Responsible Investments and Subsidiary-Level Regulation on Sustainable Performance

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Abstract

We examine how a mechanism of private tax scrutiny jointly with influential responsible institutional ownership affects sustainable business practices performance captured by ESG scores. We leverage the experience of the 2016 UK private Country-by-Country Reporting (CbCR) regulation dedicated to increase tax transparency and demotivate income shifting at subsidiary-level. Then we focus our attention on the institutional ownership endorsed by the Principles for Responsible Investment (PRI) launched by UN in 2006. We find that the effect of CbCR mandate on ESG performance is overall positive and significant only when there is a high percentage of PRI ownership. Alternatively, this effect varies with lower levels of PRI investors following a salience bias approach on social and governance agenda as urged by the same CbCR rules. This study highlights how a regulatory approach could lead investors to exert more effective engagement on corporate sustainable business practices, object of long-term investments.

Keywords: Sustainable performance, UN PRI investors, Private UK Country-by-Country Reporting regulation, UK multinational corporations.

Data Availability: Data are retrieved from public data sources as Orbis BVD, CRSP WRDS, Sustainalytics WTDS, Thomson Reuters Eikon Refinitiv, and ISS-EVA. The classification of investors has been conducted manually based on the UN PRI list released on the UN PRI website.

JEL Classification: G20; G23: G38; G39; H20; H25

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1. INTRODUCTION

Considerable research has focused on how companies and responsible investors operate within existing regulatory frameworks (Stubbs and Higgins, 2018; Krueger et al., 2024). However, there is a notable gap in the literature regarding how they can drive systemic change through direct engagement with policymakers (Khoo and Tallarita, 2024). While much of our research has centered on the systemic business practices of companies, it is equally important to consider the role of responsible investors play in influencing the sustainability practices of their portfolio companies—both positively and negatively (Gibson Brandon et al., 2022; Dikolli et al., 2022; Liang et al., 2022; Kim and Yoon, 2023). Additionally, exploring how investors can collaborate with policymakers to facilitate transformative changes in business and society is an area deserving of further attention (Cohen et al., 2023; Abraham et al. 2024). Recognizing that this topic is underexplored in the scientific community, we aim to examine the impact of financial regulatory interventions on corporate Environmental, Social, and Governance (ESG) practices, particularly when they intersect with market-based approaches employed by responsible institutional investors.

To this end, we focus on the unique regulatory experience of the Country-by-Country Reporting (hereafter, CbCR) regulation for multinational corporations (MNC) in the United Kingdom, which was designed to assist tax authorities in combating tax-motivated income shifting. In 2013, the Organization for Economic Co-operation and Development (OECD) introduced a series of recommendations to address base erosion and profit-shifting activities, notably through the introduction of CbCR guidelines (Action 13) leading to the final adoption in 2016. The CbCR regulation aims to increase external transparency, making multinational firms' tax practices more visible to tax authorities, regulators, and civil society by mandating the disclosure of multinational corporations' activities in their foreign subsidiaries (Nessa et al., 2025). This initiative represented a significant regulatory shift, as it provided new, granular financial information that exposed the activities of multinational corporations in their foreign subsidiaries for the first time.

The release of this subsidiary-level data through the mandated CbCR disclosure is a valuable step forward, since that it unveils a set of hidden financial information linking the corporate performance of sustainable practices (i.e., the role of tax transparency as an increasingly relevant component of ESG reporting – Müller et al., 2023; the social impact in terms of human rights, corruption and labor conditions - Baudot and Cooper, 2022). ESG factors influence

investor valuations, since that environmental and social objectives intersect with corporate governance concerns and financial interests, moreover when companies have subsidiaries in regions with low labor costs, favorable tax conditions, and lax environmental regulations. Institutional investors, as significant shareholders in companies worldwide, are well-positioned to monitor and influence corporate management. Their influence ranges from threatening to sell shares to actively using voting rights and engaging with management (Gillan and Starks, 2003). Furthermore, institutional investors are increasingly effective in steering corporate management and boards toward creating shareholder value (Ferreira and Matos, 2008). Perhaps most importantly, they are pushing companies to improve their environmental and social (E&S) performance globally. This shift is largely driven by investor demand for better E&S practices (Dyck et al., 2019, Azar et al., 2021).

However, the behavior of institutional shareholders in adopting responsible investment strategies is subject to debate for two primary reasons. First, their commitment to responsible investing is largely guided by voluntary market-based approaches rather than binding regulations, making it difficult to verify their practices—though there are some exceptions related to UK stewardship governance code (Bonacchi et al., 2022). Second, despite their engagement efforts, institutional investors may be influenced by performance biases, as the tradeoff between portfolio sustainability and performance can undermine the effectiveness of sustainability ratings (He et al., 2023; Gantchev et al., 2024).

While a unique, enforceable regulation is likely necessary to channel capital toward more sustainable investments, we take a different approach by examining the role of tax transparency regulation (i.e., the 2016 CbCR regulation) in multinational corporations and the influence of responsible investors on the effectiveness of sustainable business practices. We leverage the role played by institutional networks with an interest in ESG issues (covering areas such as Co2 emissions, renewable energy use, human rights violations, and employment quality) notably known as “PRI investors” following the UN Principles for Responsible Investment (PRI) (Eccles, 2010; Majoch et al., 2017; Brandon et al., 2021; Hoepner et al., 2021; Kim and Yoon, 2023; Cohen et al., 2023). It should be pointed out at the outset that PRI investors are attracted to the profits of multinational corporations like all other institutional investors. However, in the wake of climate change and many tax fraud and labor accident scandals (Christensen et al., 2017), they know that they cannot fail to look at non-financial performance. Focusing on a sample of UK-listed firms covering the period 2013-2019 with ownership structures influenced

by PRI investors this study addresses two key research questions: Do MNCs improve ESG performance when their institutional ownership is endorsed by PRI investors in response to the CbCR law adoption? Do these firms face trade-offs in their ESG performance, particularly between tax transparency (governance) and other ESG dimensions (environmental and social), amid the combined pressures from PRI investors and increasing public scrutiny by tax authorities?

Identifying the impact of PRI investors and the new CbCR requirements for multinationals on sustainable business practices (ESG practices) can be challenging. First, PRI investments may be influenced by factors such as a firm's financial performance and liquidity (Gantchev et al., 2024). In other words, firms often attract PRI investors when they are already performing well. This can lead to biased estimates of ESG performance, as PRI investors may increase their stocks' portfolios, and quite probably their engagement power, in these firms once the CbCR mandatory disclosures come into effect. Second, the relationship between CbCR and ESG practices could depend on income-shifting strategies or the disinvestment choices by decreasing risk exposure (i.e., reputational risk, and litigation risk). To overcome these challenges, we examine the impact on ESG performance surrounding the 2016 exogenous regulatory shock of the UK reform that required large businesses to disclose their tax strategy, better known as Country-by-Country Reporting regulation (Bilicka et al., 2025). First, we apply a difference-in-difference (DID) research design identifying a treatment group of the UK MNCs obliged to adopt the rules of CbCR and a control group of the non-CbCR UK listed firms to help "difference out" possible confounding factors and isolate the effect of CbCR mandate on ESG corporate performance. The first findings show an ameliorating effect on sustainable practices for CbCR MNCs.

We next explore how influential responsible institutional ownership affects the ESG performance around the CbCR regulatory adoption. We reshuffle the sample employed before by identifying a treatment group of the UK listed firms endorsed by PRI ownership and a control group of the UK listed firms owned by other institutional investors. Also, in this case we find that PRI investors' ownership is much more effective once CbCR mandate enters into force. Thus, to reconcile our first findings, we run a triple difference-in-difference (DDD) research design, by employing several matching techniques to construct a comparable control group (i.e., an entropy balancing approach and a propensity score matching), to identify the effects of MNCs obliged to adopt CbCR rules and owned by PRI investors. On the one hand,

PRI investors could mitigate ESG performance effect because overtaken by more standardized regulation that diminishes their role through engagement. On the other hand, PRI investors could provide a further effect on ESG performance following the logic of a voluntary enforcement mechanism through their monitoring activities. We find that before the CbCR adoption the relation between institutional ownership endorsed by PRI and ESG performance is not significant, even in the pre-regulatory period when we interact the presence of PRI investors with the companies that will be under the treatment of CbCR mandate. These results could indicate their interests more on financial performance than sustainability (Gantchev et al., 2024). In the post CbCR adoption we find that these firms under the treatment of CbCR and PRI ownership increase the level of ESG practices compared to the control group of firms. Our results support the view that CbCR scrutiny encourages PRI investors' trust in exercising their engagement and consequently improving ESG performance. Our results are robust to a variety of model specifications through verifying cross-sectional variation on various measures of influential institutional ownership endorsed or not by UN PRI, different entropy balancing and propensity matching techniques.

Our study is related to several studies that examine the relation between private CbCR mandate and ESG performance (Joshi, 2020; Müller et al., 2023; Nessa et al., 2025). Different from prior studies, we focus on the effect of CbCR on sustainable business practices emphasizing how tax transparency opens the box of ESG issues. Our test design not only allows us to study the effect of CbCR on ESG performance at a particular point in time but also helps us examine the evolution of such an effect over political and economic cycles at country level (i.e., 2016 is the year when CbCR takes effect in UK, and this country exits definitely from the EU). Contributing to the ongoing debate regarding the value implications of CbCR, we find that this regulatory reform effect, enhancing the power of the private scrutiny, improves not only the governance item, but also environmental and social aspects.

Our study speaks up also to the prior studies understanding how much institutional investors endorsed by UN PRI matters on ESG practices. Beyond the fact that PRI investors show a positive propensity in investing responsibly, it is necessary to admit that they show this inclination based on a voluntary mechanism not controlled, let alone enforced. Furthermore, the quality of their engagement depends on the use of ESG data information, released voluntarily by companies, for investment decision making due to the lack of comparability between firms (Amel-Zadeh and Serafeim, 2018). In this case our study shows empirically that

around CbCR adoption the UK listed firms owned by PRI investors experience an increase of ESG performance, particularly the governance pillar, confirming the salience pay-off of the tax transparency increase (Müller et al., 2023).

Our paper contributes to the growing literature on the impact of institutional investors on corporate performance across the individual Environmental, Social, and Governance (ESG) dimensions (Matos, 2020). Related to the joint effect on sustainable business practices when companies are scrutinized (CbCR treatment) within PRI investors' participation, different from prior works we see that the effect is comprehensively spread out on all the pillars (Environmental, Social, and Governance) comprising the overall ESG ratings. These results seem to lead PRI investors to be much more convinced about not just E&S corporate policies, but also the Governance aspects. In the last times, Governance has been examined separately from E&S items. However, tax transparency through CbCR rules linked mainly to Governance items, and basically embracing financial information and strategies (Bilicka et al., 2025), enhanced also E&S aspects.

While PRI investors can push for improved practices, they might not provide the same level of external accountability as public scrutiny through CbCR. Indeed, CbCR regulation aims to increase external transparency, making multinational firms' tax practices more visible to tax authorities, regulators, and civil society. Therefore, PRI investors' influence should be considered complementary to CbCR rather than a replacement (joint effect). In that sense, we highlight that higher PRI institutional ownership improves ESG performance among investees (Chen et al., 2020; Li et al., 2021; Barko et al., 2021; Bauer et al., 2023) when firms are scrutinized following CbCR rules.

The remainder of the paper is organized as follows. In Section 2, we describe the CbCR institutional setting. In Section 3, we provide an overview over the related literature and discuss our three hypotheses. In Section 4, we describe data sources and sample characteristics, and the methodology employed to test our three hypotheses. Section 5 reports the empirical results and robustness tests. Section 6 contains the conclusions of the paper. The appendix provides definitions for the variables used in our tests.

2. THE UK REGULATORY INTERVENTION OF THE COUNTRY-BY-COUNTRY REPORTING

The United Kingdom, with some of the most developed and regulated capital markets in the world, likely sees investor demand for high-quality reporting outweighing opportunistic

behavior (Ball and Shivakumar, 2005). The country's institutional architecture—comprising common law, an established audit profession, strong enforcement—creates better incentives for earnings quality in public firms compared to other EU countries (La Porta et al., 1998; Bonacchi et al., 2019). This suggests that the relative earnings quality of public and private business groups is shaped by the interplay of institutional frameworks, tax regimes, and firm incentives. As a result, two key phenomena unfold in tandem in the UK: 1) the rapid pace of regulatory reforms fostering a cutting-edge business environment under the pressure of the civil society (Baudot and Cooper, 2022), and 2) the growing awareness of responsible investments through market-based approaches (Bonacchi et al., 2022). In this study we consider one of the most significant regulatory reforms adopted in the UK with the aim to increase tax transparency, such as the 2016 Country-by-Country Reporting (hereafter, CbCR) regulation.

In the years 2013-2015 the Organization for Economic Co-operation and Development (OECD) identified the lack of information about sophisticated tax arrangements as a major barrier to effective tax enforcement. The revelation of aggressive tax planning strategies employed by multinational corporations (MNCs) put significant pressure on policymakers to tackle harmful tax practices. In response, the OECD introduced its final action plan on base erosion and profit shifting (BEPS), including measures to improve corporate tax transparency. As part of the UK's commitment to the OECD's BEPS Action Plan, particularly Action 13, the Country-by-Country Reporting (CbCR) regulations were enacted for accounting periods starting on or after 1 January 2016[1].

Prior to CbCR initiative, various transparency efforts had been introduced in the UK following IFRS framework and further governmental regulatory proposals (Kang and Grey, 2019; Brown et al., 2019). Effective from 1 January 2009, IFRS 8 requires a firm's operating segments to be based on what is reported to internal management. This contrasts with providing primary and secondary segment information, based on business activities and geographic locations, required under the prior accounting standard on segment reporting, IAS 14 Segment Reporting.

[1] Under Action Item 13, MNCs are required to enhance their disclosures to tax authorities by submitting an annual Country-by-Country (CbC) report to each jurisdiction in which they operate. This report must include details such as revenue (separated between related and unrelated entities), profit or loss before tax, income tax paid and accrued, stated capital, retained earnings, employee count, and tangible assets. To ensure consistent reporting across jurisdictions, the OECD established an agreement to enable the secure and confidential exchange of CbC reports between tax authorities worldwide. The primary aim of this reporting is to strengthen tax enforcement and discourage aggressive tax planning.

Nevertheless, such segments may not necessarily be identified on a country-by-country basis. That is, the identification of geographic segments and related disclosures on a country-by-country basis can be essentially voluntary.

Another initiative was the Company Act of 2006 requires firms to disclose the name and location of all subsidiaries owned by a British multinational corporation. Differently, CbCR rules mandatorily required MNCs to disclose tax-related information country-by-country to enhance transparency and enable tax authorities to assess better and address risks related to tax avoidance and aggressive tax planning by large multinationals. For instance, CbC reports are submitted annually by the parent company of a multinational group in its resident jurisdiction. In the direction of enhancing transparency, the OECD developed the Multilateral Competent Authority Agreement for the exchange of CbC reports. This agreement ensures that all tax authorities, regardless of local activity or disclosure requirements, have access to the same information. For example, if a UK-headquartered multinational has operations in Canada, Barbados, and France, it submits the CbC report in the UK, which is then shared with tax authorities in those countries.

Through the shift to mandatory CbCR UK's implementation: 1) UK-parented multinational groups with consolidated revenue of £750 million or more must file a CbCR with HM Revenue & Customs (HMRC). 2) The CbCR includes data on revenue, profits, taxes paid, number of employees, and assets, broken down by country. These disclosures are intended to provide tax authorities with a clearer picture of where companies are generating profits and paying taxes, allowing for better oversight and reducing opportunities for aggressive tax avoidance. At this stage we point that the UK CbCR aims at increasing corporate tax transparency by informing privately (and not publicly) tax authorities (De Simone and Olbert, 2022). This was the political path taken by the UK government over a divisive debate on whether to make CbCR disclosure mandatory and public, or mandatory and private. Proponents of public CbCR, such as the EU and the FASB, claim that public country-level disclosure makes MNCs accountable to local communities. However, supporters of private CbCR, such as the OECD, argue that requiring firms to publicly disclose a detailed geographic breakdown of their results can have unintended consequences, like an increase in proprietary costs. Nevertheless, Joshi (2020) finds that private country-level disclosures can achieve the intended reduction in tax avoidance, beyond limited

evidence in reduced income shifting[2].

The link between tax transparency through CbCR and ESG reporting concerns ethical governance practices and how MNCs operate in diverse global markets, since it puts more attention on how companies manage their global operations as profits allocation and costs incurring. It is well known that MNCs often operate across countries with varying tax rates, labor costs, and regulatory environments, and this can create incentives for profit shifting to jurisdictions with lower taxes or cheaper labor. These strategies may provide financial advantages but can raise concerns about fairness and the ethical implications of such practices. Moreover, when MNCs disclose their tax arrangements, they also signal how they contribute to the economies where they operate. Companies that pay taxes proportionate to their profits in each country demonstrate a sense of responsibility toward local communities, infrastructure, and public services, aligning with the "Social" aspect of ESG. On the other hand, firms that engage in aggressive tax avoidance through profit shifting might be seen as prioritizing financial gains over fair economic contributions, which could negatively impact their overall ESG ratings.

CbCR disclosure plays a crucial role in ensuring the integrity and transparency of MNCs' tax practices, supporting broader ESG goals by promoting responsible governance, fair economic practices, and greater accountability to stakeholders. Particularly in the UK, where capital markets attract many institutional investors (Bushee, 1998; Bhojraj et al., 2009; Edmans et al., 2024) who hold significant stocks' portfolios in UK-listed companies and engage through their monitoring roles, responsible investors have become increasingly influential. This is especially true for those endorsing the 2006 UN PRI (Principles for Responsible Investment) guidelines, which encourage long-term ESG performance (Krueger et al., 2020; Azar et al., 2021; Barber et al., 2021; Kim and Yoon, 2023). Our project explores how the adoption of private CbCR disclosure acts as an exogenous shock, shaping ESG practices when firms see an increase of

[2] Baudot and Cooper (2022) trace in their study the ambiguity and complexity of CbCR regulatory initiatives dedicated to the extractive sector and considered by various regulatory bodies, such as the IASB, SEC, and the EU. They highlight that the CbCR initiative initially emerged from the private international sphere, driven by pressure from organizations like the Tax Justice Network and the Publish What You Pay (PWYP) coalition advocating more transparency. Over time, the initiative gained traction in the public sector, particularly through discussions within the G20 and OECD about the extractive industry's influence on international development and corruption. This led to the introduction of CbCR in US legislation, coinciding with the financial crisis, and shortly afterward, CbCR was also introduced in the EU, following lobbying efforts by PWYP and concerns over inaction by the IASB.

regulatory scrutiny and contemporarily are owned by responsible shareholders.

3. THEORY, PRIOR EVIDENCE, AND HYPOTHESES DEVELOPMENT

Regulatory mandates of both public and private accounting bodies are often associated with reporting objectives, such as decision-usefulness or stewardship, and interests like investor primacy (Ravenscroft and Williams, 2009; Müller, 2014). For decades, a stewardship objective was central to accounting rules before being replaced in the 1980s by an objective focused on providing information deemed useful to financial statement users (Ravenscroft and Williams, 2009; Zhang & Andrew, 2014). Decision-usefulness objectives now dominate the mandates of several regulatory bodies. More recently, Pelger and Speiß (2017) show that private accounting bodies privilege the interests of an "inner circle" of "informed" users that includes institutional investors, analysts, global auditors, and even multinational firms themselves (Bozanic et al., 2012). In the context of the UK CbCR setting, we examine private information held by tax authorities. We see private information required by regulators could potentially induce further stakeholders' behaviors and be appreciated to mitigate a potential rise in proprietary costs at firm-level. For instance, when public CbCR mandatory disclosure was adopted for banks in the EU, the market's response was negative by identifying much more costs despite benefits (Müller et al., 2024). Along the path that the private CbCR mechanism may have been attentive to the practices of sustainability, we can't help but wonder which role investors play. Institutional ownership has become more and more influential with respect to corporate behavior itself, especially when they are responsible investors (Dyck et al., 2019; Brandon et al., 2021; Kordsachia et al., 2022).

In this study we consider the Principles for Responsible Investment (PRI) established in 2006 through a process convened by the United Nations Secretary-General Kofi Annan, reflecting the growing significance of Environmental, Social, and Governance (ESG) issues in investment practices[3]. PRI initiative seeks to encourage an active ownership and advocates for systemic

[3] In 2006, 20 asset management professionals were drawn from 12 countries and supported by a 70-member group of experts from the investment industry and intergovernmental organizations. By December 2024, it had expanded into a global network with more than 5,000 signatories representing US $128.4 trillion in assets under management. The PRI is not a specific group of investors but a broad coalition that includes asset managers (e.g., BlackRock), asset owners (e.g., California Public Employees' Retirement System), and data providers (e.g., MSCI), all committed to integrating ESG factors into their investment strategies (https://www.unpri.org/pri-blog/meeting-investors-where-theyre-at-pri-launches-new-strategy/12636.article).

changes that promote responsible investment, collaborating with other investors, and reporting on progress toward these goals. By adhering to these principles, investors contribute to fostering sustainability and promoting more responsible corporate behavior.

PRI signatories commit to voluntarily report their responsible investment activities. This enables PRI signatories to closely monitor the sustainability practices of their portfolio firms and push for more sustainable practices (Dyck et al., 2019; Brandon et al. 2021; Kordsachia et al., 2022). However, the signatory status comes with two mandatory requirements. First, all signatories need to pay an annual membership fee. Second, PRI signatory investors commit to publicly report on their responsible investment considerations and decision-making on a yearly basis. PRI reports are increasingly posted voluntarily on investor websites and provided by investment managers as signals of their ESG credentials when they compete for requests for proposals on investment mandates (as well as in subsequent reporting). While the application of the PRI is voluntary, the initiative provides a menu of actions for integrating ESG factors into investment strategies, empowering investors to take tailored approaches.

Following Barber et al. (2021), by signing the UN PRI tend, institutional investors have a higher willingness to pay. This indicates that these organizations are more committed to responsible investment practices, which aligns with the values of sustainable and impact investing. It suggests that the signatories may be more likely to invest in socially responsible projects, contributing positively to ESG goals and demonstrating their commitment to sustainability. Investors joining PRI not always could induce firms to assume more sustainable behaviors. This is supported by anecdotal evidence and recent studies showing that institutional investors, even when signing up for PRI commitments, may not show superior environmental performance in their portfolios. Gibson et al. (2022) find no improvement in ESG scores among U.S. firms that sign onto the PRI. However, for institutions domiciled outside of the U.S., these authors find that PRI signatories that claim to incorporate ESG considerations into their active equity holdings have better portfolio ESG scores than non-PRI signatories. Looking at active managers, Kim and Yoon (2023) find that PRI signatories do not improve their ESG scores and experience a decrease in returns. Additionally, an analysis of their proxy voting behavior reveals that PRI managers do not increase support for pro-ESG shareholder proposals and, in fact, decrease their support for pro-governance proposals compared to the pre-signing period.

These studies highlight that investors labelled as “socially responsible” should reflect a responsible investment approach. However, the demand for socially responsible investment

products may lead to greenwashing by asset managers. The inflow of investment dollars to the PRI signatories increases by 4.3%, but the returns reported by the signatory funds fall, suggesting that the funds signed the PRI purely for greenwashing or marketing purposes (Kim and Yoon, 2023). On this wave, Raghunandan and Rajgopal (2022) document that firms held by self-proclaimed ESG funds, as identified by Morningstar, do not have better ESG records, relative to a control sample of non-ESG funds in the same fund family. Differently, Dikolli et al. (2022) find that ESG funds of PRI families are significantly more likely to support E&S proposals and G proposals than non-ESG funds of PRI families. However, hedge funds that sign the PRI but have lower weighted-average ESG scores also underperform financially. In this case, the endorsement of responsible investment should be symptomatic of agency problems, which may in turn hurt investment performance (Liang et al., 2022). On the basis of this last agency problem consideration, we leverage the corporate experience of a privately and low-costly increasing financial information transparency at subsidiary level, to understand whether the PRI investors trust sustainable businesses practice and consequently their engagement is effective, when the scrutiny degree increases.

Financial transparency is always advocated from stakeholders though mandatory disclosure mechanisms in order to mitigate agency issues and bankruptcy risk. CbCR rules came up in the wake to drawn significant public attention to corporate tax avoidance, sparking increasing demands for greater tax transparency. Moreover, the push for such reforms stems from the fact that multinational companies typically operate across multiple jurisdictions, with subsidiaries in different countries. This international structure allows MNCs to allocate profits strategically, reducing their global tax burden through profit-shifting, tax haven use, and complex financial arrangements. Beyond these tax avoidance tactics, it often reflects a broader corporate culture prioritizing profits over ethical considerations, sustainability, or social responsibility. Müller et al. (2024) posit that firms with a weak pre-regulation ESG performance might receive more public scrutiny, as their additional CbCR disclosure is more informative about their commitment to responsible tax behavior. Therefore, we could expect that multinational corporations to reposition a range of sustainable business practices to the center, where until before there was a greater likelihood of neglecting key aspects of ESG performance, such as environmental responsibility, labor rights, or corporate transparency. Correspondingly, we hypothesize as follows:

H1: Firms subject to the UK CbCR mandate ameliorate ESG performance than not subject to the mandate, when CbCR rules take effect.

At this stage we consider two interrelated aspects: on the one hand, a regulation not only affects corporate behavior with their managerial strategies but also affects the reaction of external stakeholders. On the other hand, not all stakeholders can exert their engagement with the same intensity.

Investors factor firm tax avoidance and tax reporting into their valuation decisions (Hanlon and Slemrod, 2009; Wilson, 2009; Goh et al., 2016), but there's limited evidence regarding the mechanisms shareholders use to penalize tax policies seen as harmful. Donelson et al. (2024) explore the channel of shareholder litigation as a viable mechanism to reduce these agency costs, as it restricts behaviors detrimental to firm value and aids investors in recovering losses from previous adverse tax practices (Donelson and Yust, 2014). They examine the influence of shareholder tax litigation scrutiny, where shareholders can use to monitor and shape tax behavior. Salience theory (Mitchell, Agle, and Wood, 1997) helps explain how and why certain stakeholders, particularly investors, are more prominent in influencing corporate behavior. We focus on the UN PRI institutional investors' power, legitimacy, and urgency through their monitoring role in prioritizing ESG issues at corporate level. PRI investors typically advocate for responsible business practices, including tax transparency. It is quite debatable whether PRI investors can effectively shape corporate ESG practices and improve ESG performance, without merely encouraging greenwashing. Through the CbCR scrutiny mechanism, PRI investors could trust more on the performance and sustainability of the companies they owned by exercising a more effective engagement. This could be reflected in improving overall corporate ESG performance, beyond the salience pay-off to push companies to prioritize tax governance over other ESG pillars, narrowing a sustainable approach. Consequently, we expect that PRI investors are more likely to trust sustainable business practices when CbCR rules take effect, and we hypothesize as follows:

H2: Firms endorsed by PRI investors ameliorate ESG performance compared to firms with no-PRI investors, when CbCR rules take effect.

Market-based approaches are often preferred due to their lower perceived costs compared to

regulations. Event studies on new corporate regulation announcements frequently show negative market reactions, indicating that investors believe the costs of these regulations outweigh the benefits. Despite these market perceptions, governments recognize that market mechanisms alone cannot ensure transparency and fair competition, prompting the need for regulatory interventions that complement existing market-driven initiatives. One area of shared interest between institutional investors and regulators is tax transparency. Thus, on one side, we consider the pressure exerted by PRI (Principles for Responsible Investment) investors, who have been shown to influence firms toward more sustainable behaviors and better ESG performance. On the other side, we leverage the Country-by-Country Reporting (CbCR) regulation, adopted in 2016 as part of the OECD's BEPS framework, which further enhances regulatory efforts to improve ESG performance among UK-listed firms. Through their influence, PRI investors can encourage companies to align their reporting with the CbCR requirements, ensuring that tax governance is integrated into broader ESG performance. The interplay between regulatory mechanisms and market-based approaches needs to be explored, and we hypothesize as follows:

H3: Firms subject to the UK CbCR mandate and endorsed by PRI investors attain a better ESG performance than firms not subject to the CbCR mandate and not endorsed by PRI investors.

4. RESEARCH DESIGN

4.1. Data sources and sample construction

We use a combination of different data sources for our empirical analysis. First, we download financial accounting data by considering UK active and listed companies from Bureau van Dijk's (BvD) Orbis database. We require firms to be headquartered within the UK to ensure they are within the scope of the UK tax authorities' CbCR regulation. In this group of firms, we can identify a treatment sample of companies checking if they are classified as multinational enterprises (MNCs) with more than one active foreign subsidiary. Following the scope of the UK BEPS regulation, we also verify those MNCs exceeding the turnover threshold of GBP 750 million in their last two available reporting periods. To ensure timely data, we exclude firms whose last available reporting year is prior to 2013.

Available in Orbis Bureau van Dijk we find the percentage of ownership held by individual and

institutional investors for each of these companies. We consider the percentage as total shareholders or direct shareholders, only when these are institutional investors, such as professional money managers, including mutual fund companies, pension funds, bank trusts, and insurance companies (Bushee, 1998). With the intention to identify a group of responsible investors (Cohen et al., 2023), we check one-by-one if each institutional investor owning UK listed firms included in our sample, belongs to the list launched by the United Nations in 2006 and released on the UN PRI website up to 2019. The importance of this initiative is that it has encouraged investors to consider ESG factors in their investment processes to promote sustainable financial markets. Based on a voluntary disclosure mechanism, PRI investors (as signatories) claim that: (1) they incorporate ESG issues into investment decisions, (2) they are active owners, (3) they seek appropriate disclosure on ESG issues, (4) they promote acceptance and implementation of the principles, (5) they work together to enhance effectiveness in implementing the principles, and (6) they report progress toward implementing the principles. The PRI classification is divided in three types of signatories: (1) asset manager (e.g., BlackRock), (2) asset owners (e.g., California Public Employees' Retirement System), and (3) data providers (e.g., MSCI). What distinguishes "impact investing" as PRI investors from other approaches is an intentional desire to generate and measure both financial returns (commercial/market rate to concessionary) as well as social and/or environmental benefits. We classify PRI signatory ownership conservatively, that is, we do not assume that a subsidiary company is a PRI signatory if a parent company signed the principles, and vice versa (Krueger et al., 2024). According to our sample, we observe that the distribution of the number of institutional investors increases year by year and at the end we find that the UK listed firms employed in our sample over the time period 2013-2019 are owned continuously by no. 1,602 institutional investors classified as PRI.

The next step is to download the ESG ratings data for this group of firms. We use three sources for ESG scores that are widely used by asset managers and yield the most coverage when we match the individual firm ESG scores to the portfolio holdings. The first source we use is Sustainalytics (WRDS). It identifies key ESG issues based on analysis of a company's peer group and its broader value chain, review of the business model, and the key activities associated with environmental and/or social impacts. It then weights a comprehensive set of core and sector-specific metrics to determine a company's overall ESG performance ranging from 0 (most negative) to 100 (most positive). It also assesses data about major controversies

related to business ethics, supply chain, product, employees, etc.

The second source is Thomson Reuters Eikon Refinitiv, one of the five most reliable providers (Bolton and Kacperczyk, 2021). Its ESG data have been analyzed by more than 1,500 academic research papers (Berg et al., 2022). Refinitiv ESG data cover over 80% of the global market cap, providing information on over 12,000 public and private companies. Refinitiv ESG ratings are percentile rank scores, ranging from 0, the worst possible score, to 100, the best possible score. They are designed to objectively measure a company's relative ESG performance, commitment, and effectiveness. Refinitiv argues that its sustainability ratings are completely data-driven, effectively balanced to consider the most material industry metrics and adjusted to compensate for transparency and market cap biases. Refinitiv scores are based only on company-disclosed data available on their websites, reports, media, and news (Billio et al., 2021).

The last source we use is ISS-EVA, where ESG performance is from Institutional Shareholder Services' (ISS) ESG Corporate Rating data. Globally ISS ESG continues to see and measure improvements in corporate ESG practice: 1) more companies committing to carbon goals and more biodiversity awareness; 2) more awareness of inclusive Corporate Social Responsibility policies, increased gender and ethnic diversity at board and management level; 3) and better board composition, shareholder rights, and increases in stewardship practices such as engagement and voting. ISS ESG has also watched and listened as sustainability reporting continues to evolve, with different approaches developing in different global regulatory situations. While these changes have driven the availability of clean, comparable, and consistent data, challenges remain in the capture, measurement, and analysis of that data.

ESG considerations can be broken down into three categories. First—environmental criteria, which considers a company's actions as a steward of the environment, such as what steps a company is taking to address the depletion of the planet's resources, pollution and greenhouse gas emissions, or the effects of climate change. Second—social criteria, which considers how a company engages with all its stakeholders (including employees, customers and suppliers) rather than just shareholders, including the treatment and diversity of its employees on the frontline, management and boardroom levels, the effects of a company on the surrounding community, and whether a company is working with suppliers who share similar socially desirable values. Third—corporate governance, which considers how a company governs itself and holds itself accountable taking into account the structure and diversity of a company's

board of directors, the separation between management and the board of directors, executive compensation, equal and fair pay amongst employees, and the extent to which a company or its management or board of directors are undertaking lobbying efforts, making political and charitable donations, or engaging in corruption or bribery.

Before merging all the datasets downloaded for our sample, we match observations between Orbis and CRSP WRDS using the ISIN number for adding data related to industrial sectors. At this point we drop firms that belong to the financial industry and the oil and gas industry (following the four-digit classification). This choice is driven by two reasons: 1) financial institutions, producing lower levels of pollution (low Co2 emissions), are much less involved in social issues and they have been affected in anticipatory way by CbCR rules following the EU Capital Requirements Directive IV in 2014. 2) Oil and gas companies present by nature a higher attention to the environmental issues, and they could show higher ESG ratings, and consequently be considered as outliers.

After merging all the datasets and dropping firms based on the above criteria, we come up with the final construction of the sample employed in our analyses over the period 2013-2019, by obtaining 677 UK listed companies, where 291 are under the treatment of CbCR rules (treated firms), and 386 companies not (control firms). Among the full sample of 677 UK listed companies, we identify 588 firms covered by PRI ownership (Table 1 – Panel A).

4.2. Summary statistics

Summary statistics for the main variables used in our empirical analyses are reported in Table 1 – Panels B-E. Panel B focuses on the full sample of the UK listed firms among the years 2013-2019. Summary statistics are based on the number of observations, mean, standard deviation, percentile 25, median, and percentile 75. The variables reported are the ESG scores as dependent variables (the splitted into Environmental, Social, and Governance scores), and a set of control variables (size, leverage, ROA, tangibility, cash flows from operations, sales, investment cycle, audit qualified, dividend payments, Big4 auditing). All the variables are defined in Appendix A. Panels C presents the differences in mean and median between the treatment and control subsamples for the full period under examination (2013-2019). Considering that the shock of CbCR adoption has been identified in 2016, we show in Panel D

the differences in mean and median between the treatment and control subsamples in the period before the CbCR regulatory adoption (2013-2015). Then, we show in Panel E the differences in mean and median between the treatment and control subsamples for the period after CbCR regulatory adoption (2017-2019). We can see that the treatment subsample shows higher ESG scores compared to the control subsample in both periods, such as before and after the CbCR regulatory adoption, while the set of control variables seems to be quite similar in the pre-CbCR period. For instance, we observe that in the post-CbCR period ROA ameliorates decisively for the treated firms (0.038) compared to control firms (-0.073). From these first univariate statistics showing the statistical differences we could conclude that the sustainability improvement (higher ESG scores) is simultaneous to the improvement of financial performance (higher ROA). Nevertheless, the leverage increases for the treated firms in the post-CbCR period compared to the pre-CbCR period (from 0.414 to 0.535) as well as the investment cycle (from 0.025 to 0.140). Thus, the sustainability and financial performances of treated firms increase in a period where also the leverage and the investment cycle are much higher compared to the pre-CbCR period. We observe that the differences between the two subsamples (treatment and control) are quite more statistically significant in the post-CbCR period. Table 1 Panel F reports the correlation matrix for the variables of the full sample covering 2013-2019 employed in the empirical tests. Overall, we can see that the correlation between the variables is quite insignificant. However, ESG scores are significantly and positively correlated with size (0.368^{***}) and leverage (0.145^{***}). This happens also for the Environmental scores (correlated with size at 0.294^{***} and leverage at 0.094^{**}), Social scores (correlated with size at 0.373^{***} and leverage at 0.118^{***}), and Governance scores (correlated with size at 0.266^{***} and leverage at 0.118^{***}).

Table 2 presents the summary statistics of the distribution of the institutional ownership when it is also endorsed by UN PRI investors (Principles for Responsible Investment): among the full sample of the 677 UK listed companies we identify 588 firms owned also by PRI investors over the period 2013-2019. In Panel A (Table 2) we show the distribution of the mean and median between the 588 firms (that we call PRI full sample) and the restricted treatment group of firms under CbCR regulation (258 firms – that we call CbCR treatment group). We observe that among the total institutional ownership (*Total_IO*) of 49.45%, the total PRI ownership (*PRIownership*) is 20.46%. Thus, the ratio of PRI ownership over the total institutional ownership (*PRI_totalIO*) is around 41.38%, by indicating still an important slice of ownership

held by no-PRI investors. However, we observe that the change in PRI over the total institutional ownership (*ΔPRI_totalIO*) for the period under examination is positively around 2.51%. In other words, it seems that although PRI investors hold important stocks' portfolios, they increment their PRI ownership quite smoothly year by year. Compared to the PRI-Full sample, we see that the percentage of ownership (*Total_IO;* then splitted into *PRIownership; PRI_totalIO; NoPRIownership; NoPRI_totalIO; ΔPRIownership; ΔPRI_totalIO; ΔNoPRIownership; ΔNoPRI_totalIO*) is lower for the group of firms included in the CbCR-Treatment subsample endorsed by PRI investors. These univariate analyses indicate that this treatment group does not attract more PRI investors. In Panel B (Table 2) we show the distribution of the institutional ownership (*Total_IO;* then splitted into *PRIownership; PRI_totalIO; NoPRIownership; NoPRI_totalIO; ΔPRIownership; ΔPRI_totalIO; ΔNoPRIownership; ΔNoPRI_totalIO*) year by year. While institutional ownership increases year by year, we observe that PRI ownership is quite similar among the examined time period. Again, we see that overall, these firms in PRI-Full sample (no. 588 firms) do not attract increasingly PRI investors (see column *PRIownership*), beyond the reverse trend found on the list of UN PRI investors that become more and more. Suffice to say that from the 2006 UN PRI launch around 455 organizations from no less than 36 countries had signed up. By 2020, the number of PRI signatories had grown consistently to more than 2,300 globally (Eccles, 2010; Kim and Yoon, 2023).

4.3. Diff-in-diff and triple diff-in-diff research designs

In this study, we examine the impact of the confidential mandatory disclosure of the Country-by-Country Reporting on the sustainable business practices, identified with the ESG scores. Sustainability performance is debated from several angles. Gantchev et al. (2024) highlight the trade-off between sustainability and financial performance by examining whether investors select responsible investments only when firms financially perform well. They provide empirical support for the view that responsible investors care predominantly about performance. Moreover, their findings indicate that increased transparency may be insufficient, and regulation may be necessary to direct capital to more sustainable investments. Sustainable performance is also strongly linked to ESG disclosure, whatever it is mandatory (Downar et al., 2021; Krueger et al., 2024) or voluntary (Stubbs and Higgins, 2018; Bonacchi et al., 2022).

Anytime that sustainable performance differs from sustainable disclosure, greenwashing risk arises since the company shows a positive social image but lacks genuine environmental value, thereby misleading investor decision-making (Li, Shu and Liao, 2024; Bilicka et al., 2025). Sustainability is also linked to corporate accountability when stakeholders play a monitoring role by increasing their trust on the corporate purpose strength (Gibbons and Henderson, 2012; Gartenberg and Serafeim, 2023). In our setting, CbCR rules aims at higher public governmental scrutiny at firm-level, once they take effects. This regulatory intervention could be perceived as a further pressure to ask companies more transparency, especially from their foreign subsidiaries, where the geographical distance matters shaping differently stakeholders beliefs. Thus, CbCR regulation could affect ESG performance in both directions, positive and negative. Positive, if firms are more focused on consistently being accountable and consequently sustainable. Negative, if firms uncover hidden information by revealing a low sustainable approach overall. To address the empirical challenges, we apply a difference in difference research design (DiD) around the shock-event of the 2016 CbCR regulatory adoption. In this estimation, the treatment (control) group consists of all the UK listed firms classified as multinational corporations (MNC) with more than one active foreign subsidiary with consolidated revenues of at least (less than) GBP 750 million in the two preceding taxation years, starting in 2016. We identify a group of the UK listed firms under the treatment of the new CbCR rules. Thus, to test the first hypothesis, we estimate the following estimating the difference-in-difference model (DiD):

$$ESG_score_{i,t} = \beta_0 + \beta_1 MNC_CbCR_{i,t} + \beta_2 Post_CbCR_t + \beta_3(\boldsymbol{MNC_CbCR_{i,t}\ x\ Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t} \quad \text{Eq. (1)}$$

ESG_score, as dependent variable, is the proxy capturing the sustainable business practices performance. ESG scores are reported as values range from 0 to 100, with 100 as the highest score, then splitted into Environmental (*Environ_score*), Social (*Social_score*), and Governance pillars (*Govern_score*). MNC_CbCR is a dummy variable equal to (0) 1 if the firm is (not) a UK-parented multinational group with consolidated revenue of £750 million subject to CbCR rules in 2017–2019. $Post_CbCR$ is an indicator variable equal to 1 for all years in which the full CbCR requirements were in effect (2017–2019), and 0 otherwise (2013–2016).

$MNC_CbCR_{i,t}$ *x Post_CbCR* is the variable of our interest capturing the incremental effect on ESG performance after the 2016 CbCR regulatory adoption. $X_{i,t}$ is a vector of control variables. Control variables are often included in a DiD model for efficiency and as a check for randomization (Roberts and Whited, 2013). Moreover, in the absence of random (or as-if random) treatment assignment, the selection of appropriate control variables is essential to designing well-specified empirical tests of causal effects. Failure to include a confounding control result in omitted variable bias, an issue widely recognized in accounting research (Whited et al., 2022). Thus, following Dyck et al. (2019), Azar et al., (2021), and Gantchev et al. (2024), we consider for several and different reason the following variables. *Size* (natural logarithm of fiscal year's total assets in thousands of GBP), where we control the size of business activity and external pressures over environmental and social corporate behavior. *Leverage* (total liability scaled by total assets) and *Tangibility* (property, plant & equipment scaled by total assets) measure corporate credit constraints and discretion to invest in environmental and social initiatives. *ROA* (net income scaled by total assets), which could affect firms' investment into ESG. *Cfo* (cash flows from operations scaled by total assets) since companies investing in ESG items enhance firm value likely depend on the availability of cash financing (Fiechter et al., 2022). *Sales* (Net sales divided by total assets) since sales increase by promoting ESG practices (Tran and Pham, 2024). *Invcycle* (investment cycle computed as depreciation of tangible fixed assets scaled by total assets), since companies with the own subsidiaries are in countries where investment cycles are more pronounced, when there is a higher probability of policy changes or larger variation in possible policy outcomes (Julio and Yook, 2012). *Audit_qualified* (audit qualified opinion is a dummy variable that takes on the value of 0 for an unqualified opinion and 1 for a qualified opinion), and *Big4audit* (a dummy variable equal to 1 if the auditor is a Big 4 firm (EY, PWC, Deloitte, KPMG), and 0 if the auditor is a Second-tier auditor), since CbCR firms aim to avoid the appearance of being overly tax aggressive in tax audits (De Simone and Olbert, 2022). *Divid_payment* (dividend payments is a dummy variable that equals 1 if firm has paid any dividends in a year, and 0 otherwise), since companies with higher ESG performance are likely to pay higher dividends (Hanlon and Hoopes, 2014; Bilyay-Erdogan et al., 2023). All the control variables are lagged by one year to avoid simultaneity bias and are winsorized at the 1st and 99th percentiles to mitigate the effect of outliers (Leone et al., 2019; Ceccarelli et al., 2021). Detailed variable definitions are in Appendix A. δ_t are year fixed effects and Φ_i denotes firm and industry fixed effects. Firm-

fixed and industry-fixed effects help to control for invariant and omitted firm- and industry-related factors. Industry fixed effects are based on SIC industries. We refrain from using firm-fixed effects to ensure sufficient variation in our variables of interest and avoid over-fitting (Dyck et al., 2019). While we account for industry fixed effects, it could be that the relationship between industry and ESG scores changes over the course of our sample period or that our definition of industry (SIC Industry) might be too broad. We account for these possibilities by adding industry-year fixed effects. $\varepsilon_{i,t}$is the error term. We cluster standard errors at the firm and year levels, since the residuals may be correlated across firms or across time (MacKinnon et al., 2023)[4].

Some firms are owned by many investors with explicit preferences who in turn demand ESG information more strongly than others (Friedman et al., 2024). In our setting we explore the institutional ownership endorsed by investors showing a witnessed propensity toward the responsible investments. Thus, we consider the PRI investors' endorsement among the full sample employed in the first DiD. At this stage we reshuffle the treatment and control sub-samples, where the treatment indicates those UK listed companies owned continuously by PRI investors over the years 2013-2019. Therefore, we test the second hypothesis estimating the following difference-in-difference model (DiD):

$$ESG_score_{i,t} = \beta_0 + \beta_1 PRI_firms_{i,t} + \beta_2 Post_CbCR_t + \beta_3(\boldsymbol{PRI_firms_{i,t}\ x\ Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t} \quad \text{Eq. (2)}$$

ESG_score is the dependent variable, then splitted into Environmental (*Environ_score*), Social (*Social_score*), and Governance pillars (*Govern_score*). PRI_firms is a dummy variable equal to 1 if the UK listed firm is owned by PRI (Principles for Responsible Investment following the 2006 UN initiative), 0 otherwise. $Post_CbCR$ is an indicator variable equal to 1 for all years in which the full CbCR requirements were in effect (2017–2019), and 0 otherwise (2013–2016). $PRI_firms_{i,t}$ *x Post_CbCR* is the variable of our interest capturing the incremental effect on ESG performance after the 2016 CbCR regulatory adoption. $X_{i,t}$ is a vector of lagged control variables (*Size, Leverage, ROA, Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment,* and *Big4audit*). δ_t are year fixed effects and Φ_i denotes firm and industry

[4] In robustness analyses, we ensure that the significance of our results does not hinge on the clustering choice.

fixed effects. $\varepsilon_{i,t}$is the error term. We cluster standard errors at the firm and year levels. Following, we decide to replace the PRI_firms with *PRIownership* (as the percentage of PRI institutional ownership), and *High_PRIownership* (a dummy variable equal to 1 if the percentage of PRI institutional ownership is above the median year by year, 0 otherwise).

At this stage we recall the salience theory (Mitchell, Agle, and Wood, 1997) emphasizing certain stakeholders, like PRI investors and governmental authorities, more prominent in influencing corporate behavior. Thus, we explore the extent to which PRI investors and CbCR mandate affect corporate ESG performance. The CbCR reform aims to foster transparency and curb aggressive tax avoidance strategies, aligning corporate behavior with broader governance principles. At one hand, PRI investors' decision-making is driven by ESG factors. At the other hand, PRI investors play a critical role through engagement by pushing firms to improve their ESG practices. Therefore, we test the third hypothesis estimating a triple difference-in-difference model (DDD):

$$\begin{aligned} ESG_score_{i,t} = {} & \beta_0 + \beta_1 MNC_CbCR_{i,t} + \beta_2 PRI_firms_{i,t} + \beta_3 Post_CbCR_t \\ & + \beta_4 (MNC_CbCR_{i,t} \; x \; Post_CbCR) + \beta_5 (PRI_firms_{i,t} \; x \; Post_CbCR) + \\ & \beta_6 (\boldsymbol{MNC_CbCR_{i,t} x \, PRI_firms_{i,t} x \, Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t} \end{aligned} \qquad \text{Eq.(3)}$$

ESG_score is the dependent variable, then splitted into Environmental (*Environ_score*), Social (*Social_score*), and Governance pillars (*Govern_score*). We include all the variables of interests ($MNC_CbCR_{i,t}$ *x Post_CbCR*) proposed in Eq. (1) and ($PRI_firms_{i,t}$ *x Post_CbCR*) in Eq. (2), the lagged control variables (*Size, Leverage, ROA, Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment,* and *Big4audit*), year fixed effects (δ_t), firm and industry fixed effects (Φ_i), the error term ($\varepsilon_{i,t}$), and firm-year cluster standard errors. The novelty part of this Eq. (3) is the triple interaction $MNC_CbCR_{i,t} x \, PRI_firms_{i,t} x \, Post_CbCR$**,** that captures the joint effect of the CbCR mandate treatment together with the institutional ownership endorsed by PRI on ESG performance. The triple interaction identifies a treated sub-sample of the UK listed firms comprising UK-parented multinational group with consolidated revenue of £750 million subject to CbCR rules in 2017–2019 and on the same time owned by PRI investors (we reduce the sample from 291 firms under CbCR treatment to 258 firms under CbCR treatment and owned by PRIs). Alternatively, we obtain the subsample of control firms comprising UK

listed firms not under CbCR mandate and not endorsed by PRI investors (we reduce the sample from 386 firms not under CbCR treatment to 56 firms not under CbCR treatment and not owned by PRI). See Table 1 Panel A for the sample selection process. Following we replace the variable PRI_firms with $PRIownership$ (as the percentage of PRI institutional ownership) and $High_PRIownership$ (as a dummy variable equal to 1 if the percentage of PRI institutional ownership is above the median year by year, 0 otherwise) In this way, at one side, we can assess the strength (or weakness) of the influential PRI institutional ownership leading to positively (negatively) associated with the overall sustainable business practices. Thus, we verify whether the CbCR mandate leads to make disappear the power of PRI investors' engagement on the corporate sustainability approach. At the other, this triple interaction term could make us discover whether the joint effect is more pronounced on E&S practices compared to Governance practices. This could confirm a salience bias, where PRI investors trust more the Governance pillar, once the CbCR rules take effect, when firms are consequently more scrutinized.

4.4. Parallel trend assumption and matching techniques

The key identifying assumption for the consistency of the difference-in-differences estimator is the parallel trends assumption: treated and control firms should experience parallel trends in the outcome variable (ESG) in the absence of treatment (the CbCR rules). Although inherently untestable, diagnostic tests can offer useful insights into potential violations of this assumption. It is now increasingly common for researchers to graphically present estimates of the "treatment effect" (i.e., the difference between treatment and control groups) over time—both before and after the treatment. If the effect remains constant over time, it will create a stable difference between the treatment and control groups in each period, leading to parallel time-series trends in the outcome variable (Roberts and Whited, 2013; Armstrong et al., 2022). However, a solid theoretical foundation is necessary to explain the empirical facts. Therefore, when drawing causal inferences, no amount of econometrics can replace the need for theory. We also caution against viewing causal inferences as solely an empirical endeavor. In this direction, we run a set of parallel trend analyses on DiD (Eq. 1) and DDD (Eq. 3), by comparing the estimates of the effects of the CbCR rules' treatment with the estimates of the joint effect of the CbCR rules'

treatment within the influential institutional ownership endorsed by PRI on the sustainable business practices.

Furthermore, aware that we are comparing two different groups of firms identified in the treatment and control sub-samples (see Table 1 – Panels C, D, and E), we decide to employ two matching techniques: the entropy balancing and the propensity score matching. Entropy balancing is a quasi-matching approach which re-weights each control observation so that post-weighting distributional properties of matched variables of treatment and control observations are virtually identical, thereby ensuring covariate balance (Hainmueller, 2012; McMullin and Schonberger, 2015). As a first step, entropy balancing requires to select the distributional properties of interest (we focus on mean and variance) and the 'matching' variables (we choose *Size, Leverage, ROA, Tangibility, Cfo, Sales, Invcycle*). Next, the algorithm proceeds by first assigning possible weights (above or below one) to control observations, and then testing whether the 'balance' conditions have been met, i.e., whether the chosen distributional properties of treatment and post-weighted control observations for the matched variables are identical. The algorithm repeats this process over multiple iterations until a set of weights for control observations are found such that the balance conditions are met. Table 6 – Panel A shows the distributional properties of treatment and control firms before and after this process. The weights assigned to each control observation at the end of this procedure are then used in the regression analyses.

Studies using non-experimental data face endogeneity issues due to non-random treatment assignment. To address this, archival studies often use multiple regression (MR) models. However, MR requires correct specification of the relationship between the outcome (Y) and explanatory variables (X) to avoid biased estimates. If the relationship is mis-specified, MR can suffer from "functional form misspecification" (FFM), leading to bias, especially when treatment groups are more dissimilar. Propensity score matching (PSM) techniques help reduce this problem by minimizing reliance on the specification of the relationship between variables. In a further moment, we use propensity-score matching, we match UK listed firms within the scope of the CbCR rules' benchmark firms. To ensure high-quality matches without further sample size reduction in our treatment sample, we follow Shipman, Swanquist, and Whited (2017). As matching parameters, we use a caliper-based nearest-neighbor match, matching 1:4 without replacement with a caliper of 0.10 on firm-level continuous variables (*Size*, *Leverage*, *ROA*, *Tangibility*, *Cfo*, *Sales*, *Invcycle*).

For our main analyses we present the findings without matching (Tables 3, 4, and 5), while in further robustness tests, we present the findings using first entropy balancing (Table 6) and the propensity score matching (Table 7). We discuss the multiple approaches (i.e., pre-trend analyses, entropy balancing, propensity score matching) we have taken to address concerns about differences between treatment and control sub-samples employed.

4.5. Impact on ESG practices and PRI ownership assessment

We evaluate the impact on ESG performance from two perspectives. First, we analyze the determinants that are associated with ESG scores during the period under examination (2013-2019). We start with a year-industry fixed effect regression model that exploits the firm variation, by considering separately firms under the treatment of CbCR mandate and firms whose ownership is endorsed by PRI investors. Second, we explore with the same year-industry fixed effect regression model whether the effects are more pronounced for Environmental (*Environ_score*), Social (*Social_score*), and Governance pillars (*Govern_score*). Therefore, we estimate the following fixed-effect OLS models:

$$ESG_score_{i,t} = \beta_0 + \beta_1 MNC_CbCR_{i,t} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$
$$ESG_score_{i,t} = \beta_0 + \beta_1 PRI_firms_{i,t} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t} \quad \text{Eq. (4)}$$

ESG_score is the dependent variable, then splitted into Environmental (*Environ_score*), Social (*Social_score*), and Governance pillars (*Govern_score*). The explanatory variables of our interest are alternatively: 1) MNC_CbCR is a dummy variable equal to (0) 1 if the firm is (not) a UK-parented multinational group with consolidated revenue of £750 million subject to CbCR rules in 2017–2019, and 2) PRI_firms is a dummy variable equal to 1 if the UK listed firm is owned by PRI (Principles for Responsible Investment following the 2006 UN initiative), 0 otherwise. In our models we include: 1) the lagged control variables (*Size, Leverage, ROA, Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment,* and *Big4audit*), year fixed effects (δ_t), industry fixed effects (Φ_i), the error term ($\varepsilon_{i,t}$), and firm-year cluster standard errors.

In this section, we also assess the mechanisms that institutional investors shape ESG performance changes. Dyck et al. (2019) argue that firms enjoy a lower cost of capital if they

can make themselves attractive to a greater pool of shareholders. The consistent presence of institutional investors (85% of institutional ownership in a given firm is held by the same institutional investors from one year to the next) leads to understand more about the composition of institutional ownership. Institutional investors play a crucial monitoring role at the corporate level, but the question of whether PRI investors can effectively shape corporate ESG practices and improve ESG performance, without merely encouraging greenwashing, remains a topic of ongoing debate. PRI investors typically advocate for responsible business practices. At this stage we explore the association between the institutional ownership composition on the sustainability business practices performance by considering the group of no. 588 listed companies owned by PRI investors (see Table 1 – Panel A). Table 2 presents the summary statistics of the institutional ownership distribution among the years 2013-2019. We identify the composition of institutional ownership splitted into ownership held by PRI investors, as responsible investors, and no-PRI investors. First, like our tests so far, we regress ESG scores, then splitted into Environmental (*Environ_score*), Social (*Social_score*), and Governance pillars (*Govern_score*), on different levels of institutional ownership. Thus, we come up with the following baseline model:

$$ESG_score_{i,t} = \beta_0 = \beta_0 + \beta_1 PRIownership_{i,t} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t} \qquad \text{Eq. (5)}$$

We estimate on 1) (lagged) *PRIownership,* the percentage of PRI institutional ownership. Then we replace this explanatory variable with: 2) (lagged) *PRI_totalIO*, the percentage of PRI ownership scaled by total institutional investors' ownership, 3) (lagged) *NoPRIownership*, the percentage of institutional ownership not classified as PRI, 4) (lagged) *NoPRI_totalIO*, the percentage of institutional ownership not classified as PRI scaled by total institutional investors' ownership, (lagged) *Total_IO*, the percentage of total institutional ownership, *ChangePRIownership*, the change in the percentage of PRI institutional ownership in year t-1 from year t and *ChangePRI_totalIO*, the change in in the percentage of PRI institutional ownership from the beginning to the end of year t scaled by total institutional investors' ownership at the beginning of year t, *ChangeNoPRIownership*, the percentage of institutional ownership not classified as PRI in year t-1 from year t, and *ChangeNoPRI_totalIO*, the change in the percentage of institutional ownership not classified as PRI from the beginning to the end

of year t scaled by total institutional investors' ownership at the beginning of year t. Our OLS panel regressions include a set of lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*). With panel data, in which time series tend to be relatively short but available for a great number of cross-sectional units, parameter estimation is performed by pooling the data, and allowing for differences in individual effects can be achieved by including fixed effects. We follow this approach and include firm fixed effects (*FirmFE*) and industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. Finally, we cluster standard errors at the firm and year levels.

5. EMPIRICAL FINDINGS

5.1. Results for tests of H1 and H2

Table 3 presents the results from the estimation of the difference in difference research design (DiD) on ESG practices measured as ESG scores, and then splitted into Environmental scores, Social scores, and Governance scores, when we test the first hypothesis (H1). By employing firm fixed effects and year-industry fixed effects, and clustering standard errors at firm and year level, we find a positive association between the interaction term ($MNC_CbCR_{i,t}$ *x Post_CbCR*) and *ESG_score* (0.019^{***}), then splitted into *Environ_score* (0.031^{***}), *Social_score* (0.025^{***}), and *Govern_score* (0.047^{***}). These first results indicate that the trend completely change for firms scrutinized after the CbCR mandate, by ameliorating quite strongly the governance practices, as we expected since tax transparency is related to governance items. Furthermore, by continuing employing a DiD research design, we examine the effects of the CbCR regulatory intervention for companies whose ownership is endorsed by PRI investors. In Table 4 (Panels A-C), we present a set of results coming from the test of the second hypothesis (H2). Here we reshuffle the subsamples, by identifying two groups of firms, one owned by PRI investors (treated firms) and another one owned by no-PRI investors (control firms). In Panel A we find a positive and significant association between the interaction ($PRI_firms_{i,t}$ *x Post_CbCR*) and *ESG_score* (0.018^{***}), then splitted into *Environ_score* (0.016^{***}), *Social_score* (0.022^{***}), and *Govern_score* (0.025^{***}). Then, in Panel B we present the results after replacing in our DiD model (Eq. 2) the binary variable PRI_firms with the continuous variable *PRIownership* (the percentage of PRI institutional ownership). We observe

first that in the pre CbCR regulatory shock there are no effects for the estimated coefficients on *PRIownership* (*ESG_score* (-0.000), then *Environ_score* (0.006), *Social_score* (-0.001), and *Govern_score* (-0.001)). However, there is a positive and significant effect between the interaction term ($PRIownership_{i,t}$ *x Post_CbCR*) and *ESG_score* (0.044***), then splitted into *Environ_score* (0.024***), *Social_score* (0.058***), and *Govern_score* (0.039***). Lastly, in Panel C we present the results after replacing in our DiD model (Eq. 2) the binary variable PRI_firms with a further binary variable $High_PRIownership$ (equal to 1 if the percentage of PRI institutional ownership is above the median year by year, 0 otherwise). In the pre-CbCR regulatory shock, we find no effects for the estimated coefficients $High_PRIownership$ (*ESG_score* (0.255), then *Environ_score* (0.443), *Social_score* (-0.078), and *Govern_score* (0.161)), while the interaction term of our interest ($High_PRIownership_{i,t}$ *x Post_CbCR*) is positively and significantly associated with *ESG_score* (0.016***), then *Social_score* (0.021***), and *Govern_score* (0.019***). This empirical evidence seems to indicate that PRI investors are quite led by a salience pay-off much more focusing on Social and Governance agenda items, much less on Environmental ones, carried by the enthusiasm of adopting the CbCR mandate.

5.2. Results for tests of H3

Table 5 (Panels A-C) presents the results when we employ the triple differences regression (DDD) to test the third hypothesis (H3) without employing matching techniques. We draw several conclusions from the results. First, in Panel A, we find a positive and significant relation between the triple interaction ($MNC_CbCR_{i,t}$ *x* $PRI_firms_{i,t}$ *x Post_CbCR*) and ESG scores (1.138***), then Environmental scores (2.490***), Social scores (0.656***), and Governance scores (1.343***), consistent with the results in Table 3 and Table 4. However, with the DDD method, we document a differential impact of PRI ownership in multinational corporations under CbCR mandate ameliorating the effect on sustainable business practices' performance. However, the coefficients on the interaction ($MNC_CbCR_{i,t}$ *x Post_CbCR*) are correspondingly for ESG scores (0.093***), then Environmental scores (0.226***), Social scores (0.277**), and Governance scores (0.184), while the coefficients on the interaction ($PRI_firms_{i,t}$ *x Post_CbCR*) are correspondingly for ESG scores (0.215**), then Environmental scores (0.182**), Social scores (0.390**), and Governance scores (0.965***). The results suggest that

within the joint effect of CbCR mandate and ownership endorsed by PRI investors, UK MNCs gain overall higher levels of ESG performance. In Panel B, we replace the binary variable PRI_firms with *PRIownership* (the percentage of PRI institutional ownership) in the DDD regression. In this case we find that estimated coefficients on *PRIownership* in the period before CbCR takes effect is not significant, by indicating that PRI investors do not exercise an effective engagement. We observe the same also for the interaction ($MNC_CbCR_{i,t}$ *x* $PRI_firms_{i,t}$) indicating no effects before the regulatory shock. However, the trend changes when we explore first the interaction ($PRIownership_{i,t}$ *x Post_CbCR*) for ESG scores (0.065^{***}), Social scores (0.085^{***}), and Governance scores (0.076^{***}), but not significant for Environmental scores (0.018). Following, we focus on the triple interaction of our interest ($MNC_CbCR_{i,t}$ *x* $PRIownership_{i,t}$ *x Post_CbCR*), and we find a positive and significant association with then Environmental scores (0.109^{***}), Social scores (0.129^{**}), but weak with ESG scores (0.073^{*}), and not significant with Governance scores (0.081). We interpret these results that the joint effect in the post regulatory shock is more pronounced for E&S practices consistent with Dyck et al (2019). In Panel C, we replace the binary variable PRI_firms with a further binary variable $High_PRIownership$ (equal to 1 if the percentage of PRI institutional ownership is above the median year by year, 0 otherwise) in the DDD regression. We observe that the triple interaction of our interest ($MNC_CbCR_{i,t} x High_PRIownership_{i,t} x Post_CbCR$) is positively and significantly associated with the ESG scores (0.106^{**}), then splitted into Environmental scores (0.171^{***}), Social scores (0.180^{***}), and Governance scores (0.172^{**}). The results suggest that high PRI ownership enforces the relation of MNCs under CbCR mandate and the overall sustainable business practices following the onset of the regulatory intervention.

5.3. Results of parallel trend-analyses and employing matching techniques

We take multiple approaches to address concerns about differences between treatment and control UK listed firms, which we mention before in Section 4.4. At the same time, we test our three hypotheses (H1, H2, and H3), we evaluate the reasonableness of the parallel trends assumption underlying the difference-in-differences tests. In figure 2, we plot the yearly coefficients (i.e., *MNC_CbCR x Year*) capturing the difference relative to the 2016 base year between treatment and control firms' ESG scores (Panel A), Environmental scores (Panel B),

Social scores (Panel C), and Governance scores (Panel D) (Atanasov and Black, 2021). For panels dedicated to DiD, we see that the differential is not significantly different from zero during the pre-period, consistent with parallel trends, for all panels with the exception of Panel A with the estimated coefficients on ESG scores. Then we do the same by reporting in each panel the results coming from the estimated coefficients of the triple interactions (i.e., $MNC_CbCR_{i,t}\ x\ PRI_firms_{i,t}\ x\ Year$) on ESG scores, then splitted into Environmental (*Environ_score*), Social (*Social_score*), and Governance pillars (*Govern_score*). We observe that in all four panels (DDD) the differential is not significantly different from zero during the pre-period, consistent with parallel trends assumption.

Following, we apply entropy balancing to the sample employed in the triple difference-in-difference design (DDD). We use the first three moments (mean, variance, and skewness) and the entire pre-periods to calculate weights (i.e., fiscal years 2013, 2014, and 2015). We then use the average pre-period firm-year weights for each firm as the firm specific weight that is carried out throughout the replication of the main analyses. Covariates used in the entropy balancing include all the continuous variables (*Size*, *Leverage*, *ROA*, *Tangibility*, *Cfo*, *Sales*). Table 6, Panel A reports the summary statistics across the treatment and control groups, and Table 6 (Panels B, C, and D) provides the main test results. Again, our conclusions remain qualitatively the same as the main analyses.

Using propensity-score matching (PSM), we match 1:4 without replacement with a caliper of 0.10, UK MNC_CbCR firms within the scope of the CbCR regulation with UK benchmark listed firms based on pre-regulation levels of *Size*, *Leverage*, *ROA*, *Tangibility*, *Cfo*, *Sales* (Table 7 – Panel A). Then we employ the covariates generated by PSM in all the DDD regressions and we find the results hold (Table 7 – Panel B, C, and D). We can observe that the effects are much stronger for Social and Governance scores. It seems that the CbCR mandate shape a salience bias within PRI investors engagement on Social and Governance agenda items. Our main inferences do not change when using different matching strategies: from using a sample of unmatched UK listed firms to using propensity score matching passing through entropy balancing weights.

5.4. Further empirical findings

Table 8 Panel A presents the impact of CbCR mandate on ESG practices for the UK MNCs

among the period under examination 2013-2019. We see that by employing a year-industry fixed effects OLS panel regression the estimated coefficients (MNC_CbCR) are positively significant on *ESG_score*, then splitted into Environmental (*Environ_score*), Social (*Social_score*), and Governance pillars (*Govern_score*). However, the magnitude of the estimated coefficients is much stronger on Social scores. In Table 8 Panel B, we measure the impact of PRI investors on ESG practices. By identifying a sample of UK listed firms endorsed by PRI investors, we find that all the estimated coefficients (PRI_firms) are positively significant. Compared to the prior estimated coefficients (MNC_CbCR), in this case the magnitude is much lower, but still high as before for Social scores.

Following we assess the mechanism of PRI ownership. In Table 9 (Panels A-G), we find positive and significant results on *ESG_score*, then splitted into Environmental (*Environ_score*), Social (*Social_score*), and Governance pillars (*Govern_score*), in case of (lagged) *PRIownership* (the percentage of PRI institutional ownership), and (lagged) *PRI_totalIO* (the percentage of PRI ownership scaled by total institutional investors' ownership). In all these regressions we include firm fixed effects and year-industry fixed effects. Again, the magnitude of the estimated coefficients is much stronger on Social scores among the examined period (2013-2019). Furthermore, we do not find any significant results when we explore *ChangePRIownership* (the change in the percentage of PRI institutional ownership in year t-1 from year t), and *ChangePRI_totalIO* (the change in in the percentage of PRI institutional ownership from the beginning to the end of year t scaled by total institutional investors' ownership at the beginning of year t) (Table 9, Panel F).

6. CONCLUDING REMARKS

We posit that firms could ameliorate their sustainable business practices when two mechanisms enter into force: at one hand the regulatory intervention on scrutinizing subsidiary financial information and at the other hand the engagement exercised by responsible investors when they trust on the first mechanism. The simultaneous pressure exerted by both mechanisms on companies could lead them to increase their focus on all those practices that are based on Environmental, Social and Governance issues. To understand this phenomenon, we draw on the experience of UK-listed companies that are being forced to adopt the new regulations under private Country-by-Country Reporting starting in 2016. The companies that are forced to adopt

these standards (which in our sample are the treated companies) correspond to the following defined criteria: UK-parented multinational groups with consolidated revenue of £750 million or more must file a CbCR with HM Revenue & Customs (HMRC). We investigate how companies can also be influenced by the participation of responsible investors, which we identify according to the PRI initiative launched by the United Nations in 2006. Since the CbCR regulation intends to increase the level of fiscal transparency and disincentivize income shifting, we expect there to be a salience bias aimed at governance practices by decentralizing social and environmental issues much more.

By employing a difference-in-difference research design, we find that companies improve ESG performance when forced to adopt CbCR regulation. Next, we find that firms improve ESG performance after the regulatory shock if they are participated by PRI investors. Finally, when we examine the joint effect, we find that the effect is positive and significant overall for ESG practices when firms are not only scrutinized according to the new CbCR parameters but also have high participation of PRI investors. This study speaks up to all the studies considering the effects of regulation on ESG practices and more broadly CSR (Downar et al., 2021; Fiechter et al. 2022; Krueger et al., 2024). Furthermore, it contributes to understanding when responsible investors engage more effectively on the trust of tax transparency private regulation as the CbCR mandate (Dyck et al., 2019; Gibson Brandon et al., 2022; He et al., 2023). Lastly, it enhances the hidden effects on sustainable business practices thanks to the adoption of a tax subsidiary-level regulation (Joshi et al., 2020; Müller et al., 2023; Nessa et al., 2025).

REFERENCES

Abraham, J., Olbert, M., & Vasvari, F. (2024). ESG disclosures in the private equity industry. *Journal of Accounting Research*, *62*(5), 1611-1660.

Amel-Zadeh, A., & Serafeim, G. (2018). Why and how investors use ESG information: Evidence from a global survey. *Financial analysts journal*, *74*(3), 87-103.

Atanasov, V., & Black, B. (2021). The trouble with instruments: The need for pretreatment balance in shock-based instrumental variable designs. *Management Science*, *67*(2), 1270-1302.

Azar, J., Duro, M., Kadach, I., & Ormazabal, G. (2021). The big three and corporate carbon emissions around the world. *Journal of Financial Economics*, *142*(2), 674-696.

Ball, R., & Shivakumar, L. (2005). Earnings quality in UK private firms: comparative loss recognition timeliness. *Journal of accounting and economics*, *39*(1), 83-128.

Barber, B. M., Morse, A., & Yasuda, A. (2021). Impact investing. *Journal of Financial*

Economics, *139*(1), 162-185.
Barko, T., Cremers, M., & Renneboog, L. (2022). Shareholder engagement on environmental, social, and governance performance. *Journal of Business Ethics*, *180*(2), 777-812.
Baudot, L., & Cooper, D. J. (2022). Regulatory mandates and responses to uncomfortable knowledge: The case of country-by-country reporting in the extractive sector. *Accounting, organizations and society*, *99*, 101308.
Bauer, R., Ruof, T., & Smeets, P. (2021). Get real! Individuals prefer more sustainable investments. *The Review of Financial Studies*, *34*(8), 3976-4043.
Berg, F., Koelbel, J. F., Pavlova, A., & Rigobon, R. (2022). *ESG confusion and stock returns: Tackling the problem of noise* (No. w30562). National Bureau of Economic Research.
Bhojraj, S., & Swaminathan, B. (2009). How does the corporate bond market value capital investments and accruals?. *Review of Accounting Studies*, *14*, 31-62.
Bilicka, K. A., Casi, E., Seregni, C., & Stage, B. (2025). Tax strategy disclosure: A greenwashing mandate?. Accepted in *Journal of Accounting Research*.
Billio, M., Costola, M., Hristova, I., Latino, C., & Pelizzon, L. (2021). Inside the ESG ratings:(Dis) agreement and performance. *Corporate Social Responsibility and Environmental Management*, *28*(5), 1426-1445.
Bilyay-Erdogan, S., Danisman, G. O., & Demir, E. (2023). ESG performance and dividend payout: A channel analysis. *Finance Research Letters*, *55*, 103827.
Bolton, P., & Kacperczyk, M. (2021). Do investors care about carbon risk?. *Journal of financial economics*, *142*(2), 517-549.
Bonacchi, M., Klein, A., Longo, S., & Strampelli, G. (2022). The effects of credible voluntary disclosures: Institutional investor engagement and investees' ESG performances. *European Corporate Governance Institute Law Working Paper*, (622), 10-2139.
Bonacchi, M., Marra, A., & Zarowin, P. (2019). Organizational structure and earnings quality of private and public firms. *Review of Accounting Studies*, *24*, 1066-1113.
Bozanic, Z., Dirsmith, M. W., & Huddart, S. (2012). The social constitution of regulation: The endogenization of insider trading laws. *Accounting, Organizations and Society*, *37*(7), 461-481.
Brown, R. J., Jorgensen, B. N., & Pope, P. F. (2019). The interplay between mandatory country-by-country reporting, geographic segment reporting, and tax havens: Evidence from the European Union. *Journal of Accounting and Public Policy*, *38*(2), 106-129.
Bushee, B. J. (1998). The influence of institutional investors on myopic R&D investment behavior. *Accounting review*, 305-333.
Ceccarelli, M., Glossner, S., Homanen, M., & Schmidt, D. (2021). Which institutional investors drive corporate sustainability?. *Available at SSRN 3988058*.
Chen, T., Dong, H., & Lin, C. (2020). Institutional shareholders and corporate social responsibility. *Journal of Financial Economics*, *135*(2), 483-504.
Christensen, H. B., Floyd, E., Liu, L. Y., & Maffett, M. (2017). The real effects of mandated information on social responsibility in financial reports: Evidence from mine-safety records. *Journal of Accounting and Economics*, *64*(2-3), 284-304.
Cohen, S., Kadach, I., & Ormazabal, G. (2023). Institutional investors, climate disclosure, and carbon emissions. *Journal of Accounting and Economics*, *76*(2-3), 101640.
De Simone, L., & Olbert, M. (2022). Real effects of private country-by-country disclosure. *The Accounting Review*, *97*(6), 201-232.
Dikolli, S. S., Frank, M. M., Guo, Z. M., & Lynch, L. J. (2022). Walk the talk: ESG mutual fund voting on shareholder proposals. *Review of Accounting Studies*, *27*(3), 864-896.

Donelson, D. C., & Yust, C. G. (2014). Litigation risk and agency costs: Evidence from Nevada corporate law. *The Journal of Law and Economics*, *57*(3), 747-780.
Donelson, D. C., Glenn, J. L., McGuire, S. T., & Yust, C. G. (2024). The effect of shareholder scrutiny on corporate tax behavior: Evidence from shareholder tax litigation. *Contemporary Accounting Research*, *41*(1), 163-194.
Downar, B., Ernstberger, J., Reichelstein, S., Schwenen, S., & Zaklan, A. (2021). The impact of carbon disclosure mandates on emissions and financial operating performance. *Review of Accounting Studies*, *26*(3), 1137-1175.
Dyck, A., Lins, K. V., Roth, L., & Wagner, H. F. (2019). Do institutional investors drive corporate social responsibility? International evidence. *Journal of financial economics*, *131*(3), 693-714.
Eccles, N. S. (2010). UN principles for responsible investment signatories and the anti-apartheid SRI movement: A thought experiment. *Journal of Business Ethics*, *95*, 415-424.
Edmans, A., Gosling, T., & Jenter, D. (2024). Sustainable investing: Evidence from the field. *FEB-RN Research Paper*, (18).
Ferreira, M. A., & Matos, P. (2008). The colors of investors' money: The role of institutional investors around the world. *Journal of financial economics*, *88*(3), 499-533.
Fiechter, P., Hitz, J. M., & Lehmann, N. (2022). Real effects of a widespread CSR reporting mandate: Evidence from the European Union's CSR Directive. *Journal of Accounting Research*, *60*(4), 1499-1549.
Friedman, H. L., Heinle, M. S., & Luneva, I. (2024). Implications of introducing investor-focused ESG reporting. *The Wharton School Research Paper Forthcoming*.
Gantchev, N., Giannetti, M., & Li, R. (2024). Sustainability or performance? Ratings and fund managers' incentives. *Journal of Financial Economics*, *155*, 103831.
Gartenberg, C., & Serafeim, G. (2023). Corporate purpose in public and private firms. *Management Science*, *69*(9), 5087-5111.
Gibbons, R., & Henderson, R. (2012). Relational contracts and organizational capabilities. *Organization science*, *23*(5), 1350-1364.
Gibson Brandon, R., Glossner, S., Krueger, P., Matos, P., & Steffen, T. (2022). Do responsible investors invest responsibly?. *Review of Finance*, *26*(6), 1389-1432.
Gillan, S., & Starks, L. T. (2003). Corporate governance, corporate ownership, and the role of institutional investors: A global perspective. *Weinberg Center for Corporate Governance Working Paper*, (2003-01).
Goh, B. W., Lee, J., Lim, C. Y., & Shevlin, T. (2016). The effect of corporate tax avoidance on the cost of equity. *The Accounting Review*, *91*(6), 1647-1670.
Hainmueller, J. (2012). Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies. *Political analysis*, *20*(1), 25-46.
Hanlon, M., & Hoopes, J. L. (2014). What do firms do when dividend tax rates change? An examination of alternative payout responses. *Journal of Financial Economics*, *114*(1), 105-124.
Hanlon, M., & Slemrod, J. (2009). What does tax aggressiveness signal? Evidence from stock price reactions to news about tax shelter involvement. *Journal of Public economics*, *93*(1-2), 126-141.
He, Y. E., Kahraman, B., & Lowry, M. (2023). ES risks and shareholder voice. *The Review of Financial Studies*, *36*(12), 4824-4863.
Hoepner, A. G., Majoch, A. A., & Zhou, X. Y. (2021). Does an asset owner's institutional

setting influence its decision to sign the principles for responsible investment?. *Journal of Business Ethics*, *168*, 389-414.
Joshi, P. (2020). Does private country-by-country reporting deter tax avoidance and income shifting? Evidence from BEPS Action Item 13. *Journal of Accounting Research*, *58*(2), 333-381.
Julio, B., & Yook, Y. (2012). Political uncertainty and corporate investment cycles. *The journal of finance*, *67*(1), 45-83.
Kang, H., & Gray, S. J. (2019). Country-specific risks and geographic disclosure aggregation: Voluntary disclosure behaviour by British multinationals. *The British Accounting Review*, *51*(3), 259-276.
Khoo, K., & Tallarita, R. (2024). Expanding Shareholder Voice: The Impact of SEC Guidance on Environmental and Social Proposals. *Available at SSRN 4913660*.
Kim, S., & Yoon, A. (2023). Analyzing active fund managers' commitment to ESG: Evidence from the United Nations Principles for Responsible Investment. *Management science*, *69*(2), 741-758.
Kordsachia, O., Focke, M., & Velte, P. (2022). Do sustainable institutional investors contribute to firms' environmental performance? Empirical evidence from Europe. *Review of Managerial Science*, *16*(5), 1409-1436.
Krueger, P., Sautner, Z., & Starks, L. T. (2020). The importance of climate risks for institutional investors. *The Review of financial studies*, *33*(3), 1067-1111.
Krueger, P., Sautner, Z., Tang, D. Y., & Zhong, R. (2024). The effects of mandatory ESG disclosure around the world. *Journal of Accounting Research*, *62*(5), 1795-1847.
Leone, A. J., Minutti-Meza, M., & Wasley, C. E. (2019). Influential observations and inference in accounting research. *The Accounting Review*, *94*(6), 337-364.
Li, T., Shu, X., & Liao, G. (2024). Does corporate greenwashing affect investors' decisions?. *Finance Research Letters*, *67*, 105877.
Li, Z. F., Patel, S., & Ramani, S. (2021). The role of mutual funds in corporate social responsibility. *Journal of Business Ethics*, *174*, 715-737.
Liang, H., Sun, L., & Teo, M. (2022). Responsible hedge funds. *Review of Finance*, *26*(6), 1585-1633.
MacKinnon, J. G., Nielsen, M. Ø., & Webb, M. D. (2023). Cluster-robust inference: A guide to empirical practice. *Journal of Econometrics*, *232*(2), 272-299.
Majoch, A. A., Hoepner, A. G., & Hebb, T. (2017). Sources of stakeholder salience in the responsible investment movement: why do investors sign the principles for responsible investment?. *Journal of Business Ethics*, *140*, 723-741.
Matos, P. (2020). ESG and responsible institutional investing around the world: A critical review.
McMullin, J. L., & Schonberger, B. (2015). Entropy-balanced discretionary accruals. *SSRN Electronic Journal*.
Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *Academy of management review*, *22*(4), 853-886.
Müller, J. (2014). An accounting revolution? The financialisation of standard setting. *Critical Perspectives on Accounting*, *25*(7), 539-557.
Müller, R., Spengel, C., & Weck, S. (2023). How do investors value the publication of tax information? Evidence from the European public country-by-country reporting. *Contemporary Accounting Research*, *41*(3), 1893-1924.

Nessa, M. L., Persson, A. V., Song, J. Z., Towery, E. M., & Vernon, M. E. (2025). The Effect of US Country-by-Country Reporting on US Multinationals' Tax-Motivated Income Shifting and Real Activities. *Journal of Accounting Research*.

Pelger, C., & Spiess, N. (2017). On the IASB's construction of legitimacy–the case of the agenda consultation project. *Accounting and Business Research*, *47*(1), 64-90.

Porta, R. L., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of political economy*, *106*(6), 1113-1155.

Raghunandan, A., & Rajgopal, S. (2022). Do ESG funds make stakeholder-friendly investments?. *Review of Accounting Studies*, *27*(3), 822-863.

Ravenscroft, S., & Williams, P. F. (2009). Making imaginary worlds real: The case of expensing employee stock options. *Accounting, organizations and society*, *34*(6-7), 770-786.

Roberts, M. R., & Whited, T. M. (2013). Endogeneity in empirical corporate finance1. In *Handbook of the Economics of Finance* (Vol. 2, pp. 493-572). Elsevier.

Shipman, J. E., Swanquist, Q. T., & Whited, R. L. (2017). Propensity score matching in accounting research. *The Accounting Review*, *92*(1), 213-244.

Stubbs, W., & Higgins, C. (2018). Stakeholders' perspectives on the role of regulatory reform in integrated reporting. *Journal of Business Ethics*, *147*, 489-508.

Tran, H. T., & Pham, H. S. T. (2024). How environmental, social, and governance disclosure promotes sales? Empirical evidence from global firms. *Journal of Strategic Marketing*, *32*(1), 1-19.

Whited, R. L., Swanquist, Q. T., Shipman, J. E., & Moon Jr, J. R. (2022). Out of control: The (over) use of controls in accounting research. *The Accounting Review*, *97*(3), 395-413.

Wilson, R. J. (2009). An examination of corporate tax shelter participants. *The accounting review*, *84*(3), 969-999.

Zhang, Y., & Andrew, J. (2014). Financialisation and the conceptual framework. *Critical perspectives on accounting*, *25*(1), 17-26.

Tables and Figures

Appendix A: Variable Definitions

Variable	Definition
	Firm-level ESG performance
Data sources:	Sustainalytics WRDS (following replaced by Thomson Reuters Eikon Refinitiv, and ISS-EVA in additional tests)
ESG_score	ESG score, it weighs the E, S, and G score to obtain a company overall ESG performance. Values range from 0 to 100, with 100 as the highest score.
Environ_score	Environmental Score: this component reflects a firm's business actions in terms of environmental responsibility.
Social_score	Social Score: this component reflects a firm's commitment to the community.
Govern_score	Governance Score: this component reflects the firm's commitment to reach the best governance practices.
	Institutional investor classification
Data sources:	Orbis Bureau Van Dijk; UN PRI list to classify PRI investors
Total_IO	Total institutional ownership if shareholders are professional money managers, mutual funds, pension funds, bank trusts, and insurance companies (as classified by the Orbis Bureau Van Dijk database).
PRIownership	The percentage of PRI institutional ownership (Principles for Responsible Investment following the 2006 UN initiative).
High_PRIownership	A dummy variable equal to 1 if the percentage of PRI institutional ownership (Principles for Responsible Investment following the 2006 UN initiative) is above the median year by year, 0 otherwise.
PRI_totalIO	The percentage of PRI institutional ownership (Principles for Responsible Investment following the 2006 UN initiative) is scaled by the total ownership of institutional investors.
NoPRIownership	The percentage of institutional ownership *not* classified as PRI.
NoPRI_totalIO	The percentage of institutional ownership *not* classified as PRI (Principles for Responsible Investment) scaled by total institutional investors' ownership.
ΔPRIownership	The change in the percentage of PRI (Principles for Responsible Investment) institutional ownership in year t-1 from year t.
ΔPRI_totalIO	The change in in the percentage of PRI (Principles for Responsible Investment) institutional ownership from the beginning to the end of year t scaled by total institutional investors' ownership at the beginning of year t.
ΔNoPRIownership	The percentage of institutional ownership not classified as PRI (Principles for Responsible Investment) in year t-1 from year t.
ΔNoPRI_totalIO	The change in the percentage of institutional ownership not classified as PRI (Principles for Responsible Investment) from the beginning to the end of year t scaled by total institutional investors' ownership at the beginning of year t.
	Variables for DiD and DDD models
MNC_CbCR	A dummy variable equal to 1 if the firm is a UK-parented multinational group (MNC) with consolidated revenue of £750 million due to file a Country-by-Country Report with HM Revenue & Customs (HMRC), 0 otherwise.
PRI_firms	A dummy variable equal to 1 if the UK listed firm is owned by PRI (Principles for Responsible Investment following the 2006 UN initiative), 0 otherwise.
High_PRIownership	A dummy variable equal to 1 if the percentage of PRI institutional ownership (Principles for Responsible Investment following the 2006 UN initiative) is above the median year by year, 0 otherwise.
Post_CbCR	A dummy variable equal to 1 for the years post-adoption of the UK Country-by-Country Reporting regulation (2017-2019), 0 otherwise.
	Firm-level control variables
Data source*:*	Orbis Bureau Van Dijk and CRSP WRDS
Size	Natural logarithm of fiscal year's total assets in thousands of GBP.
Leverage	Total liability scaled by total assets.

ROA	Net income scaled by total assets.
Tangibility	Property, plant & equipment scaled by total assets.
Cfo	Cash from operations scaled by total assets.
Sales	Net sales divided by total assets.
Invcycle	Investment cycle is computed as depreciation of tangible fixed assets scaled by total assets.
Audit_qualified	Audit qualified opinion is a dummy variable that takes on the value of 0 for an unqualified opinion and 1 for a qualified opinion.
Divid_payment	Dividend payments is a dummy variable that equals one if firm has paid any dividends in a year, and 0 otherwise.
Big4audit	This is a dummy variable equal to 1 if the auditor is a Big 4 firm (EY, PWC, Deloitte, KPMG), and 0 if the auditor is a Second-tier auditor.
Industry	Four digits SIC code (drop if industry>=6000 & industry<=6999 | industry>=4900 & industry<=4999; financial companies and utilities).

Figure 1 – DiD and DDD research design and fixed effect structure
This figure illustrates the general timeline from 2013 to 2019 and the different periods (*Pre* and *Post*) with respect of the Country-by-Country regulatory adoption in the year 2016. Beyond to control for time-invariant cross-sectional variation (our models include firm fixed effects - *firm FE*), our inferences cannot be confounded by an omitted variable unless this variable covaries with our key variables not only in the cross-section but also in the time series. Thus, we include a further a year-by-industry fixed effect structure (*year x industry FE*) to control for unobserved factors that may vary across both time and industries.

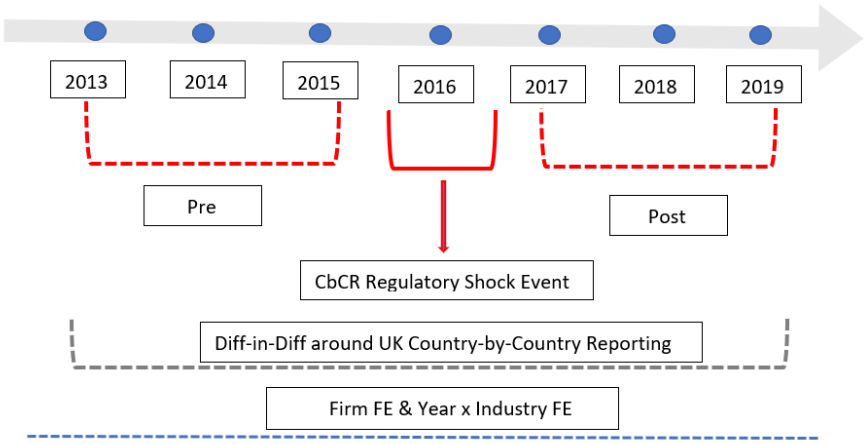
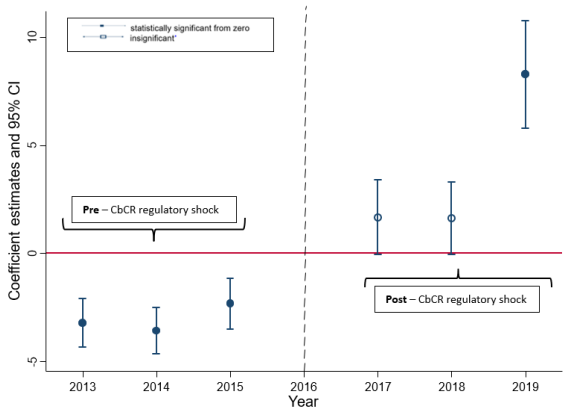


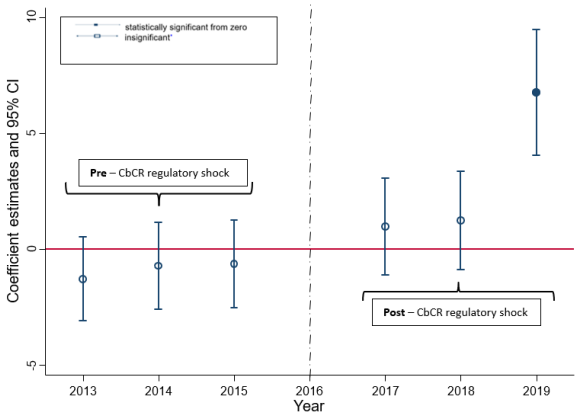
Figure 2 – Parallel trend analysis on DiD and DDD
Panel A, B, C, and D plot coefficients from the diff-in-diff (DiD) and triple diff-in-diff (DDD) estimations employed to measure the incremental effects on ESG scores *(ESG_score),* environmental scores *(Environ_score),* social scores *(Social_score),* and governance scores *(Govern_score)* using a sample no. 677 UK-listed firms (of which no. 291 UK listed multinational corporations as treated firms, and a no. 386 UK listed firms not classified as multinational corporations as control firms) covering the period 2013-2019 around the regulatory adoption of the Country-by-Country Reporting in 2016. For each panel we present two figures: 1) one dedicated to the DiD coefficients between the treated and the control firms; 2) one dedicated to the triple DDD coefficients between the treated and the control firms when they are covered by PRI (Principles for Responsible Investment) investors.

Panel A. ESG scores.

DiD estimates

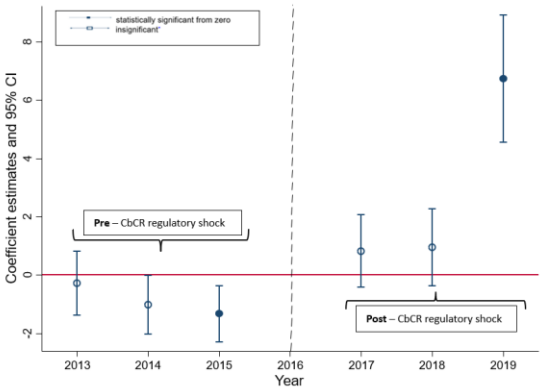


Triple DDD estimates

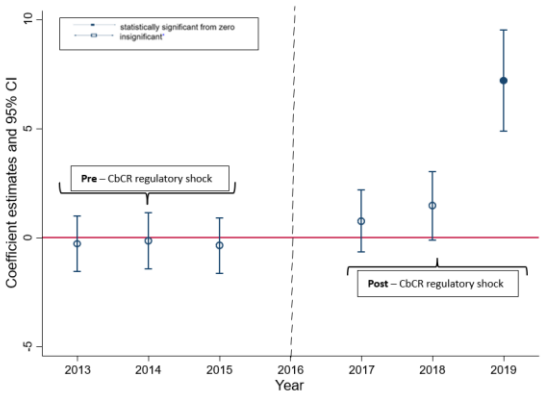


Panel B. Environmental scores.

DiD estimates

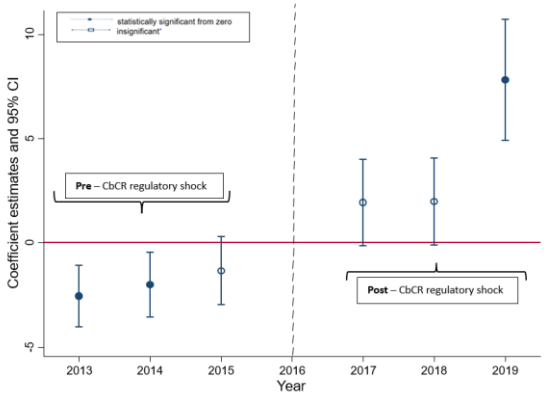


Triple DDD estimates

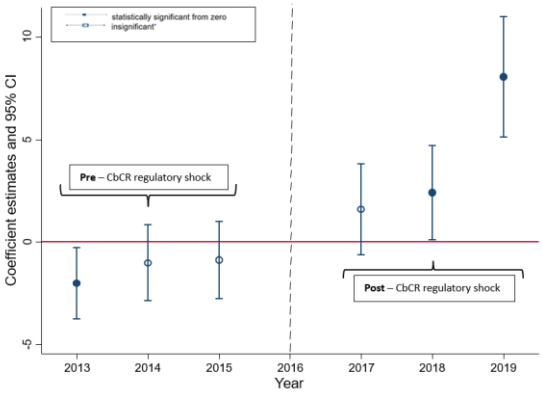


Panel C. Social scores.

DiD estimates

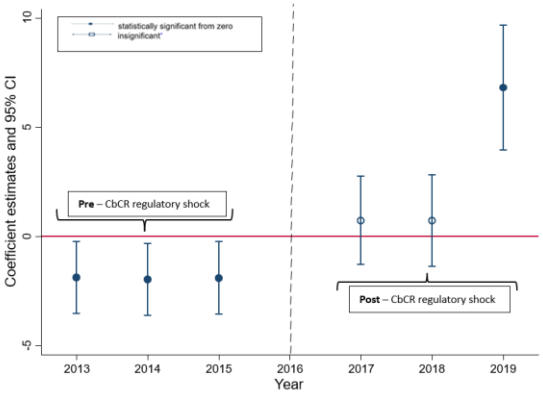


Triple DDD estimates



Panel D. Governance scores.

DiD estimates



Triple DDD estimates

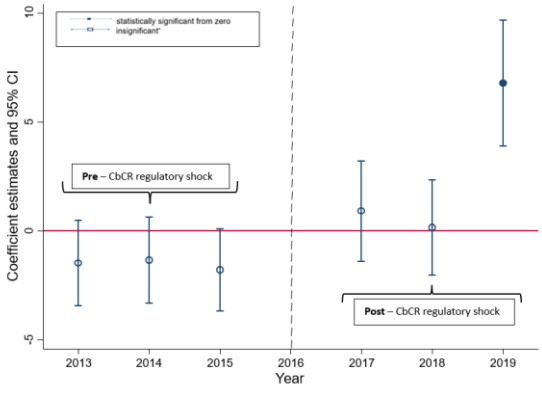


Table 1
Sample composition and summary statistics

Panel A. Sample selection process.
This table presents the sample selection process. The sample comprises UK-listed firms covering the 2013–2019 period. Financial Accounting data are obtained from Orbis BVD and CRSP WRDS. ESG data are from Sustainalytics WRDS (following replaced by Thomson Reuters Eikon Refinitiv, and ISS-EVA)

Sample of UK-listed firms		No. firms
UK listed firms (by merging dataset from Orbis BVD, CRSP WRDS, and Sustainalytics)	1,010	
less firms belonging to the sectors of financial institutions and utilities		(333)
Final sample		677
Identification of the two subsamples – treatment & control		
treated firms under the treatment of CbCR rules		291
control firms not under the treatment of CbCR rules		386
PRI ownership participation		
Firms endorsed by UN PRI investors (Principles for Responsible Investment)	588	
under the treatment of CbCR rules		258
not under the treatment of CbCR rules		330
Firms *not* endorsed by UN PRI investors (Principles for Responsible Investment)	89	
under the treatment of CbCR rules		33
not under the treatment of CbCR rules		56

Panel B. Main summary statistics for the **full sample 2013-2019**.
This table reports the summary statistics (mean, standard deviation, percentile 25, median, and percentile 75) for the full sample of no. 677 UK listed firms covering the time period around the adoption of the Country-by-Country Reporting (CbCR) regulation (years 2013-2019). All continuous variables are winsorized at 1% and 99% level. All the variables are detailed in Appendix I.

	N. obs	Mean	Sd	P25	Median	P75
ESG_score	4,739	50.64	19.06	38.67	50.78	63.31
Environ_score	4,739	42.74	25.28	22.91	40.58	61.70
Social_score	4,739	53.15	21.11	37.13	54.39	69.12
Govern_score	4,739	54.35	22.06	37.83	56.28	71.06
Size	4,739	4.307	2.232	2.608	4.295	6.060
Leverage	4,739	0.405	0.208	0.236	0.438	0.557
ROA	4,739	-0.065	0.231	-0.097	0.025	0.068
Tangibility	4,739	0.134	0.127	0.021	0.094	0.216
Cfo	4,739	-0.008	0.202	-0.043	0.061	0.106
Sales	4,739	0.691	0.486	0.296	0.612	1.093
Invcycle	4,739	0.024	0.021	0.007	0.017	0.037
Audit_qualified	4,739	0.135	0.342	0	0	0
Divid_payment	4,739	0.396	0.489	0	0	1
Big4audit	4,739	0.519	0.499	0	1	1

Panel C. Differences in mean and median between treatment and control sub-samples **2013-2019**.
This table reports the summary statistics mean, median and differences of the main variables employed in our analyses between the *treatment sample* adhering to the Country-by-Country Reporting (CbCR) regulation (291 firms) and *control sample* not adhering to the Country-by-Country Reporting (CbCR) regulation (386 firms) covering the time period before and after the CbCR regulatory shock (years 2013-2019). All continuous variables are winsorized at 1% and 99% level. ***, **, * indicates significance level at 1%, 5%, and 10%, respectively. All the variables are detailed in Appendix I.

	Treatment: Mean	Control: Mean	Difference in Mean: Treatment-Control	t-stat	Treatment: Median	Control: Median	Difference in Median: Treatment-Control	t-stat
ESG_score	55.54	45.51	10.03***	[8.15]	55.85	45.78	10.07***	[7.23]
Environ_score	48.04	37.19	10.85***	[6.57]	45.23	31.87	13.36***	[5.39]
Social_score	59.03	47.00	12.03***	[8.90]	61.34	47.55	13.79***	[7.07]
Govern_score	57.60	50.95	6.650***	[4.56]	60.52	50.56	9.96***	[5.13]
Size	4.779	4.155	0.624***	[9.71]	4.714	4.054	0.660***	[6.08]
Leverage	0.408	0.418	-0.010	[-0.26]	0.460	0.425	0.035***	[3.62]
ROA	-0.051	-0.049	-0.002	[-0.34]	0.018	0.028	-0.010***	[-2.64]
Tangibility	0.144	0.135	0.009***	[3.29]	0.121	0.083	0.038***	[6.00]
Cfo	0.011	0.001	0.010***	[2.32]	0.067	0.056	0.011***	[3.01]
Sales	0.639	0.810	-0.171***	[-10.1]	0.572	0.723	-0.151***	[-9.21]
Invcycle	0.026	0.022	0.004***	[6.31]	0.019	0.016	0.003***	[3.64]
Audit_qualified	0.140	0.131	0.009	[0.85]	0	0	0.000	[0.00]
Divid_payment	0.389	0.402	-0.013	[-0.81]	0	0	0.000	[0.00]
Big4audit	0.587	0.467	0.120***	[7.48]	1	0	1.000	[0.00]

Panel D. Differences in mean and median between treatment and control sub-samples **2013-2015**.
This table reports the summary statistics mean, median and differences of the main variables employed in our analyses between the *treatment sample* adhering to the Country-by-Country Reporting (CbCR) regulation (291 firms) and *control sample* not adhering to the Country-by-Country Reporting (CbCR) regulation (386 firms) covering the period before the adoption of the CbCR regulation (years 2013-2015). All continuous variables are winsorized at 1% and 99% level. ***, **, * indicates significance level at 1%, 5%, and 10%, respectively. All the variables are detailed in Appendix I.

	Treatment: Mean	Control: Mean	Difference in Mean: Treatment-Control	t-stat	Treatment: Median	Control: Median	Difference in Median: Treatment-Control	t-stat
ESG_score	52.25	45.16	7.09*	[1.95]	52.55	45.29	7.26	[1.59]
Environ_score	47.43	38.12	9.31	[1.46]	47.66	37.68	9.98*	[1.74]
Social_score	51.73	45.38	6.35	[0.83]	51.86	44.62	7.24*	[1.87]
Govern_score	55.93	51.56	4.37*	[1.98]	55.37	51.86	3.51***	[2.48]
Size	4.567	3.876	0.691***	[5.68]	4.541	3.930	0.611***	[3.04]
Leverage	0.414	0.411	0.003	[0.38]	0.465	0.425	0.040	[0.91]
ROA	-0.066	-0.060	0.006	[0.50]	0.016	0.031	-0.015***	[-2.93]
Tangibility	0.132	0.124	0.008	[1.21]	0.111	0.078	0.033***	[2.99]
Cfo	0.001	-0.012	0.013	[1.04]	0.068	0.062	0.006	[1.11]
Sales	0.619	0.787	-0.168***	[-6.14]	0.572	0.745	-0.173	[-1.72]
Invcycle	0.025	0.020	0.005***	[2.98]	0.017	0.016	0.001	[1.23]
Audit_qualified	0.000	0.097	-0.097	[1.45]	0	0	0.000	[0.00]
Divid_payment	0.393	0.404	-0.011	[-0.87]	0	0	0.000	[0.00]
Big4audit	0.609	0.499	0.110***	[3.48]	1	0	1.000	[0.00]

Panel E. Differences in mean and median between treatment and control sub-samples **2017-2019**.
This table reports the summary statistics mean, median and differences of the main variables employed in our analyses between the *treatment sample* adhering to the Country-by-Country Reporting (CbCR) regulation (291 firms) and *control sample* not adhering to the Country-by-Country Reporting (CbCR) regulation (386 firms) covering the period after the adoption of the CbCR regulation (years 2017-2019). All continuous variables are winsorized at 1% and 99% level. ***, **, * indicates significance level at 1%, 5%, and 10%, respectively. All the variables are detailed in Appendix I.

	Treatment: Mean	Control: Mean	Difference in Mean: Treatment-Control	t-stat	Treatment: Median	Control: Median	Difference in Median: Treatment-Control	t-stat
ESG_score	61.30	46.29	15.01***	[6.21]	61.23	47.42	7.26***	[5.69]
Environ_score	53.47	37.42	16.05***	[4.97]	50.10	32.41	9.98***	[3.99]
Social_score	65.38	48.36	17.02***	[6.94]	68.82	49.39	7.24***	[5.58]
Govern_score	62.82	51.21	11.61***	[3.55]	66.08	51.01	3.51***	[4.03]
Size	7.380	4.095	3.285***	[7.91]	7.803	4.153	0.611***	[4.99]
Leverage	0.535	0.448	0.087	[0.85]	0.498	0.420	0.040***	[3.50]
ROA	0.038	-0.073	0.111	[0.84]	0.048	0.025	-0.015	[-0.93]
Tangibility	0.169	0.156	0.013***	[2.80]	0.153	0.084	0.033***	[5.31]
Cfo	0.085	-0.013	0.098	[1.42]	0.077	0.054	0.006***	[2.62]
Sales	0.930	0.894	0.036***	[4.39]	0.583	0.709	-0.173***	[-6.96]
Invcycle	0.140	0.045	0.095	[0.96]	0.046	0.016	0.001	[3.39]
Audit_qualified	0.092	0.158	-0.066	[-0.21]	0	0	0.000	[0.00]
Divid_payment	0.750	0.394	0.356	[0.38]	1	0	0.000	[0.00]
Big4audit	0.938	0.448	0.490***	[6.69]	1	0	1.000	[0.00]

Panel F. Correlation matrix.

This table presents the correlation matrix of all the variables of the full sample of the UK listed firms (677 firms) employed in our main analyses covering the years 2013-2019. All continuous variables are winsorized at 1% and 99% level. ***, **, * indicates significance level at 1%, 5%, and 10%, respectively. All the variables are detailed in Appendix I.

	ESG _score	Environ _score	Social _score	Govern _score	Size	Leverage	ROA	Tangibility	Cfo	Sales	Invcycle	Audit _qualified	Divid _payment	BIG4 audit
ESG_score	1													
Environ_score	**0.870*****	1												
Social_score	**0.898*****	**0.741*****	1											
Govern_score	**0.726*****	**0.458*****	**0.457*****	1										
Size	**0.368*****	**0.294*****	**0.373*****	**0.266*****	1									
Leverage	**0.145*****	**0.094****	**0.118*****	**0.118*****	-0.015	1								
ROA	-0.067	-0.059	**-0.120*****	-0.015	**0.420*****	**-0.047****	1							
Tangibility	**-0.094****	-0.063	**-0.065***	**-0.066***	**0.169*****	0.011	**0.085*****	1						
Cfo	-0.016	-0.045	**-0.061***	0.027	**0.435*****	**-0.059*****	**0.657*****	**0.164*****	1					
Sales	**-0.109*****	**-0.101****	**-0.129*****	-0.058	**0.054*****	**0.135*****	**0.197*****	-0.007	**0.241*****	1				
Invcycle	**0.310*****	**0.276*****	**0.277*****	**0.211*****	**0.150*****	0.012	0.017	**0.034***	**0.031***	-0.021	1			
Audit_qualified	-0.057	-0.054	-0.021	-0.056	**-0.173*****	0.036	**-0.210*****	0.018	**-0.176*****	**-0.146*****	0.012	1		
Divid_payment	**0.203*****	**0.229*****	**0.141*****	**0.159*****	**0.522*****	0.015	**0.324*****	**0.096*****	**0.338*****	**0.182*****	**0.096*****	**-0.176*****	1	
Big4audit	**0.102****	0.029	**0.115*****	**0.117*****	**0.632*****	**0.046****	**0.243*****	**0.050*****	**0.237*****	**0.119*****	**0.091*****	**-0.123*****	**0.384*****	1

Table 2
PRI institutional ownership - summary statistics

Panel A. Summary statistics detailing the institutional ownership distribution for the UK listed endorsed by UN PRI.
This table reports the summary statistics in mean and median of the distribution in percentage for the ownership (*Total_IO; PRIownership; PRI_totalIO; NoPRIownership; NoPRI_totalIO; ΔPRIownership; ΔPRI_totalIO; ΔNoPRIownership; ΔNoPRI_totalIO*) between the full sample of UK listed firms owned by PRI (Principles for Responsible Investment) investors (no. 588 firms – PRI Full sample) and the treatment sample of UK multinational corporations (no. 258 firms – CbCR Treatment sample) owned by PRI investors covering the time period around the adoption of the Country-by-Country Reporting (CbCR) regulation (years 2013-2019). All continuous variables are winsorized at 1% and 99% level. ***, **, * indicates significance level at 1%, 5%, and 10%, respectively. All the variables are detailed in Appendix I.

	PRI-Full sample: Mean	CbCR-Treatment sample: Mean	PRI-Full sample: Median	CbCR-Treatment sample: Median
Total_IO	49.45	44.09	48.09	43.59
PRIownership	20.46	18.97	20.09	16.09
PRI_totalIO	41.38	50.13	40.88	43.09
NoPRIownership	28.99	28.73	27.72	25.72
NoPRI_totalIO	58.62	58.55	56.28	55.99
ΔPRIownership	4.25	3.06	4.02	2.59
ΔPRI_totalIO	2.51	0.87	2.18	0.77
ΔNoPRIownership	2.39	2.50	2.18	2.22
ΔNoPRI_totalIO	3.16	2.95	3.02	2.89

Panel B. Distribution of the mean per year of the institutional ownership for the UK listed endorsed by UN PRI.
This table reports the mean of the distribution in percentage for the ownership (*Total_IO; PRIownership; PRI_totalIO; NoPRIownership; NoPRI_totalIO; ΔPRIownership; ΔPRI_totalIO; ΔNoPRIownership; ΔNoPRI_totalIO*) for the full sample of UK listed firms owned by PRI investors (no. 588 firms – PRI Full sample) covering years 2013-2019, around the 2016 Country-by-Country Reporting (CbCR) regulatory adoption. All continuous variables are winsorized at 1% and 99% level. All the variables are detailed in Appendix I.

Year	Total_IO	PRI ownership	PRI _totalIO	NoPRI ownership	NoPRI _totalIO	ΔPRI ownership	ΔPRI _totalIO	ΔNoPRI ownership	ΔNoPRI _totalIO
2013	46.99	20.01	42.58	26.98	57.42	-	-	-	-
2014	47.46	20.05	42.25	27.41	57.75	0.20	-0.78	1.59	0.57
2015	47.43	20.27	42.74	27.16	57.26	1.10	1.16	-0.91	-0.85
2016	48.51	18.77	38.69	29.74	61.31	-7.40	-9.48	9.50	7.07
2017	50.93	20.21	39.68	30.72	60.32	7.67	2.56	3.30	-1.61
2018	51.8	21.38	41.27	30.42	58.73	5.79	4.01	-0.97	-2.64
2019	53.39	22.77	42.65	30.62	57.35	6.50	3.34	0.66	-2.35
Mean	49.45	20.46	41.38	28.99	58.62	4.25	2.51	2.39	3.16

Table 3
Difference in difference (DiD) on ESG practices of UK listed multinational corporations after the CbCR regulatory shock

This table presents the results from the estimation of the difference in difference research design (DiD) on ESG practices (*ESG_score*, and then splitted into *Environ_score*, *Social_score*, *Govern_score* - Columns 1-4) using a sample of no. 677 UK-listed firms (of which no. 291 UK listed multinational corporations, and a no. 386 UK listed firms not classified as multinational corporations) covering the period 2013-2019. *MNC_CbCR* is a dummy variable equal to 1 if the firm is a UK-parented multinational group with consolidated revenue of £750 million due to file a Country-by-Country Report with HM Revenue & Customs (HMRC), 0 otherwise. The shock event corresponds to the year 2016 regulatory initiative of the UK Country-by-Country Reporting. *Post_CbCR* is a dummy variable equal to 1 for the years post-adoption (2017-2019), 0 otherwise. ***MNC_CbCR x Post_CbCR*** is the interaction term capturing the difference-in-differences effect of the UK Country-by-Country Reporting regulation for a multinational corporation under the treatment of filing the CbC reports. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) firm fixed effects (*FirmFE*) and industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

$$ESG_score_{i,t} = \beta_0 + \beta_1 MNC_CbCR_{i,t} + \beta_2 Post_CbCR_t + \beta_3(\boldsymbol{MNC_CbCR_{i,t}\ x\ Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	ESG _score	*Environ _score*	*Social _score*	*Govern _score*
MNC_CbCR x Post_CbCR	**0.019*****	**0.031*****	**0.025*****	**0.047*****
	[2.75]	[5.34]	[3.00]	[3.74]
$Size_{t-1}$	0.664	0.097	0.567	0.979*
	[1.52]	[0.29]	[1.20]	[1.85]
$Leverage_{t-1}$	0.006	0.001	0.005	0.013
	[0.33]	[0.07]	[0.26]	[0.64]
ROA_{t-1}	-0.003	-0.000	-0.004	-0.006
	[-0.20]	[-0.02]	[-0.20]	[-0.33]
$Tangibility_{t-1}$	0.004	0.003	0.029	-0.063
	[0.07]	[0.08]	[0.50]	[-1.09]
Cfo_{t-1}	0.009	0.005	0.016	0.007
	[0.37]	[0.25]	[0.52]	[0.26]
$Sales_{t-1}$	0.010	0.010	0.010	0.018
	[1.07]	[1.25]	[0.93]	[1.57]
$Invcycle_{t-1}$	-0.042	-0.097	-0.011	-0.024
	[-0.13]	[-0.38]	[-0.03]	[-0.07]
Audit_qualified	-0.012	-0.019***	-0.010	-0.011
	[-1.63]	[-3.14]	[-1.47]	[-1.34]
Divid_payment	0.815	1.247*	0.298	0.837
	[1.05]	[1.85]	[0.34]	[0.86]
Big4audit	0.518	0.463	1.302	0.591
	[0.56]	[0.57]	[1.33]	[0.59]
_cons	0.079***	0.072***	0.090***	0.072**
	[3.20]	[3.95]	[3.38]	[2.44]
FirmFE	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.487	0.434	0.482	0.459
N	4,062	4,062	4,062	4,062

Table 4
Difference in difference (DiD) on ESG practices of PRI institutional ownership after the CbCR regulatory shock

Panel A. This table presents the results from the estimation of the difference in difference research design (DiD) on ESG practices (*ESG_score*, and then splitted into *Environ_score*, *Social_score*, *Govern_score* - Columns 1-4) using a sample of no. 677 UK-listed firms (of which no. 588 firms owned by PRI investors (Principles for Responsible Investment) and a no. 89 firms owned by institutional investors not classified in PRI) covering the period 2013-2019. *PRI_firms* is a dummy variable equal to 1 if the UK listed firm is owned by PRI (Principles for Responsible Investment following the 2006 UN initiative), 0 otherwise. The shock event corresponds to the year 2016 regulatory initiative of the UK Country-by-Country Reporting. *Post_CbCR* is a dummy variable equal to 1 for the years post-adoption (2017-2019), 0 otherwise. ***PRI_firms x Post_CbCR*** is the interaction term capturing the difference-in-differences effect of the UK Country-by-Country Reporting regulation for a group of firms under the treatment of participation of PRI investors compared to a group of control firms with no PRI investors. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) firm fixed effects (*FirmFE*) and industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

$$ESG_score_{i,t} = \beta_0 + \beta_1 PRI_firms_{i,t} + \beta_2 Post_CbCR_t + \beta_3(\boldsymbol{PRI_firms_{i,t}\ x\ Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	ESG _score	*Environ _score*	*Social _score*	*Govern _score*
PRI_firms x Post_CbCR	**0.018*****	**0.016*****	**0.022*****	**0.025*****
	[2.97]	[2.97]	[3.04]	[3.58]
$Size_{t-1}$	0.393	0.262	0.260	0.452
	[0.93]	[0.79]	[0.56]	[0.90]
$Leverage_{t-1}$	0.002	0.002	0.011	0.005
	[0.11]	[0.15]	[0.54]	[0.26]
ROA_{t-1}	-0.005	-0.002	-0.008	-0.009
	[-0.30]	[-0.16]	[-0.44]	[-0.55]
$Tangibility_{t-1}$	0.009	0.018	0.035	0.027
	[0.18]	[0.41]	[0.67]	[0.54]
Cfo_{t-1}	0.003	0.008	0.005	0.005
	[0.13]	[0.42]	[0.19]	[0.18]
$Sales_{t-1}$	0.011	0.008	0.010	0.014
	[1.19]	[1.06]	[0.99]	[1.29]
$Invcycle_{t-1}$	-0.074	-0.056	-0.090	-0.091
	[-0.27]	[-0.22]	[-0.29]	[-0.31]
Audit_qualified	-0.016**	-0.019***	-0.016**	-0.016**
	[-2.33]	[-3.25]	[-2.05]	[-2.10]
Divid_payment	0.821	1.384**	0.441	0.860
	[1.12]	[2.06]	[0.54]	[1.03]
Big4audit	0.571	0.495	1.128	0.700
	[0.66]	[0.61]	[1.17]	[0.75]
_cons	0.070***	0.072***	0.080***	0.071**
	[2.94]	[3.94]	[3.03]	[2.57]
FirmFE	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.476	0.433	0.463	0.458
N	4,062	4,062	4,062	4,062

Panel B. This table presents the results from the estimation of the difference in difference research design (DiD) on ESG practices (*ESG_score*, and then splitted into *Environ_score*, *Social_score*, *Govern_score* - Columns 1-4) using a sample of no. 677 UK-listed firms (of which no. 588 firms owned by PRI investors (Principles for Responsible Investment) and a no. 89 firms owned by institutional investors not classified in PRI) covering the period 2013-2019. ***PRIownership*** is the percentage of PRI institutional ownership (Principles for Responsible Investment following the 2006 UN initiative). The shock event corresponds to the year 2016 regulatory initiative of the UK Country-by-Country Reporting. *Post_CbCR* is a dummy variable equal to 1 for the years post-adoption (2017-2019), 0 otherwise. ***PRIownership x Post_CbCR*** is the interaction term capturing the difference-in-differences effect of the UK Country-by-Country Reporting regulation for firms that have the percentage of ownership held by institutional investors classified as PRI. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) firm fixed effects (*FirmFE*) and industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

$$ESG_score_{i,t} = \beta_0 + \beta_1 PRIownership_{i,t} + \beta_2 Post_CbCR_t + \beta_3(\boldsymbol{PRIownership_{i,t}\ x\ Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	ESG _score	*Environ _score*	*Social _score*	*Govern _score*
PRIownership	-0.000	0.006	-0.001	-0.001
	[-0.01]	[0.46]	[-0.06]	[-0.07]
PRIownership x Post_CbCR	**0.044*****	**0.024***	**0.058*****	**0.039****
	[2.58]	[1.68]	[2.97]	[2.03]
$Size_{t-1}$	0.410	0.214	0.302	0.503
	[0.98]	[0.65]	[0.66]	[1.01]
$Leverage_{t-1}$	0.004	0.002	0.010	0.007
	[0.23]	[0.10]	[0.47]	[0.33]
ROA_{t-1}	-0.005	-0.002	-0.008	-0.009
	[-0.31]	[-0.11]	[-0.45]	[-0.53]
$Tangibility_{t-1}$	0.005	0.008	0.022	0.042
	[0.10]	[0.19]	[0.41]	[0.82]
Cfo_{t-1}	0.003	0.007	0.005	0.004
	[0.11]	[0.39]	[0.20]	[0.16]
$Sales_{t-1}$	0.010	0.008	0.010	0.014
	[1.09]	[1.06]	[0.99]	[1.24]
$Invcycle_{t-1}$	-0.051	-0.075	-0.072	-0.050
	[-0.18]	[-0.30]	[-0.24]	[-0.17]
Audit_qualified	-0.013***	-0.015***	-0.014**	-0.014***
	[-2.78]	[-3.61]	[-2.56]	[-2.65]
Divid_payment	0.919	1.422**	0.551	0.936
	[1.25]	[2.11]	[0.68]	[1.12]
Big4audit	0.653	0.407	1.232	0.830
	[0.76]	[0.50]	[1.27]	[0.89]
_cons	0.075***	0.075***	0.084***	0.080***
	[3.22]	[4.20]	[3.26]	[2.91]
FirmFE	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.475	0.433	0.463	0.457
N	4,062	4,062	4,062	4,062

Panel C. This table presents the results from the estimation of the difference in difference research design (DiD) on ESG practices (*ESG_score*, and then splitted into *Environ_score*, *Social_score*, *Govern_score* - Columns 1-4) using a sample of no. 677 UK-listed firms (of which no. 588 firms owned by PRI investors (Principles for Responsible Investment) and a no. 89 firms owned by institutional investors not classified in PRI) covering the period 2013-2019. *High_PRIownership* is a dummy variable equal to 1 if the percentage of PRI institutional ownership (Principles for Responsible Investment following the 2006 UN initiative) is above the median year by year, 0 otherwise. The shock event corresponds to the year 2016 regulatory initiative of the UK Country-by-Country Reporting. *Post_CbCR* is a dummy variable equal to 1 for the years post-adoption (2017-2019), 0 otherwise. ***High_PRIownership x Post_CbCR*** capturing the difference-in-differences effect of the UK Country-by-Country Reporting regulation for firms that have the percentage of ownership held by institutional investors classified as PRI above the median year by year. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) firm fixed effects (*FirmFE*) and industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

$$ESG_score_{i,t} = \beta_0 + \beta_1 High_PRIownership_{i,t} + \beta_2 Post_CbCR_t + \beta_3(\boldsymbol{High_PRIownership_{i,t}\ x\ Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	ESG _score	*Environ _score*	*Social _score*	*Govern _score*
High_PRIownership	0.255	0.443	-0.078	0.161
	[0.61]	[1.21]	[-0.17]	[0.32]
High_PRIownership x Post_CbCR	**0.016*****	0.006	**0.021*****	**0.019*****
	[3.21]	[1.34]	[3.75]	[3.33]
$Size_{t-1}$	0.409	0.215	0.313	0.503
	[0.98]	[0.65]	[0.68]	[1.01]
$Leverage_{t-1}$	0.005	0.001	0.009	0.007
	[0.26]	[0.04]	[0.44]	[0.37]
ROA_{t-1}	-0.006	-0.002	-0.009	-0.010
	[-0.39]	[-0.15]	[-0.53]	[-0.63]
$Tangibility_{t-1}$	0.003	0.009	0.025	0.041
	[0.06]	[0.22]	[0.47]	[0.80]
Cfo_{t-1}	0.003	0.007	0.006	0.004
	[0.14]	[0.35]	[0.20]	[0.14]
$Sales_{t-1}$	0.011	0.009	0.011	0.015
	[1.17]	[1.11]	[1.06]	[1.33]
$Invcycle_{t-1}$	-0.085	-0.057	-0.109	-0.094
	[-0.31]	[-0.23]	[-0.36]	[-0.32]
Audit_qualified	-0.013***	-0.015***	-0.014**	-0.014***
	[-2.75]	[-3.59]	[-2.57]	[-2.58]
Divid_payment	0.877	1.388**	0.498	0.913
	[1.19]	[2.06]	[0.61]	[1.10]
Big4audit	0.627	0.416	1.208	0.789
	[0.72]	[0.51]	[1.24]	[0.84]
_cons	0.075***	0.076***	0.086***	0.078***
	[3.21]	[4.18]	[3.31]	[2.86]
FirmFE	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.476	0.433	0.463	0.458
N	4,062	4,062	4,062	4,062

Table 5
Triple differences regression (DDD) among ESG practices, UK listed multinational corporations and PRI institutional ownership after the CbCR regulatory shock

Panel A. This table reports coefficients estimated from the triple differences regression (DDD) of the ESG practices (*ESG_score*, and then splitted into *Environ_score*, *Social_score*, *Govern_score* - Columns 1-4) on the indicators of multinational corporations, post Country by Country Reporting regulation and institutional ownership under PRI classification using a sample of no. 677 UK-listed firms (of which no. 291 UK listed multinational corporations, and a no. 386 UK listed firms not classified as multinational corporations) covering the period 2013-2019. *MNC_CbCR* is a dummy variable equal to 1 if the firm is a UK-parented multinational group with consolidated revenue of £750 million due to file a Country-by-Country Report with HM Revenue & Customs (HMRC), 0 otherwise. The shock event corresponds to the year 2016 regulatory initiative of the UK Country-by-Country Reporting. *Post_CbCR* is a dummy variable equal to 1 for the years post-adoption (2017-2019), 0 otherwise. *MNC_CbCR x Post_CbCR* is the interaction term capturing the difference-in-differences effect of the UK Country-by-Country Reporting regulation for a multinational corporation under the treatment of filing the CbC reports. *PRI_firms* is a dummy variable equal to 1 if the UK listed firm is owned by PRI (Principles for Responsible Investment following the 2006 UN initiative), 0 otherwise. *PRI_firms x Post_CbCR* is the interaction term capturing the difference-in-differences effect of the UK Country-by-Country Reporting regulation for a group of firms under the treatment of participation of PRI investors compared to a group of control firms with no PRI investors. ***MNC_CbCR x PRI_firms x Post_CbCR*** is the interaction term capturing the incremental effect of PRI institutional ownership on the multinational corporations-ESG practices relation. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) firm fixed effects (*FirmFE*) and industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

$$ESG_score_{i,t} = \beta_0 + \beta_1 MNC_CbCR_{i,t} + \beta_2 PRI_firms_{i,t} + \beta_3 Post_CbCR_t + \beta_4 (MNC_CbCR_{i,t} \text{ x } Post_CbCR) + \beta_5 (PRI_firms_{i,t} \text{ x } Post_CbCR) + \beta_6 (\boldsymbol{MNC_CbCR_{i,t} \text{ x } PRI_firms_{i,t} \text{ x } Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	ESG _score	*Environ _score*	*Social _score*	*Govern _score*
MNC_CbCR x Post_CbCR	0.093***	0.226***	0.390**	0.965***
	[4.74]	[7.38]	[2.29]	[2.84]
PRI_firms x Post_CbCR	0.215**	0.182**	0.277**	0.184
	[2.08]	[2.04]	[2.44]	[1.48]
MNC_CbCR x PRI_firms x Post_CbCR	**1.138*****	**2.490*****	**0.656*****	**1.343*****
	[5.18]	[7.76]	[3.20]	[3.71]
$Size_{t-1}$	0.003	0.394	0.111	0.174
	[0.00]	[0.77]	[0.17]	[0.25]
$Leverage_{t-1}$	0.018	0.008	0.007	0.023
	[0.68]	[0.38]	[0.25]	[0.84]
ROA_{t-1}	0.004	0.004	0.005	0.001
	[0.20]	[0.20]	[0.21]	[0.06]
$Tangibility_{t-1}$	0.003	0.016	0.020	0.054
	[0.06]	[0.30]	[0.31]	[0.91]
Cfo_{t-1}	0.004	0.007	0.005	0.004
	[0.13]	[0.24]	[0.16]	[0.12]
$Sales_{t-1}$	0.014	0.011	0.012	0.026
	[1.09]	[1.03]	[0.84]	[1.69]
$Invcycle_{t-1}$	-0.032	-0.129	-0.025	-0.042
	[-0.08]	[-0.37]	[-0.06]	[-0.11]
Audit_qualified	-0.801	-1.217	-0.942	-0.021
	[-0.79]	[-1.38]	[-0.84]	[-0.02]
Divid_payment	1.031	1.254	1.033	0.886
	[1.08]	[1.47]	[0.93]	[0.83]
Big4audit	0.501	0.873	1.064	0.417
	[0.41]	[0.81]	[0.77]	[0.32]
_cons	0.757**	0.074***	0.081**	0.072
	[2.19]	[2.66]	[2.11]	[1.85]
FirmFE	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.473	0.437	0.461	0.459
N	4,062	4,062	4,062	4,062

Panel B. This table reports coefficients estimated from the triple differences regression (DDD) of the ESG practices (*ESG_score*, and then splitted into *Environ_score*, *Social_score*, *Govern_score* - Columns 1-4) on the indicators of multinational corporations, post Country by Country Reporting regulation and institutional ownership under PRI classification using a sample of no. 677 UK-listed firms (of which no. 291 UK listed multinational corporations, and a no. 386 UK listed firms not classified as multinational corporations) covering the period 2013-2019. ***PRIownership*** is the percentage of PRI institutional ownership (Principles for Responsible Investment following the 2006 UN initiative). *MNC_CbCR* is a dummy variable equal to 1 if the firm is a UK-parented multinational group with consolidated revenue of £750 million due to file a Country-by-Country Report with HM Revenue & Customs (HMRC), 0 otherwise. The shock event corresponds to the year 2016 regulatory initiative of the UK Country-by-Country Reporting. *Post_CbCR* is a dummy variable equal to 1 for the years post-adoption (2017-2019), 0 otherwise. We consider a set of interaction terms: *MNC_CbCR x PRIownership* capturing the effect of multinational corporations within the percentage of ownership held by institutional investors classified as PRI; *MNC_CbCR x Post_CbCR* capturing the difference-in-differences effect of the UK Country-by-Country Reporting regulation for a multinational corporation under the treatment of filing the CbC reports; *PRIownership x Post_CbCR* capturing the difference-in-differences effect of the UK Country-by-Country Reporting regulation for firms that have the percentage of ownership held by institutional investors classified as PRI; ***MNC_CbCR x PRIownership x Post_CbCR*** is the interaction term capturing the incremental effect of PRI institutional ownership on the multinational corporations-ESG practices relation after the adoption of the UK Country-by-Country Reporting regulation. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) firm fixed effects (*FirmFE*) and industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

$$ESG_score_{i,t} = \beta_0 + \beta_1 MNC_CbCR_{i,t} + \beta_2 PRIownership_{i,t} + \beta_3 Post_CbCR_t + \beta_4 (MNC_CbCR_{i,t} \text{ x } Post_CbCR) + \beta_5 (PRIownership_{i,t} \text{ x } Post_CbCR) + \beta_6 (\boldsymbol{MNC_CbCR_{i,t} \text{ x } PRIownership_{i,t} \text{ x } Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	ESG _score	*Environ _score*	*Social _score*	*Govern _score*
PRIownership	0.020	0.023	0.017	0.020
	[0.90]	[1.30]	[0.70]	[0.77]
MNC_CbCR x PRIownership	0.059	0.006	0.094*	0.096
	[1.43]	[0.14]	[1.91]	[1.54]
MNC_CbCR x Post_CbCR	0.016**	0.017**	0.019**	0.042***
	[2.51]	[2.47]	[2.51]	[3.74]
PRIownership x Post_CbCR	0.065***	0.018	0.085***	0.076***
	[3.02]	[0.98]	[3.52]	[2.99]
MNC_CbCR x PRIownership x Post_CbCR	**0.073***	**0.109*****	**0.129****	0.081
	[1.72]	[2.58]	[2.54]	[1.56]
$Size_{t-1}$	0.524	0.104	0.452	0.696
	[1.23]	[0.31]	[0.98]	[1.39]
$Leverage_{t-1}$	0.004	0.000	0.007	0.008
	[0.24]	[0.02]	[0.36]	[0.43]
ROA_{t-1}	-0.004	-0.001	-0.007	-0.007
	[-0.28]	[-0.07]	[-0.41]	[-0.45]
$Tangibility_{t-1}$	0.011	0.000	0.010	0.058
	[0.22]	[0.00]	[0.19]	[1.13]
Cfo_{t-1}	0.005	0.005	0.008	0.000
	[0.22]	[0.26]	[0.30]	[0.01]
$Sales_{t-1}$	0.012	0.009	0.011	0.016
	[1.27]	[1.21]	[1.11]	[1.45]
$Invcycle_{t-1}$	-0.039	-0.097	-0.041	-0.025
	[-0.14]	[-0.38]	[-0.13]	[-0.08]
Audit_qualified	-0.150**	-0.190***	-0.145	-0.141
	[-2.16]	[-3.14]	[-1.84]	[-1.85]
Divid_payment	0.755	1.226	0.342	0.693
	[1.02]	[1.82]	[0.42]	[0.82]
Big4audit	0.555	0.513	1.097	0.672
	[0.65]	[0.64]	[1.15]	[0.73]
_cons	6.560***	6.707***	7.362***	6.379**
	[2.78]	[3.68]	[2.82]	[2.30]
FirmFE	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.477	0.434	0.465	0.460
N	4,062	4,062	4,062	4,062

Panel C. This table reports coefficients estimated from the triple differences regression (DDD) of the ESG practices (*ESG_score*, and then splitted into *Environ_score*, *Social_score*, *Govern_score* - Columns 1-4) on the indicators of multinational corporations, post Country by Country Reporting regulation and institutional ownership under PRI classification using a sample of no. 677 UK-listed firms (of which no. 291 UK listed multinational corporations, and a no. 386 UK listed firms not classified as multinational corporations) covering the period 2013-2019. ***High_PRIownership*** is a dummy variable equal to 1 if the percentage of PRI institutional ownership (Principles for Responsible Investment following the 2006 UN initiative) is above the median year by year, 0 otherwise. *MNC_CbCR* is a dummy variable equal to 1 if the firm is a UK-parented multinational group with consolidated revenue of £750 million due to file a Country-by-Country Report with HM Revenue & Customs (HMRC), 0 otherwise. The shock event corresponds to the year 2016 regulatory initiative of the UK Country-by-Country Reporting. *Post_CbCR* is a dummy variable equal to 1 for the years post-adoption (2017-2019), 0 otherwise. We consider a set of interaction terms: *MNC_CbCR x High_PRIownership* capturing the effect of multinational corporations within the percentage of ownership held by institutional investors classified as PRI above the median year by year; *MNC_CbCR x Post_CbCR* capturing the difference-in-differences effect of the UK Country-by-Country Reporting regulation for a multinational corporation under the treatment of filing the CbC reports; *High_PRIownership x Post_CbCR* capturing the difference-in-differences effect of the UK Country-by-Country Reporting regulation for firms that have the percentage of ownership held by institutional investors classified as PRI above the median year by year; ***MNC_CbCR x High_PRIownership x Post_CbCR*** is the interaction term capturing the incremental effect of PRI institutional ownership above the median year by year on the multinational corporations-ESG practices relation after the adoption of the UK Country-by-Country Reporting regulation. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) firm fixed effects (*FirmFE*) and industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

$$ESG_score_{i,t} = \beta_0 + \beta_1 MNC_CbCR_{i,t} + \beta_2 High_PRIownership_{i,t} + \beta_3 Post_CbCR_t + \beta_4 (MNC_CbCR_{i,t} \text{ x } Post_CbCR) + \beta_5 (High_PRIownership_{i,t} \text{ x } Post_CbCR) + \beta_6 (\boldsymbol{MNC_CbCR_{i,t} \text{ x } High_PRIownership_{i,t} \text{ x } Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	ESG _score	*Environ _score*	*Social _score*	*Govern _score*
High_PRIownership	0.365	0.341	0.054	0.493
	[0.80]	[0.86]	[0.11]	[0.95]
MNC_CbCR x High_PRIownership	0.113	0.020	0.072	0.297**
	[1.27]	[0.23]	[0.79]	[2.25]
MNC_CbCR x Post_CbCR	0.015**	0,012	0.017**	0.034***
	[2.21]	[1.87]	[2.17]	[3.15]
High_PRIownership x Post_CbCR	0.016***	0.071	0.022***	0.021***
	[3.35]	[1.56]	[3.95]	[3.57]
MNC_CbCR x High_PRIownership x Post_CbCR	**0.106****	**0.171*****	**0.180*****	**0.172****
	[2.22]	[3.49]	[3.39]	[2.52]
$Size_{t-1}$	0.523	0.064	0.482	0.717
	[1.24]	[0.19]	[1.05]	[1.44]
$Leverage_{t-1}$	0.006	0.001	0.007	0.010
	[0.34]	[0.08]	[0.34]	[0.49]
ROA_{t-1}	-0.005	-0.000	-0.007	-0.008
	[-0.30]	[-0.02]	[-0.42]	[-0.47]
$Tangibility_{t-1}$	0.013	0.001	0.012	0.061
	[0.26]	[0.02]	[0.23]	[1.18]
Cfo_{t-1}	0.006	0.004	0.008	0.001
	[0.23]	[0.23]	[0.31]	[0.03]
$Sales_{t-1}$	0.012	0.010	0.012	0.016
	[1.26]	[1.25]	[1.18]	[1.49]
$Invcycle_{t-1}$	-0.053	-0.088	-0.068	-0.028
	[-0.19]	[-0.35]	[-0.22]	[-0.10]
Audit_qualified	-0.121**	-0.142***	-0.126**	-0.119**
	[-2.49]	[-3.30]	[-2.26]	[-2.17]
Divid_payment	0.741	1.212	0.298	0.655
	[1.00]	[1.80]	[0.36]	[0.78]
Big4audit	0.567	0.503	1.114	0.680
	[0.65]	[0.62]	[1.15]	[0.73]
_cons	0.068***	0.067***	0.076***	0.065**
	[2.91]	[3.70]	[2.93]	[2.36]
FirmFE	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.476	0.434	0.464	0.460
N	4,062	4,062	4,062	4,062

Table 6
Employing entropy balancing
In these tables we propose the analyses of table 5 (Panels A, B, and C) of the triple differences regression (DDD) of the ESG practices (*ESG_score*, and then splitted into *Environ_score*, *Social_score*, *Govern_score* - Columns 1-4) on the indicators of multinational corporations, post Country by Country Reporting regulation and institutional ownership under PRI classification covering the period 2013-2019.

Panel A. This table reports the results of the matching via entropy. We use the first three moments (mean, variance, and skewness) and the entire pre-periods to calculate weights (i.e., fiscal years 2013, 2014, and 2015). We then use the average pre-period firm-year weights for each firm as the firm specific weight that is carried out throughout the replication of the main analyses. Covariates used in the entropy balancing include all the continuous variables (*Size*, *Leverage*, *ROA*, *Tangibility*, *Cfo*, *Sales*). In this panel, we report covariates before matching (*Pre-entropy balancing*) and after matching (*Post-entropy balancing*) between the treatment group of no. 291 UK listed multinational corporations, and the control group of no. 386 UK listed firms not classified as multinational corporations.

Pre-entropy balancing

Variable	Treatment (N=291)			Control (N=386)		
	Mean	Variance	Skewness	Mean	Variance	Skewness
Size	4.567	4.881	-0.226	4.080	4.658	-0.135
Leverage	0.414	0.042	-0.232	0.422	0.040	0-.217
ROA	-0.066	0.044	-2.161	-0.038	0.047	-2.392
Tangibility	0.132	0.014	0.629	0.134	0.014	0.656
Cfo	0.001	0.026	-2.377	0.006	0.038	-2.511
Sales	0.619	0.232	0.359	0.862	0.258	-0.049
Invcycle	0.025	0.004	0.558	0.022	0.003	0.864

Post-entropy balancing

Variable	Treatment (N=291)			Control (N=386)		
	Mean	Variance	Skewness	Mean	Variance	Skewness
Size	4.567	4.881	-0.226	4.567	4.881	-0.226
Leverage	0.414	0.042	-0.232	0.414	0.042	-0.232
ROA	-0.066	0.044	-2.161	-0.066	0.044	-2.161
Tangibility	0.132	0.014	0.629	0.132	0.014	0.629
Cfo	0.001	0.026	-2.377	0.001	0.026	-2.377
Sales	0.619	0.232	0.359	0.619	0.232	0.359
Invcycle	0.025	0.004	0.558	0.025	0.004	0.558

Panel B. In this panel we report the coefficients estimated from the triple differences regression (DDD) of the ESG practices (*ESG_score*, and then splitted into *Environ_score*, *Social_score*, *Govern_score* - Columns 1-4). The variable of our interest is ***MNC_CbCR x PRI_firms x Post_CbCR***, such as the interaction term capturing the incremental effect of PRI institutional ownership on the multinational corporations-ESG practices relation. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) firm fixed effects (*FirmFE*) and industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

$$ESG_score_{i,t} = \beta_0 + \beta_1 MNC_CbCR_{i,t} + \beta_2 PRI_firms_{i,t} + \beta_3 Post_CbCR_t + \beta_4 (MNC_CbCR_{i,t} \; x \; Post_CbCR) + \beta_5 (PRI_firms_{i,t} \; x \; Post_CbCR) + \beta_6 (\boldsymbol{MNC_CbCR_{i,t} x PRI_firms_{i,t} \; x \; Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

0

	(1)	(2)	(3)	(4)
	ESG _score	*Environ _score*	*Social _score*	*Govern _score*
MNC_CbCR x Post_CbCR	0.096***	0.023***	0.040**	0.010***
	[4.55]	[7.05]	[2.12]	[2.81]
PRI_firms x Post_CbCR	0.022**	0.018	0.029**	0.017
	[1.97]	[1.81]	[2.31]	[1.23]
MNC_CbCR x PRI_firms x Post_CbCR	**0.113*****	**0.250*****	**0.615*****	**0.137*****
	[4.90]	[7.31]	[2.76]	[3.59]
$Controls_{t-1}$	Yes	Yes	Yes	Yes
FirmFE	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.496	0.464	0.486	0.486
N	4,062	4,062	4,062	4,062

Panel C. In this panel we report the coefficients estimated from the triple differences regression (DDD) of the ESG practices (*ESG_score*, and then splitted into *Environ_score*, *Social_score*, *Govern_score* - Columns 1-4). The variable of our interest is ***MNC_CbCR x PRIownership x Post_CbCR***, such as the interaction term capturing the incremental effect of PRI institutional ownership on the multinational corporations-ESG practices relation after the adoption of the UK Country-by-Country Reporting regulation. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) firm fixed effects (*FirmFE*) and industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

$$ESG_score_{i,t} = \beta_0 + \beta_1 MNC_CbCR_{i,t} + \beta_2 PRIownership_{i,t} + \beta_3 Post_CbCR_t + \beta_4 (MNC_CbCR_{i,t} \text{ x } Post_CbCR) + \beta_5 (PRIownership_{i,t} \text{ x } Post_CbCR) + \beta_6 (\boldsymbol{MNC_CbCR_{i,t} \text{ x } PRIownership_{i,t} \text{ x } Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	ESG_score	*Environ_score*	*Social_score*	*Govern_score*
PRIownership	0.064*	0.054**	0.104**	0.086**
	[1.96]	[2.12]	[2.47]	[2.14]
MNC_CbCR x PRIownership	0.015**	0.054	0.010	0.012
	[2.42]	[0.84]	[1.06]	[1.25]
MNC_CbCR x Post_CbCR	0.067***	0.032***	0.061***	0.058***
	[5.52]	[2.86]	[3.16]	[3.11]
PRIownership x Post_CbCR	0.006	0.017	0.037	0.027
	[0.24]	[1.10]	[1.42]	[1.05]
MNC_CbCR x PRIownership x Post_CbCR	**0.428*****	**0.225*****	**0.383*****	**0.372*****
	[7.23]	[3.80]	[4.06]	[3.97]
$Controls_{t-1}$	Yes	Yes	Yes	Yes
FirmFE	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.514	0.503	0.539	0.544
N	4,062	4,062	4,062	4,062

Panel D. In this panel we report the coefficients estimated from the triple differences regression (DDD) of the ESG practices (*ESG_score*, and then splitted into *Environ_score*, *Social_score*, *Govern_score* - Columns 1-4). The variable of our interest is ***MNC_CbCR x High_PRIownership x Post_CbCR***, such as the interaction term capturing the incremental effect of PRI institutional ownership above the median year by year on the multinational corporations-ESG practices relation after the adoption of the UK Country-by-Country Reporting regulation. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) firm fixed effects (*FirmFE*) and industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

$$ESG_score_{i,t} = \beta_0 + \beta_1 MNC_CbCR_{i,t} + \beta_2 High_PRIownership_{i,t} + \beta_3 Post_CbCR_t + \beta_4 (MNC_CbCR_{i,t} \text{ x } Post_CbCR) + \beta_5 (High_PRIownership_{i,t} \text{ x } Post_CbCR) + \beta_6 (\boldsymbol{MNC_CbCR_{i,t} \text{ x } High_PRIownership_{i,t} \text{ x } Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	ESG_score	*Environ_score*	*Social_score*	*Govern_score*
High_PRIownership	0.149	0.205	0.294	0.188
	[0.19]	[0.43]	[0.37]	[0.25]
MNC_CbCR x High_PRIownership	0.023	0.016	0.022	0.037
	[1.02]	[0.95]	[0.97]	[1.54]
MNC_CbCR x Post_CbCR	0.011	0.096	0.011	0.012
	[0.60]	[0.97]	[0.60]	[0.71]
High_PRIownership x Post_CbCR	0.011	0.032	0.101	0.136
	[1.25]	[0.53]	[1.07]	[1.51]
MNC_CbCR x High_PRIownership x Post_CbCR	**0.111*****	**0.064*****	**0.112*****	**0.108*****
	[8.30]	[7.15]	[8.24]	[8.05]
$Controls_{t-1}$	Yes	Yes	Yes	Yes
FirmFE	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.564	0.515	0.553	0.560
N	4,062	4,062	4,062	4,062

Table 7
Employing propensity score matching

In these tables, we propose the analyses of Table 5 (Panels A, B, and C) of the triple differences regression (DDD) of ESG practices (*ESG_score*, and then split into *Environ_score*, *Social_score*, *Govern_score* - Columns 1-4) on the indicators of multinational corporations, post Country by Country Reporting regulation and institutional ownership under PRI classification covering the period 2013-2019. We employ a *propensity score matching* technique between the treatment group of no. 291 UK-listed multinational corporations under CbCR mandate, and the control group of no. 386 UK-listed firms not under CbCR mandate.

Panel A. This table presents the control variables' difference in means tests after propensity score matching. We use the entire pre-periods (i.e., fiscal years 1993, 1994, and 1995) to balance covariates, employing use a caliper-based nearest-neighbor match (matching 1:4 without replacement with a caliper of 0.10) on firm-level continuous variables (*Size, Leverage, ROA, Tangibility, Cfo, Sales, Invcycle*).

		Mean			
		Treated	*Control*	*Difference*	*t-stat*
		#no.firms	#no.firms		
	U=Unmatched	291	386		
Variable	**M=Matched**	291	386		
Size	U	4.567	4.080	0.487***	5.68
	M	4.566	4.542	0.024	0.11
Leverage	U	0.414	0.422	-0.008*	-1.94
	M	0.414	0.408	0.006	-0.32
ROA	U	-0.066	-0.038	-0.028	-1.24
	M	-0.061	-0.063	0.002	0.15
Tangibility	U	0.132	0.134	-0.002	0.33
	M	0.134	0.133	0.001	0.40
Cfo	U	0.001	0.006	-0.005	0.81
	M	0.001	0.002	-0.001	0.42
Sales	U	0.619	0.862	-0.243***	-7.31
	M	0.619	0.702	-0.083	-0.76
Invcycle	U	0.025	0.022	0.003***	3.56
	M	0.025	0.027	-0.002	-1.80

Panel B. In this panel we report the coefficients estimated from the triple differences regression (DDD) of the ESG practices (*ESG_score*, and then splitted into *Environ_score*, *Social_score*, *Govern_score* - Columns 1-4). The variable of our interest is ***MNC_CbCR x PRI_firms x Post_CbCR***, such as the interaction term capturing the incremental effect of PRI institutional ownership on the multinational corporations-ESG practices relation. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) firm fixed effects (*FirmFE*) and industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

$$ESG_score_{i,t} = \beta_0 + \beta_1 MNC_CbCR_{i,t} + \beta_2 PRI_firms_{i,t} + \beta_3 Post_CbCR_t + \beta_4 (MNC_CbCR_{i,t} \text{ x } Post_CbCR) + \beta_5 (PRI_firms_{i,t} \text{ x } Post_CbCR) + \beta_6 (\boldsymbol{MNC_CbCR_{i,t} x PRI_firms_{i,t} x Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	ESG_score	*Environ_score*	*Social_score*	*Govern_score*
MNC_CbCR x Post_CbCR	0.045***	0.034***	0.047***	0.040***
	[7.93]	[8.99]	[8.68]	[4.42]
PRI_firms x Post_CbCR	0.047	0.021	0.047	0.011
	[1.10]	[0.78]	[1.14]	[1.42]
MNC_CbCR x PRI_firms x Post_CbCR	**0.462*****	**0.345*****	**0.480*****	**0.408*****
	[5.95]	[6.87]	[6.29]	[3.90]
$Controls_{t-1}$	Yes	Yes	Yes	Yes
FirmFE	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.410	0.402	0.417	0.495
N	4,062	4,062	4,062	4,062

Panel C. In this panel we report the coefficients estimated from the triple differences regression (DDD) of the ESG practices (*ESG_score*, and then splitted into *Environ_score*, *Social_score*, *Govern_score* - Columns 1-4). The variable of our interest is ***MNC_CbCR x PRIownership x Post_CbCR***, such as the interaction term capturing the incremental effect of PRI institutional ownership on the multinational corporations-ESG practices relation after the adoption of the UK Country-by-Country Reporting regulation. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) firm fixed effects (*FirmFE*) and industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

$$ESG_score_{i,t} = \beta_0 + \beta_1 MNC_CbCR_{i,t} + \beta_2 PRIownership_{i,t} + \beta_3 Post_CbCR_t + \beta_4 (MNC_CbCR_{i,t} \text{ x } Post_CbCR) + \beta_5 (PRIownership_{i,t} \text{ x } Post_CbCR) + \beta_6 (\boldsymbol{MNC_CbCR_{i,t} \text{ x } PRIownership_{i,t} \text{ x } Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	ESG_score	*Environ_score*	*Social_score*	*Govern_score*
PRIownership	0.065***	0.035*	0.077***	0.079***
	[2.90]	[1.81]	[3.09]	[3.07]
MNC_CbCR x PRIownership	0.075	0.021	0.126**	0.119
	[1.69]	[0.46]	[2.39]	[1.82]
MNC_CbCR x Post_CbCR	0.051	0.050	0.011	0.032***
	[0.70]	[0.68]	[0.13]	[2.68]
PRIownership x Post_CbCR	0.014**	0.011	0.013	0.022**
	[2.14]	[1.70]	[1.47]	[2.55]
MNC_CbCR x PRIownership x Post_CbCR	**0.084***	**0.095****	**0.154*****	**0.089***
	[1.95]	[2.22]	[3.00]	[1.67]
$Controls_{t-1}$	Yes	Yes	Yes	Yes
FirmFE	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.596	0.563	0.584	0.577
N	4,062	4,062	4,062	4,062

Panel D. In this panel we report the coefficients estimated from the triple differences regression (DDD) of the ESG practices (*ESG_score*, and then splitted into *Environ_score*, *Social_score*, *Govern_score* - Columns 1-4). The variable of our interest is ***MNC_CbCR x High_PRIownership x Post_CbCR***, such as the interaction term capturing the incremental effect of PRI institutional ownership above the median year by year on the multinational corporations-ESG practices relation after the adoption of the UK Country-by-Country Reporting regulation. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) firm fixed effects (*FirmFE*) and industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

$$ESG_score_{i,t} = \beta_0 + \beta_1 MNC_CbCR_{i,t} + \beta_2 High_PRIownership_{i,t} + \beta_3 Post_CbCR_t + \beta_4 (MNC_CbCR_{i,t} \text{ x } Post_CbCR) + \beta_5 (High_PRIownership_{i,t} \text{ x } Post_CbCR) + \beta_6 (\boldsymbol{MNC_CbCR_{i,t} \text{ x } High_PRIownership_{i,t} \text{ x } Post_CbCR}) + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	ESG_score	*Environ_score*	*Social_score*	*Govern_score*
High_PRIownership	0.093**	0.059	0.010**	0.009**
	[2.09]	[1.74]	[2.23]	[2.12]
MNC_CbCR x High_PRIownership	0.016	0.011	0.014	0.023**
	[1.67]	[1.27]	[1.43]	[2.03]
MNC_CbCR x Post_CbCR	0.028***	0.024***	0.084	0.076***
	[4.02]	[4.70]	[1.16]	[8.94]
High_PRIownership x Post_CbCR	0.022***	0.014***	0.028***	0.011
	[3.33]	[2.72]	[3.90]	[1.83]
MNC_CbCR x High_PRIownership x Post_CbCR	**0.715*****	**0.611*****	**0.733*****	**0.817*****
	[12.43]	[11.64]	[12.69]	[11.55]
$Controls_{t-1}$	Yes	Yes	Yes	Yes
FirmFE	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.532	0.546	0.502	0.509
N	4,062	4,062	4,062	4,062

Table 8
Impact on ESG practices

Panel A. Impact of multinational corporations on ESG practices. This table presents the results from the estimation of OLS panel regression using a sample no. 677 UK-listed firms (of which no. 291 UK listed MNC, and a no. 386 UK listed firms not classified as MNC) covering the period 2013-2019. The dependent variables are ESG scores (*ESG_score*), and then ESG is split into environmental scores (*Environ_score*), social scores (*Social_score*), and governance scores (*Govern_score*) (Columns 1-4). The variable of our interest is *MNC_CbCR,* a dummy variable equal to 1 if the firm is a UK-parented multinational group with consolidated revenue of £750 million due to file a Country-by-Country Report with HM Revenue & Customs (HMRC), 0 otherwise. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

$$ESG_score_{i,t} = \beta_0 + \beta_1 MNC_CbCR_{i,t} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	ESG_score	*Environ_score*	*Social_score*	*Govern_score*
MNC_CbCR	**0.109*****	**0.098*****	**0.121*****	**0.109*****
	[6.34]	[7.41]	[6.59]	[5.73]
$Controls_{t-1}$	Yes	Yes	Yes	Yes
FirmFE	No	No	No	No
IndustryxYearFE	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.450	0.456	0.448	0.434
N	4,062	4,062	4,062	4,062

Panel B. Impact of PRI investors on ESG practices. This table presents the results from the estimation of OLS panel regression using a sample of no. 677 UK-listed firms (of which no. 588 firms owned by PRI investors (Principles for Responsible Investment) and a no. 89 firms owned by institutional investors not classified in PRI) covering the period 2013-2019. The dependent variables are ESG scores (*ESG_score*), and then ESG is split into Environmental scores (*Environ_score*), social scores (*Social_score*), and governance scores (*Govern_score*) (Columns 1-4). The variable of our interest is *PRI_firms,* a dummy variable equal to 1 indicating the firm owned by PRI (Principles for Responsible Investment following the 2006 UN initiative), 0 otherwise. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

$$ESG_score_{i,t} = \beta_0 + \beta_1 PRI_firms_{i,t} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	ESG_score	*Environ_score*	*Social_score*	*Govern_score*
PRI_firms	**0.278*****	**0.231****	**0.315*****	**0.296*****
	[2.71]	[2.41]	[2.82]	[2.64]
$Controls_{t-1}$	Yes	Yes	Yes	Yes
FirmFE	No	No	No	No
IndustryxYearFE	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.586	0.570	0.579	0.546
N	4,062	4,062	4,062	4,062

Table 9
Assessing the mechanism of PRI ownership

This table presents the results from the estimation of OLS panel regression using a sample of no. 588 UK-listed firms with institutional ownership classified as PRI (Principles for Responsible Investment) investors from 2013 until 2019. The dependent variables are ESG scores (*ESG_score*) in all panels, and then ESG is split into environmental scores (*Environ_score*), social scores (*Social_score*), and governance scores (*Govern_score*) (Columns 1-4). The explanatory variables of our interest are: (lagged) ***PRIownership*** (Panel A), the percentage of PRI institutional ownership, (lagged) ***PRI_totalIO*** (Panel B), the percentage of PRI ownership scaled by total institutional investors' ownership, (lagged) ***NoPRIownership*** (Panel C), the percentage of institutional ownership not classified as PRI, (lagged) ***NoPRI_totalIO*** (Panel D), the percentage of institutional ownership not classified as PRI scaled by total institutional investors' ownership, (lagged) ***Total_IO*** (Panel E), the percentage of total institutional ownership, ***ChangePRIownership*** (Panel F), the change in the percentage of PRI institutional ownership in year t-1 from year t and ***ChangePRI_totalIO*** (Panel F), the change in in the percentage of PRI institutional ownership from the beginning to the end of year t scaled by total institutional investors' ownership at the beginning of year t, ***ChangeNoPRIownership*** (Panel G), the percentage of institutional ownership not classified as PRI in year t-1 from year t, and ***ChangeNoPRI_totalIO*** (Panel G), the change in the percentage of institutional ownership not classified as PRI from the beginning to the end of year t scaled by total institutional investors' ownership at the beginning of year t. Our regressions include: 1) lagged controls (*Size, Leverage, ROA*, *Tangibility, Cfo, Sales, Invcycle, Audit_qualified, Divid_payment, Big4audit*), and 2) firm fixed effects (*FirmFE*) and industry–year fixed effects (*IndustryxYearFE*). All the annual firm-level continuous variables are winsorized at the 1% and 99% level. T-statistics, based on two-way cluster-robust standard errors at firm and year level, are presented below the coefficient estimates. ∗, ∗∗, and ∗∗∗ denotes significance at the 10%, 5%, and 1% level, respectively. All variables are defined in detail in Appendix A.

Panel A. Variable of interest ***PRIownership.***

$$ESG_score_{i,t} = \beta_0 + \beta_1 PRIownership_{i,t} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$
$$ESG_score_{i,t} = \beta_0 + \beta_1 PRIownership_{i,t-1} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

Panel B. Variable of interest ***PRI_totalIO.***

$$ESG_score_{i,t} = \beta_0 + \beta_1 PRI_totalIO_{i,t} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$
$$ESG_score_{i,t} = \beta_0 + \beta_1 PRI_totalIO_{i,t-1} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

Panel C. Variable of interest ***NoPRIownership.***

$$ESG_score_{i,t} = \beta_0 + \beta_1 NoPRIownership_{i,t} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$
$$ESG_score_{i,t} = \beta_0 + \beta_1 NoPRIownership_{i,t-1} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

Panel D. Variable of interest ***NoPRI_totalIO.***

$$ESG_score_{i,t} = \beta_0 + \beta_1 NoPRI_totalIO_{i,t} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$
$$ESG_score_{i,t} = \beta_0 + \beta_1 NoPRI_totalIO_{i,t-1} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

Panel E. Variable of interest ***Total_IO.***

$$ESG_score_{i,t} = \beta_0 + \beta_1 Total_IO_{i,t} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$
$$ESG_score_{i,t} = \beta_0 + \beta_1 Total_IO_{i,t-1} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

Panel F. Variable of interest ***Change in PRI.***

$$ESG_score_{i,t} = \beta_0 + \beta_1 ChangePRIownership_{i,t} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$
$$ESG_score_{i,t} = \beta_0 + \beta_1 ChangePRI_totalIO_{i,t} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

Panel G. Variable of interest ***Change in No PRI.***

$$ESG_score_{i,t} = \beta_0 + \beta_1 ChangeNoPRIownership_{i,t} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$
$$ESG_score_{i,t} = \beta_0 + \beta_1 ChangeNoPRI_totalIO_{i,t} + X_{i,t-1} + \delta_t + \Phi_i + \varepsilon_{i,t}$$

Panel A

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	ESG_score	*Environ_score*	*Social_score*	*Govern_score*	*ESG_score*	*Environ_score*	*Social_score*	*Govern_score*
$PRIownership_t$	**0.077*****	**0.042****	**0.082*****	**0.071*****				
	[2.71]	[2.22]	[2.83]	[2.51]				
$PRIownership_{t-1}$					**0.069****	**0.044****	**0.073****	**0.065***
					[2.15]	[2.18]	[2.01]	[2.01]
$Controls_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FirmFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.446	0.379	0.444	0.436	0.483	0.445	0.474	0.478
N	4,116	4,116	4,116	4,116	3,528	3,528	3,528	3,528

Panel B

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	ESG_score	*Environ_score*	*Social_score*	*Govern_score*	*ESG_score*	*Environ_score*	*Social_score*	*Govern_score*
$PRI_totalIO_t$	**0.052*****	**0.031*****	**0.056*****	**0.044*****				
	[5.03]	[4.48]	[5.13]	[4.49]				
$PRI_totalIO_{t-1}$					**0.026*****	**0.016*****	**0.026*****	**0.025*****
					[3.61]	[3.32]	[3.52]	[3.50]
$Controls_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FirmFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.498	0.460	0.490	0.489	0.451	0.382	0.448	0.441
N	4,116	4,116	4,116	4,116	3,528	3,528	3,528	3,528

Panel C

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	ESG_score	*Environ_score*	*Social_score*	*Govern_score*	*ESG_score*	*Environ_score*	*Social_score*	*Govern_score*
$NoPRIownership_t$	-0.017	**-0.020****	-0.020	-0.013				
	[-1.70]	[-2.08]	[-1.84]	[-1.06]				
$NoPRIownership_{t-1}$					-0.004	-0.005	-0.010	0.003
					[-0.45]	[-0.56]	[-1.06]	[0.26]
$Controls_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FirmFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.401	0.480	0.496	0.469	0.402	0.486	0.497	0.468
N	4,116	4,116	4,116	4,116	3,528	3,528	3,528	3,528

Panel D

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	ESG_score	*Environ_score*	*Social_score*	*Govern_score*	*ESG_score*	*Environ_score*	*Social_score*	*Govern_score*
$NoPRI_totalIO_t$	-0.135	-0.139	-0.143	-0.131				
	[-1.58]	[-1.55]	[-1.68]	[-1.31]				
$NoPRI_totalIO_{t-1}$					0.047	0.080	0.010	0.064
					[0.51]	[0.85]	[0.12]	[0.62]
$Controls_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FirmFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.401	0.482	0.495	0.468	0.496	0.478	0.492	0.464
N	4,116	4,116	4,116	4,116	3,528	3,528	3,528	3,528

Panel E

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	ESG_score	*Environ_score*	*Social_score*	*Govern_score*	*ESG_score*	*Environ_score*	*Social_score*	*Govern_score*
$Total_IO_t$	-0.034	-0.037	-0.045	-0.028				
	[-1.20]	[-1.32]	[-1.54]	[-0.73]				
$Total_IO_{t-1}$					-0.022	-0.044	-0.020	-0.012
					[-0.61]	[-1.14]	[-0.56]	[-0.28]
$Controls_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FirmFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.497	0.479	0.493	0.465	0.496	0.478	0.492	0.462
N	4,116	4,116	4,116	4,116	3,528	3,528	3,528	3,528

Panel F

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	ESG_score	*Environ_score*	*Social_score*	*Govern_score*	*ESG_score*	*Environ_score*	*Social_score*	*Govern_score*
$ChangePRIownership_t$	0.001	0.001	-0.000	0.001				
	[0.39]	[1.51]	[-0.03]	[0.72]				
$ChangePRI_totalIO_t$					-0.000	0.004	-0.002	0.001
					[-0.03]	[1.13]	[-0.43]	[0.13]
$Controls_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FirmFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.495	0.477	0.491	0.462	0.497	0.479	0.493	0.465
N	3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,528

Panel G

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	ESG_score	*Environ_score*	*Social_score*	*Govern_score*	*ESG_score*	*Environ_score*	*Social_score*	*Govern_score*
$ChangeNoPRIownership_t$	-0.000	-0.000	-0.000	-0.000				
	[-0.27]	[-0.11]	[-0.32]	[-0.26]				
$ChangeNoPRI_totalIO_t$					-0.000	-0.000	-0.000	-0.000
					[-0.25]	[-0.44]	[-0.13]	[-0.29]
$Controls_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FirmFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IndustryxYearFE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering SE	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year	firm-year
Adj. R^2	0.409	0.491	0.404	0.475	0.400	0.481	0.495	0.468
N	3,528	3,528	3,528	3,528	3,528	3,528	3,528	3,528