. First, search activity reflects the behaviour and preferences of not just investors, but other types of important information users including customers, suppliers, and employees. Furthermore, as most individuals commonly use Internet search engines to locate and collect information—with Google by far the most commonly-used search engine—search activity data is representative of individuals' behaviour from across a broad range of economic, social and political backgrounds.[5] Second, and perhaps most importantly, Da et al. (2011) emphasises that search activity is a revealed measure of attention: if one searches for something in Google, one is undoubtedly paying attention to that thing (rather than simply *saying* one is paying attention to that thing). Given these attributes, a number of studies have used Google search activity to examine a range of attention-related questions in finance (Da et al., 2011, 2015; Preis et al., 2013), economics (Choi & Varian, 2012), and political science (Stephens-Davidowitz, 2014). Furthermore, a growing body of capital-markets research in accounting also uses search activity as a measure of investor attention (Brown et al., 2015; Drake et al., 2012).

In our analysis, we begin by describing the cross-country and time-time series properties of our search activity data, and by establishing its validity as a measure of the level of investor and stakeholder attention directed towards sustainability reports. Using data from across 33 different countries, we provide robust evidence of search activity for sustainability reports. We then document a strong association between the level of search activity for sustainability reports and firms' supply of these reports. This analysis is based on the idea that a valid measure of investor and stakeholder attention should comove with the local supply of sustainability reports. First, we show that for the period 2004–2017 both search activity for sustainability reports and firms' supply of these reports grew in tandem. Second, we show that calendar-month variation in search activity for sustainability reports is associated with the timing of local firms' disclosure of these reports.

To provide insight into the economic magnitude of this search behaviour, we then show that the level of attention directed towards sustainability reports is very low compared to the level of attention directed towards financial and accounting information. On average, the level of search activity for sustainability reports is 4.35%, 7.46% and 6.25% of the level of search activity for annual reports, earnings, and stock prices, respectively. These results suggest that while it has grown over time, investor and stakeholder attention towards sustainability reports remains relatively low.

Next, we examine the first of two related research questions: *Who* pays attention to sustainability reports? To do so, we test two broad hypotheses. First, building on work in environmental economics, and in particular theory on the environmental Kuznets curve (Grossman & Krueger, 1993, 1995), we predict and show that individuals in economically-developed countries are more likely to pay attention to and seek out information on firms' CSR activities than individuals in less-developed countries. Second, we examine how differences in legal origins explain cross-country variation in search activity for sustainability reports. On the one hand, investors and stakeholders in countries

[4]We define nonfinancial stakeholders to be stakeholders other than shareholders (Roberts, 1992). Hereafter, we simply use the term 'stakeholders' for this group of users.

[5]By February 2009, Google accounted for over 70% of all search queries performed in the United States (Da et al., 2015).

with civil law traditions—where firms are typically more stakeholder-oriented—may pay greater attention to sustainability reports (La Porta et al., 2008). This prediction is consistent with a large literature in law and finance that suggests that citizens in stakeholder-oriented countries have stronger preferences for corporations to be altruistic and prosocial (Benabou & Tirole, 2006, 2010; Liang & Renneboog, 2017). On the other hand, investors and stakeholders in countries with common law traditions—where firms are usually more shareholder-oriented—may pay greater attention to sustainability reports (La Porta et al., 2008). This reasoning is motivated by the general finding in the literature that information asymmetry is typically greater in shareholder-oriented countries, where important constituents engage with firms as outsiders, and, as such, more heavily rely on disclosures—such as sustainability reports—to monitor the activities of firms (Ball et al., 2000, 2003).

In testing these competing predictions, we find that the *absolute* level of search activity for sustainability reports is higher in common law countries than in civil law countries. This result likely reflects differences in firms' information environments in common law countries as compared with civil law countries. However, when we examine *relative* search activity—and thereby hold constant cross-country differences in information asymmetry—we show that the level of search activity for sustainability reports *relative* to the level of search activity for accounting and financial information is higher in civil law countries than in common law countries. This result is consistent with findings in prior research that suggest citizens in stakeholder-oriented countries have stronger preferences for firms to act prosocially (Liang & Renneboog, 2017).

In our remaining analyses, we address the second of the two related research questions explored in this paper: *Why* do people pay attention to sustainability reports? Specifically, we examine whether sustainability reports are used for two primary purposes: firm valuation; and, the assessment of the societal impacts of firms' actions (independent of how these activities affect future cash flows and earnings). If CSR activities affect firms' future earnings and cash flows, then we expect investors to find related disclosures useful for their valuation decisions. If external stakeholders demand CSR activities for their societal benefit—and these stakeholders deem the information supplied in sustainability reports to be useful for assessing the benefits of these activities—then we expect stakeholders to seek out sustainability reports. We provide evidence that investors and stakeholder pay attention to sustainability reports for both of these purposes. We show that search activity for sustainability reports is positively associated with search activity for information on environmental and social issues. We also show that search activity for sustainability reports is increasing in search activity for information associated with firm valuation.

In this paper, we make several contributions. First, we introduce the use of Google search activity data as a measurement methodology that can be applied to address a broad range of questions related to the supply of and demand for sustainability information. Prior studies in accounting have used Google search activity data to examine how investors seek out and use financial information (Brown et al., 2015; Drake et al., 2012). We extend this body of research by using Google search activity data as a direct measure of the level of investor and stakeholder attention directed towards sustainability reports. We then use this measure to show that individuals across a range of countries actively seek out firms' sustainability reports.

Second, we offer a number of useful insights for corporate managers, many of whom are increasingly dedicating greater amounts of resources towards the production of CSR information (KPMG, 2013). By establishing the level of attention directed towards sustainability reports and providing insight into why investors and stakeholder use these disclosures, the findings in our paper help inform corporate managers as to whether and how they should supply CSR information (Christensen et al., 2018; Dhaliwal et al., 2011). By extension, the findings in this paper also contribute to the literature on the regulation of and standard setting for sustainability disclosures (Christensen et al., 2018). In particular, by providing further evidence that suggests that investors seek out sustainability reports for valuation purposes (Ioannou & Serafeim, 2015; Margolis et al., 2009), our paper has potential implications for policy makers who are considering whether sustainability

reports should be mandated, the type of information firms should be required to report and the standards and guidelines that they should follow, and whether these reports should be audited (Grewal et al., 2020; Ioannou & Serafeim, 2019).[6]

Third, our paper contributes to the literature in accounting and finance on cross-country differences in CSR activity and reporting. Prior research has shown that a country's legal origin is strongly correlated with both CSR activity and firms' information environment (Ball et al., 2000, 2003; Liang & Renneboog, 2017). A large literature in environmental economics also shows that economic development and environmental degradation are closely related (Grossman & Krueger, 1993, 1995). Our study extends both these literatures. We show that investors and stakeholders in more economically-developed countries pay greater attention to sustainability reports. By establishing that civil law countries have higher levels of relative search activity for sustainability reports, our results also suggest that citizens in stakeholder-oriented countries have stronger preferences for firms to act prosocially. The latter of these two findings informs the continuing debate over whether all CSR activities must be profit maximizing (Friedman, 1970) or if some of these activities should sacrifice profits in the social interest (Benabou & Tirole, 2010; Hart & Zingales, 2017).

This paper is not without limitations. On their own, the methods employed in this study do not identify the causal effect of different institutional factors on demand for sustainability reports. Instead, this paper should be viewed as an exploratory study that first introduces a measurement methodology—the use of Google search activity for sustainability reports—and then documents a number of empirically-robust, theoretically-motivated associations between institutional factors and the level of attention directed towards sustainability reports. As such, this paper is best viewed as a starting point for future research that exploits natural experiments and other sources of plausibly exogenous variation to identify the causal effects of different factors on the demand for and supply of sustainability reports. A further limitation is that average Google search activity likely proxies for a certain type of user, such as pro-social individuals rather than small number of institutional investors and therefore the findings are not generalisable to all types of users.

The paper proceeds as follows. Section 2 discusses the literature. Section 3 describes the data and empirical approach. Section 4 presents empirical results. Section 5 provides concluding remarks.

2 | RELATED LITERATURE

2.1 | Do people pay attention to sustainability reports?

Benabou and Tirole (2010) outlines three reasons for why firms may invest in corporate social responsibility: (i) doing well by doing good; (ii) delegated philanthropy; and (iii) agency problems. Individuals may seek out and use sustainability reports for different purposes given each of these explanations for corporate social responsibility.

First, the theory of 'doing well by doing suggests managers may invest in CSR in order to improve their firm's financial performance (Deng et al., 2013; Dimson et al., 2015; Flammer, 2015).[7] Michelon et al. (2020) argues and provides some evidence consistent with that shareholder activism increasingly demanding CSR transparency in part due to CSR being a risk that needs managed. As such, if CSR activities affect firms' future earnings and cash flows—and, in turn, firms' financial performance

[6]Examples of voluntary standards for CSR reporting include the Global Reporting Initiative (GRI, 2013), the United Nations' Global Compact (https://www.unglobalcompact.org/participation/report/cop), the Integrated Reporting framework (IIRC, 2013), and Sustainability Accounting Standards Board (https://navigator.sasb.org). Regarding mandatory reporting standards, the Securities and Exchange Commission has reinforced the necessity of companies to be more forthcoming in their 10K's about the climate risks that they face (SEC, 2010)

[7]As summarised by Martin and Moser (2016), corporate social responsibility could directly increase revenue by increasing demand for products and services (Lev et al., 2010; Navarro, 1998), attracting, retaining and motivating high-quality employees (Balakrishnan et al., 2011; Bhattacharya et al., 2008), lowering the cost of equity capital (Dhaliwal et al., 2011), and reducing the risk of punitive actions by regulatory agencies during a negative event (Godfrey, 2005).

(Ferrell et al., 2016; Krüger, 2015)—then we should expect to see investors seek out and use sustainability reports for valuation and investment purposes.[8]

Alternatively, firms may invest in CSR activities if corporate stakeholders and other citizens have strong preferences for companies to act in a prosocial or altruistic manner—independent of how these actions affect firms' discounted future cash flows (Benabou & Tirole, 2006, 2010; Hart & Zingales, 2017). According to this theory of 'delegated philanthropy' (where the firm acts as a channel for the expression of citizen values), individuals will seek out and use sustainability reports in order to assess the environmental and societal benefits of firms' actions.

Finally, firms may invest in CSR due to insider-initiated corporate philanthropy—for example, corporations giving to charities on the boards of which their executives or own board members sit (Friedman, 1970; Hemingway & Maclagan, 2004). If this is the case, investors may seek out and use sustainability reports in order to monitor firm management and limit insider-initiated CSR activities. In this sense, demand for sustainability reports is much like demand for financial reports and other corporate disclosure (Healy & Palepu, 2001).

However, the level of investor and stakeholder attention directed towards sustainability reports also hinges on the credibility of these disclosures. CSR reporting is voluntary in the vast majority of settings (Christensen et al., 2018). As documented in a large body of research in financial accounting, voluntary disclosures are not always credible (Beyer et al., 2010; Healy & Palepu, 2001; Verrecchia, 2001). Firms have discretion in terms of whether and how much they disclose about their CSR activities. This raises the possibility that social and political pressures may create incentives for managers to selectively disclose information on their firms' CSR activities (Adams, 2004; Cho & Patten, 2007; Deegan, 2002; Patten, 2002; Solomon et al., 2013).[9] The absence of mandated CSR reporting standards also provides firms with discretion in terms of *how* managers report CSR information. Managers may potentially use this discretion to distort the perceived costs and benefits of firms' CSR activities. A literature on 'greenwashing' has emerged that studies this behaviour (Cho et al., 2015; Marquis et al., 2016). To obscure (harmful) CSR information, managers may also use boilerplate language as an avoidance strategy (Crilly et al., 2016).[10]

In discussing the above features of sustainability reporting, a body of research in accounting suggests potential users may not find sustainability reports to be credible or useful (Hobson & Kachelmeier, 2005; Holder-Webb et al., 2009; Ramanna, 2013). If this is the case, investors and other corporate stakeholders may heavily discount or entirely dismiss the informational content of sustainability reports. As such, it remains an open empirical question as to whether investors and stakeholders seek out and use sustainability reports.

2.2 | Who pays attention to sustainability reports?

A growing literature in finance examines the association between corporate social responsibility and economic development (Dyck et al., 2019; Ferrell et al., 2016; Liang & Renneboog, 2017). Finding that firms in wealthier countries have higher CSR ratings, Ferrell et al. (2016) argues that individuals in more economically-developed countries are likely to care more about sustainability issues than individuals in less-developed countries, who are more likely to be preoccupied with daily economic

[8]There is a stream of the CSR accounting literature that focuses on the relevance of sustainability disclosures for predicting environmental performance, future operating performance, and firm valuation (Al-Tuwaijri et al., 2004; Clarkson et al., 2008; Hughes et al., 2001; Patten, 2002). The findings from this body of research are mixed. Some studies suggest investors find CSR reporting to be informative (Clarkson et al., 2013; Dhaliwal et al., 2011, 2012; Griffin et al., 2017; Matsumura et al., 2014).

[9]For instance, research shows that managers in so-called 'sin' industries (e.g., alcohol, tobacco, firearms) use CSR reporting to legitimise their operations and shape assessments of firms' impact on society (Byrd et al., 2017; Grougiou et al., 2016).

[10]In recent years, voluntary standards for CSR reporting have emerged to harmonise disparate reporting practices and improve the credibility of CSR disclosures (e.g., Global Reporting Initiative, the Sustainability Accounting Standards Board, etc). Empirical evidence on the effectiveness of these standards is, however, mixed (Christensen et al., 2018).

survival.[11] This work draws on earlier research in environmental economics that looks at the association between economic development and environmental degradation (Grossman & Krueger, 1995; Lopez, 1994; Panayotou, 1997; Seldon & Song, 1994; Stern & Common, 2001). This literature is grounded in theory on the environmental Kuznets curve (EKC), which models environmental degradation as a concave function of economic development (Grossman & Krueger, 1993, 1995). According to the EKC, in poor countries, economic growth causes environmental degradation to rise sharply as firms rapidly industrialise and consumption increases. However, beyond a threshold—that is, the point at which individuals have sufficient discretionary income and leisure time to commit to environmental causes and the state has the necessary resources to enforce environmental regulations—further economic growth leads to a subsequent reduction in environmental degradation. If these findings from across the finance and economics literatures hold and investors and corporate stakeholders come to care more about the environment as they grow wealthier, then we expect that the level of investor and shareholder attention directed towards sustainability reports should be greater in countries with higher levels of economic development.

An equally sizable literature in law and finance examines the economic consequences of legal origins (La Porta et al., 2008). Liang and Renneboog (2017) draws on this work to show that firm-level CSR investment and performance is higher in countries with civil law legal traditions as compared to countries with common law legal traditions. In this paper, the authors argue that this result is consistent with the notion that citizens' in countries where firms are more stakeholder-oriented—that is, countries with civil law origins—have stronger preferences for corporations to be altruistic and prosocial than citizens in countries where firms are more shareholder-oriented, namely, countries with common law origins (Benabou & Tirole, 2006, 2010; La Porta et al., 2008). As such, we should expect the level of attention directed towards sustainability reports to be greater in countries with civil law origins than in countries with common law origins.

However, independent of underlying social preferences, attention towards sustainability reports may also vary due to cross-country differences in corporate governance and reporting practices. Beginning with Ball et al. (2000, 2003), a significant stream of the accounting literature contends that demand for external financial reports is lower in civil law countries than in countries with common law origins. This contention is based on the premise that information asymmetry is less pronounced in civil law countries, where important constituencies directly engage with firm management as 'insiders'. In contrast, information asymmetry is more pronounced in common law countries, where important constituencies reside outside the firm and must instead rely on financial reports and other corporate disclosures to monitor and evaluate management. A similar argument is also likely to apply to legal origins and sustainability disclosures. As discussed by Christensen et al. (2018, p. 75), if firm-constituent interactions are at arms' length (or are more 'passive' in nature), then sustainability reporting is likely to be especially useful for monitoring the CSR activities of corporations and for facilitating comparisons of these activities across firms. However, as Christensen et al. (2018) goes on to point out, if the interaction between firms and their constituents are more relational and involve greater dialogue between management and external stakeholders, then information on CSR activities can be privately exchanged and the need for public sustainability reporting is reduced. This line of reasoning suggests that, due to differences in corporate governance and information asymmetry, the level of investor and stakeholder attention directed towards sustainability reports is likely to be greater in countries with common law origins than in countries with civil law origins.

In summary, the legal origins literature in law and finance gives rise to two competing predictions. However, the mechanisms underlying these predictions should differentially affect the *absolute* and *relative* levels of attention directed towards sustainability reports. The absolute level of attention is

[11] A counter-argument to this position is that users in less-developed countries are more likely to bear the environmental and social costs of firms' activities. Also, less-developed countries typically have less developed welfare states, and so there may be a greater role for firm philanthropy in these countries (i.e., corporations picking up some of the welfare 'slack' in failed or failing states). Both of these stories suggest users in less-developed countries could care more about firms' sustainability disclosures.

affected by a country's preferences for CSR activities (i.e., a social preferences effect) *and* the country's information environment (i.e., an information asymmetry effect). In contrast, if we assume that the effect of information asymmetry on demand for corporate disclosures is the same for both financial and non-financial reports, then the level of attention directed towards sustainability reports relative to the level of attention directed towards traditional corporate disclosures and financial information should only be driven by cross-country differences in social preferences. This suggests that while the level of *absolute* demand for sustainability reports may be higher or lower in civil law countries (depending on which of the social preferences or information asymmetry effects dominate), the level of *relative* demand for sustainability reports should be higher in civil law countries (as the information asymmetry effect has been partialled out).

3 | DATA AND SAMPLE SELECTION

3.1 | Variable measurement

3.1.1 | Google search activity

We use Internet search activity for sustainability reports as a direct measure of the level of investor and shareholder attention directed towards sustainability reports. Specifically, we use Google Trends to obtain country-level aggregate search volume data from Google search engine users. A public web facility of Google Inc., Google Trends reports the level of search activity for a specified string or search term. Google Trends allows search activity to be identified by the geographic area in which the search was initiated. Google Trends also allows search activity for strings to be queried in different languages. We use these features of the platform to categorise search activity based on the specific country and language in which searches were initialised.

Obtaining search activity data from Google Trends requires the specification of search strings that Google users might employ when searching for information on a given topic. We obtained search activity data using several alternative collections of search strings. Our research is affected by four features of the data provided by Google Trends.

First, Google does not provide a raw count of the number of searches initiated for string *s* in country *i* during period *t*. Instead, Google Trends uses a fixed scaling option that reports a normalised measure that scales search activity for string *s* in country *i* during period *t* by the maximum level of search activity for string *s* in country *i* over the specified time range (Brown et al., 2015). By construction, this measure of search activity is bound between 0 and 100.

Second, Google Trends does not report search activity that falls below an undisclosed measurement threshold. Instead, Google simply reports search activity below this threshold as zero. As a result, values of zero in our dataset should be interpreted as 'very low' levels of search activity rather than the absence of search activity. If we assume this threshold is the same across countries, we can identify cross-country differences in *absolute* search activity. For instance, if Country A displays search activity for 'sustainability report' while Country B fails to display search activity for 'sustainability report' over the same period (i.e., all observations for Country B are coded as zero), then we are able to say that the absolute level of search activity is greater, on average, in Country A than Country B. We have evidence that this threshold 'binds' in our data set (we observe that all countries report at least one period where search activity for sustainability reports is coded as zero). As such, if we assume Google employs a common lower-bound in their measurement method, the reported search activity measure reveals at least some information about differences in absolute search activity across countries.[12]

[12]We undertake a range of robustness checks in the empirical section of this paper to ensure that our results are not driven by censoring from this lower-bound. Nevertheless, this feature of the data provided by Google Trends limits our ability to make certain cross-country comparisons of absolute search activity.

With these limitations in mind, we exploit a third feature of the platform to perform cross-country and cross-string comparisons of *relative* search activity. Specifically, Google Trends allows multiple search strings to be concurrently queried. When this is done, the resulting search activity measure is scaled by the maximum level of search activity across all of the queried search strings. We exploit this feature of the platform by specifying our string of interest ('sustainability report') and a benchmark string (e.g., 'earnings' or 'stock price'). Using this approach, we are able to make cross-country comparisons of relative search activity. These comparisons are appealing as they require us to make less onerous assumptions about Google Trend's measurement and normalisation procedures.

Finally, Google Trends allows search terms to be queried in different languages. We exploit this feature of the platform to measure search activity in both English and the 'local' language of the country in question.[13] We used the Google Translate service to translate our search terms of interest from English into each country's local language.

3.1.2 | Search strings for dependent variable

According to the 2013 KPMG Survey of Corporate Responsibility, the most-commonly used terms globally for the non-financial reporting activities of firms are 'sustainability' (43%), 'corporate social responsibility' (25%) and 'corporate responsibility' (14%). As discussed in Khan et al. (2016), the terms 'sustainability,' 'environmental, social, and governance', and 'corporate social responsibility' have also been used interchangeably in the past. Khan et al. (2016) states that more firms around the world use the word 'sustainability' rather than 'CSR' to describe the strategic aspect of their efforts to improve performance on ESG issues.[14] As shown in the results section of this paper, Google search engine users also more commonly employ the term 'sustainability report'. For these reasons, we use search activity for the string 'sustainability report' as our primary measure of demand for information on firms' ESG activities and CSR performance.[15]

3.1.3 | Explanatory variables—institutional and economic factors

To examine the question of *who* seeks out sustainability reports, we explore differences in the legal origins and economic institutions of the countries in our sample. Consistent with the CSR literature and research in finance and law, we use legal tradition as a proxy for a country's stakeholder orientation (Ball et al., 2000; Dhaliwal et al., 2012; La Porta et al., 2008; Liang & Renneboog, 2017). We define countries with a civil law origin as stakeholder-oriented, and countries with a common law origin as shareholder-oriented. Consistent with the literature in developmental economics and finance, we use annual GDP per capita to capture the level of economic development in a country (Acemoglu et al., 2001; Liang & Renneboog, 2017). We collect and use data on country-year GDP per capita from the World Bank.

[13] We define the most-commonly spoken language in a country as its 'local' language.

[14] As noted by Khan et al. (2016), the institutionalisation of the term sustainability in the form of a new C-level position, the Chief Sustainability Officer, is a manifestation of this phenomenon (Miller & Serafeim, 2015). Moreover, this term is consistent with the labelling of the Sustainability Accounting Standards Board.

[15] Google Trends queries for the string 'sustainability report' return results for all searches that contain this phrase – for example, 'Johnson & Johnson sustainability report', 'mining industry sustainability report'. For robustness, we also use the term 'CSR report' in our analysis and find that our main results are unchanged. These untabulated results are available from the authors upon request.

3.1.4 | Explanatory variables—measures of attention directed toward environmental, social, and investment information

To address the question of *why* individuals search for sustainability reports, we explore variation in the levels of attention directed towards information related to environmental and social issues, and information that is useful for firm valuation.[16] When demand for these types of information increase, we expect to see investors and stakeholders seek out sustainability reports.

We use weekly Google search activity data to measure the level of attention directed towards information on environmental and social issues, and the level of attention directed towards financial information. We use these proxies to capture exogenous shifts in demand for information on topics or issues relevant to firms' CSR activities (e.g., the release of a major climate change report or press coverage of a high-profile corporate human rights violation). To achieve this, we identify search strings that reflect the information contained in the environmental and social sections of a sustainability report. The environmental section of a sustainability report typically consists of measures of emission performance, pollution abatement, and the quality of a firms' environmental practices (e.g., the introduction of environmental management systems and measures for limiting carbon emissions). Likewise, the social section of sustainability reports typically consists of information on a firms' compliance with human rights policies and the presence of particular worker safety standards and other industrial relations matters. For these reasons, we use the broad term 'environment' to capture search activity related to demand for information on environmental issues and related topics. Similarly, we use the broad term 'human rights' to capture search activity related to demand for information on social justice issues and the industrial relations topics contained in sustainability reports. Finally, to measure changes in short-run demand for financial information, we use weekly search activity for the terms 'stock price' and/or 'share price'.

For robustness, we also examine alternative proxies for short-run changes in demand for information related to environmental and social issues, and firm valuation. These proxies are based on news media content (headlines in national newspapers) and capital-market measures (share trading volumes). We discuss these robustness measures in the empirical section of this paper. All variable defintions are reported in (Appendix 1).

3.2 | Sample selection

The data in our sample is measured at the country level. Our sample begins in 2004, the earliest date Google Trends reports search activity numbers, and ends in 2017. Following Simnett et al. (2009) and Dhaliwal et al. (2012), we include in our sample observations from only those countries that: (i) are home to firms that have supplied CSR reports (as per the Corporate Register); and (ii) have information available on legal origin, economic development, and the country-level control variables we require to conduct our analysis. As a result, our sample contains approximately 13,000 weekly observations (4000 monthly observations) from across a total of 33 different countries. Table 2 provides a summary of the countries featured in our final sample.

3.3 | Descriptive statistics

Table 1 reports descriptive statistics for our pooled data set. Table 2 reports descriptive statistics for the individual countries in our sample. As per Table 1 Panel A, we find that 19 of the 33 countries in

[16]Following Liang and Renneboog (2017) and a large number of papers that examine CSR and sustainability reports, we do not examine the governance component of CSR reports. This component of ESG information overlaps with traditional corporate governance issues, which may be significantly different from issues of concern to other stakeholders

TABLE 1 Descriptive statistics

	Google search activity					Other variables	
	SUST_REPORT	*CSR_REPORT*	*ENVIRONMENT*	*HUMAN RIGHTS*	*STOCK PRICE*	*SUPPLY*	*GDP ('000)*
Panel A: Number of countries (out of 33) for which there was search activity for the search term							
Local lang.	19	10	33	32	27	32	33
English	24	10	33	33	33	32	33
Panel B: Local language—descriptive statistics for the 19 countries with search activity for 'sustainability report'							
Mean	25	23	45	35	29	215	35.69
Median	19	18	42	31	26	147	37.56
Min	0	0	4	0	0	2	2.55
Max	100	100	100	100	100	1057	93.91
SD	24	21	20	19	20	222	17.66
No. of obs	3192	1512	3192	3192	3024	3192	3192
Panel C: English—descriptive statistics for the 24 countries with search activity for 'sustainability report'							
Mean	20	21	42	33	28	213	33.08
Median	13	17	38	31	24	147	35.40
Min	0	0	7	2	0	2	2.55
Max	100	100	100	100	100	1057	93.91
SD	22	20	20	19	17	214	17.56
No. of obs	4032	1680	4032	4032	4032	3864	4032

Note: Descriptive statistics on Google search activity variables at monthly intervals across the period from 2004 to 2017, annual GDP, and the annual number of sustainability reports issued at the country-level (*SUPPLY*).

SUST_REPORT is the level of search activity for sustainability reports, *CSR_REPORT* is the level of search activity for CSR reports, *ENVIRONMENT* is the level of search activity for environment, *HUMAN_RIGHTS* is the level of search activity for human rights, and *STOCK_PRICE* is the level of search activity for stock price.

Statistics in Panel B and C are based on the pooling of country-month observations and presented for both search strings translated into the local language (Panel B) and search activity for the string in English (Panel C).

our sample show evidence of local-language search activity for the string 'sustainability report', and 10 of the 33 countries in our sample show evidence of local-language search activity for the string 'csr report' (the remaining 14 and 23 countries in our sample, respectively, do not display sufficient search activity to meet Google Trends' reporting threshold). This suggests that investors and stakeholders more commonly use the term 'sustainability report' when searching for firms' non-financial disclosures. Given the measurement threshold imposed by Google Trends, this also suggests at a minimum that there is significant search activity for sustainability reports in at least a subset of countries.

In Table 1 Panel B (Panel C), we report descriptive statistics for the data from the 19 (24) countries in our sample with documented local-language (English) search activity for sustainability reports. Due to the normalised nature of the Google Trends data, all search-activity measures in our data set have a maximum value of 100. Similarly, most of the search-activity measures in our data set have a minimum value of zero (i.e., for a given string, there is at least one country-month observation where search activity did not exceed the reporting threshold imposed by Google Trends).[17] Consistent with right skewness in the distributions of the search activity data, the mean is marginally greater than the median for each of the search strings we examine. This likely reflects the fact that our data set captures the effect of certain topical events that cause significant spikes in interest—for example, the Paris Agreement, extreme weather events.

[17]Again, values of zero should be interpreted as 'low' rather than no search activity.

TABLE 2 Country-level means for key variables: 2004–2017

Country	Sustainability report		Time trend		GDP ('000)	No. of reports	Legal origin
	Local lang.	English	Local lang.	English			
Australia	38.51	38.51	0.79	0.79	40.58	265.21	Common
Austria	–	–			43.62	97.86	Civil
Belgium	16.88	17.03	0.70	0.88	40.37	97.29	Civil
Brazil	31.66	6.71	0.81	−0.20	13.93	227.50	Civil
Canada	45.55	45.55	0.88	0.88	41.12	233.43	Common
Chile	–	–			19.03	70.79	Civil
Denmark	–	–			42.86	97.43	Civil
Finland	–	–			39.03	84.71	Civil
France	–	10.18		0.64	36.52	296.07	Civil
Germany	49.64	40.95	0.86	0.94	41.03	394.36	Civil
Greece	–	–			27.42	31.86	Civil
Hong Kong	23.04	23.04	0.90	0.90	48.31	153.71	Common
India	17.55	17.55	−0.57	−0.57	4.58	72.14	Common
Italy	16.52	12.76	−0.60	0.21	35.03	259.79	Civil
Japan	16.96	10.24	−0.60	−0.51	36.47	415.71	Civil
Malaysia	9.08	9.08	0.29	0.29	21.90	36.43	Common
Mexico	–	–			15.36	61.79	Civil
Netherlands	15.24	19.90	−0.53	0.58	45.30	205.00	Civil
New Zealand	9.86	9.86	0.07	0.07	32.66	36.07	Common
Norway	–	–			58.40	59.21	Civil
Pakistan		3.80		0.25	4.37	13.29	Common
Philippines	6.45	6.45	0.36	0.36	5.87	17.57	Civil
Portugal	–	–			26.95	81.43	Civil
Singapore	24.13	24.13	0.95	0.95	72.58	36.14	Common
South Africa	–	14.56		−0.34	11.77	176.71	Common
South Korea	–	12.70		−0.80	30.56	–	Civil
Spain	–	8.11		0.33	32.48	330.79	Civil
Sweden	29.67	19.85	0.75	0.95	42.58	191.71	Civil
Switzerland	22.40	15.61	0.44	0.85	54.33	139.00	Civil
Thailand	6.22	4.43	0.79	0.02	13.62	37.64	Common
Taiwan	–	–				41.07	Civil
United Kingdom	44.48	44.48	0.78	0.78	37.37	585.00	Common
United States	55.01	55.01	0.84	0.84	50.49	678.79	Common
Mean	25.20	19.60	0.42	0.38	33.33	172.67	–
No. countries w. obs	19	24	19	24	32	32	33

Note: Sustainability Report is the mean level of monthly Google search activity for 'sustainability report' across the period from 2004 to 2017. A null field implies Google Trends reported no search activity for that country. Time trend is the correlation between monthly Google search activity for 'sustainability report' and calendar time measured at monthly intervals. GDP is annual per capital GDP. Number Reports is the mean of the annual number of sustainability reports per country obtained from Corporate Register. The – implies the countries have no recorded search activity above the Google Trends reporting threshold.

In Tables 1 and 2, we also report descriptive statistics for the non-search activity measures employed in this paper. GDP per capita varies significantly across the countries in our sample. India has the lowest country-year GDP per capita ($2549 in 2004) and Singapore the highest ($93,905 in 2017). We also report information on the annual number of sustainability reports supplied by firms in each of the countries in our sample. We sourced these reports from the Corporate Register, which is a comprehensive directory of published corporate environmental and social reports. Across our sample, the number of annual sustainability reports issued by firms within each country varies substantially. Firms in the Philippines issued the fewest number of reports (two reports in 2004), while firms in Hong Kong issued the greatest number of reports (1057 reports in 2017). Finally, in terms of legal traditions, 21 of the 33 countries in our sample have legal systems with civil law origins, while the remaining 12 countries in our sample have legal systems with common law origins.

4 | RESULTS

4.1 | Do people pay attention to sustainability reports?

We start our analysis by examining whether there is an association between the level of search activity for sustainability reports and firms' supply of these reports. We conduct this analysis as a validity check of our search activity measure. Specifically, if our search activity measure varies when theory suggests demand for information on firms' CSR activities should fluctuate—that is, when sustainability reports are issued by firms—then we are more comfortable claiming our measure proxies for the overall level of attention directed towards sustainability reports within a country at a given time. In pursuing these objectives, we explore this association in three ways: using variation over time, using variation across countries, and using an event study design.

In Figure 1, we plot mean monthly search activity for sustainability reports over time. We also plot the mean number of annual sustainability reports that are filed by firms at the country-level. Figure 1 shows a significant increase in the mean number of sustainability reports supplied over this period—a trend documented by prior research (Simnett et al., 2009). The Figure shows that the mean level of monthly search activity for sustainability reports—while heavily cyclical—has also steadily increased over time.

To further explore these trends, Table 2 reports the correlation, for each country, between the level of search activity for sustainability reports and calendar time measured at monthly intervals. The time trends in search activity vary across countries. For example, as reported in Table 2, Singapore (0.95), Hong Kong (0.90), Canada (0.88), and Germany (0.86) all have highly-significant positive trends over time in search activity for sustainability reports. In contrast, Italy (−0.60), Japan (−0.60), and India (−0.57) have significant negative trends over time in search activity for sustainability reports.

We use this variation to better understand the association between the level of search activity for sustainability reports and firms' supply of these reports. Specifically, we estimate the following baseline ordinary least squares (OLS) regression using our panel of country-year observations:

$$SUPPLY_{it} = \alpha + \beta\, SUST\_REPORT_{it} + \beta\, SUST\_REPORT_{it-1} + \beta GDP_{it} + \mu_{it}, \qquad (1)$$

where $SUPPLY_{it}$ is the number of sustainability reports issued by firms in country i in year t. We identify firms as having issued a report if this report is lodged with the Corporate Register. $SUST\_REPORT_{it}$ is the mean monthly level of search activity for sustainability reports in country i in year t. GDP_{it} is the per capita GDP of country i in year t. We include this measure to control for country-level wealth and income. We estimate Equation (1) both with and without country fixed effects, which we include to control for unobservable country heterogeneity due to time-invariant country characteristics. We expect a positive coefficient on $SUST\_REPORT_{it}$ and/or $SUST\_REPORT_{it-1}$ if there is an association between the level of search activity for sustainability reports and firms' supply of these reports.

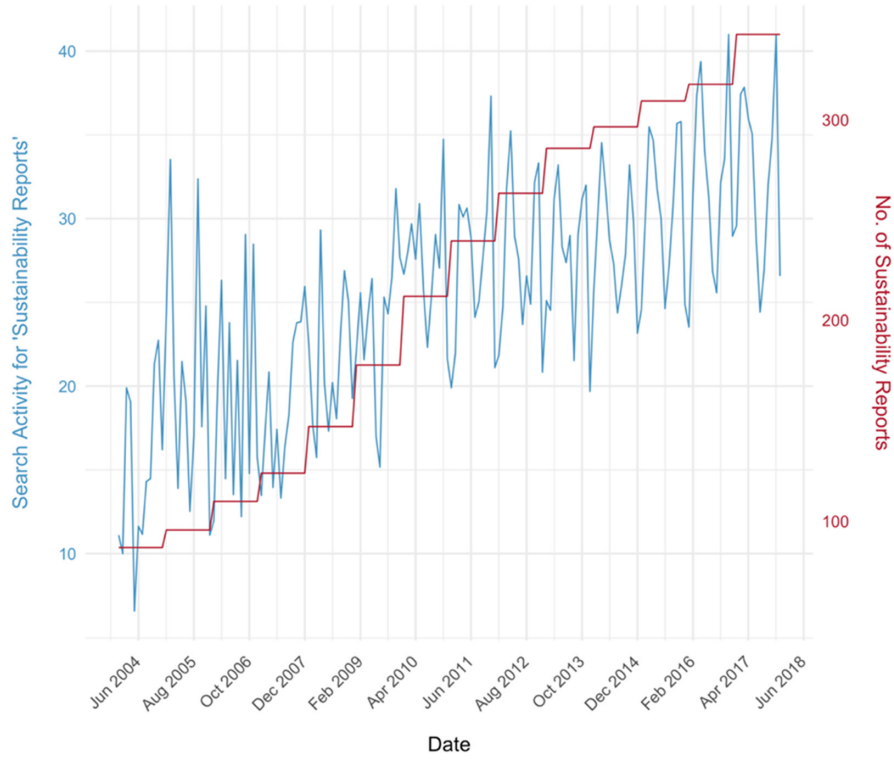


FIGURE 1 Search activity and supply of sustainability reports: 2004–2017. This Figure presents monthly Google search activity for sustainability reports and the mean annual number of sustainability reports that are registered with the Corporate Register at the country level. Monthly Google search activity is measured as the mean level of Google search activity across all 19 countries in our sample with recorded Google search activity for sustainability reports. The Figure should be viewed in colour.

The estimates from Equation (1) are reported in Table 3. Columns (1)–(3) report results from local-language search activity. Columns (4)–(6) report results from search activity in English. Column (1) reports the baseline results. Columns (2) and (3) report the results from an extended model that includes GDP per capita and lagged search activity for sustainability reports. Across each of these specifications, the results show a strong positive association between the level of search activity for sustainability reports in periods t and $t-1$ and firms' supply of these reports. Focusing on the results reported in column (3), we see that the coefficients on $SUST\_REPORT_{it}$ and $SUST\_REPORT_{it-1}$ are positive and statistically significant ($\beta = 2.06$, $p<0.01$ and $\beta = 1.88$, $p<0.01$).[18] Finally, as the estimates reported across columns (1)–(6) are quantitatively very similar, our results do not appear to be driven by how we translate the search string into each country's local language.

Overall, Table 3 provides evidence that search activity for sustainability reports is strongly associated with firms' supply of these reports over time. Consistent with the idea that more firms will supply sustainability reports when investors and stakeholders increasingly seek out these disclosures, this result supports the validity of our search activity data as a direct measure of the level of investor and stakeholder attention directed towards sustainability reports.

In addition to these long-run trends, Figure 1 also shows a consistent pattern of peaks and troughs in search activity for sustainability reports. To further investigate this seasonality, we plot the mean

[18]For robustness, we also demean all variables by the country mean and re-estimate columns (1)–(3). Employing this empirical approach yields estimates that are qualitatively similar to the results reported in Table 3. These results are untabulated, but available upon request from the authors.

TABLE 3 Search activity for and firms' supply of sustainability reports

	(1)	(2)	(3)	(4)	(5)	(6)
Language	**Local**	**Local**	**Local**	**English**	**English**	**English**
DV = SUPPLY	**OLS**	**OLS**	**OLS**	**OLS**	**OLS**	**OLS**
SUST_REPORT (*t*)	6.17***	3.54***	2.06***	7.73***	5.76***	3.30***
	(11.6)	(2.91)	(2.36)	(9.94)	(5.02)	(3.07)
SUST_REPORT (*t*−1)		3.65***	1.88***		3.54***	1.95*
		(3.43)	(2.52)		(3.26)	(1.87)
GDP			0.01***			0.01***
			(8.84)			(6.07)
CONSTANT	339.18***	317.00***	−16.31	253.73***	196.96***	−57.97
	(6.07)	(5.34)	(−0.24)	(4.92)	(3.68)	(−1.02)
No. of observations	266	247	247	322	299	299
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by year	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.77	0.81	0.84	0.77	0.81	0.83

Note: Results from estimation (and extensions) of the baseline regression:

$SUPPLY_{it} = \alpha + \beta\ SUST\_REPORT_{it} + \beta\ SUST\_REPORT_{it-1} + \beta GDP_{it}$.

$SUPPLY_{it}$ is the number of sustainability reports produced by firms in country *i* in year *t*. $SUST\_REPORT_{it}$ is the mean monthly level of Google search activity for sustainability report in country *i* in year *t*. GDP_{it} is the per capita GDP of country *i* in year *t*. Robust *t*-statistics are reported in parentheses and calculated using standard errors clustered by year. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

level of search activity for sustainability reports by calendar month in Figure 2. This figure shows significant variation across the year, with search activity peaking in March and November, and bottoming out in July and December. Formally, an *F*-test strongly rejects equality in monthly mean search activity across the year (F-stat = 21.79, $p < 0.0001$).

While there are a number of possible explanations for this seasonality, we investigate whether increases in search activity for sustainability reports coincide with the timing of the supply of these reports by firms within the year. Motivated by analogous findings in the financial accounting literature that document an increase in the demand for—and use of—earnings reports around the release date of these disclosure (Ball & Brown, 1968; Beaver, 1968), this line of inquiry is presented as a further test of the validity of our search activity data as a direct measure of the level of investor and stakeholder attention directed towards sustainability reports.

Sustainability reports and other non-financials are typically released after the disclosure of firms' primary financials. Correspondence with the Director of Corporate Register suggests this occurs at approximately the same time as firms' annual general meeting (AGM). To examine this more formally, we identify the primary financial year-end date for each country in our sample and then test whether there is an increase in search activity 4-months after this date—that is, when firms in that country usually hold their AGM (and, by extension, release their sustainability reports). We do so by estimating the following baseline OLS regression using our panel of monthly country-level observations:

$$SUST\_REPORT_{imt} = \alpha + \beta Reporting\_Month_{im} + \mu_{imt}, \quad (2)$$

where $SUST\_REPORT_{imt}$ is the level of search activity for sustainability reports in month *m* of year *t* for country *i*. $Reporting\_Month_{im}$ is a dummy variable takes a value of 1 if month *m* is 4 months after the primary financial year-end date for country *i* (i.e., when AGMs typically take place), and a value of zero otherwise. If investors and stakeholders search for sustainability reports around the time these disclosures are issued by firms, we expect to observe a positive coefficient on this variable.

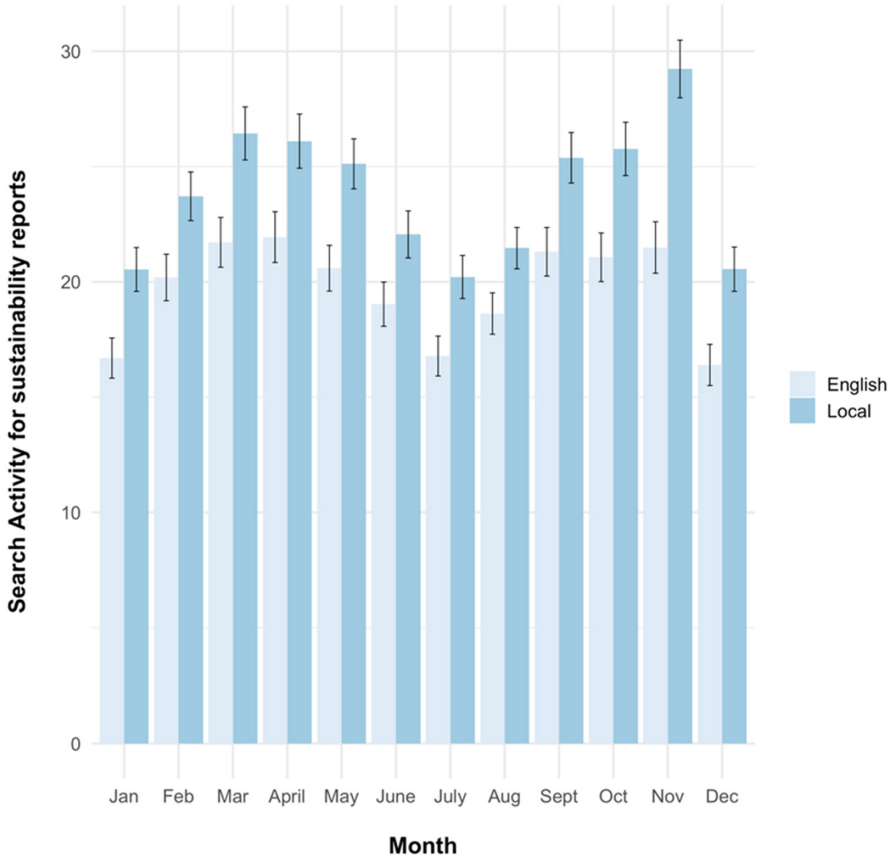


FIGURE 2 Search activity for sustainability reports by calendar month. This Figure plots by calendar month the mean level of Google search activity for sustainability reports across all 19 countries in our sample with recorded search activity for sustainability reports over the period 2004–2017. Error bars are standard errors of the mean. The Figure should be viewed in colour.

The results from estimation of Equation (2) are reported in Table 4. Columns (1)–(3) report results from local-language search activity. Columns (4)–(6) report results from search activity in English. In column (1), we estimate our regression over the full sample period (2004–2017). We find evidence of a weak association between search activity for sustainability reports and *Reporting_Month* ($p < 0.10$). However, in the previous section of this paper we document a significant increase in the supply of sustainability reports over time. A potential consequence of this positive supply trend is that seasonality due to the reporting cycle might only emerge over time.[19] To examine this idea, we split our sample into an 'early' period (2004–2010) and a 'late' period (2010–2017). We then estimate separate regressions for each period. Reported in columns (2) and (3), the results from these regressions show strong evidence of seasonality in only the late period, 2011 to 2017. Specifically, as reported in column (2), there is no evidence of seasonality in the earlier period, 2004 to 2010 ($\beta = -1.96$, $p > 0.10$). In contrast, in column (3), the coefficient on *Reporting_Month* is positive and highly-statistically significant ($\beta = 5.77$, $p < 0.01$).[20] This same pattern in our results is reflected in the estimates reported in columns (4)–(6), where we use English search strings in our analysis.

[19]At the start of our sample, when relatively few firms issued reports, few users may have actively sought out these disclosures, but over time as the number of firms issuing sustainability reports increased, a greater number of users may have sought out these reports upon their disclosure.
[20]For Panels A and B, there are 3192 and 4032 observations in our baseline models, respectively. In Panel A, we have 14 years × 19 countries × 12 months. In Panel B, we have 14 years × 24 countries × 12 months).

TABLE 4 When do users search for sustainability reports?

	(1)	(2)	(3)	(4)	(5)	(6)
Language	**Local**	**Local**	**Local**	**English**	**English**	**English**
	OLS	**OLS**	**OLS**	**OLS**	**OLS**	**OLS**
DV = SUST_REPORT	**2004–2017**	**2004–2010**	**2011–2017**	**2004–2017**	**2004–2010**	**2011–2017**
REPORTING_MONTH	1.90*	−1.96	5.77***	1.75**	−0.82	4.33***
	(1.65)	(−1.47)	(10.37)	(2.02)	(−0.80)	(6.95)
CONSTANT	62.18***	50.78***	68.45***	60.79***	49.96***	68.16***
	(29.90)	(14.66)	(90.17)	(27.43)	(13.85)	(87.04)
No. of observations	3192	1596	1596	4032	2016	2016
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by month	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.4373	0.264	0.7283	0.4634	0.2693	0.7911

Note: Results from estimation of alternate specifications of the following baseline regression:

$SUST\_REPORT_{imt} = \alpha + \beta\ REPORTING\_MONTH_{im}$.

$SUST\_REPORT_{imt}$ is the level of search activity for sustainability report in month m of year t for country i. $REPORTING\_MONTH_{im}$ is a dummy variable that takes the value of 1 if month m is 4 months after the primary financial year-end for country i. Robust t-statistics are reported in parentheses and calculated using standard errors clustered by month. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

Overall, Table 4 shows that in recent years positive spikes in search activity for sustainability reports align with the specific months in which firms issue these reports. As additional evidence of the strong association between search activity for sustainability reports and firms' supply of these reports, this finding further supports the validity of our search activity data as a direct measure of the level of investor and stakeholder attention directed towards sustainability reports.

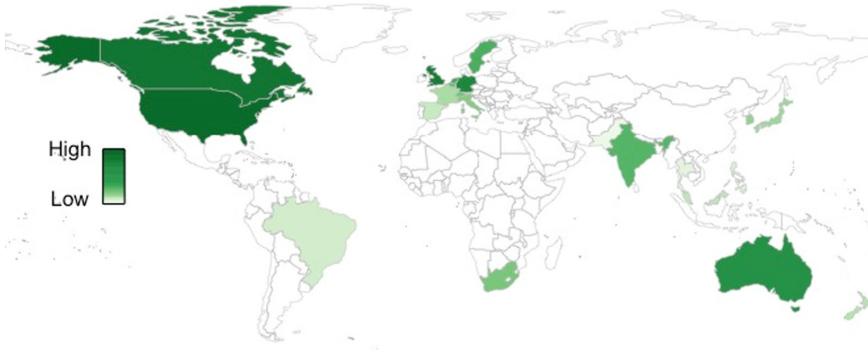
4.2 | Who pays attention to sustainability reports? Part I: Examining differences in *absolute* search activity

In this subsection we examine the question of *who* pays attention to sustainability reports by establishing whether differences in search activity for sustainability reports across countries can be explained by relating search activity to a country's legal origin and level of economic development.

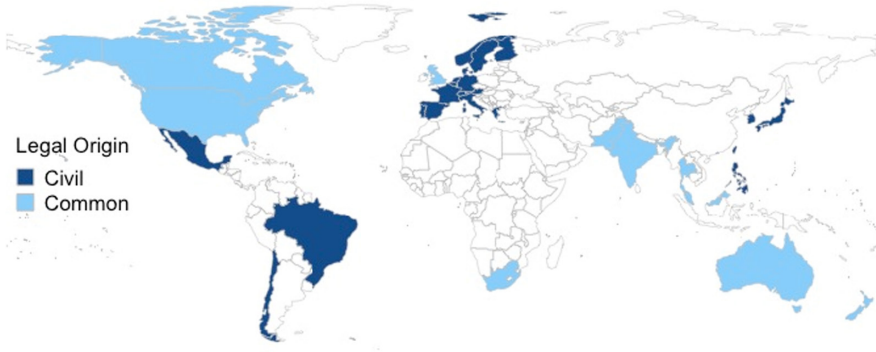
We first plot in Figure 3 Panel A, the distribution of mean country-level search activity for sustainability reports on a world map using the Google Trends data, with darker shading indicating higher levels of search activity. In Figure 3 Panel B, we plot the distribution of legal origins around the world. As can be seen comparing by the two panels, countries with higher levels of search activity for sustainability reports are more likely to have common law traditions than civil law origins.

Table 5 reports univariate differences across countries in search activity for sustainability reports. In Panel A, the results show that common law countries have higher levels of search activity for sustainability reports (mean search activity = 27) than civil law countries (mean search activity = 23). This difference is economically- and statistically-significant ($p < 0.01$). This general result, which holds when using either the English search string or local-language search string, suggests that a country's legal system is associated with the level of investor and shareholder attention directed towards sustainability reports.

Table 5 Panel B shows that countries with higher levels of economic development (i.e., country-year observations with above-median GDP per capita) have more search activity for sustainability reports (mean search activity = 32) than countries with lower levels of economic development (mean search activity = 14). This difference is again economically- and statistically-significant ($p < 0.01$). This



Panel (a): Average monthly level of Google search activity for 'sustainability report' by country



Panel (b): Legal origins around the world by country

FIGURE 3 Search activity for sustainability reports and legal origin by country

general result, which also holds when using either the English search string or local-language search strings, suggests at the univariate level that national wealth is also strongly associated with the level of investor and shareholder attention directed towards sustainability reports.

A large literature in development economics documents a strong association between economic development and legal institutions (Acemoglu et al., 2001).[21] As such, to better understand the association between each of these factors and the level of attention directed towards sustainability reports, we estimate the following baseline OLS regression using our panel of monthly country-level observations:

$$SUST\_REPORT_{imt} = \alpha + \beta COMMON_i + \beta GDP_{it} + \mu_{imt}, \quad (3)$$

where $SUST\_REPORT_{imt}$ is the level of search activity for sustainability reports in month m of year t for country i. $COMMON_i$ is a dummy variable that takes a value of 1 if country i has a common law legal origin and 0 if it has a civil law tradition. Following the law and finance literature, we

[21] For reference, in our sample, the GDP of common-law countries is greater than the GDP of civil-law countries ($p < 0.01$).

TABLE 5 Cross-country differences in the level of attention directed towards sustainability reports

	No. of obs.		Mean		Median	
	Local	**English**	**Local**	**English**	**Local**	**English**
Panel A: Civil vs. Common						
Civil law	1512	2016	22.82	15.04	17	9
Common law	1680	2016	27.34	24.17	22	17
	3192	4032				
t/*z* stat			−5.45	−13.58	−4.74	−8.91
p-Value			<0.0001	<0.0001	<0.0001	<0.0001
Panel B: GDP						
Low GDP	1248	2016	14.08	9.68	9	6
High GDP	1944	2016	32.35	29.53	30	26
	3192	4032				
t/*z* stat			−24.76	−32.43	−24.46	−30.63
p-Value			<0.0001	<0.0001	<0.0001	<0.0001

Note: Tests of differences in mean monthly search activity for sustainability reports between civil- versus common law countries, and between high- versus low-GDP countries. Common law countries are countries with common law legal origins. Civil law countries with civil law legal origins. High GDP are country-year observations that are above the median GDP per capita.

classify common law countries as more shareholder-oriented and civil law countries as more stakeholder-oriented (La Porta et al., 2008; Liang & Renneboog, 2017). GDP_{it} is the GDP per capita of country i in year t. Depending upon which of the social preferences or information asymmetry effects dominates, we may observe either a positive or negative coefficient on $COMMON_i$. Consistent with our prediction that the level of attention directed towards information on firms' CSR activities is higher in wealthier, more-developed countries, we expect a positive coefficient on GDP_{it}.

To estimate the above model, we use OLS and random-effects generalised least squares (GLS)—the latter of which is estimated using maximum likelihood. We use random-effects models in this panel setting given that the explanatory variable, legal origin, is time invariant (Liang & Renneboog, 2017).[22] We also include time fixed effects. By capturing inter-country, time-varying heterogeneity in search activity, these fixed effects control for worldwide shocks that may be correlated with economic development and search activity for sustainability reports. Our analysis is restricted to countries with at least some level of search activity for sustainability report (this reduces our sample to a total of 3192 country-month observations from 19 countries).[23]

In Table 6, we report the results from estimating Equation (3). Columns (1)–(3) report results from local-language search activity. Columns (4)–(6) report results from search activity in English. The estimates produced by our baseline specification show a strong positive association between the level of search activity for sustainability reports and a country's level of economic development. As seen in Table 6 columns (1) and (2), the coefficient on *GDP* is positive and statistically significant ($\beta = 0.42$, $p < 0.01$ and $\beta = 1.02$, $p < 0.01$, respectively). In contrast, the association between the level of search activity for sustainability reports and a country's legal origin is less clear. As seen in columns (1) and

[22]Liang and Renneboog (2017) employs random effects in the same manner to examine the association between a firm's CSR rating and its country's legal origin. That said, this paper does not employ an explicit identification strategy. As such, we do not claim the methods employed in this study allow us to identify the causal effect of economic development and legal origin on demand for sustainability reports. Instead, this paper should be viewed as a descriptive study that introduces a novel measurement approach – search activity data – to the accounting literature.

[23]For robustness, in untabulated analysis we re-estimate Equation (3) on our full sample after assigning a zero value to each observation for those countries with no measured search activity for sustainability reports. The results of this robustness check are quantitatively similar to the estimates documented in Table 6. Thus, we conclude that our results do not appear to be driven by censoring of our dependent variable from below.

TABLE 6 Who seeks out and uses sustainability reports?

	(1)	(2)	(3)	(4)	(5)	(6)
Language	**Local**	**Local**	**Local**	**English**	**English**	**English**
DV = SUST_REPORT	**OLS**	**GLS**	**GLS**	**OLS**	**GLS**	**GLS**
GDP	0.42**	1.02***	0.73***	0.51***	1.11***	0.88***
	(2.76)	(10.73)	(5.50)	(3.60)	(14.65)	(8.23)
COMMON	3.96	3.17	−10.01	10.62*	12.36**	1.98
	(0.64)	(0.48)	(−1.26)	(2.22)	(2.56)	(0.34)
*GDP * COMMON*			0.37***			0.31***
			(3.25)			(3.17)
CONSTANT	8.07			−2.65		
	(1.24)			(−0.53)		
No. of observations	3192	3192	3192	4032	4032	4032
Country RE	No	Yes	Yes	No	Yes	Yes
Month-year FE	No	Yes	Yes	No	Yes	Yes
Cluster SE	Month, Country			Month, Country		
Adj. R^2	0.11	0.18	0.18	0.21	0.22	0.23

Note: Results from estimation of alternate specifications of the baseline following regression: $SUST\_REPORT_{imt} = \alpha + \beta\ GDP_{it} + \beta\ COMMON_i$. $SUST\_REPORT_{imt}$ is the level of search activity for sustainability report in country i in month m of year t. GDP_{it} is per capita GDP in country i in year t. $COMMON_i$ is a dummy variable that takes the value 1 if country i has a common law origin. The sample is restricted to those countries that have some level of search activity for sustainability reports. t-statistics are reported in parentheses. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

(2), when we examine local-language search activity the coefficient on *COMMON* is not distinguishable from zero at any meaningful level of statistical significance. However, as seen in columns (4) and (5), when we examine English-language search activity for sustainability reports the coefficient on *COMMON* is positive and statistically significant ($\beta = 10.62$, $p < 0.05$ and $\beta = 12.36$, $p < 0.05$, respectively). These results imply—albeit somewhat weakly—that common law countries have higher levels of search activity for sustainability reports than countries with civil law legal origins.

To provide further insight, we extend the model estimated in Table 6 by including a variable that captures the interaction between a country's legal system and its level of economic development. This allows us to test whether the level of economic development in a country mediates the association between legal origin and the level of search activity for sustainability reports. In Table 6 columns (3) (local-language) and (6) (English), the coefficient on *COMMON*GDP* is positive and statistically significant ($\beta = 0.37$, $p < 0.01$ and $\beta = 0.31$, $p < 0.01$, respectively). This result implies that increases in search activity for sustainability reports associated with economic development are larger in common law countries. One explanation for this finding may be that citizens in common law countries have lower baseline preferences for corporations to be altruistic and that these preferences only grow more pronounced with increased wealth and economic security.

Overall, Tables 5 and 6 suggest that, consistent with theory on the environmental Kuznets curve, economic development is strongly associated with the level of investor and shareholder attention directed towards sustainability reports. We also find some evidence that differences in search activity for sustainability reports across countries can be explained by relating search activity to a country's legal origin. We show that the level of attention directed towards sustainability reports is greater in countries with common law legal origins, with this association strongest in more-developed common law countries.

TABLE 7 *Relative* search activity for sustainability reports

	Local language					English				
	ANNUAL REPORT	*EARNINGS*	*STOCK PRICE*	*SHARE PRICE*	*PRICE*	*ANNUAL REPORT*	*EARNINGS*	*STOCK PRICE*	*SHARE PRICE*	*PRICE*
Panel A										
Mean	0.1297	0.3101	0.6732	0.3641	0.5396	0.0662	0.1255	0.1334	0.1069	0.1052
Median	0.0435	0.0746	0.1304	0.0513	0.0625	0.0469	0.0952	0.0833	0.0588	0.0588
Min	0.0101	0.0108	0.0100	0.0100	0.0100	0.0101	0.0111	0.0100	0.0100	0.0105
Max	4	6.75	10.6	9	9	1	2	2	1.4	1.4
Std	0.2766	0.5835	1.1450	0.8392	0.9608	0.0750	0.1324	0.1603	0.1531	0.1502
No. of monthly obs.	1832	2361	1721	1168	1060	2491	2623	2297	1894	1587
No. of countries	17	20	16	13	13	22	22	20	19	18
Panel B										
Common										
Mean	0.0383	0.0850	0.0976	0.0652	0.0821	0.0398	0.0969	0.0977	0.0652	0.0776
Median	0.0333	0.0566	0.0611	0.0500	0.0588	0.0333	0.0625	0.0625	0.0500	0.0588
Obs	1179	1192	878	505	197	1190	1287	960	579	271
Civil										
Mean	0.2949	0.5395	1.2726	0.5918	0.6440	0.0903	0.1531	0.1590	0.1253	0.1109
Median	0.1556	0.1842	0.0975	0.0556	0.0690	0.0667	0.1177	0.1053	0.0690	0.0594
Obs	653	1169	843	663	863	1301	1336	1337	1315	1316
Differences										
Mean *t* stat	2.57**	2.59**	3.69***	1.54	1.97*	3.57***	2.22**	2.18**	3.30***	2.44**
Median *z* stat	9.15***	2.70**	8.63**	1.44	1.79*	9.65***	7.94**	4.42***	6.06***	0.40
Panel C										
Low GDP										
Mean	0.2375	0.0850	0.6217	1.0242	0.9338	839	981	941	650	648
Median	0.1000	0.0571	0.0909	0.2000	0.3715	0.0822	0.1465	0.1314	0.1472	0.1219

(Continues)

TABLE 7 (Continued)

	Local language					English				
	ANNUAL REPORT	*EARNINGS*	*STOCK PRICE*	*SHARE PRICE*	*PRICE*	*ANNUAL REPORT*	*EARNINGS*	*STOCK PRICE*	*SHARE PRICE*	*PRICE*
High GDP										
Mean	0.0440	0.4269	0.7117	0.1769	0.2397	1652	1642	1356	1244	939
Median	0.0333	0.1042	0.1818	0.0417	0.0385	0.0580	0.1129	0.1347	0.0859	0.0936
Difference										
t Stat	−2.14**	2.3**	0.21	−1.32	−1.62	1.29	1.31	0.11	2.28**	1.1
z Stat	−6.07***	6.35***	6.45***	−3.75***	−4.3**	5.07***	2.74***	4.96***	3.24***	0.41

Note: Descriptive statistics (Panel A) and cross-country differences (Panels B and C) in the level of search activity for 'sustainability report' *relative* to benchmark terms (e.g., 'Annual report', 'earnings'). *, **, *** represent significance at the 10%, 5%, and 1% level.

4.3 | Who pays attention to sustainability reports? Part I: Examining differences in *relative* search activity

In the previous subsection of this paper, we provided evidence that *absolute* search activity for sustainability reports is greater in common law countries vis-à-vis civil law countries. This result, however, does not necessarily imply that citizens in countries with common law legal origins have stronger preferences for firms to act prosocially. By documenting differences in absolute search activity, we may instead simply be measuring cross-country variation in firms' information environments. As we argue above, the level of attention directed towards all types of public disclosures—including sustainability reports—may be lower in countries with civil law traditions because the stakeholder-orientation of the firms in these countries allows information for monitoring and corrective action to typically be internally communicated to insiders, rather than publicly through disclosure to outsiders (as is standard for firms in common law countries).

To address confounding from cross-country differences in information asymmetry, we exploit a feature of the Google Trends platform that allows for search activity across multiple strings to be queried simultaneously. We make use of this feature by specifying for each query two concurrent search strings: the string of interest ('sustainability report') and a benchmark search string. In our analysis, we use each of 'earnings', 'annual report', 'share price', and 'stock price' as benchmark search strings. When performing these multi-string queries, the resulting search activity measure for sustainability report is scaled by the maximum level of weekly search activity across the two strings over the specified time frame. We argue that this *relative* search activity measure more precisely captures cross-country differences in the level of attention direct towards sustainability reports that is driven by social preferences. This multi-string approach scales and thus partials out variation in search activity driven by a country's general information environment, as proxied by the level of search activity for traditional financial information (e.g., 'annual report'; 'earnings').

Given Google only reports search activity above a certain threshold, we collect and analyse our data at the monthly level. By employing this wider search window, we capture higher frequencies of search behaviour, and thus limit censoring of our search activity measure from below. For each observation, we divide the level of search activity for sustainability reports by the level of search activity for each of the benchmark terms in that month. To avoid spurious scaling that arises from dividing by zero, we follow Da et al. (2011) and Brown et al. (2015) and use only observations from months where there was search activity for both the numerator and denominator search strings.[24] To ensure this does not lead us to overstate relative search activity for sustainability reports, we also compute for robustness a metric that includes search activity for months that have values of zero.

When we measure relative search activity using these concurrent search string queries (the string of interest, 'sustainability report', and a benchmark string) the data set generated features a smaller sample of countries than found in the data set examined in our prior analysis. This arises because there are some countries without sufficient levels of search activity for either some of the benchmark terms or for the term sustainability report when it is scaled by a benchmark (e.g., the level of search activity for sustainability report when scaled by the level of search activity for stock price falls below the reporting threshold employed by Google Trends). As shown in Table 7 Panel A, when using the benchmark term 'annual report', our sample contains data from 17 countries. When using the benchmark term 'earnings', our sample contains data from 20 countries. When using the benchmark term 'stock price', our sample contains data from 16 countries. When using the benchmark term 'share price', our sample contains data from 13 countries. Finally, when using the higher of 'stock price' or 'share price'

[24]Either the numerator (level of search activity for sustainability reports) or the denominator (e.g., the level of search activity for annual reports) could be zero. This will bias our measure if values of zero are included in the metric computation.

in each country (we refer to this combined benchmark term as 'price'), our sample contains data from 13 countries.[25]

In Table 7 Panel A, we present descriptive statistics for our local-language and English measures of relative search activity for sustainability reports. The results show that the median level of search activity for sustainability reports is relatively low across all benchmarks. Specifically, as seen in Table 7 Panel A, based on our local-language results, the median level of search activity for sustainability reports is 4.35% of the level of search activity for annual reports, 7.46% of the level of search activity for earnings, 13.04% of the level of search activity for stock price, 5.13% of the level of search activity for share price, and 6.25% of the level search activity for the higher of either stock price or share price. Also reported in Table 7 Panel A, the results are quantitatively similar for relative search activity in English. Overall, our descriptive statistics suggest that investors and stakeholders pay attention to sustainability reports, but the economic importance of this search activity in a typical country-month appears to be relatively low compared to the level of attention directed towards traditional financial reports and fundamental performance metrics.[26]

In Table 7 Panel B, we present the results from a set of univariate tests of the difference in the level of relative search activity for sustainability reports between civil law and common law countries. Across the five benchmark terms we consider, the results show that civil law countries have higher levels of relative search activity than common law countries. These differences are statistically significant at either the 1% or 5% level for each of our benchmark terms. Specifically, if we focus on the local-language results, the median level of relative search activity for sustainability reports in countries with civil law (common law) legal origins is 15.6% (3.3%) of the search activity for annual report, 18.4% (5.7%) the level of search activity for earnings, 9.8% (6.1%) the level of search activity for stock price, 5.6% (5.0%) the level of search activity for share price, and 6.9% (5.9%) the level of search activity for the higher of either stock price or share price. Also reported in Table 7 Panel B, cross-country differences in relative search activity in English are similar. Overall, these results suggest that search activity for sustainability reports relative to search activity for traditional corporate disclosures and financial performance metrics is considerably greater in countries with civil law origins.

In Table 7 Panel C, we present the results from a set of univariate tests of the difference in the level of relative search activity for sustainability reports between high-GDP countries and low-GDP countries. For the majority of benchmark terms we employ, we do not observe any statistical difference in the mean levels of relative search activity for sustainability reports between low and high-GDP countries. We do observe statistical differences in the median relative search activity between low and high-GDP countries; however, the direction of the difference varies depending on the specific benchmark we employ. As such, at a univariate level, we fail to find evidence that search activity for sustainability reports relative to search activity for information on firms' fundamental financial performance is greater in more economically-developed countries.

However, as we mentioned previously, economic development and legal regime are correlated. Therefore, we estimate the following baseline regression using our panel of monthly country-level observations:

[25]Investors searching for price information could use either the term 'share price' or 'stock price'. The combined benchmark uses for each country the search activity for one of 'stock price' or 'share price' based on which term has a higher level of search activity in that country. The lower number of country-level observations for the combined price metric is due to the greater number of zeros for sustainability report when scaled by the combined benchmark term. This occurs because choosing the most-frequently used price string (e.g., stock or share) results in a larger scaling factor, giving rise to an increase in the number of zeros for the scaled measure of search activity for sustainability reports.

[26]To determine the extent of any bias due to the non-inclusion of observations with zero search activity, we make the following assumptions. Where search activity for the numerator search string 'sustainability report' is >0 and search activity for the denominator benchmark search string = 0, we set that country-month observation = 1. Where search activity for the numerator search string 'sustainability report' = 0 and search activity for the denominator benchmark search string >0, we set that country-month observation = 0. When we apply this set of assumptions and replicate the analysis in Table 7A, the median level of search activity for sustainability reports is 2.1% of the level of search activity for annual reports, 2.3% of the level of search activity for earnings, 3.2% of the level of search activity for stock price, and 0% of the level of search activity for share price.

TABLE 8 Where is relative search activity for sustainability reports greatest?

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Language	**Local**	**Local**	**Local**	**Local**	**Local**	**English**	**English**	**English**	**English**	**English**
	GLS	**GLS**	**GLS**	**GLS**	**GLS**	**GLS**	**GLS**	**GLS**	**GLS**	**GLS**
Benchmark term										
DV = SUST_REPORT/	*ANNUAL REPORT*	*EARNINGS*	*STOCK PRICE*	*SHARE PRICE*	*PRICE*	*ANNUAL REPORT*	*EARNINGS*	*STOCK PRICE*	*SHARE PRICE*	*PRICE*
GDP	−0.0027***	0.0093***	0.0103***	−0.0044**	−0.0074***	−0.0006**	−0.0003*	0.0001	−0.0024***	−0.0017***
	(−7.41)	(14.38)	(7.32)	(−2.22)	(−3.78)	(−6.70)	(−1.76)	(0.81)	(−11.54)	(−8.65)
COMMON	−0.2244***	−0.4817***	−1.2302***	−0.4894***	−0.4764***	−0.0514**	−0.0627***	−0.0770***	−0.0655***	−0.0343***
	(−17.25)	(−22.09)	(−24.85)	(−9.28)	(−5.70)	(−18.60)	(−13.18)	(−13.61)	(−10.67)	(−4.66)
No. of obs.	1832	2361	1721	1168	1060	2491	2623	2297	1894	1587
Country RE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.27	0.25	0.32	0.15	0.13	0.25	0.22	0.38	0.44	0.53

Note: Results from estimation of alternate specifications of the baseline following regression:

$SUSREPORT\_BENCHMARK_{imt} = \alpha + \beta\ GDP_{it} + \beta\ COMMON_i$.

$SUSREPORT\_BENCHMARK_{imt}$ is the level of search activity for 'sustainability report' relative to the level of search activity for each of the benchmark terms (e.g., 'Annual report'; 'earnings) for country i in month m of year t. GDP_{it} is the annual per capita GDP in country i in year t. $COMMON_i$ is a dummy variable that takes the value 1 if country i has a common law legal origin. z-statistics are reported in parentheses. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

TABLE 9 Why do individuals seek out sustainability reports?

	(1)	(2)	(3)	(4)	(5)	(6)
Language	**Local**	**Local**	**Local**	**English**	**English**	**English**
DV = SUST_REPORT	**OLS**	**OLS**	**OLS**	**OLS**	**OLS**	**OLS**
ENVIRONMENT	0.10***	0.10***		0.08***	0.07***	
	(8.87)	(8.62)		(6.43)	(6.34)	
HUMAN RIGHTS	0.07***	0.06***		0.07***	0.07***	
	(6.2)	(6.02)		(6.59)	(6.51)	
STOCK PRICE	0.03***		0.03***	0.03***		0.04***
	(2.74)		(3.12)	(2.74)		(3.74)
SUST_REPORT (t−1)	0.15***	0.15***	0.13***	0.14***	0.14***	0.12***
	(13.79)	(13.76)	(11.08)	(12.91)	(12.93)	(10.33)
SHARE_TURNOVER		4.78***			3.02***	0.04***
		(4.36)			(2.76)	(3.74)
MEDIA_ENVIRONMENT			4.11***			1.09
			(3.82)			(1.06)
MEDIA_HUMANRIGHTS			6.77***			3.76***
			(6.15)			(3.63)
CONSTANT	34.94***	33.93***	40.13***	35.85***	36.00***	43.20***
	(21.87)	(20.48)	(24.31)	(21.41)	(21.87)	(25.64)
No. of observations	13,139	13,139	12,115	13,140	13,139	12,115
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Week	Week	Week	Week	Week	Week
Adj. R^2	0.40	0.40	0.36	0.40	0.40	0.36

Note: Results from estimation of alternate specifications of the following baseline regression:
$SUST\_REPORT_{it} = \alpha + \beta\ ENVIRONMENT_{it} + \beta\ HUMAN\ RIGHTS_{it} + \beta\ STOCK\ PRICE_{it} + \beta\ SUST\_REPORTt_{it-1}$.
$SUST\_REPORT_{it}$ is the level of search activity for sustainability reports for country i in week t. $ENVIRONMENT_{it}$, $HUMAN\ RIGHTS_{it}$, *and* $STOCK\ PRICE_{it}$ are the levels of search activity for these strings for country i in week t. $SHARE\_TURNOVER_{it}$ is share turnover for country i in week t. $MEDIA\_ENVIRONMENT_{it}$ and $MEDIA\_HUMANRIGHTS_{it}$ is a count of the headlines containing these terms in the national newspapers of country i in week t. Robust t-statistics are reported in parentheses and calculated using standard errors clustered by week. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

$$SUSREPORT\_BENCHMARK_{imt} = \alpha + \beta COMMON_{it} + \beta GDP_{it} + \mu_{imt}, \quad (4)$$

where $SUSREPORT\_BENCHMARK_{imt}$ is the level of search activity for sustainability reports in country i in month m of year t relative to the level of search activity for a benchmark financial term in country i in month m of year t. Specifically, we benchmark against the terms 'annual report', 'earnings', 'stock price', and 'share price'. All other variables in Equation (4) are defined as above. Given legal origin is time invariant, we estimate Equation (4) using random-effects GLS. We also include time fixed effects to control for global shocks. If search activity for sustainability reports relative to search activity for financial information is higher in civil law countries, the coefficient on $COMMON_{it}$ should be negative.

In Table 8, we report the results for estimating Equation (4). Columns (1)–(5) report results from local-language search activity. Columns (6)–(8) report results from search activity in English. Across both sets of results, the estimates strongly suggest that the level of search activity for sustainability reports relative to the level of search activity for traditional financial information is higher in countries

with civil law traditions compared to countries with common law legal origins. This difference—which is economically-important and statistically-significant—holds for each of the benchmark terms we employ. If we focus on local-language results, the coefficient on *COMMON* is consistently negative and ranges from $\beta = -0.2244$, $p < 0.01$ to $\beta = -1.2302$, $p < 0.01$. In contrast, across each of the columns in Table 8, the size and direction of the coefficient on *GDP* vary based on the specific benchmark term we employ when scaling our search activity measure. We reconcile this result with our earlier finding—namely, that absolute search activity appears to be increasing in GDP—by pointing out that economic development may increase the level of attention directed towards both sustainability reports *and* traditional financial disclosures (i.e., as investors and stakeholders grow wealthier they may come to care more about all types of firm activities). As it is not clear ex ante which of these increases in demand for information is greater, our measure of relative search activity may be either positively or negatively related to GDP.

Overall, Tables 7 and 8 suggest investors and stakeholders in civil law countries pay greater attention to sustainability reports *relative* to traditional firm disclosures and financials than individuals in common law countries. This is consistent with the idea that citizens in countries where firms are more stakeholder-oriented have stronger preferences for corporations to engage in prosocial activities. In contrast, we show that the relationship between relative search activity for sustainability reports and economic development is less clear.

4.4 | Why do people pay attention to sustainability reports?

As discussed above, intrinsic concern for environmental or social issues may lead external stakeholders to seek out sustainability reports. At the same time, investors should pay attention to sustainability reports if these disclosures contain information that is useful for firm valuation. To test these predictions, we examine whether investors and stakeholders pay more attention to sustainability reports when demand for information on either environmental or social issues is like to be greater, and when demand for information that is useful for firm valuation is likely to be greater. To do so, we use our panel of weekly country-level observations to estimate the following baseline OLS regression:

$$SUST\_REPORT_{it} = \alpha + \beta ENVIRONMENT_{it} + \beta HUMANRIGHTS_{it} + \beta STOCKPRICE_{it} + \mu_{it}, \quad (5)$$

where again $SUST\_REPORT_{it}$ is the level of search activity for sustainability reports in country i in week t. $ENVIRONMENT_{it}$ is the level of search activity for strings that include the term 'environment' in country i in week t. This is our measure of demand for information on the environment or environmental issues. $HUMANRIGHTS_{it}$ is the level of search activity for strings that include the term 'human rights' in country i in week t. This is our measure of demand for information on human rights and, more broadly, social issues. $STOCKPRICE_{it}$ is the level of search activity for strings containing the term 'stock price' in country i in week t. This is our measure of demand for information that is useful for firm valuation. Consistent with our predictions that shifts in demand for information pertaining to the environment, social issues and firm valuation will drive investors to pay greater attention to sustainability reports, we expect positive coefficients on $ENVIRONMENT_{it}$, $HUMANRIGHTS_{it}$, and $STOCKPRICE_{it}$.

In Table 9, we report the results from estimating Equation (5). Columns (1)–(3) report results from local-language search activity. Columns (4)–(6) present results from search activity in English. As reported in Table 9 column (1), the estimates from our baseline specification show a positive and statistically-significant association between search activity for sustainability reports and our proxies for demand for information on the environmental issues ($\beta = 0.10$, $p < 0.01$), social issues

(β = 0.07, $p<0.01$), and firm valuation (β = 0.03, $p<0.01$).[27] Reported in Table 9 column (4), the English-language results are quantitatively very similar.

For robustness, we examine alternate proxies for demand for information related to the environment, social issues, and firm valuation. As an alternative to our search activity-based measure of demand for information useful for firm valuation, we use the weekly share market trading volume for each country. We scale this measure of trading activity by the highest week of share market turnover in that country over our sample period. Reported in Table 9 columns (2) and (5), the coefficient on *SHARE_TURNOVER* is positive and statistically significant (β = 4.78, $p<0.01$ and β = 3.02, $p<0.01$, respectively). This result is again consistent with an association between additional demand for information for firm valuation and increased attention directed towards search activity for sustainability reports.

As alternative proxies to our search activity-based measures of demand for information on environmental and social issues, we use the weekly count of media headlines in country *i* that include the terms 'environment' or 'human rights'. We use Factiva to construct this measure and source the number of times in each country-week that the terms 'environment' or 'human rights' are mentioned in the headline of that country's national newspapers. We then scale this number by the maximum weekly count of headlines mentioning the environment or human rights in that country during the period of our sample. Reported in Table 9 columns (3) and (6), the coefficients on *MEDIA_ENVIRONMENT* (β = 4.11, $p<0.01$ and β = 1.09, $p>0.10$, respectively) and *MEDIA_HUMANRIGHTS* (β = 6.77, $p<0.01$ and $\beta = 3.76$, $p<0.01$, respectively) are positive and (for the most part) statistically significant.

To extend this analysis, we also examine whether demand for information on the environment or demand for information on social issues is more strongly associated with search activity for sustainability reports. We do so by conducting an *F*-test of the equality of the coefficients on *ENVIRONMENT* and *HUMAN_RIGHTS*. Using the local-language estimates reported in Table 9 column (1), we find that demand for information on the environment appears to be more strongly associated with search activity for sustainability reports than demand for information on social issues (*F*-test = 5.13, $p<0.05$). However, when we use the English-language estimates reported in Table 9 column (4), we fail to detect a statistically-significant difference between the coefficients on *ENVIRONMENT* and *HUMAN_RIGHTS*.

Overall, the results reported in Table 9 suggest that investors pay more attention to sustainability reports when demand for information on the environment and social issues is likely greater, and when demand for information that is useful for firm valuation is likely greater. This finding supports the idea that individuals search for sustainability reports both out of an intrinsic concern for environmental and social issues, and for the purposes of firm valuation. Furthermore, we find weak evidence that search activity for sustainability reports is more strongly associated with demand for information on environmental issues than demand for information on social issues.

5 | CONCLUSION

In this paper, we introduce country-level Google search activity as a direct measure of the level of investor and stakeholder attention directed towards sustainability reports. We validate this measure by documenting a strong association between the level of search activity for sustainability reports and firms' supply of these reports. This analysis is based on the idea that a valid measure of investor and stakeholder attention should comove with the local supply of sustainability reports. First, we show that for the period 2004–2017 both search activity for sustainability reports and firms' supply of these reports grew in tandem. Second, we show that calendar-month variation in search activity for sustain-

[27] To guard against the possibility users searching for the term 'environment' also included 'report' in their search string (i.e., we are picking up search activity for sustainability reports with our proxy for demand for information on the environment), we also use a search string with a Boolean operator that excludes searches for that contain the term 'report' in the same query as 'environment'. The results, not tabulated, are similar to the findings above.

ability reports is associated with the timing of local firms' disclosure of these reports. We then show that the level of attention directed towards sustainability reports is very low compared to the level of attention directed towards financial and accounting information.

Next, we examine two related research questions. First, we identify *who* pays attention to sustainability reports. In the cross-section, we find that search activity for sustainability is positively associated with the level of economic development in a country. This is consistent with findings in environmental and developmental economics, in particularly theory on the environmental Kuznets curve. While we show that *absolute* search activity for sustainability reports is greater in countries with common law origins than in countries with civil law traditions, when we examine *relative* search behaviour—that is, the level of search activity for sustainability reports relative to the level of search activity for financial performance metrics—we find individuals in civil law countries pay greater attention to sustainability reports than individuals in common law countries. We argue the former result reflects differences in the information environments faced by firms in the two types of countries, while the latter result is consistent with stronger preferences for prosocial corporate actions amongst citizens in countries where firms are more stakeholder-oriented. Relatedly, we present evidence that suggests sustainability reports are used for two primary purposes: the assessment of the societal benefits and costs of firms' actions, and firm valuation.

In summary, we use a direct measure of attention—Internet search activity—to provide some of the first direct empirical evidence on the level of investors and stakeholder attention directed towards sustainability reports. Overall, our findings inform debate over whether sustainability reporting should be mandated, and, if so, the information firms should be required to report in these disclosures. Our findings also offer a number of useful insights for corporate managers, many of whom are increasingly dedicating greater amounts of resources towards the production of CSR information.

ACKNOWLEDGEMENT

We thank Mary Barth, Katherine Schipper, Tom Barry, Samuel Gethin-Jones, Gillian Vesty and seminar participants at the Royal Melbourne Institute of Technology for their helpful comments and suggestions. All errors are our own. Open access publishing facilitated by The University of Melbourne, as part of the Wiley - The University of Melbourne agreement via the Council of Australian University Librarians.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are publicly available from Google Trends and the world bank.

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How to cite this article: Ferguson, P.J., Hronsky, J. & Pinnuck, M. (2023) Who pays attention to sustainability reports and why? Evidence from Google search activity. *Accounting & Finance*, 63, 3519–3551. Available from: https://doi.org/10.1111/acfi.13045

APPENDIX 1: VARIABLE DEFINITIONS

Variables	Definition	Source
Google search strings	*Google weekly search activity for the following search strings*	
SUS_REPORT	'sustainability report'	Google Trends
CSR_REPORT	'csr report'	Google Trends
ENVIRONMENT	'environment'	Google Trends
HUMAN RIGHTS	'human rights'	Google Trends
STOCK PRICE	'stock price'	Google Trends
SHARE PRICE	'share price'	Google Trends
COMB_PRICE	'share price' or 'stock price'	Google Trends
Google search strings	*Google monthly search activity for 'sustainability report' relative to search activity for the following search strings*	
ANNUAL REPORT	'annual report'	Google Trends
EARNINGS	'earnings	Google Trends
SHARE PRICE	'share price'	Google Trends
STOCK PRCE	'stock price'	Google Trends
COMB_PRICE	'share price' or 'stock price'	Google Trends

Variables	Definition	Source
Other variables		
SUPPLY	Number of sustainability reports issued by firms in country *i* in year *t*	Corporate Register
GDP	GDP per capita of country *i* in year *t*	World Bank
SHARE_TURNOVER	Share turnover for each country *i* in week *t* scaled by the maximum weekly share turnover for country *i* during over the period of the sample	Thomson Reuters Datastream
MEDIA_ENVIRONMENT	Number of headlines containing the term 'environment' in the national newspaper of country *i* in week *t* scaled by the maximum weekly number of headlines containing the term 'environment' in the national newspaper of country *i* over the period of our sample	Factivia
MEDIA_HUMANRIGHTS	Number of headlines containing the term 'human rights' in the national newspaper of country *i* in week *t* scaled by the maximum weekly number of headlines containing the term 'human rights' in the national newspaper of country *i* over the period of our sample	Factivia
COMMON	A dummy variable that takes the value of 1 for countries with common law legal origins. Source: Appendix B in Liang and Renneboog (2017)	