DISCUSSION PAPER

// KATARZYNA BILICKA, ELISA CASI, CAROL SEREGNI, AND BARBARA M. B. STAGE

Tax Strategy Disclosure: A Greenwashing Mandate?

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Tax strategy disclosure: A greenwashing mandate?[*]

Katarzyna Bilicka[†]
Utah State University and NBER

Elisa Casi[‡]
NHH Norwegian School of Economics and ZEW

Carol Seregni[§]
The Wharton School
University of Pennsylvania

Barbara M. B. Stage[¶]
WHU - Otto Beisheim School of Management and ZEW

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Abstract

We investigate the effects of a *qualitative* tax disclosure mandate aimed at improving tax transparency and compliance by imposing reputational costs for firms. We use, as an exogenous shock, the 2016 UK reform that required large businesses to disclose a tax strategy. We find that treated firms—those that must publish a tax strategy report—also significantly increase the volume of tax strategy disclosure in their annual reports, but this disclosure contains more boilerplate. The standalone tax strategy reports contain similar narrative as the annual reports, are sticky, and their quality is correlated with those of other sustainability disclosures on gender and human rights. Turning to real behavioral changes, we document no significant effect on tax planning across several proxies and firm characteristics. While we find that the mandate increased media attention on treated firms, our results suggest that this enforcement channel might not work in the context of qualitative disclosure, which may be hard to verify for outside stakeholders. Even in subsamples of firms that we would expect to behave differently, we document similar responses. Taken together, our findings indicate that mandating qualitative tax disclosure has incentivized firms to portray themselves as good tax citizens without changing their practices.

JEL: G38, M41, M48, H26, H20

Keywords: Disclosure Regulation, Nonfinancial Disclosure, Corporate Social Responsibility, Tax Transparency, Corporate Tax Avoidance

I.   INTRODUCTION

In the summer of 2022, the European Commission endorsed appropriate tax risk management as one of the key criteria to assess whether an economic activity should be considered sustainable (European Commission, July 2022). In line with this, the Global Sustainability Standards Board has recently adopted a tax standard that incorporates tax strategy information into firms' corporate social responsibility (CSR) reports.[1] Policymakers have also deemed this kind of disclosure to be important, as the UK tax strategy mandate and the Australian voluntary Tax Transparency Code demonstrate. Like other CSR information, tax strategy reporting comes mostly in the form of *qualitative* disclosures and includes, for example, information on the management of tax risk, the relationship with tax authorities, and attitude to tax planning. The rationale behind encouraging firms to publish their tax strategy is to increase transparency and reduce tax avoidance by imposing reputational costs.

We study the effects of a UK regulation that requires large businesses to disclose tax strategy information.[2] The UK mandate has two central goals: (1) to increase the availability of tax information to the general public and (2) to curb tax avoidance.[3] This regulatory change requires a group of firms with operations in the United Kingdom to report their tax strategies, including tax risk governance, attitude towards tax planning, tax risk appetite, and the relationship with the local tax authority, Her Majesty's Revenue and Customs (HMRC). The mandated report can either stand alone or be integrated into another report, for example, the annual report. An interesting feature of our setting is that the HMRC is regulating the disclosure but explicitly relies on public scrutiny, so-called "naming and shaming," as the enforcement mechanism.[4] For public pressure to influence firm behavior, a disclosure must impose

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[1] The Global Sustainability Standards Board sets the globally most used sustainability standards. See https://www.globalreporting.org/news/news-center/four-in-five-largest-global-companies-report-with-gri/. For the information on the GRI tax standard, see https://www.globalreporting.org/standards/standards-development/topic-standard-project-for-tax/.

[2] The UK regulation we study is the Schedule 19 of the Finance Act 2016. The full text of the regulation is available at https://www.gov.uk/guidance/large-businesses-publish-your-tax-strategy.

[3] David Gauke, the former financial secretary of the UK Treasury, stated these goals in an interview, see https://www.theguardian.com/business/2015/jul/23/big-businesses-agree-stop-aggressive-tax-planning-hmrc.

[4] The consultation documents related to the regulation noted that the law entailed "a legislative requirement for all large businesses to publish their tax strategy, enabling shareholder, investor, and public scrutiny of their approach towards tax planning and tax compliance" (HMRC [2015]). A chief executive at the HMRC also stated: "If they [large businesses] have to explain to people what their tax strategy is, it does have an effect on their behavior" (*The Financial Times* [2016]).

additional costs on the firm. The regulation we study has the requisite characteristics. Mandating *qualitative* tax disclosures could inform stakeholders, given findings on the informativeness of a narrative discussion on tax risks in annual reports (Campbell et al. [2014]; Beatty et al. [2019]; Bozanic et al. [2017]). In the UK setting, NGOs believe that narrative tax strategy disclosure can provide details to judge business tax affairs and hold companies accountable. According to these NGOs, actionable elements of such a disclosure would include an explicit mention of who has key roles and responsibilities, concrete examples of internal actions taken to address tax risk, and specific statements on factors shaping tax planning choices (Fair Tax Foundation [2017]).

In our setting, some firms were already voluntarily disclosing some tax strategy information in their annual reports before the reform (PwC [2016]). Yet the reform may have led to new information even for those firms, as it sets a minimum bar for which information tax strategy disclosures should include. In fact, PwC [2016] shows that the UK mandate goes beyond what most of the voluntary disclosures included before the reform.[5] In addition, behavioral change may occur through a reduction in information processing costs for stakeholders. In our context, we expect a reduction of processing costs along the three dimensions identified by Blankespoor et al. [2019]: increased awareness, easier accessibility, and lower integration costs. The mandate increases *awareness* because the regulatory change was a salient event for stakeholders.[6] It improves the *accessibility* of information because it demands an easily accessible report.[7] Furthermore, it can reduce *integration costs*, as it provides four clearly defined categories of disclosure that can facilitate benchmarking against peers (Robinson and Schmidt [2013]; Healy and Palepu [2001]; Maines and McDaniel [2000]). The reduction in processing costs, coupled with improved information on firms' tax affairs, might increase stakeholders' attention to firm tax planning. Therefore, after the reform, this additional stakeholder pressure could improve tax

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[5] PwC notes the following when reviewing the tax strategy disclosure of the largest listed companies post-reform: "*The format for tax governance disclosure is evolving; companies are now disclosing the processes used in the tax department to ensure compliance and effective management of tax risk.*" (PwC [2016], page 3).

[6] The tax authorities established a dedicated page and issued related notices. Government officials also discussed the reform in media outlets. Several reports from Big Four and other tax advisors were issued to explain the new disclosure requirement.

[7] Certain companies might strategically hide the standalone tax strategy report on the website, as Belnap [2022] detects that some non-UK headquartered firms published the tax strategy report on webpages that are difficult to find. But we were able to retrieve the tax strategy reports of treated firms through a simple Google search with the company name and key words like "tax strategy."

reporting and compliance *if* the disclosure is informative enough to pressure firms to change their behavior.

Yet research provides mixed evidence about the reputational costs of tax avoidance (Gallemore et al. [2014]; Chen et al. [2019]; Hoopes et al. [2018]; Dyreng et al. [2020]). Especially given the qualitative nature of tax strategy disclosures, firms may be tempted to communicate that their actions comport with broad societal interests without changing their behavior. Qualitative CSR information risks being boilerplate and vague (SASB [2017]) and can be harder to verify than quantitative information (e.g., Christensen et al. [2021]; She [2022]), potentially resulting in unsubstantiated claims (O'Donovan [2002]). This practice is commonly referred to as "greenwashing" in the CSR literature (Siano et al. [2017]; Christensen et al. [2021]). Thus, it is unclear whether requiring narrative tax strategy reporting will lead to the intended outcomes.

We study whether the mandate fulfilled two objectives that are common among tax transparency regimes: improving disclosures and reducing avoidance. We start by considering the effects on the availability of tax information, which we proxy by the *quantity* and *quality* of tax strategy disclosures in the annual reports. We focus on changes in tax strategy disclosures in the annual report for two reasons. First, while nearly all the UK-headquartered firms we analyze publish a separate tax strategy report, most also had voluntarily discussed their tax strategy in their annual reports before the mandate (PwC [2016]). This feature allows us to investigate the causal effects of the mandate on changes in firms' quantity and quality of tax strategy disclosure, holding the disclosure outlet fixed. Simply using the newly published standalone tax strategy reports, we could not do so, as we cannot compare this disclosure to firms' pre-reform behavior. Second, and more generally, annual reports are a critical disclosure outlet, and our goal is to evaluate the reform's *overall* effect on firms' tax disclosure. While we expect the mandate to increase the quantity of disclosure, the effect on quality is ambiguous. An unintended consequence of the mandate could be to reduce the quality of tax disclosure in annual reports.

To quantify the availability of tax information in the annual report, we build a novel text-based measure. First, we manually classify sentences describing firms' tax strategy from a representative

subsample of annual reports. We then use naïve Bayes machine learning to classify sentences in all annual reports in our sample as those about tax strategy. We measure the *quantity* of tax strategy information disclosed with the number of tax strategy sentences and the number of words in these sentences. We measure its *quality* by computing the level of boilerplate and the specificity of firms' tax strategy sentences following the textual analysis literature (e.g., Lang and Stice-Lawrence, [2015]; Hope et al., [2016]; Dyer et al., [2017]).[8] We verify that both proxies capture disclosure characteristics that are relevant for stakeholders to evaluate firms' tax strategies. In an interview we conducted, the chief executive of the Fair Tax Foundation, Paul Monaghan, indicated that *informative* tax strategies avoid boilerplate statements and include specifics, such as the name of the person responsible for the tax strategy and a list of firm subsidiaries.[9]

Next we investigate the effect of the mandate on tax planning. To capture possible changes in tax avoidance, we use the following proxies: cash and book ETRs and a textual measure of tax haven operations, as calculated by Law and Mills [2022].[10]

To provide causal evidence, we use a difference-in-differences methodology and compare the UK-headquartered firms affected by the mandate, that is, those with turnover exceeding GBP 200 million or a balance sheet total exceeding GBP 2 billion, and unaffected ones, before and after the reform. To pinpoint the effects of *qualitative* tax disclosure, we exclude the very large firms that fall under the *quantitative* country-by-country reporting requirements, which were introduced around the same time. Hence our treated sample includes only firms above the mandatory *qualitative* threshold and below the

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[8] "Boilerplate" identifies the portion of very common phrases that a firm uses in its tax strategy disclosures. "Specificity" represents the percentage of words in the tax strategy disclosures that provide particular information, such as names of persons, locations, and organizations. When disclosures are specific, firms are providing relevant details on a subject. See Section IV for details on how we operationalize these concepts with examples.

[9] The Fair Tax Foundation reviewed the quality of the tax strategy reports of the largest UK listed companies; see Fair Tax Foundation [2017]. We conducted a 45-minute online interview with Paul Monaghan on January 19, 2024. The Fair Tax Foundation is an NGO that accredits firms exhibiting responsible tax conduct.

[10] In the appendix, we provide two additional tests. First, we rely on Orbis information on key unconsolidated financials to investigate changes in profit shifting across firm subsidiaries. We do not detect any significant change in ETRs in tax havens. One caveat is that Orbis has limited coverage of financial information for tax havens. Therefore we do not include those outcomes in our main analysis. Second, we show that tax planning-related investment (PPE, R&D, and intangible investment) and financing (debt financing) strategies do not change for treated firms relative to control firms after the reform.

country-by-country reporting threshold.[11] The Schedule 19 of the 2016 Finance Act set thresholds at the unconsolidated level, but UK firms need not disclose their unconsolidated profit and loss account when already disclosing a consolidated one (see Company Act 2006 – S408). To overcome this limitation, we use consolidated data to define thresholds. We validate the definition of our treatment by hand, collecting tax strategy reports for our treated firms.[12] For all treated firms, we can find a tax strategy report (either standalone or in the annual report). Our control group includes UK firms below the *qualitative* threshold, which are most comparable to the treatment group. For this purpose, we exclude small firms.[13] We perform several robustness checks to test the sensitivity of the results to our sample: we rerun the analysis including small firms and foreign multinationals with UK operations and use kernel and propensity-score matching. We focus on the UK-headquartered firms, as the compliance burden of the 2016 reform is similar and applies to the whole firm, not just a UK portion of its operations, as would be the case with foreign multinationals. Our final regression sample includes 206 firms (69 treated and 137 controls) with 1,183 observations over the period of 2013–2019.

While our empirical analysis focuses on the effects of the mandate on the disclosure in the annual reports, we also provide descriptive evidence on the disclosure in the standalone tax strategy reports. Understanding the quality and quantity of disclosure in these reports matters from a policy perspective, as future regulations may require a similar standalone report when defining tax strategy disclosure provisions. Three main takeaways emerge from this descriptive analysis. First, when comparing tax strategy reports for the same firm over time, we document high stickiness, i.e., firms tend to report the same information every year. We provide anecdotal evidence that firms remove relevant information from their reports, which is reflected in a reduction in average disclosure quality between reports from

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[11] Firms included in our sample have median cash ETRs of 18% and book ETR of 19%, similar to the ETRs of country-by-country firms, which have 21% for cash and 22% for book ETRs. We do not include the latter in the analysis, but our sample appears to have similar tax avoidance opportunities.

[12] For some firms that, at the consolidated level, reach the treatment threshold, we do not find a tax strategy report. We hand-check the geography of their operations in their annual report and conclude that all of them operate largely outside of the United Kingdom and therefore do not fall under the reporting requirement. (We either rely on geographical segment reporting, or, if unavailable, disclosure on the main markets of the company.)

[13] We exclude small firms as they are the least comparable to our treated firms. We rely on the UK government-defined size thresholds to identify small firms: GBP 10.2 million annual turnover and GBP 5.1 million total assets. In the online appendix Table C2 Panel A, we show that our baseline results are robust to the inclusion of these small firms in the sample.

2019 and 2023. Second, we show that the disclosure in the annual report resembles that in the tax strategy report. (The average level of similarity between the annual report tax strategy disclosure and the tax strategy report is 53%.) Third, we collect two other standalone CSR reports that UK companies must publish: the Modern Slavery Statement and the Gender Pay Gap Report. We find that the disclosure characteristics across the three CSR reports are correlated. For example, firms that misreport their gender gap statistics (Bailey et al. [2022]) report lower quality disclosure in their standalone tax strategy reports than other firms.

Turning to the causal analysis on the impact of mandating a tax strategy disclosure, we start by presenting the effects of the reform on disclosure quality and quantity and tax avoidance. We show that the volume of tax strategy disclosure increased on average: treated firms intend to exceed the law's requirements by providing both a separate tax strategy report *and* increasing tax strategy disclosure in their annual reports. The number of sentences and words used to describe tax strategies in the annual reports increased significantly. However, the quality of tax strategy information provided in annual reports decreases, as the level of boilerplate increases significantly. Additionally, we find no evidence that firms reduce their overall tax avoidance, as we detect no significant change in effective tax rates nor in the scale of tax haven operations. We show that the parallel trends assumption holds in the pre-reform period and that firms do not anticipate the reform both in terms of disclosure and tax avoidance outcomes. One potential concern with the insignificant results on tax avoidance could be that our tests lack power, due to a rather small sample size. However, in robustness tests when we extend the sample along several dimension or match firms on a set of observable characteristics, we find in some instances even a statistically significant increase in tax avoidance, as opposed to the policy-intended decrease.

In the second part of the paper, we focus on understanding why the enforcement mechanism—increased public pressure through improved information and reduced processing costs—did not produce the intended behavioral changes contrary to government expectations. UK policymakers wanted large firms to reveal their tax practices and aimed to discourage aggressive tax planning via increased public

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attention (HMRC [2015], Point 1.18.).[14] The UK public had demonstrated a strong interest in firms' tax affairs, and evidence shows that public attention had induced changes in firm tax disclosure and tax avoidance in response to *quantitative* mandates (Campbell [2014]; Dyreng et al. [2016]). Hence, we start by examining changes in stakeholder pressure after the reform. We proxy for this pressure using the level of media attention and find that treated firms experience a statistically significant increase in attention after the reform. We then manually collect articles that explicitly mention the tax strategy mandate using Nexis Uni and find almost 40 articles discussing the reform, including some in major media outlets, such as *The Guardian* and *The Financial Times*.[15] Moreover, two NGOs scrutinized the compliance and quality of the tax strategy reports of large foreign and UK multinationals (Tax Justice Network [2019]; Fair Tax Foundation [2017]). We show that this increased scrutiny did make companies comply with the letter of the law (they produce a tax strategy report and increase overall tax strategy disclosure in the annual reports) but very few complied with the spirit of the law (the quality of the disclosure decreased after the reform). As pointed out in the Fair Tax Foundation analysis of the largest UK companies, many tax strategy reports discuss tax planning oriented toward the "need to maximize returns for shareholders." We confirm this by manually investigating earnings calls of our treated and control firms: only 3% indicated responsible tax conduct as their goal, while the rest had narratives centered around tax as a cost to minimize (which remains unchanged post reform).

In the final part of our analysis, we analyze the effects of the reform across sub-groups of firms for which we would expect higher reputational costs. We examine three pre-reform firm characteristics that we use to split both our treated and control groups into subgroups; these are public attention, the corporate social responsibility rating, and tax aggressiveness. For firms that are subject to higher public attention pre-reform, we might observe improved reporting of their tax strategies and improved tax compliance post reform because they could expect higher scrutiny of their tax affairs. We then

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[14] For similar public attention to firms' tax strategies in the United States, see also https://www.forbes.com/sites/taxnotes/2022/06/28/microsoft-and-cisco-face-shareholder-pressure-over-public-disclosures/?sh=4484bf595d39.

[15] See the respective articles available at https://www.theguardian.com/business/2015/jul/23/big-businesses-agree-stop-aggressive-tax-planning-hmrc and https://www.ft.com/content/bca9bb20-6aca-11e6-ae5b-a7cc5dd5a28c

investigate whether responses differ, depending on the firms' overall attitude toward corporate social responsibility, in line with the notion that firms view tax strategy disclosures as a CSR measure. Finally, we study whether more aggressive firms, the primary target of the reform, feel more pressure to change behavior in anticipation of higher reputational damage or misuse the new disclosure mandate to pose as good citizens without altering their practices. Overall we do not find any statistically significant differences in the subsamples of firms we consider. This corroborates the conclusion that the reform did not increase public scrutiny sufficiently to alter firm real behavior, even for subgroups for which we would have expected that outcome. We only find evidence suggesting that companies that care less about stakeholders (proxied by below median CSR score) provide more boilerplate in disclosures post reform. This comports with the idea that a disclosure can be strategically drafted in a vague greenwashing language in the absence of a reputational threat and that a disclosure mandate then induces no real behavioral change.

Our study contributes to two streams of literature. Specifically, it addresses (1) the effects of tax transparency initiatives and (2) the effects of CSR-type narrative disclosures. While there is a growing literature on the effects of *quantitative* tax disclosures, researchers know little about the effects of *qualitative* ones, despite their increasing popularity. Mandating the disclosure of *quantitative* tax information can affect firm behavior (Blouin et al. [2010]; Tomohara et al. [2012]; Gupta et al. [2014]; Henry et al. [2016]; Hope et al. [2013]; Joshi [2020]; Joshi et al. [2020]; Overesch and Wolff [2021]), and it offers valuable information to tax authorities (Bozanic et al. [2017]). At the extreme, mandating the disclosure of country-level economic activity can affect the organizational structures of multinationals (De Simone and Olbert [2022]). We contribute to the literature by providing novel evidence on the effects of mandating the reporting of *qualitative* tax information on firm disclosure choices and tax avoidance. We show that a qualitative mandate can have unintended consequences on the quality of overall tax disclosure and does not lead to reductions in tax avoidance. A concurrent paper, by Xia [2023] also employs our setting. Xia [2023] studies the effect of mandating *qualitative* tax information in the United Kingdom on tax avoidance and the quality of the mandated tax strategy reports. Her results support our conclusion of no reduction in tax avoidance. Our paper complements

hers, as she does not investigate the effect of the mandate on overall tax transparency, the second policy goal, but focuses on the quality of tax strategy reports. We provide causal evidence on the consequences of the UK mandate on the *quantity* and *quality* of tax disclosures in *annual reports*. As such, we account for the fact that many UK firms were voluntarily providing tax strategy information before the reform. While the documented increase in the quantity of tax strategy disclosure in the annual reports suggests that the mandate accelerated the tax strategy disclosure trend for treated firms, we also demonstrate an unintended consequence of the reform: the deterioration of tax strategy disclosure quality in annual reports.

Second, we contribute to the literature on CSR by analyzing the effects of a CSR-like narrative disclosure mandate where firms can exploit discretion to engage in greenwashing. Since qualitative information is harder to verify (She [2022]), firms seem to be able to provide unsubstantiated CSR disclosures that say what stakeholders want to hear (Cho and Patten [2007]; Christensen et al. [2021]), as supported by our findings using three distinct subsamples of firms for which we expect higher reputational costs. We add to the literature on CSR disclosure by showing that the quality of tax strategy disclosures relates to other CSR disclosures in nontax domains. We also extend the findings of Dyer et al. [2017] by documenting that, in addition to accounting standards and financial regulators' initiatives, mandating nonfinancial disclosure can affect the information volume and content of financial disclosure and reduce its quality. Hence, for CSR-type mandated disclosures to change firm behavior, for example, to reduce tax avoidance, they may need to be more verifiable than the currently proposed formats for tax strategy reports in the United Kingdom and the very similar recent Global Reporting Initiative Tax Standard (GRI 207).[16] Otherwise firms can comply by providing the required information without reconciling it with their underlying real activities.

II.   INSTITUTIONAL SETTING

Domestic and international regulations are increasingly mandating multinationals around the world to disclose more information on their tax strategies and the geographical distribution of tax payments.

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[16] See https://www.globalreporting.org/media/sfcpcrt4/gri-207-tax-standard-2019-factsheet.pdf.

While early initiatives focused exclusively on mandating quantitative disclosure,[17] more recent ones have centered on promoting or demanding *qualitative* disclosures.[18] We focus on the UK tax strategy disclosure regulation, which was passed in Parliament on September 15, 2016. This new requirement applies to firms with a UK presence having a UK-group turnover exceeding GBP 200 million or balance sheet total assets exceeding GBP 2 billion in the last year.[19] Those firms must publish either a separate tax strategy report on their website or integrate the discussion of their tax strategy in an existing report, for example, the annual report, and the board must approve it.[20]

The information required covers four topics. First, firms must discuss how their UK tax risk is managed, resulting in such statements as the following: "The CFO and Head of Tax oversee tax risk management, which is undertaken by the Group's tax team. The tax team consists of the Head of Tax, who leads the team, two Tax Managers and a Tax Accountant," or "Overall responsibility for ensuring that tax risk is managed effectively across the Group lies with the Board. The Audit Committee reviews the effectiveness of the risk management process on behalf of the Board."[21]

Second, firms should describe their attitude to tax planning resulting in such sentences as "Cairn undertakes tax planning that supports our business and reflects commercial and economic activity. The Group's policy is not to enter into any artificial tax avoidance schemes" or "Cairn will base its views on the relevant tax laws in force at the time and seeks to minimize disputes."[22]

Third, firms should offer insights into their tax risk appetite, which leads to such disclosures as "It is the aim of RM to minimize the level of risk taken in relation to both UK and overseas taxation matters wherever possible. Given the size and diversity of the business, taken with the complexities of taxation

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[17] Examples include the Dodd-Frank Financial Reform and Consumer Protection Act, the FIN48, the EU CRD IV and the Capital Requirements Regulation, the Action 13 of the BEPS project, which has now been introduced in most countries around the world.
[18] Recent initiatives promoting the disclosure of qualitative tax information include the Tax Transparency Package Proposal by the European Commission in 2015, the Global Reporting Initiative Tax Standard (GRI 207), the UK tax strategy regulation, and the Australian voluntary Tax Transparency Code.
[19] For more details, see HMRC [2016]. UK subsidiaries of a multinational group with global turnover exceeding EUR 750 million must also publish a tax strategy report. See Schedule 19 "Large business: tax strategies and sanctions" of the Finance Act 2016, available at https://www.legislation.gov.uk/ukpga/2016/24/schedule/19.
[20] For the complete law, see "Schedule 19 - Large business: tax strategies and sanctions" of the Finance Act 2016, available at https://www.legislation.gov.uk/ukpga/2016/24/schedule/19.
[21] The sentences are taken from SEGRO's tax strategy.
[22] The sentences are taken from Cairn's tax strategy.

legislation in multiple tax jurisdictions, it is inevitable that an element of tax risk will arise" or "Where complete mitigation of a risk is not possible, reduction to a minimum level is sought."[23]

Fourth, firms should explain their relationship with HMRC, which was done in such sentences as "The Group is committed to the principles of integrity, transparency and openness and seeks to apply these in its dealings with the UK tax authorities" or "Where possible we seek constructive and early discussions on any new tax matter to obtain certainty. We engage positively when discussing any differences in legal interpretation between ourselves and HMRC."[24]

Besides the existence of moderate monetary penalties,[25] compliance was expected to be achieved mainly via public pressure. In 2010, UK firms were subject to public scrutiny from ActionAid International, a global nonprofit organization, highlighting how around 50 percent of the FTSE100 were not compliant with the requirement to disclose the full list of subsidiaries and their respective (tax haven) locations in annual reports. The reputational threat induced almost all FTSE100 to become fully compliant within two years after the ActionAid International campaign (Dyreng et al. [2016]). There was a similarly successful public campaign aimed at inducing noncompliant US-headquartered firms to publish their tax strategy reports (Belnap [2022]).

In our setting, UK firms' awareness of societal interest in corporate tax affairs resulted in the disclosure of tax strategy information for the UK multinationals long *before* the tax strategy report was mandated (PwC [2016]). For example, in the United Kingdom in 2016, 66% of the FTSE100 companies disclosed their approach to tax and their tax governance voluntarily. However, according to the UK survey data, tax-aggressive firms might be exactly the ones less willing to voluntarily disclose tax-related information (TNS [2015]). Thus, forcing all large firms to explain their tax-related practices had the goal to discourage aggressive tax planning via increased public attention (HMRC [2015], Point 1.18.).

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[23] The sentences are taken from RM's tax strategy.
[24] The sentences are taken from Clipper Logistics' tax strategy.
[25] There is a penalty for not publishing a tax strategy report: a noncompliant firm faces a monetary punishment of GBP 7,500 for being caught without a tax strategy report and another GBP 7,500 if the report is not published six months after it should have been, plus GBP 7,500 for each following month until the firm becomes compliant.

III.   HYPOTHESIS DEVELOPMENT

We expect public pressure to influence firm behavior around the introduction of the tax strategy report in 2016. This is because, in our setting, the new disclosure requirement imposed additional reputational costs on firms due to a new mandatory set of information that firms must disclose and decreased stakeholder processing costs when evaluating firm's tax strategy. First, the reform establishes four categories that must be discussed in a tax strategy report. Thus, firms now must provide details about their tax affairs, which, for most firms, go beyond what they originally provided voluntarily (PwC, [2016]). Second, it decreases information processing costs by increasing stakeholders' awareness of tax strategy disclosure, improving accessibility through an easily accessible report and by setting clear information categories that enhance comparability across firms' disclosure. In what follows, we develop our hypotheses related to how the reform can affect (1) the availability of tax information to the public and (2) tax planning.

The Availability of Tax Information

Increasingly, taxes are seen as part of a firm's corporate social responsibility (e.g., Grewal and Serafeim [2020]), and both investors and other stakeholders value firms' efforts concerning these issues. As such, we would expect firms to react to the mandate by conveying that their actions comport with broader societal interests across all corporate communication channels, that is, not only by issuing a standalone tax strategy report but also by incorporating this disclosure in the financial reports (O'Donovan [2002]). The annual report may be an especially salient disclosure outlet, as it is considered more credible and visible than other reports (Grewal [2019]). However, it is unclear whether an increase in the volume of disclosure would lead to an increase in the *quality* of tax information available to the public.

On the one hand, the quality of tax strategy disclosure could increase, as Schedule 19 of the Finance Act 2016 provides clear categories for the information to be disclosed. Clear categories imply that the mandate may function well for stakeholders as a benchmarking tool (Robinson and Schmidt [2013]; Healy and Palepu [2001]; Maines and McDaniel [2000]). Benchmarking can enhance public pressure,

helping stakeholders determine firms' *relative* compliance (Christensen et al. [2021]) and can induce firms to increase transparency around their tax affairs. On the other hand, due to the *qualitative* nature of the disclosure, firms may be able to draft vague disclosures (Freedman and Vella [2015], [2016]), thus providing low quality information. Our first set of hypotheses follows.

H1a: *The tax strategy mandate will induce firms to publish a tax strategy report and will increase the volume of their tax strategy disclosure in the annual report.*

H1b: *The mandate to disclose tax strategy information will not affect the quality of tax strategy disclosure in the annual report.*

Tax Planning Strategies

The literature has mainly focused on analyzing the effects of mandating *quantitative* tax information on tax avoidance. For example, in the context of FIN48 adoption in the United States, evidence suggests that public disclosure of additional tax figures on unrecognized tax benefits can enable the detection of tax avoidance (Lisowsky et al. [2013]) and help estimate current and future tax figures (Ciconte et al. [2016]). While at the same time the quality of FIN 48 disclosures is lower for more tax aggressive firms (Robinson and Schmidt [2013]). Further, there was a documented reduction in tax avoidance (measured in terms of changes in different types of ETRs) after the introduction of FIN48 (e.g., Hope et al. [2013]; Gupta et al. [2014]; Henry et al. [2016]).

Requiring the disclosure of *qualitative* tax information could induce similar benefits. Mandating the publication of a tax strategy report should foster shareholders', investors', and the public's scrutiny of firms' tax affairs. For example, in the United Kingdom, intensive media coverage of tax scandals has increased the transparency of firms' tax affairs and reduced their tax avoidance (Dyreng et al. [2016]). Firms are aware of the proprietary costs related to qualitative disclosure around their tax strategy, as

evidenced by the lobbying effort they exerted during the consultation phase preceding the publication of the law.[26]

Further, increases in transparency, especially related to CSR disclosures, can affect firms' strategies (Wu et al. [2020]). NGOs believe that the UK qualitative tax strategy disclosure could be helpful in judging business tax affairs and in holding companies accountable (Fair Tax Foundation [2021]). Therefore, we would expect that mandating a formalized written tax strategy can reduce corporate tax avoidance through public scrutiny. Some benefits may also be specific to the qualitative nature of the UK disclosure mandate. This is because qualitative disclosure can provide more nuanced information on firms' tax affairs. As such, *qualitative* disclosure can help information processing by less sophisticated users of disclosures (e.g., the public and employees), who are the main targets of this CSR-like disclosure.

However, mandating the disclosure of *qualitative* tax information can have drawbacks, compared to *quantitative* tax information, because of the inherent characteristics of such disclosure. Specifically, nonnumerical disclosures may not help NGOs because they are harder to verify (She [2022]) since they can be drafted using boilerplate and vague terms (Hope et al. [2016]; Christensen et al. [2021]). In line with this, anecdotal evidence indicates that stakeholders are concerned over the quality of tax strategy disclosures.[27] Hence we may see no change in firm tax planning after the mandate for a tax strategy report is introduced. Our second hypothesis follows:

H2: Following the tax strategy mandate, firms will not reduce the level of tax avoidance.

IV.   SAMPLE SELECTION AND VARIABLE MEASUREMENT

Sample Construction

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[26] See the summary of responses to the consultation published at https://assets.publishing.service.gov.uk/media/5a80df1fed915d74e33fce24/Improving_Large_Business_Tax_Compliance_-_summary_of_responses__M-7501-02_.pdf.

[27] Cisco's shareholders have stated in relation to the UK Tax Strategy report the company issues: "The document is not fit-for-purpose, insofar as it does not provide investors with the information to undertake an appraisal of the company's tax risk appetite" (https://www.forbes.com/sites/taxnotes/2022/06/28/microsoft-and-cisco-face-shareholder-pressure-over-public-disclosures/?sh=23a665515d39).

Our initial sample consists of 1,157 listed firms that have headquarters in the United Kingdom based on the ownership information from the Bureau Van Dijk Orbis database in 2019 and that we can match to Datastream. We focus our analysis on listed firms for two reasons. First, to construct our measure of tax disclosure, we require firms to have easily accessible and comparable annual reports, that is, all written under international financial reporting standards (IFRS) rather than local generally accepted accounting principles (GAAP) standards. Second, listed firms may be subject to more public scrutiny (Dyreng et al. [2016]). Thus, we expect them to face the highest compliance burden and the highest reputational costs. The reason we focus on UK multinationals is twofold. First, multinationals face similar tax avoidance opportunities, which differ from those of domestic firms (Bilicka [2019]). Second, all UK multinationals face similar compliance burdens concerning the 2016 reform. These are higher, compared to other foreign multinationals, for which only part of their structure is subject to the regulation.[28]

For each of those 1,157 firms, we obtain data from four sources: Accounting data and firm information from Datastream, CSR ratings from Refinitiv ESG (Asset4), and firm media exposure from Ravenpack. We merge these datasets using ISIN numbers. We then add annual reports from the Perfect Information Filings Experts database, matching by firm name to firms in Datastream. We then remove firms for which we have no financial data on relevant variables (tax paid, pre-tax income, assets, sales) two years prior and two years after the reform.

Next we restrict our sample to firms that are not subject to country-by-country reporting. In the United Kingdom, the country-by-country reporting requirement was also introduced in 2016 but at a different size threshold, as it applies to multinationals with sales above EUR 750 million. Excluding these firms enables us to isolate the effect of mandating the disclosure of a tax strategy report from that of mandating country-by-country reporting.

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[28] In the online appendix Table C2 Panel B, we show that our results hold when including foreign multinationals with presence in the UK in our sample. As expected, coefficient sizes are smaller in this sample, as it includes less exposed firms.

Using this sample, we construct treatment and control groups for our analysis. Our treated firms are multinationals that must publish tax strategy reports from 2016 onward but do not have to disclose country-by-country reporting, that is, firms that have over GBP 200 million in annual sales or GBP 2 billion of total assets but have sales below EUR 750 million. Given that Schedule 19 of the 2016 Finance Act set thresholds at the unconsolidated level, but UK firms need not disclose their unconsolidated profit and loss account when having a consolidated one (see Company Act 2006 – S408), we use consolidated data to define thresholds. We validate this approximated treatment definition by hand. First, we collect tax strategy reports for our treated firms and find tax strategy reports for 75 out of 120 firms. Then, for firms for which we did not find tax strategy reports, we manually inspect the annual reports to evaluate where firms operate and find that their UK operations are likely too small to be subject to the mandate. (We either rely on geographical segment reporting, or, if not available, disclosure on the main markets of the company.) To avoid incorrect assignments, we drop these 45 firms from the sample. In an untabulated analysis, we check that our results are robust to including these firms in our analysis in the control group.

We find no tax strategy reports for firms in the control group. Firms in our control group are those that do not have to publish the tax strategy report and the country-by-country report that are most comparable to the treatment group. For this purpose, we exclude small firms, according to the UK small business size thresholds.[29] Finally, we remove observations with missing and singleton financial data, which excludes 6 of the firms for which we have tax strategy reports from our final regression sample. Table 1 provides an overview of each step of the final sample selection. Our final regression sample consists of 206 (212) unique firms for the disclosure (tax planning) outcomes: 69 (67) firms belong to the treated group, and 137 (145) firms belong to the control group.[30]

Measures of Tax Strategy Disclosure

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[29] For details on the threshold definition, see https://www.gov.uk/annual-accounts/microentities-small-and-dormant-companies. We show that our results are robust to including small firms in the online appendix.
[30] In online appendix Table C3 Panel A, we show that our tax planning results are robust to running the estimation in the disclosure sample.

We construct a firm-level measure of tax strategy disclosure in the annual report by employing textual analysis. We pick a representative subsample of annual reports from years 2010 to 2016 and manually collect sentences in which firms discuss their tax strategy. Our classification is based on a PwC analysis of the voluntary tax disclosure in annual reports of firms listed in the FTSE100 (PwC [2016]). This analysis considers five categories of information: approach to tax, tax governance, cash tax reconciliation, total tax contribution, and geographical reporting of the tax liability. We consider only the first two categories because they represent purely qualitative tax information and reflect the information required in the tax strategy reports under Schedule 19 of the Finance Act 2016.[31]

We use our manually constructed training sample to classify the tax sentences in all annual reports using the naïve Bayes classifier. We use a test sample to evaluate the effectiveness of the classifier and find consistently high levels of *accuracy* and *recall* ranging from 0.88 to 0.95.[32] Based on the classified sentences in each annual report, we construct a measure of the volume of firm-year level qualitative disclosure, which is equal to the number of tax strategy sentences in a firm's annual report. In Appendix B, we include examples of the tax strategy sentences classified using the trained naïve Bayes classifier. We include the number of words as an additional proxy for the *quantity* of tax strategy disclosure provided.

Having isolated the portion of the annual report in which a firm discusses its tax strategy, we follow the literature studying qualitative disclosures (e.g., Dyer et al. [2017]; Hope et al. [2016]; Lang and Stice-Lawrence [2015]) to construct two proxies for the *quality* of the information provided: the level of boilerplate and the degree of specificity. The level of boilerplate captures the amount of common phrases a firm uses in its tax strategy sentences and is computed as the portion of trigrams in a firm's tax strategy sentences that is found in at least 5 percent of the documents in a given fiscal year. To measure the degree of specificity, we use the Stanford Named Entity Recognition (NER) tool and

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[31] In Table C5 in the online appendix, we test how the reform affected these three quantitative voluntary disclosures that we do not analyze in the paper, as a mandate for qualitative tax disclosure may spur firms to also voluntarily increase their quantitative tax disclosures. We find very small and insignificant coefficients for these outcomes (Coeff on sentences, 0.0464, on words, 0.752 with high p-values). This comports with PWC's [2016] observation of much less voluntary quantitative than qualitative tax strategy disclosure for large UK firms. It also shows that firms do not go beyond what is required of them.

[32] For details of the technique and robustness analysis of the machine learning approach, see Appendix B.

capture specific words that convey detailed information that is relevant to the disclosing firm. Specific words are determined based on how often the text refers to people, places, organizations, time, date, money or percentages. We scale the number of specific words by the number of tax strategy words in the annual report. We provide examples of tax strategy sentences including common phrases and specific words in Appendix C.

From a methodological perspective, the machine learning approach we use to classify tax strategy sentences refines previous methodologies, which mostly used the dictionary approach (e.g., Balakrishnan et al. [2019]; Campbell et al. [2014]; Allen et al. [2021]). As such, we contribute to the growing literature that uses machine learning to capture qualitative disclosures (e.g., Donovan et al. [2021]).

In an untabulated analysis, we consider firm characteristics that determine which firms discuss their tax strategy before the 2016 reform and the extent of their disclosures. We show that media attention encourages a firm to offer insights into its tax practices. Another important driver of a firm's willingness to discuss its tax strategy and the extent of the disclosure is board composition. Firms with greater tax and accounting expertise on the board tend to disclose their tax strategy in the annual reports, and, in such firms, this type of disclosure is, on average, longer. Consequently, we control for these characteristics in our empirical analyses.

Measures of Tax Planning Strategies

Our main measures of tax avoidance are cash and book ETRs—the two most common proxies available when analyzing non-US settings (Hanlon and Heitzman [2010]; Bruehne and Jacob [2019]).[33] Following the literature, we set ETR observations in loss years to missing, since losses distort ETR-based tax measures and inhibit interpretation (e.g., Dyreng et al. [2017]; Chyz et al. [2019]; Robinson et al. [2010]).

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[33] While we use the unadjusted cash and book ETRs in our baseline tests, we show in online appendix table C3 panel B that our results are fully robust to industry-size adjusted measures of cash and book ETR.

Note that book and cash ETR proxies capture nonconforming tax avoidance only and do not capture changes in tax accounting accruals. However, our sample is exclusively composed of listed firms, which face high capital market pressure and thus are less likely to adopt conforming tax avoidance (e.g., Hanlon and Heitzman [2010]; Badertscher et al. [2019]). Cash ETR captures tax deferral strategies, which are not included in the book ETR measure. Since our sample consists of UK headquartered firms only, this limits the types of tax avoidance proxies available to us, compared to a US setting. The lack of foreign tax expenses prevents us from using book-tax difference proxies and reporting of the item "unrecognized tax benefit" is not required under IFRS.

While cash and book ETR measures are the most widely used proxies for tax avoidance, they may remain unchanged even when firms change their tax avoidance practices in some regions. (ETR changes in different regions can cancel each other out.) Further, they do not allow for disentangling different drivers of the final average tax rate.

Therefore, we also study the effects of the mandate on tax havens operations of our firms. For this, we rely on the newly introduced textual measure from Law and Mills [2022], which captures the degree of tax planning related economic activity in tax havens by using a dictionary of textual offshore input and output activity mentions in direct proximity to tax haven mentions in the annual reports.[34] We are interested in this measure for two reasons. First, firms could use nonhaven tax planning more aggressively and reduce the reputationally riskier haven activity. This would constitute a reduction in tax avoidance, but our ETR measure cannot capture that, since firms are substituting between two types of avoidance strategies. Second, firms may also reallocate their operations across tax havens from "very risky" Dot havens to "less risky" Big7 ones, as documented in the context of country-by-country reporting (De Simone and Olbert [2022]). It is harder to argue for economic substance in a Dot Haven relative to Big7 haven, hence the reputational threat of having unsubstantiated activity is high there.

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[34] We must slightly adapt the methodology of Law and Mills [2022] to a non-US setting. Given that UK annual reports exhibit a less standardized structure relative to 10-Ks (El-Haj et al. [2020]), we cannot identify the list of our sample firms' subsidiaries from Exhibit 21-like disclosures. Instead we rely on mentioning of tax haven names in the full text of the annual report. Like us, Law and Mills [2022] also validate their measure for firms without Exhibit 21 relying on tax havens disclosure in 10-Ks narrative. This measure is based on the methodology of Hoberg and Moon [2017, 2019]

Since this reallocation would not show up in the overall tax haven activity measure, we also split tax haven activity in Dot and Big7 haven activity.

In robustness analysis in Appendix F, we further examine additional tax planning-related investment and financing strategies and for the subset of firms for which information is available, at the unconsolidated ETRs.

V. DESCRIPTIVE EVIDENCE

Characteristics of Control and Treated Groups

In Panel A of Table 2, we show the pre-2016 descriptive statistics for the variables used in our analysis, which we break down into treatment and control groups.[35] Treated firms in our sample provide more tax strategy discussion in their annual report with seven tax strategy sentences (288 tax strategy words), which corresponds to 0.4 percent of the total sentences in the average annual report in our sample. Firms in the control group disclosed, on average, 3.2 sentences (134 tax strategy words). Further, we observe less boilerplate in the treated group compared to the control group but do not detect a statistically significant difference in the level of specificity between the two groups. Treated firms are significantly larger, more levered, older, less likely to incur losses, and more likely to have at least a board member with a tax or accounting background. Moreover, they have higher operating volatility, analyst following, and media attention but lower return volatility. Differences in size between treated and control groups are to be expected, given that the threshold to belong to the treated group depends on size and turnover.[36]

In Panel B of Table 2, we show the industry distribution for both treated and control group firms. We find that most firms in our sample belong to B2C industries (non-B2C firms are highlighted

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[35] In Table A1 of the online appendix, we provide descriptive statistics for the complete sample period.
[36] The level differences in firm characteristics in Table 2 do not invalidate our causal identification strategy, especially since we control for them in all specifications. In the robustness section, we provide additional tests to address any remaining concerns about comparability between treated and control groups by showing results using four variants of a matched sample.

in gray) and that treated and control firms operate in similar industries. Yet the percentage of B2C firms in the treated group (86%) is higher than in the control group (66%).

Characteristics of Standalone Tax Strategy Reports

In this section, we provide a set of comprehensive descriptives on the standalone tax strategy reports. As our baseline, we choose tax strategy reports in 2019, as this is the last year we include in our causal analysis. We compare these standalone tax strategy reports against the tax strategy disclosure in the annual reports, across time (between 2019 and 2023), and against the latest version of other CSR-related reports available on firms' websites at the time of writing (Gender Pay Gap Reports and Modern Slavery Statements).

We start by summarizing the characteristics of the tax strategy reports of our treated firms in Table 3. First, the length of documents in our treated sample varies substantially with an average length of 817 words and 43 sentences and a standard deviation of 500 words.[37] Second, on average, the level of boilerplate is 26 percent, and the degree of specificity is 10 percent. Thus, overall specificity is low and boilerplate is high.[38]

Then we focus on similarities between tax strategy disclosure in annual reports and in tax strategy reports.[39] In Figure 1 Panel A, we plot the distribution of the similarity between the annual report tax strategy disclosure and the tax strategy report.[40] The similarity score ranges between 15 and 80 percent, with mean of 52%, and is homogeneously distributed over this interval. To understand which

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[37] In Online Appendix B, we present examples of two extreme cases. RPS, a UK multinational offering professional services, provides a one-page tax strategy report, where the description of its tax planning strategy and its relationship to tax authorities is limited to a few lines while the discussion of its risk management extends over three paragraphs. Jupiter, a UK fund management group, presents an 11-page report, where, besides the mandatory topics, it offers an overview of the firm's total tax contribution and geographical distribution of tax payments.

[38] In Online Appendix B, we present an example of a tax strategy report with a higher degree of specificity. Macfarlane, a UK packaging and label multinational, scores 19 percent on our specificity index. For example, it states the exact period to which the described tax payment overview refers, it describes organizational details of the tax function, and it lists each subsidiary with the corresponding name and location.

[39] The similarity measure is a measure of similarity *within* firm and *across* disclosure type. To clarify, in contrast to the similarity score, the Boilerplate measure is a measure of similarity *within* a disclosure type (annual report or tax strategy report) and *across* different firms. Thus, it indicates similarity with other firms, and it is a measure of copy-pasting *between* firms.

[40] We capture the similarity of the tax strategy disclosures in the two outlets by computing the cosine similarity.

firm characteristics are correlated with the similarity measure, in Table 4, we compare means of company characteristics during the period of 2013–2019 for firms exhibiting high and low similarity levels. We document that firms with higher similarity across their annual report and standalone disclosure on tax strategy are larger and have more growth opportunities. They also have higher CSR ratings, more analysts following, and more media attention. They tend to have longer tax strategy disclosures in the annual reports and less boilerplate in both outlets. These correlations suggest that firms that have more attention on them and are larger pay more attention to having their disclosures across the two outlets look more similar. Furthermore, these more similar disclosures contain less boilerplate, which is in line with higher quality disclosure for firms that have more attention on them. We do not observe the same pattern for similarity.

To investigate firm characteristics that correlate with similarity in the two disclosures beyond the textual *content* of disclosure, we then study the relationship between the *quality* of disclosure in tax strategy and annual reports. In Table H1 in the appendix, we examine whether more similar levels of boilerplate and specificity across the two disclosure outlets are correlated with any observable firm characteristics. In line with content similarity, we show that larger firms have lower differences in specificity, and that higher media attention and longer annual report disclosure is related to more similar boilerplate and specificity levels. This does not mean large firms have more boilerplate disclosure but that the quality of disclosure relates more between outlets. Overall Tables 4 and H1 are in line with larger firms having more resources to invest in conveying a *consistent* message across disclosure channels. For example, they likely have an investor relations officer, and recent survey evidence suggests that these officers can considerably influence corporate disclosures (Brown et al. [2019]). In untabulated tests, we do not find any systematic industry patterns.

We conclude that mainly size, length of disclosure and attention on firms by the public and analysts (characteristics which are all positively correlated with each other) drive similarity in disclosure content and quality between firms. This finding is consistent with a notion that firms under more public scrutiny should feel pressure to provide consistent and more comprehensive disclosure. To further isolate the drivers of disclosure, we turn to regression analysis in the next section, where we can exploit

the UK mandate as a shock for identification of within-firm changes while holding firm characteristics constant.

We proceed with the descriptive analysis by comparing the standalone tax strategy reports for the same firm across time (2019 and 2023).[41] When comparing their similarity in Figure 1 Panel B, we can see that firms mostly continue using the same sentences over time. Strikingly, around 80 percent of the firms in our sample have little to no change in the content of the reports between 2019 and 2023. When considering how disclosure quantity and quality evolve, we detect a statistically significant decrease in specificity in Table 5. We manually review the reports and find three broad categories of changes.[42] Some firms change the title of the unit or the person responsible for the tax strategy report. Other firms add context to help clarifying a statement, especially if the statement can be misunderstood as aggressive tax planning. In line with the tax strategy being viewed as part of CSR, one firm modified the report from stating that it is acting in the interest of shareholders to stating that it is acting in the interest of stakeholders, including shareholders, clients, employees, and tax authorities. We also find instances in which firms reduce the specificity of their disclosure. For example, the name of the person signing the report or the list of subsidiaries or entities covered in the report were removed.

Finally, we compare the quality of the disclosure across different CSR-related reports to study whether firms that provide a poor-quality tax strategy report also do so along other dimensions of their sustainability reporting. For this purpose, we examine two important CSR reports that are mandated for UK firms of a certain size. Since 2017, UK firms with at least 250 employees must provide key statistics on their pay policy, including the median and mean gender pay gap. The related report is collected by the Government Equalities Office and the underlying data is made publicly available on the UK government website.[43] In addition, since 2015, UK firms with turnover of at least £36 million have been mandated to publish a report on how they comply with legal requirements to ensure slavery-free supply

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[41] For 2023, we only found 68 out of 75 tax strategy reports. We manually review the missing ones and detect that either the firm has become insolvent, has been acquired, or the UK operations are no longer above the turnover/asset thresholds.

[42] Concrete examples of changes are provided in Appendix D.

[43] For more information on the Gender Gap Report, see the government related page available at https://www.gov.uk/government/publications/gender-pay-gap-reporting-guidance-for-employers.

chains.[44] Companies publish both their Gender Pay Gap Report and the Modern Slavery Statement on their websites. We manually collected these documents for all treated firms in our sample.[45] We also obtain statistics on "impossible reporting" from Bailey et al. [2022]. The authors study the quality of gender pay gap reports of UK firms and develop a measure called "impossible disclosure" that detects when the statistics reported on the gender pay gap are mathematically impossible. For example, when the separate median pay values for women and men cannot be reconciled with the combined values.

Table 6 provides evidence of positive but not always very strong correlations between the quality of disclosure in the tax strategy reports and gender pay gap and modern slavery disclosures. In Panels A and B, we show the correlations between length, boilerplate, and specificity across the different reports. Specifically, there is very a significant correlation of 25.4 % in specificity between gender pay gap and tax strategy reports and positive correlation in boilerplate between tax strategy reports and both the gender pay gap and modern slavery reports. Panel C shows means of disclosure quality for tax strategy reports separately for firms that report impossible gender gap pay statistics and those that do not do that. We find that firms that provide impossible disclosure on their gender pay gap provide shorter tax strategy reports with more boilerplate and lower specificity. Bailey et al. [2022] suggest that impossible reporting is a measure of very poor-quality disclosures. They show that, on average, firms with clear incentives to misreport are more likely to provide impossible disclosure numbers (e.g., in instances where the median pay gap is favorable for the employer). As such, the evidence from Panel C indicates that firms with very poor quality disclosure for gender pay gaps have significantly worse quality of tax strategy disclosure. Taken together, our findings indicate that the quality of tax strategy reports relates to the quality of other CSR reports that firms in our sample provide.

VI. CAUSAL EFFECTS OF THE UK DISCLOSURE MANDATE

Difference-in-Differences Estimations and Results Discussion

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[44] For more information on the Modern Slavery Statement, see the government related page available at https://www.gov.uk/guidance/publish-an-annual-modern-slavery-statement.
[45] We collected 59 Gender Gap Reports and 72 Modern Slavery Statements out of the 75 treated firms in our sample. The missing reports are either due to the conditions for reporting not being satisfied (firms being below the employee size threshold) or non-compliance.

To causally identify the effects of mandating disclosure of qualitative tax information, we use the introduction of mandatory tax strategy reporting in the United Kingdom in 2016 as an exogenous shock to tax information disclosure and employ a difference-in-differences strategy. This legislation requires groups over a certain size to disclose additional qualitative tax information. Thus, we consider firms that must publish a tax strategy report as treated firms. As a control group, we use firms that are below the size threshold and need not publish a tax strategy report.[46] Our difference-in-differences specification takes the following form:

$$ReformOutcomes_{it} = \alpha + \beta_1 Post_t \times TaxStrategyReport_i + BX_{it} + \gamma_i + \delta_t + \varepsilon_{it}, \qquad (1)$$

where i is firm and t is year. $Post_t$ is a dummy, which denotes years after 2016.[47] $TaxStrategyReport_i$ is a dummy equal to one for those firms that must publish a tax strategy report. For firm-level controls (X_{it}), we follow Balakrishnan et al. [2019] and use size, leverage, age, geographical complexity, market-to-book ratio, operating volatility, an information production quantity proxy, and performance volatility. In addition, we control for media attention and the board's tax accounting expertise, which, as we already discussed, are important determinants of voluntary tax strategy disclosure. We lag all our controls because some of our control variables may also be affected by the reform: for example, in Section VII, we show that media attention increased post reform. We include firm (γ_i) and year (δ_t) fixed effects. Thus, we estimate the effect of mandatory disclosure using the within-firm variation. We cluster standard errors at the firm level.

We examine the effects of the reform on the *volume* of tax strategy information, as proxied by the number of tax strategy sentences (*Tax Strategy Sentences$_{it}$*) and the number of words in these sentences (*Tax Strategy Words$_{it}$*). We next consider the *quality* of the tax strategy disclosures, as proxied by the level of boilerplate (*Boilerplate$_{it}$*) and the degree of specificity (*Specificity$_{it}$*). We then test whether

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[46] Our choice of control group firms is restricted to the United Kingdom because of the need of an annual report in comparable format to our treated group. The advantage of a UK control group, however, is that we can control in our research design for shocks to the UK economy that would affect firms' disclosure and ETRs in the control and treated groups equally by differencing out the common time trend within the United Kingdom.

[47] Although the first articles highlighting the proposal to introduce a mandatory tax strategy report are from May 2015, the size threshold was only announced in the summer of 2015 (HMRC [2015]). This threshold applied to turnover and assets in 2015. The reform is effective for fiscal years starting on or after September 2016.

mandating a tax strategy report affects firm tax avoidance, measured by cash ETR (*Cash ETR$_{it}$*), book ETR (*Book ETR$_{it}$*), and tax haven operations (*Law/Mills Tax Haven Activity$_{it}$*). To understand whether firms reallocate between more and less risky tax haven operations, we also split tax haven activity in Dot (*Law/Mills Dot Haven Activity$_{it}$*) and Big7 havens (*Law/Mills Big7 Haven Activity$_{it}$*).

Hypothesis 1 indicates that the reform will increase the *volume* of tax strategy disclosure in the annual reports but not the *quality*. Thus, we expect coefficient β_1 to be positive and significant in regressions with *Tax Strategy Sentences$_{it}$* and *Tax Strategy Words$_{it}$* as dependent variables and small and insignificant in regressions with tax strategy disclosure *quality* measures. Hypothesis 2 suggests no effect on tax avoidance. Hence, we expect the coefficient on β_1 to have a small magnitude and to be insignificant in specifications with measures of *tax planning* as outcome variables.

We present the results in Table 7 Panels A and B. Panel A Columns (1) and (2) show the results for the quantity measures, and columns (3) and (4) for the quality ones. We find that, for affected firms, the volume of tax strategy disclosure in the annual report significantly increased, relative to the control firms, after the reform. Results from Column (2) indicate that treated firms after the reform increased the number of sentences describing their tax strategy in the annual report by 1.7 on average, compared to control firms. Given that the average treated firm had seven tax strategy sentences in its annual report before the reform (Table 2), this suggests an increase of almost 24 percent. Results from Columns (3) and (4) indicate that the mandate significantly increased the level of boilerplate, without having any effect on specificity. This indicates that, although the volume of tax strategy disclosure increased, its quality deteriorated. In Panel B, we report the effects of the reform on tax planning. In Columns (1) and (2), we present the results for cash and book ETRs, and Columns (3)–(5) display the effects on tax haven operations. We find no significant effect on tax planning for our treated firms after the reform across all measures of tax avoidance and profit shifting.

Event Study Evidence

Our identification strategy assumes that qualitative tax disclosure and the appetite for tax avoidance for the control and treated firms would have evolved in parallel in the absence of the reform.

We test the plausibility of this assumption using an event study.[48] We also use this method to evaluate the speed with which the reform affects our outcome variables. We estimate Equation 2 separately for the control and treated groups. This is a version of Equation 1, in which we replace the coefficient on the interaction between the post-2016 dummy and the treated firm indicator with seven separate indicator variables, each marking one year during the t-3 to t+3 periods, relative to the year before the treatment event date (t=-1). We omit the indicator for period t-1 to serve as a benchmark. We estimate the following equation:

$$ReformOutcomes_{it} = \sum_{k=-3}^{3} \beta_k * D_t^k + \gamma_i + \varepsilon_{it}. \qquad (2)$$

The variables of interest are the dummies D_t^k, which indicate a point in k periods from the reform year (2016). The coefficient on each dummy estimates the difference in each dependent variable in that year, relative to year k-1 (2015). As a dependent variable, we use the reform outcome variables described above. We cluster standard errors at the firm level, as specified in Equation 1. We use the most parsimonious approach and include only firm fixed effects (γ_i) and do not include any control variables. We show that these event studies are robust to including control variables in Online Appendix Figure C2.

We present the corresponding dynamic event study results in Figure 2. For each year, we plot the coefficient estimates and the 95 percent confidence intervals separately for treated and control groups. We show that the quantity of tax strategy disclosure for treated and control groups evolved similarly before the 2016 reform, with both types of firms increasing this disclosure throughout the sample period. We document that, after the reform, treated firms increased the volume of their tax strategy disclosure in the annual report at a much quicker rate than control group firms, as shown in Panels (a) and (b). Given that some firms were already disclosing some information on their tax strategy in the annual report before the reform, these findings suggest that the mandate significantly accelerated

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[48] The level differences in firm characteristics in Table 2 do not invalidate our causal identification strategy, especially since we control for them in all specifications. In the robustness section, we provide additional tests to address any remaining concerns about comparability between treated and control groups by showing results using four variants of a matched sample.

the tax strategy disclosure trend for the treated firms. Panel (c) shows that the level of boilerplate disclosure evolved similarly before the reform for both treated and control groups but increased substantially for treated firms afterward, with a slight drop for control group firms. The degree of specificity did not change following the reform for either of those groups, as evidenced in Panel (d). Overall our results suggest that the reform did not increase tax transparency, as proxied by the quality of disclosure.

In Panels (e), (f), and (g), we show that there was no significant difference in the evolution of cash ETRs, book ETRs, and the Law and Mills tax haven operations measure between treated and control firms before the reform in any of the pre- or post-treatment periods. This suggests that firms did not change tax avoidance in anticipation of the reform and that the disclosure mandate did not affect tax avoidance after it took effect.

VII.   MECHANISMS

In this section, we explore potential mechanisms that could influence firms' behavior after the reform. We first directly examine the effect of the mandate on public pressure: the channel the regulator envisioned to drive the changes in firms' disclosures and tax planning. We then consider three firm characteristics that are likely to indicate exposure to higher reputational costs. These are the level of pre-reform media attention, the attitude toward societal stakeholders, and the degree of tax aggressiveness (cash ETR level). We split the sample of both control and treated firms according to the sample median of each of those measures in the pre-reform period and study the effects of the mandate in each of these subsamples separately. We repeat the analysis from Section VI on each subsample by directly comparing, for example, high (low) media attention firms in our treated group to high (low) media attention in our control group.

Effect of the reform on public pressure

We begin by investigating whether the mandate affected the extent of public pressure exerted on our treated firms. Since the literature offers mixed evidence on the effects of public pressure on firm behavior (e.g., Chen et al. [2019]; Dyreng et al. [2020]; Dyreng et al. [2016]), it is critical to understand

whether a qualitative regulation such as the one we are examining can induce public scrutiny. As a proxy, we use a measure of media attention: the maximum number of distinct news events over a 91-day window from Ravenpack. In Table 8 and Figure 3, we show that media attention on treated firms significantly increased after the reform. This is the case for both firms that had high and low media attention in the pre-reform years, although the increase is higher for the former group.[49] Evidence from Figure 3 shows a jump in attention right around the reform and only for treated firms. The control firms experience a gradual increase over the sample period with no discontinuous jump around the reform time.

While our measure captures general media attention to firms in our sample, it does not allow us to say whether this attention relates to the new tax strategy mandate. To do so, we complement this evidence with a manual search of news, business, and legal publications using Nexis Uni.[50] We find around 40 articles with explicit references to the UK reform appearing in leading news outlets like the *The Guardian* and *The Financial Times*. Moreover, we find that two NGOs scrutinized the existence and the quality of the tax strategy report of different groups of firms. The Tax Justice Network shamed a sample of US companies for not complying with the law or for the poor quality of the published reports. The Fair Tax Foundation analyzed the 50 largest UK-listed companies and reached out to the scrutinized companies to push for improving their low-quality reports. Overall our evidence suggests that this new disclosure has been the subject of public scrutiny.

Belnap [2022] shows that the scrutiny by Tax Justice Network helped induce full compliance to publish tax strategy reports for US multinationals. Yet only 6% of companies in his sample improved the quality of their tax strategy reports. Our evidence on the UK multinationals comports with Belnap's findings, as we show a high and persistent level of boilerplate for tax strategy reports over time and a reduction in their specificity. Thus, we conclude that firms do not perceive the increased public attention

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[49] Firms in the high media attention category have above-median news coverage before the reform, while those in the low media attention category have below-median coverage.

[50] Using Ravenpack, we cannot access the original text of the news. This is why we complement the analysis with Nexis Uni. Beyond the articles we manually select, there might be many more about firms' tax affairs. We focus on articles that explicitly refer to the UK reform introducing the mandatory tax strategy report to make the hand collection feasible and because those articles provide important direct evidence about the visibility of the reform.

as a major reputational threat. It appears that qualitative disclosure about tax strategy is hard to verify for stakeholders, as firms can comply by publishing a tax strategy report as mandated under Schedule 19 of the Finance Act 2016 without providing sensitive information they can be held accountable for.

As highlighted by the Fair Tax Foundation, most of the top 50 largest UK companies still display a shareholder-centered approach to tax according to which tax is a cost and the goal is to maximize firm returns (Fair Tax Foundation [2017]). To understand whether this is also the case for firms in our sample, we collect earnings call transcripts and examine what message firms communicate about taxes during the calls. We find the calls' transcripts for 58 companies, of which 40 are treated and 18 are control firms. We identify tax sentences[51] and manually review them: out of about 1,070 tax sentences, only four highlight firms' responsible tax practices, while the rest talk about tax as a cost. These cost sentences mostly discuss the drivers for the current level of effective tax rates.[52] After the reform, we do not detect any change in the narrative around tax payments, supporting the argument that companies remain shareholder, not stakeholder, focused when it comes to taxes.[53]

Heterogenous responses according to firm characteristics

We summarize the results from this heterogeneity analysis in Figure 4. Each panel of that figure considers the effects of the mandate on a different outcome. Within each panel, we plot the difference-in-differences coefficients with 90% confidence intervals across six subsamples: in blue circles, we have high and low media attention firms, in green diamonds high and low CSR rating firms, and in red squares high and low tax aggressiveness firms. We mark firms with low levels of each of those characteristics in empty shapes and those with high levels of each of the characteristics in filled shapes. The corresponding regression coefficients are reported in Tables G1–G3 in the appendix.

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[51] We select tax sentences using the same approach as for annual reports. See Appendix B for more details.
[52] We provide a list of examples of such tax-related statements in earnings calls in Appendix E.
[53] We formally test for a change in the number of tax mentions in earnings calls in untabulated regressions following our baseline specification; the coefficient on treated times post interaction is 0.484 with standard error of 0.332.

We first examine differences in reactions to the reform for firms subject to high and low media attention measured in pre-reform years.[54] We document a significant increase in the quantity of disclosure for high media attention firms only. While low media attention firms do not increase their disclosure significantly, we find that the difference in the response between the high and low media attention firms is not statistically significant. This evidence suggests that, at least for high attention firms, the reform led to significantly more disclosure. We do not detect any further differences in the response to the reform between those two types of firms. Together with the findings on the increase in media attention, our results suggest that the tax strategy disclosure was subject to public scrutiny, but firms did not perceive any reputational threat from this external monitoring as the quality of the disclosure did not increase and tax planning did not decline, even in firms with higher media attention.

We then study whether firms with different levels of stakeholder focus, in terms of CSR strategy, respond differently to the reform. A company's tax footprint is a core component of its CSR strategy because the payment of a fair share of taxes is an immediate indication of the impact a company has on society.[55] The literature provides mixed evidence on the relationship between CSR and tax aggressiveness, as it shows that firms scoring very low on different CSR metrics are more tax aggressive (e.g., Hoi et al. [2013], Watson [2015]) while those with higher CSR scores do not necessarily pay more taxes (e.g., Davis et al. [2016]). Our descriptive evidence in the UK context suggests that the quality (or lack thereof) of the tax strategy report is correlated with the quality of other CSR reports, which supports the idea that a firm's tax strategy and its CSR activities are directly related.

Upfront, however, it is unclear how CSR performance moderates the effect of the reform we study. On the one hand, firms with less sustainable strategies may anticipate reputational damage and be more likely to change their behavior following the disclosure mandate. On the other hand, these same firms may be the only ones willing to depict themselves as good tax citizens while not making real changes

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[54] An alternative measure for capturing perceived public pressure is being in a B2C business. The idea is that companies that are more exposed to consumer attention might feel higher pressure to change behavior post reform. In unreported robustness tests, we split the sample on B2C firms but did not find a significant difference in outcomes between the two groups, confirming our results on the media attention split.
[55] See PwC, Tax is a crucial part of the ESG conversation, available at
https://www.pwc.com/gx/en/services/tax/publications/tax-is-a-crucial-part-of-esg-reporting.html.

to their actions. We test this by relying on the CSR score provided by Refinitiv (Asset4), which is among the most prominent CSR rating agencies. Refinitiv uses the largest list of individual indicators (282), as indicated by Berg et al. [2022], and it is suitable for our analysis because it offers several CSR-related scores. We use the *Controversy Adjusted ESG Score* because it adjusts the CSR performance for material controversies identified by negative media stories relative to those directly reported by the company. Thus, it provides us with a measure of real CSR performance in contrast to the general *ESG score*, which is not adjusted for controversies and is subject to possible biases from company self-reporting. We document that the tax strategy disclosure of firms with a lower CSR score becomes more boilerplate after the reform suggesting that low CSR-performing firms are also those providing the least useful tax strategy disclosure in their annual report, with a significant *boilerplate* change of 10% compared to firms with high CSR performance showing an insignificant and small *boilerplate* change of 0.3%.[56] We detect no change in tax planning across the two sub-groups.

Finally, since the UK reform was particularly targeted at tax aggressive firms, we study whether these firms reacted differently to the mandate. On the one hand, highly tax aggressive firms could increase the quality and quantity of tax strategy disclosure and reduce tax avoidance more. One reason could be that they may be more exposed to public attention after the reform, which could result in a need to justify their tax positions. If they cannot credibly do so, they may reduce their tax avoidance. On the other hand, if firms can evade informative disclosure via greenwashing, highly tax aggressive ones may not change their avoidance while still increasing the quantity of tax disclosure to display a *commitment* to being good tax citizens. Consistent with this argument, Towery [2017] finds that firms facing the highest costs of disclosing provide lower quality narrative descriptions to tax authorities in response to Schedule UTP in the US context. We find no significant difference between more and less tax aggressive firms across all outcomes, both related to tax disclosure and tax planning. Thus, we do not find evidence that the reform had a differential impact, even for those firms with potentially higher reputational costs due to the reform.

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[56] From table G2 in the appendix, the p-value for the difference in coefficients between the two samples is 18.8%. Thus, the coefficient difference is almost significant at traditional level, despite the small sample size. We have the CSR score only for 87 treated and control firms in our sample.

Our results consistently provide a picture of an increase in the volume of tax strategy disclosure combined with a reduction in its quality and no change in tax planning across different types of firms.

VIII.   ROBUSTNESS AND ADDITIONAL ANALYSIS

In this section, we discuss several tests we conduct to check the robustness of our causal findings. Apart from the first set of results using alternative measures of tax planning, the results we discuss here are not tabulated in the main text to streamline the paper's exposition. They can be found in the online appendix, as indicated below.

Additional tax planning related outcomes

Tax planning related investment and financing strategies

In Appendix F we further expand our set of tax planning measures by studying several potential drivers of reductions in ETRs. First, firms can reduce tax expenses temporarily by investing in certain asset classes that enjoy preferential depreciation rates. Second, they can opt for permanent tax rate reduction strategies, such as debt shifting—where they shift interest expenses from high to low tax countries—or invest in R&D and intangible assets to enjoy reduced tax rates from IP box regimes, like the one existing in the United Kingdom, or investment tax credits abroad. Relatedly, intangibles also facilitate tax planning via transfer pricing arrangements, as they are considered hard-to-value assets. In Table F1, we investigate whether firms alter the use of these different tax planning strategies by analyzing changes to leverage, capital intensity, intangible intensity, and R&D intensity (e.g., Hanlon and Heitzman [2010]; Dyreng et al. [2019]). While changes in these real outcomes need not to be driven by tax planning, if firms reduce tax planning through these channels, we expect changes in these variables. For example, if firms change their R&D tax planning strategies, they could adjust R&D spending and their intangibles intensity. We find no significant change across all these measures with very small coefficient magnitudes. This confirms that treated firms did not change tax planning-related activities compared to our control firms after treatment. Event studies in Figure C1 in the online appendix also show no indication of anticipated tax planning changes prior to the reform. Instead trends in the three years prior to the reform are flat.

Unconsolidated measures of Cash and Book ETR

In addition, in Table F2, we use unconsolidated cash and book ETR measures for the subsidiaries of our multinationals for which this information is available. This measure allows us to capture regional changes in ETRs that may be obscured by the overall multinational ETR. We start by showing that subsidiary-level ETRs did not significantly change on average, consistent with our main tax planning result at the multinational level. We then consider ETRs for the following geographic regions separately: UK, non-UK, non-UK high and low tax countries as well as non-UK tax haven countries. We do not find any ETR increases for any of those regional subsamples. For subsidiaries of treated firms located in non-UK low tax countries, we even find a significant reduction in Cash ETRs, in line with some of our matching results.

One caveat with this analysis is that Orbis data has limited coverage of subsidiaries in general and specifically for the UK multinationals as well. While we find at least one subsidiary for all 206 firms. On average Orbis provides firm IDs for 51% of subsidiaries that the multinational reports to have and ETRs for 15% of all reported subsidiaries. Further, the coverage of financial information in tax havens is limited to Cyprus, Ireland, Luxemburg, Malta, and Singapore. Therefore, we caution overinterpreting these results.

Industry Adjusted Tax Aggressiveness Measure

As a robustness check to our main ETR measures, in Panel B of Table C3 in the online appendix, we explore industry-size adjusted versions of tax aggressiveness (Balakrishnan et al. [2019]), which measures the difference between the three-year cash ETR (book ETR) and the median cash ETR (book ETR) of the industry-size cohort to which the firm belongs (where the median is a within three-year median). We continue to find no statistically significant change in tax planning using the industry-size-adjusted tax aggressiveness measure.

Propensity-Score Matching

To attenuate the concern that treated and control group firms differ in terms of some of the observable characteristics in the pre-reform periods (see Table 2), we construct a matched sample. We

use nearest neighbor propensity-score matching and match within industry on total assets in the two years before the reform, 2015 and 2014. Alternatively, we match on the number of employees. We set the caliper width to 0.2 of the standard deviation of the propensity score and allow for matching of up to four nearest neighbors and replacement. We test the robustness of this matching by using kernel matching and changing the number of nearest neighbors to three or two.

We find that the results (reported in online appendix Table C1) using the matched sample regression resemble our baseline. When matching on total assets (employees) using nearest neighbor matching, the reform increases the tax strategy disclosure in annual reports by 76 (74) tax strategy words and using kernel matching by 65 (76) tax strategy words. Tax strategy sentences increase by between 1.3 to 1.6 sentences. In all four matching specifications, the coefficients on the outcomes tax strategy words and sentences differ significantly from zero. When it comes to the effects on the quality of disclosure, we observe a significant increase in the *boilerplate* measure by six to seven percentage points in the two kernel-matched specifications, which supports the conclusion that the quality of disclosure is not improved but rather deteriorates due to the reform. In the two smallest propensity-score matched samples (only 370 or 398 observations), the increase in Boilerplate is insignificant. Further, the level of specificity does not change significantly, and the coefficient size remains small. The effect of the reform on cash ETRs is statistically significant in two out of the four specifications, but the sign is negative. The coefficient on book ETR (sign negative) and the Law/Mills measure of haven activity (sign mostly positive) is always insignificant.

The Effect of the Reform including Non-UK multinationals with UK Presence

While our main analysis evaluates the effects of the mandate on the UK multinationals only and not on foreign multinationals operating in the United Kingdom, those foreign multinationals were also subject to the disclosure requirements. Our choice of firms that comprise the main sample ensures that all firms in our sample face similar compliance burdens concerning the 2016 reform and a similar reporting environment concerning their annual report disclosures. For UK-headquartered multinationals, the compliance burden under the 2016 reform is higher, compared to non-UK headquartered multinationals, for which only part of the structure is subject to the regulation. As a

robustness test, we extend the analysis to also include the foreign multinationals with UK presence. In choosing which foreign MNEs to include in our sample, we follow the same sample selection steps as in our main analysis. This extends our sample by 32%. Our results using this extended sample resemble our baseline results. Tax strategy sentences (words) increase by 1.3 (60), and Boilerplate increases by four percentage points. As expected, these coefficients are smaller compared to our baseline results since foreign multinationals are less exposed to the reform. Our findings for specificity and our measures of tax avoidance are also unaffected by this sample extension and continue to be small and insignificant.

Dictionary Approach

Our preferred method of identifying the volume of tax strategy disclosure in the annual reports involves using a naïve Bayesian algorithm, which could be considered a complex method. However, for the purpose of our analysis, a dictionary approach that simply counts the tax strategy sentences that include the word "tax" is not well suited. There is no set of ideal keywords that we can use to clearly identify tax strategy sentences. When a firm discusses its approach to tax or tax governance, examples of the most frequent phrases include "group tax," "tax laws," "tax rate," and "tax position." These words can be used in several other tax contexts in the annual reports unrelated to tax strategy. Thus, it is the sentence as a whole that determines whether a firm is discussing its approach to tax or tax governance.

Still, as a robustness test of our measures for the volume of tax strategy disclosure, we construct a very conservative dictionary-based count of the most frequent words used in tax strategy sentences but not used in nontax strategy sentences. We use this dictionary approach to classify sentences in the annual reports. Since we explicitly exclude words that appear in both types of sentences, the resulting classification severely underestimates the volume of the true tax strategy sentences in the annual reports. This means that we continue to find that the tax strategy mandate significantly increases the volume of disclosure in the annual reports but that the magnitude of the effect is smaller.

IX.   CONCLUSION

Governments worldwide are striving to reduce corporate tax avoidance and increase tax transparency. We focus on one of the measures designed to achieve this—mandating the disclosure of

a qualitative tax strategy report—and investigate its effects on firm behavior. We find that firms tend to provide a similar narrative about their tax strategy across outlets and over time. Importantly, we detect a decrease of disclosure quality as firms provide less specific information about their tax strategy in newer reports. Firms that offer low quality disclosure in tax strategy reports also provide low quality disclosures across CSR-related outlets such as, for example, the Gender Pay Gap Reports.

We find that, while affected firms increase the volume of discussion of their tax strategy in their annual reports, they also include more boilerplate statements without changing their underlying behavior. We thus demonstrate the difficulty of generating a standard that avoids low-quality disclosures when the disclosure mandate asks for qualitative information only. This is true even in the presence of increased public pressure on the affected companies. The results of our study contribute to a better understanding of the differences between demanding *qualitative* and *quantitative* tax disclosures. In contrast to mandates for quantitative disclosures, our findings suggest that qualitative information may not be verifiable for outside stakeholders making public pressure hard to effectively work as a driver for behavioral changes. In our setting, firms may increase the volume of qualitative disclosure as a type of insurance against negative public attention, which in turn can reduce the overall quality of tax strategy disclosures, including in a very central disclosure outlet, the annual report. Since the UK tax strategy reports in many respects resemble qualitative CSR disclosures, which are becoming more common, our findings are of relevance to policymakers considering introducing these types of purely qualitative disclosure mandates.

Reference List

ALLEN, E., D. E. O'LEARY, H. QU, and C. W. SWENSON. 'Tax Specific versus Generic Accounting-Based Textual Analysis and the Relationship with Effective Tax Rates: Building Context.' Journal of Information Systems 35 (2021): 115-147.

ANTWEILER, W., and M.Z. FRANK. 'Is all that talk just noise? Information content of internet stock message boards'. Journal of Finance 59 (2004): 1259-1294.

BADERTSCHER, B. A., S. P. KATZ, S. O. REGO, and R. J. WILSON. 'Conforming tax avoidance and capital market pressure.' The Accounting Review 94 (2019): 1-30.

BAILEY, M., S. GLAESER, J. D. OMARTIAN, and A. RAGHUNANDAN. 'Misreporting of mandatory ESG disclosures: Evidence from gender pay gap information.' (2022): Working Paper.

BALAKRISHNAN, K., J. L. BLOUIN, and W. R. GUAY. 'Tax Aggressiveness and Corporate Transparency.' The Accounting Review 94 (2019): 45-69.

BEATTY, A., L. CHENG, and H. ZHANG. 'Are risk factor disclosures still relevant? Evidence from market reactions to risk factor disclosures before and after the financial crisis.' Contemporary Accounting Research, 36 (2019): 805-838.

BELNAP, A. 'The Effect of Intermediary Coverage on Disclosure: Evidence from a Randomized Field Experiment.' Journal of Accounting and Economics (2022): 101522.

BERG, F., J. F. KOELBEL, and R. RIGOBON. 'Aggregate confusion: The divergence of ESG ratings.' Review of Finance, 26(6) (2022): 1315-1344.

BILICKA, K. A. 'Comparing UK tax returns of foreign multinationals to matched domestic firms.' American Economic Review 109 (2019): 2921-53

BLANKESPOOR, E., E. DEHAAN, J. WERTZ, and C. ZHU. 'Why do individual investors disregard accounting information? The roles of information awareness and acquisition costs.' Journal of Accounting Research, 57 (2019): 53-84.

BLOUIN, J. L., C. A. GLEASON, L. F. MILLS, and S. A. SIKES. 'Pre-empting disclosure? Firms' decisions prior to FIN No. 48.' The Accounting Review 85(3) (2010): 791-815.

BOZANIC, Z., J. HOOPES, J. THORNOCK, and B. WILLIAMS. 'IRS Attention.' Journal of Accounting Research 55 (2017): 79-114.

BOYD, D. E., and P. K. KANNAN. '(When) Does Third-Party Recognition for Design Excellence Affect Financial Performance in Business-to-Business Markets?' Journal of Marketing 82(2) (2018): 108-123.

BROWN, L. D., A. C. CALL, M. B. CLEMENT, and N. Y. SHARP. 'Managing the narrative: Investor relations officers and corporate disclosure.' Journal of Accounting and Economics 67(1) (2019): 58-79.

BRUEHNE, A., and M. JACOB. 'Corporate tax avoidance and the real effects of taxation: A review.' (2019). Working Paper.

CAMPBELL, J. L., H. CHEN, D. S. DHALIWAL, H.-M. LU, and L. B. STEELE. 'The Information Content of Mandatory Risk Factor Disclosures in Corporate Filings.' Review of Accounting Studies 19 (2014): 396-455.

CHEN, S., K. SCHUCHARD, and B. STOMBERG. 'Media coverage of corporate taxes.' The Accounting Review 94 (2019): 83–116.

CHO, C. H., and D. M. PATTEN. (2007). 'The role of environmental disclosures as tools of legitimacy: A research note.' Accounting, Organizations and Society 32 (2007): 639–647.

CHRISTENSEN, H. B., L. HAIL, and C. LEUZ. 'Mandatory CSR and sustainability reporting: economic analysis and literature review.' Review of Accounting Studies 26 (2021): 1176-1248.

CHYZ, J., F. GAERTNER, A. KAUSAR, and L. WATSON. 'Overconfidence and corporate tax policy.' Review of Accounting Studies 24 (2019): 1114-1145.

CICONTE, W., M. DONOHOE, P. LISOWSKY, and M. MAYBERRY. 'Predictable uncertainty: The relation between unrecognized tax benefits and future income tax cash outflows.' (2016) Working Paper.

DAVIS, A. K., D. A. GUENTHER, L. K. KRULL, and B. M. WILLIAMS. 'Do socially responsible firms pay more taxes?' The Accounting Review 91.1 (2016): 47-68.

DE SIMONE, L., and M. OLBERT. 'Real Effects of Private Country-by-Country Disclosure Real Effects of Private Country-by-Country Disclosure.' The Accounting Review 97.6 (2022): 201-232.

DONOVAN, J., J. JENNINGS, K. KOHARKI, and J. LEE. 'Measuring credit risk using qualitative disclosure.' Review of Accounting Studies 26 (2021): 815-863.

DYER, T., M. LANG, and L. STICE-LAWRENCE. 'The evolution of 10-K textual disclosure: Evidence from Latent Dirichlet Allocation.' Journal of Accounting and Economics 64 (2017): 221–245.

DYRENG, S. D., M. HANLON, and E. L. MAYDEW. 'When does tax avoidance result in tax uncertainty?' The Accounting Review, 94(2) (2019): 179-203.

DYRENG, S. D., M. HANLON, E. L. MAYDEW, and J. R. THORNOCK. 'Changes in corporate effective tax rates over the past 25 years.' Journal of Financial Economics 124 (2017): 441-463.

DYRENG, S. D., J. L. HOOPES, P. LANGETIEG, and J. H. WILDE. 'Strategic subsidiary disclosure.' Journal of Accounting Research 58 (2020): 643-692.

DYRENG, S., J. HOOPES, and J. WILDE. 'Public Pressure and Corporate Tax Behaviour.' Journal of Accouting Research 54 (2016): 147-186.

EL-HAJ, M., P. ALVES, P. RAYSON, M. WALKER, and S. YOUNG 'Retrieving, classifying and analysing narrative commentary in unstructured (glossy) annual reports published as PDF files.' Accounting and Business Research, 50(2020): 6-34.

EL-HAJ, M., P. RAYSON, M. WALKERS, S. YOUNG, and V. SIMAKI. 'In search of meaning: Lessons, resources and next steps for computational analysis of nancial discourse.' Journal of Business Finance & Accounting 46 (2019): 265-306.

EUROPEAN COMMISSION (EC). 'Platform on Sustainable Finance - Draft Report on Minimum Safeguards.' July 2022. Available pdf

FAIR TAX FOUNDATION. 'Tax Strategy Reporting among FTSE50' (2017). Available pdf

FAIR TAX FOUNDATION. 'Global Multinational Business Standard.' (2021). Available pdf

FINANCIAL TIMES. 'Google tells MPs: 'We are paying 20% tax.' (2016). Available 377

FREEDMAN, J. A., and J. VELLA. 'Response to Consultation Document "Improving Large Business Tax Compliance" published by HMRC on July 22, 2015.' Oxford University Centre for Business Taxation. (2015)

FREEDMAN, J. A., and J. VELLA. 'Finance Act 2016 Notes.' British Tax Review 5 (2016): 652-663.

GALLEMORE, J., E. L. MAYDEW, and J. R. THORNOCK. 'The reputational costs of tax avoidance.' Contemporary Accounting Research 31 (2014): 1103-1133.

GREWAL, J. 'Disclosure of emerging trends: evidence from climate change business opportunities.' Working Paper. (2019)

GREWAL, J., and G. SERAFEIM. 'Research on corporate sustainability: Review and directions for future research.' Foundantions and Trends in Accounting 14 (2020): 73-127.

GUPTA, S., L. F. MILLS, and E. TOWERY. 'The Effect of Mandatory Financial Statement Disclosures of Tax Uncertainty on Tax Reporting and Collections: The Case of FIN 48 and Multistate Tax Avoidance.' Journal of American Taxation Association 36 (2014): 203-229.

HANLON, M., and S. HEITZMAN. 'A review of tax research.' Journal of Accounting and Economics 50 (2010): 127–178.

HEALY, P. M., and K. G. PALEPU. 'Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature.' Journal of Accounting and Economics 31 (2001): 405-440.

HENRY, E., N. MASSEL, and E. TOWERY. 'Increased Tax Disclosures and Corporate Tax Avoidance.' National Tax Journal 69 (2016): 809-830.

Her Majesty's Revenue and Customs (HMRC). 'Improving Large Business Tax Compliance (Consultation Document).' 22 July 2015. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/447313/Improving_Large_Business_Tax_Compliance.pdf

Her Majesty's Revenue and Customs (HMRC). 'Guidance: Large businesses: publish your tax strategy.' 24 June 2016. Available at: https://www.gov.uk/guidance/large-businesses-publish-your-tax-strategy

HOOPES, J. L., L. ROBINSON, and J. SLEMROD. 'Public Tax-Return Disclosure.' Journal of Accounting and Economics 66 (2018):142-162.

HOPE, O. K., M. MA, and W. B. THOMAS. 'Tax Avoidance and Geographic Earnings Disclosure.' Journal of Accounting and Economics 56 (2013): 170-189.

HOPE, O. K., D. HU, and H. LU. 'The benefits of specific risk-factor disclosures.' Review of Accounting Studies 21 (2016): 1005-1045.

HOBERG, G., and S. K. MOON. 'Offshore activities and financial vs operational hedging.' Journal of Financial Economics 125.2 (2017): 217-244.

HOBERG, G., and S. K. MOON. 'The offshoring return premium.' Management Science 65.6 (2019): 2876-2899.

HOI, C. K., Q. WU, and H. ZHANG. 'Is corporate social responsibility (CSR) associated with tax avoidance? Evidence from irresponsible CSR activities.' *The Accounting Review* 88. 6 (2013): 2025-2059.

HUANG, A. H., A. Y. ZANG, and R. Zheng. 'Evidence on the information content of text in analyst reports. ' The Accounting Review 89 (2014): 2151-2180.

JOSHI, P. 'Does private country-by-country reporting deter tax avoidance and income shifting? evidence from BEPS Action Item 13.' Journal of Accounting Research 58 (2020): 333-381.

JOSHI, P., E. OUTSLAY, A. PERSSON, T. SHEVLIN, and A. VENKAT. 'Does public country-by-country reporting deter tax avoidance and income shifting? evidence from the European banking industry.' Contemporary Accounting Research 37 (2020): 2357-2397.

LANG, M., and L. STICE-LAWRENCE. 'Textual analysis and international financial reporting: Large sample evidence.' Journal of Accounting and Economics 60 (2015): 110-135.

LAW, K. K., and L. F. MILLS. 'Taxes and haven activities: Evidence from linguistic cues.' The Accounting Review 97.5 (2022): 349-375.

LISOWSKY, P., L. ROBINSON, and A. SCHMIDT. 'Do Publicly Disclosed Tax Reserves Tell Us About Privately Disclosed Tax Shelter Activity?' Journal of Accounting Research 51 (2013): 583-629.

MAINES, L. A., and L. S. MCDANIEL. 'Effects of comprehensive-income characteristics on nonprofessional investors' judgments: The role of financial-statement presentation format.' The Accounting Review 75 (2000): 179-207.

O'DONOVAN, G. 'Environmental disclosures in the annual report: Extending the applicability and predictive power of legitimacy theory.' Accounting, Auditing & Accountability Journal 15 (2002): 344-371.

OVERESCH, M., and H. WOLFF. 'Financial transparency to the rescue: Effects of public Country-by-Country Reporting in the European Union banking sector on tax Avoidance.' Contemporary Accounting Research 38 (2021): 1616-1642.

PRICEWATERHOUSECOOPERS (PWC). 'Shaping the Tax Transparency Debate - Trends in Voluntary Tax Disclosure.' 2016. Available at: https://www.pwc.co.uk/tax/assets/pdf/shaping-the-tax-transparency-debate.pdf

ROBINSON, L. A., and A. P. SCHMIDT. 'Firm and investor responses to uncertain tax benefit disclosure requirements.' The Journal of the American Taxation Association 35 (2013): 85-120.

ROBINSON, J., S. SIKES, and C. WEAVER. 'Performance measurement of corporate tax departments.' The Accounting Review 85 (2010): 1035–1064.

SUSTAINABILITY ACCOUNTING STANDARDS BOARD (SASB). 'The state of disclosure 2017: An analysis of the effectiveness of sustainability disclosure in SEC filings.' 2017. Available apdf.

SHE, G. 'The Real Effects of Mandatory Nonfinancial Disclosure: Evidence from Supply Chain Transparency.' The Accounting Review 97.5 (2022): 399-425.

SIANO, A., A. VOLLERO, F. CONTE, and S. AMABILE. '"More than words": Expanding the taxonomy of greenwashing after the Volkswagen scandal.' Journal of Business Research 71 (2017): 27-37.

TAX JUSTICE NETWORK. 'Brass necks and boilerplate: How US multinationals treat UK requirements for tax strategy disclosure.' (2019).

TOMOHARA, A., H. J. LEE, and S. LEE. 'Did FIN 48 increase companies' tax payments? Trade-off between disclosure and tax burdens.' Applied Economics, 44(32) (2012): 4239-4248.

TOWERY, E. M. 'Unintended consequences of linking tax return disclosures to financial reporting for income taxes: Evidence from Schedule UTP.' The Accounting Review 92 (2017): 201-226.

TNS. 'Exploring large business tax strategy behaviour.' (2015) Available at: https://assets.publishing.

service.gov.uk/government/uploads/system/uploads/attachment_data/

file/444898/HMRC_Research_Report_363_-_Exploring_Large_Business_Tax_ Behaviours.pdf

WATSON, L. 'Corporate social responsibility, tax avoidance, and earnings performance.' *The Journal of the American Taxation Association* 37. 2 (2015): 1-21.

WU, Y., K. ZHANG, and J. XIE. 'Bad greenwashing, good greenwashing: Corporate social responsibility and information transparency.' Management Science 66 (2020): 3095-3112.

XIA, J. (2023). 'Qualitative disclosure as a tax enforcement mechanism: Evidence from the UK tax strategy disclosure requirement.' Working Paper (2023).

Table 1: Sample Selection Steps.

	Unique Firms	Firm-Year Observations
Selection Steps		
Unbalanced sample: Domestic MNEs with time-series data in Datastream for the period 2013-2019	1,157	7,218
Balanced sample on sales, taxes paid, total assets, and cash ETR for the period 2014-2018	675	4,725
Dropping CbC reporting firms	(208)	(1,456)
Dropping firms with uncertain control/treated assignment (hand-checked)	(45)	(315)
Dropping small firms	(149)	(1,043)
Dropping observations if missing controls	(38)	(580)
Intermediate Sample	**235**	**1,331**
Selection Steps Disclosure Sample		
Dropping if missing documents from Perfect Information	(20)	(139)
Dropping singleton observations	(9)	(9)
Final Disclosure Analysis Sample	**206**	**1,183**
Selection Steps ETR Analysis Sample		
Dropping if missing Cash/Book ETR outcome variable	(13)/(13)	(216)/(214)
Dropping singleton observations	(10)/(10)	(10)/(10)
Final Cash (Book) ETR Analysis Sample	**212** **(212)**	**1,105** **(1,107)**

Note: This Table presents the sample selection steps we follow to identify our final sample of firms as described in Section IV.

Table 2: Characteristics of Control and Treated Firms.

Panel A: Test for the Difference in Means for Control and Treated Firms Pre-treatment.

Variable	Control		Treated		Difference in means			
	Obs	Mean	Obs	Mean	Diff	St Err	t-value	p-value
Outcomes								
Tax Strategy Words	306	134.095	146	288.726	-154.632	21.904	-7.05	0
Tax Strategy Sentences	306	3.203	146	7.157	-3.955	.522	-7.6	0
Boilerplate	257	0.241	140	.134	.106	.022	4.85	0
Specificity	257	0.042	140	.038	.003	.003	1.1	.279
Cash ETR	296	0.222	141	.249	-.028	.022	-1.25	.216
Book ETR	297	0.209	142	.227	-.018	.015	-1.15	.259
Law/Mills Haven	306	0.271	146	.35	-.078	.047	-1.65	.099
Law/Mills Dot Haven	306	0.095	146	.123	-.029	.032	-.9	.374
Law/Mills Big 7Haven	306	0.229	146	.288	-.059	.044	-1.3	.188
Media Attention	306	8.415	146	19.061	-10.646	1.403	-7.6	0
Controls								
Size	306	10.954	146	12.941	-1.988	.106	-18.7	0
Leverage	306	0.072	146	.133	-.061	.017	-3.65	.001
Age	306	2.970	146	3.319	-.349	.057	-6.2	0
Geographic Com.	306	0.598	146	.63	-.032	.032	-1	.308
Loss	306	0.108	146	.069	.04	.028	1.45	.153
Mkt to Book Ratio	306	1.415	146	1.645	-.23	.137	-1.7	.095
Std Dev of Sales	306	8.876	146	10.4	-1.524	.074	-20.55	0
Analyst Following	306	1.175	146	1.903	-.729	.051	-14.25	0
Std Dev of Returns	306	2.301	146	2.12	.18	.031	5.8	0
Board Tax/Acc	306	0.195	146	.247	-.052	.013	-4.15	0

Note: Panel A presents the pre-2016 (pre-treatment) summary sample statistics on the variables used in the analysis. We show the results of the t-test for the difference in means for our outcome and control variables for treated and control firms respectively over the pre-period. All variables are winsorized at the 1st and 99th percentiles besides ETRs which are censored to be between 0 and 1. We show summary statistics for the full sample period in the online appendix. All variables are defined in Appendix A.

Table 2 continued on next page

Panel B: Industry distribution for Control and Treated Firms Pre-treatment.

Fama-French industry code (30 industries)	Control		Treated	
	Freq.	Percent	Freq.	Percent
Apparel	1	1%	0	0%
Banking, Insurance, Real Estate, Trading	16	12%	13	19%
Beer & Liquor	0	0%	1	1%
Business Equipment	20	15%	4	6%
Business Supplies and Shipping Container	1	1%	1	1%
Chemicals	2	1%	2	3%
Communication	1	1%	2	3%
Construction and Construction Materials	5	4%	7	10%
Consumer Goods	5	4%	0	0%
Electrical Equipment	4	3%	0	0%
Everything Else	2	1%	1	1%
Fabricated Products and Machinery	7	5%	1	1%
Food Products	6	4%	4	6%
Healthcare, Medical Equipment, Pharmaceutical	7	5%	3	4%
Personal and Business Services	43	31%	14	20%
Petroleum and Natural Gas	1	1%	0	0%
Precious Metals, Non-Metallic, and Indu	5	4%	0	0%
Printing and Publishing	0	0%	1	1%
Recreation	2	1%	0	0%
Restaurants, Hotels, Motels	0	0%	2	3%
Retail	3	2%	4	6%
Steel Works	0	0%	1	1%
Textiles	0	0%	1	1%
Transportation	4	3%	3	4%
Wholesale	2	1%	4	6%
Total	**137**	**100%**	**69**	**100%**

Note: Panel B presents the industry composition of our sample control and treated firms. We highlight non-B2C firms in grey. We follow the B2C classification of Boyd and Kannan [2018].

Table 3: Descriptive Statistics on Tax Strategy Reports.

Tax Strategy Disclosure	Obs	Mean	St. Dev.	P25	Median	P75
Words TSR	75	816.88	499.72	514.00	728.00	992.00
Sentences TSR	75	43.04	36.23	27.00	34.00	46.00
Boilerplate TSR	75	0.26	0.06	0.22	0.25	0.30
Specificity TSR	75	0.10	0.04	0.07	0.09	0.12

Note: This Table presents summary sample statistics related to relevant variables used in the analysis of the tax strategy reports. For the sample of treated firms, we manually collected 75 tax strategy reports for our treated firms of which 69 are in the regression sample. All variables are defined in Appendix A.

Table 4: Disclosure Characteristics Across Outlets – Tax Strategy Reports and Annual Reports.

Means of Firm Characteristics by Similarity between Annual Reports and Tax Strategy Reports.	Observations		Means		Difference
Similarity:	Low	High	Low	High	
Cash ETR	248	249	0.309	.271	0.038
Size	231	233	12.722	13.744	-1.022***
Leverage	249	249	0.178	.201	-0.022
Age	245	249	2.917	2.971	-0.054
GEO Complexity	249	249	17.000	.598	16.402
Loss Firm	249	249	0.124	.076	0.048*
MTB Ratio	231	233	1.248	2.069	-.822***
Sales Volatility	241	242	10.370	10.504	-0.134*
Analyst Following	223	218	1.613	2.058	-0.446***
Media Attention	216	229	25.685	41.205	-15.52***
Board Tax/Acc	227	227	0.255	.241	0.013
CSR Rating	94	188	0.411	.447	-0.036*
B2C Industry	249	249	0.832	.896	-0.065**
Words (TSR)	249	249	819.028	817.45	1.579
Sentences (TSR)	249	249	42.008	44.466	-2.458
Boilerplate (TSR)	249	249	0.272	.255	0.017***
Specificity (TSR)	249	249	0.102	.089	0.013***
Words (AR)	230	236	242.465	463.288	-220.823***
Sentences (AR)	230	236	5.909	11.632	-5.723***
Boilerplate (AR)	215	232	0.163	.12	0.043***
Specificity (AR)	215	232	0.042	.041	0.001

Note: This Table provides descriptive characteristics on the drivers of the similarities across the tax strategy disclosure in the annual report and in the standalone report. Here, we compare firm characteristics for all of the 75 treated firms with tax strategy reports of which 69 are later included in the final regression sample. We measure firm characteristics and annual report (AR) characteristics over the period 2013-2019. We measure disclosure characteristics of the tax strategy report (TSR) in 2019. High (low) similarity means above (below) median level of similarity. The Table excludes the one treated firm with integrated tax strategy disclosure in the annual report, i.e., that does not have a standalone tax strategy report. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. All variables are defined in Appendix A.

Table 5: Disclosure Characteristics Across Time – Tax Strategy Reports in 2019 and 2023

	Observations	Means		diff
		2019	2023	
Words (TSR)	68	843.323	874.294	30.97
Sentences (TSR)	68	44.279	37.691	-6.588
Boilerplate (TSR)	68	.267	0.259	-0.007
Specificity (TSR)	68	.099	0.068	-0.032***

Note: This Table describes correlations of disclosure characteristics for standalone tax strategy report across time. For 2023, we only found 68 out of 75 tax strategy reports. The Table excludes the one treated firm with integrated tax strategy disclosure in the annual report, i.e., that does not have a standalone tax strategy report. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Disclosure Characteristics Across CSR-related Reports.

Panel A: Correlation Table Comparing Disclosure Characteristics between Tax Strategy Reports (TSR) and Modern Slavery Statement (MSS)

Variables	(1)	(2)	(3)	(4)
	Words (TSR)	Sentences (TSR)	Boilerplate (TSR)	Specificity (TSR)
Words (MSS)	-0.024			
Sentences (MSS)		0.009		
Boilerplate (MSS)			0.143	
Specificity (MSS)				0.091

Panel B: Correlation Table Comparing Disclosure Characteristics between Tax Strategy Reports (TSR) and Gender Pay Gap Reports (GPGR)

Variables	(1)	(2)	(3)	(4)
	Words (TSR)	Sentences (TSR)	Boilerplate (TSR)	Specificity (TSR)
Words (GPGR)	0.074			
Sentences (GPGR)		0.006		
Boilerplate (GPGR)			0.139	
Specificity (GPGR)				0.254*

Panel C: Difference in Means of Tax Strategy Report Characteristics by Misreporting Statistics

	Observations		Means		Dif.
Impossible Disclosure (GPGR):	No	Yes	No	Yes	
Words (TSR)	53	9	874.793	638.111	236.681**
Sentences (TSR)	53	9	47.358	35.666	11.692*
Boilerplate (TSR)	53	9	0.260	.294	-.035**
Specificity (TSR)	53	9	0.100	.084	.016*

Note: This Table describes correlations of disclosure characteristics across different CSR-related reports. Panel A shows correlations between disclosure characteristics of tax strategy reports and modern slavery statements for the firms in our sample. Panel B shows correlations between disclosure characteristics of tax strategy reports and gender pay gap reports for the firms in our sample. Panel C describes the disclosure characteristics of the tax strategy report by impossible disclosure in the gender pay gap report. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: The Effect of Mandatory Qualitative Tax Strategy Disclosure Regulation.

Panel A: Tax Strategy Disclosure in Annual Report

| | Disclosure Quantity | | Disclosure Quality | |
| Dep.Var. | (1) | (2) | (3) | (4) |
	Tax Strategy Words	Tax Strategy Sentences	Boilerplate	Specificity
Treated $\times$ Post	76.93***	1.716***	0.0567**	0.00396
	(25.120)	(0.572)	(0.022)	(0.004)
R-squared	0.797	0.846	0.719	0.536
Observations	1,183	1,183	1,063	1,063
N. of Firms	206	206	197	197

Panel B: Tax Planning

| | (1) | (2) | (3) | (4) | (5) |
Dep. Var.	Cash ETR	Book ETR	Law/Mills Tax Haven Activity	Law/Mills Dot Haven Activity	Law/Mills Big7 Haven Activity
Treated $\times$ Post	-0.012	-0.008	-0.0154	-0.0407	0.0148
	(0.025)	(0.018)	(0.0615)	(0.0394)	(0.0551)
R-squared	0.487	0.525	0.484	0.496	0.484
Observations	1,105	1,107	1,183	1,183	1,183
N. of Firms	212	212	206	206	206
Firm FE	X	X	X	X	X
Year FE	X	X	X	X	X
Controls	X	X	X	X	X
Clustering	firm	firm	firm	firm	firm

Note: Panel A (B) summarizes the results on the effect of the reform on volume and quality of tax strategy disclosure (tax avoidance). The dependent variable is displayed at the top of each column, respectively. Panel A Columns (3)-(4) have fewer observations than columns (1)-(2) because zero tax strategy sentences lead to missing observations for the Boilerplate and Specificity measures. Treated denotes a dummy equal 1 for firms that are required by Schedule 2019 of the Finance Act 2016 to publish a tax strategy report. Post denotes a dummy equal 1 for all periods from 2016. In all columns we control for lagged: Size, Leverage, Age, Geographic Complexity, Loss, Market-to-Book Ratio, Standard Deviation of Sales, Analyst Following, Return Volatility, Media Attention, Tax and Accounting Board Members. All variables are defined in Appendix A. Standard errors are clustered at firm level and are reported in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 8: The Effect of Mandatory Qualitative Tax Strategy Disclosure Regulation on Firm Attention.

| VARIABLES	(1) Media Attention	(2) Media Attention High -Attention Pre-Reform	(3) Media Attention Low Attention Pre-Reform
Treated × Post	13.54***	22.453***	5.078***
	(2.675)	(4.830)	(1.698)
P-Value Diff across Samples		0.001***	
Observations	1,176	543	513
R-squared	0.717	0.585	0.606
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Clustering	Yes	Yes	Yes
Number of Firms	206	87	80

Note: The table shows the results on the effect of the reform on public attention. The dependent variable is displayed at the top of each column. Treated denotes a dummy equal 1 for firms that are required by Schedule 2019 of the Finance Act 2016 to publish a tax strategy report. Post denotes a dummy equal 1 for all periods from 2016. In all columns we control for lagged: Size, Leverage, Age, Geographic Complexity, Loss, Market-to-Book Ratio, Standard Deviation of Sales, Analyst Following, Return Volatility, Tax and Accounting Board Members. To test for the difference in statistical significance of the interaction coefficients on treated times post dummies between the two sub-samples, we estimate a triple difference-in-differences regression, as follows: $ReformOutcomes_{it} = \alpha + \boldsymbol{\beta_1}Post_t \times TaxStrategyReport_i \times Split_i + \beta_2 Post_t \times TaxStrategyReport_i + BX_{it} + BX_{it} \times Split_i + \gamma_i Split_i + \delta_t + \varepsilon_{it}$, where $Split_i$ is a dummy equal to 1 for high media attention firms. We report the p-value of the coefficient β_1 on the triple-difference to evaluate the significance of the difference between the interaction coefficients in the split sample analysis. All variables are defined in Appendix A. Standard errors are clustered at firm level and are reported in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Figure 1: Similarity between TR and AR Tax Strategy Disclosure

Panel A: Histogram of Similarities between Annual Reports and Tax Strategy Reports.
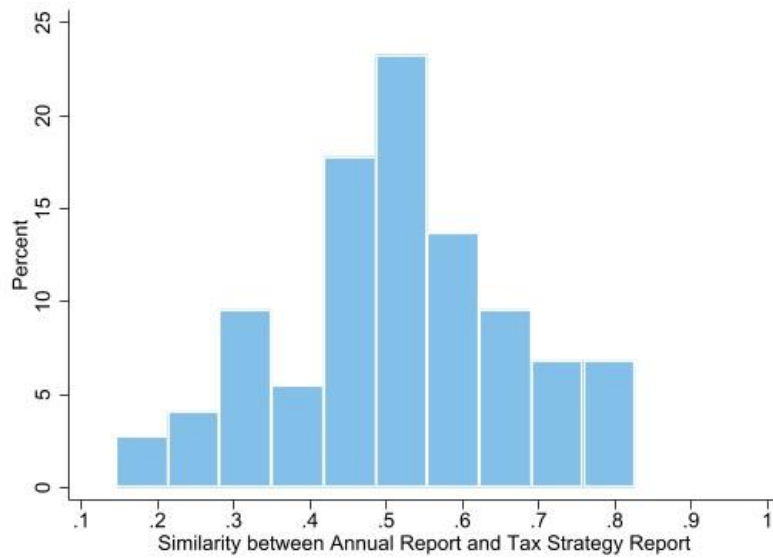

Panel B: Histogram of Similarities between Old and New Tax Strategy Reports.
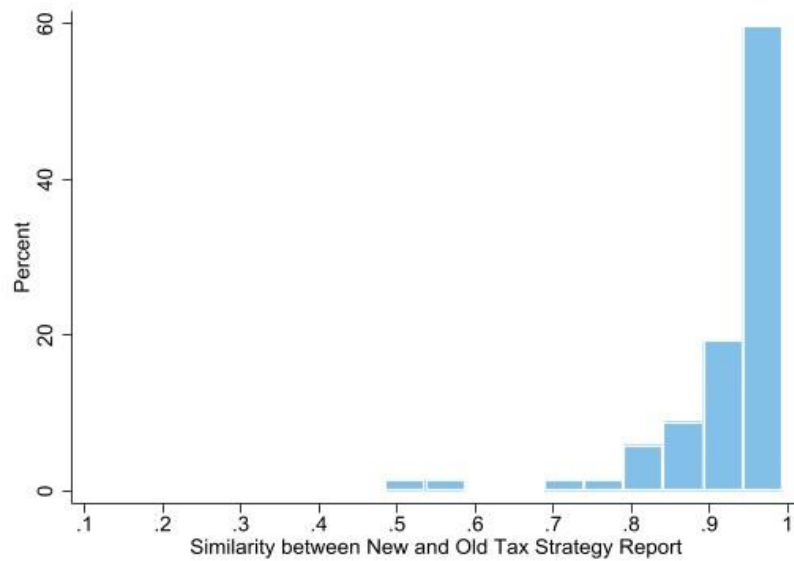

Note: This Figure provides descriptive statistics on the similarity between the annual reports and the separate tax strategy reports in Panel A and on the similarity between standalone tax strategy reports retrieved in 2019 and the standalone tax strategy reports retrieved in 2023 for the same sample of firms. Both panels show the histogram of the distribution of cosine-similarities between the two set of reports. Panel B excludes the one treated firm with integrated tax strategy disclosure in the annual report, i.e., that does not have a standalone tax strategy report. All variables are defined in Appendix A.
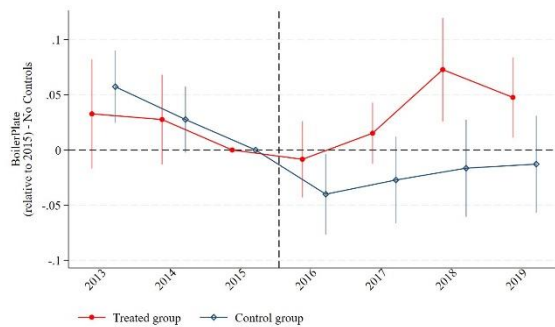
Figure 2: Dynamic Effects of the Reform on Qualitative Tax Disclosure - Event Studies.
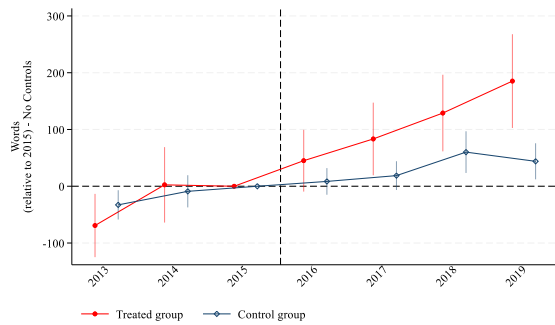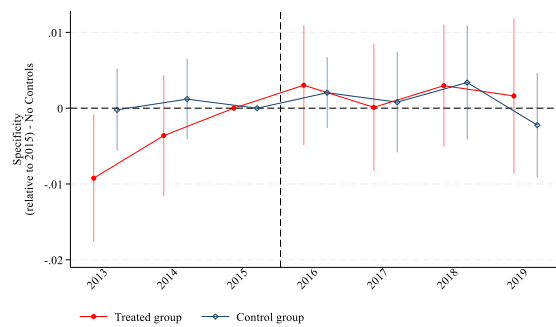

(a) Tax Strategy Words
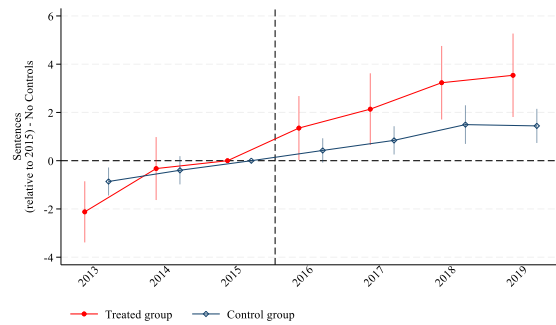
(b) Tax Strategy Sentences

(c) Boilerplate

(d) Specificity
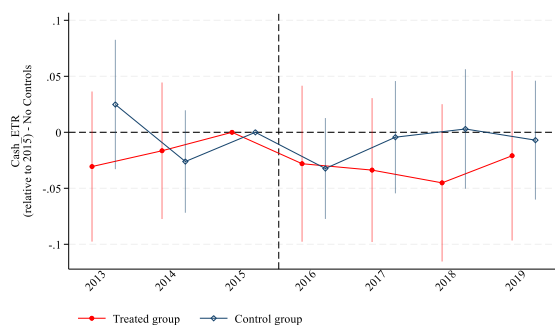
(e) Cash ETR
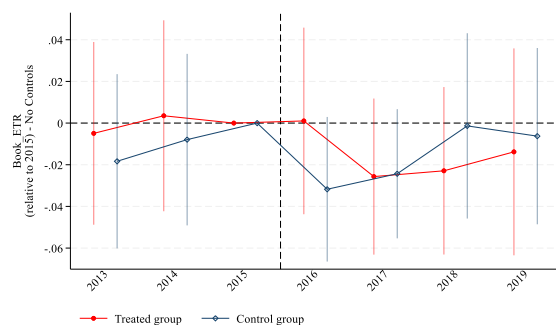
(f) Book ETR

Figure 2 (continued on next page)
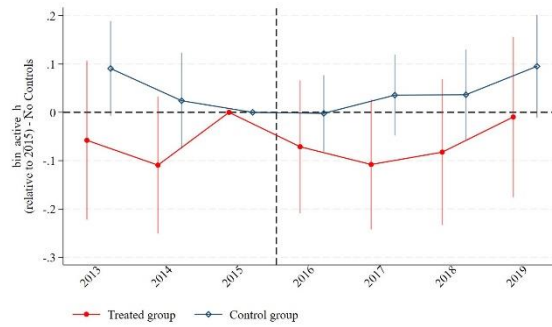
(g) Law/Mills Tax Haven Activity

Note: This figure plots the event study regression coefficients for treated – red full circles and control groups – hollow blue diamonds. Each dot represents the difference between the outcome variable in each year relative to the baseline year, 2015. All variables are defined in Appendix A. The vertical lines represent the 95% confidence intervals.

Figure 3: Dynamic Effects of the Reform on Media Attention - Event Studies.
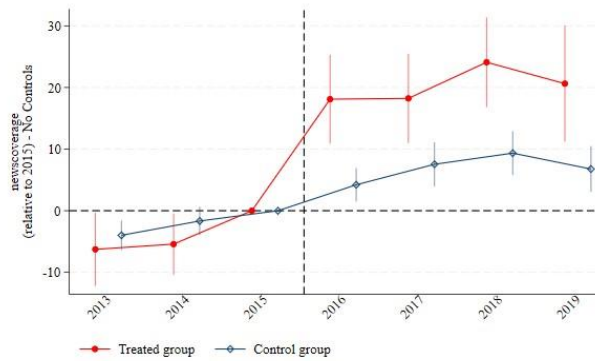
Note: This figure plots the event study regression coefficients for treated – red full circles and control groups – hollow blue diamonds. Each dot represents the difference between the outcome variable Media Attention in each year relative to the baseline year, 2015. All variables are defined in Appendix A. The vertical lines represent the 95% confidence intervals.

Figure 4: The Effect of Mandatory Qualitative Tax Disclosure Regulation by Pre-Reform Media Attention, CSR Performance, and Tax Aggressiveness

Panel A: Disclosure in Annual Reports – Treatment Coefficients of Split-Groups
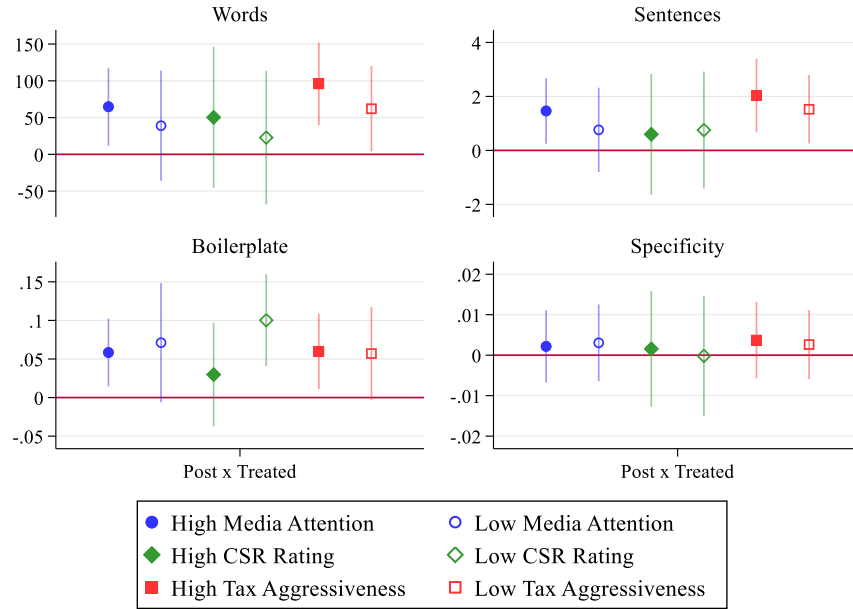
Panel B: Firm Tax Avoidance – Treatment Coefficients of Split-Groups
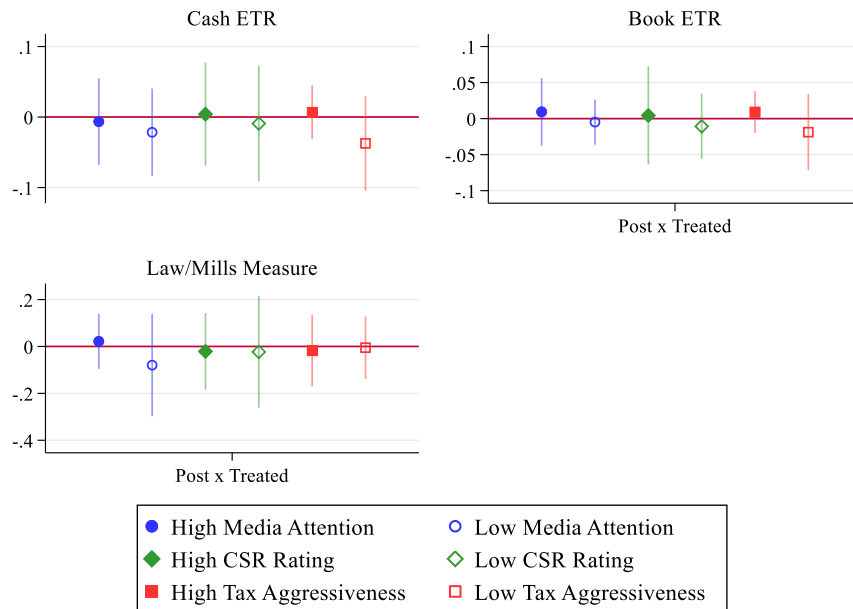
Note: This Figure Panel A (Panel B) summarizes the regression results on the effect of the reform on volume and quality of tax disclosure (tax avoidance) by sub-samples, the coefficients on Post x Treated. The sample is restricted to firms with (a) *above (below) median pre-treatment* news coverage as measure of Media Attention (blue hollow /filled circles), or (b) *above (below) median pre-treatment* CSR rating adjusted for CSR controversies as a measure of CSR performance (green hollow/filled diamonds), or (c) *above (below) median pre-treatment* Cash ETR as measure of tax aggressiveness (red hollow/filled squares). The dependent variable is displayed at the top of each sub-figure, respectively. Treated denotes a dummy equal 1 for firms that are required by Schedule 2019 of the Finance Act 2016 to publish a tax strategy report. Post denotes dummy equal 1 for all periods from 2016 In all regressions we control for firm and year fixed effects and lagged: Size, Leverage, Age, Geographic Complexity, Loss, Market-to-Book Ratio, Standard Deviation of Sales, Analyst Following, Return Volatility, Media Attention, Tax and Accounting Board Members. All variables are defined in Appendix A. Standard errors are clustered at firm level. The figure shows confidence intervals at the 10 percent level of significance. The corresponding Tables are reported in the appendix (G1-G3).

APPENDIX

A. Variable Definitions

Variable	Description
Tax Strategy Words	The number of words in the annual report that describe the tax strategy. Tax strategy disclosure in the annual report is identified by the naïve Bayes algorithm at the sentence level.
Tax Strategy Sentences	The number of sentences in the annual report that describe the tax strategy. Tax strategy disclosure in the annual report is identified by the naïve Bayes algorithm at the sentence level.
Boilerplate	The portion of trigrams in a firm's tax strategy sentences that is found in at least 5% of all firms' tax strategy disclosures in a given fiscal year.
Specificity	The number of specific words in the annual report that appear in sentences which describe the tax strategy scaled by total number of tax strategy words. Tax strategy disclosure in the annual report is identified by the naïve Bayes algorithm at the sentence level. Following Hope et al. [2016] specific words are defined as: entity names, including names of persons, locations, and organizations; quantitative values in percentages; money values; times; and dates as captured by the Stanford Named Entity Recognition (NER) tool.
Words TSR	The number of words in the dedicated tax strategy report (TSR). This is usually a standalone report in our sample. In one case the dedicated tax strategy report was integrated in the annual report and the firm did not publish a standalone report. In all other cases the standalone report is used.
Sentences TSR	The number of sentences in the dedicated tax strategy report (TSR). This is usually a standalone report in our sample. In one case the dedicated tax strategy report was integrated in the annual report and the firm did not publish a standalone report. In all other cases the standalone report is used.
Boilerplate TSR	The portion of trigrams in a firm's tax strategy report that is found in at least 5% of all firms' tax strategy reports in a given fiscal year. The TSR is usually a standalone report in our sample. In one case the dedicated tax strategy report was integrated in the annual report and the firm did not publish a standalone report. In all other cases the standalone report is used.
Specificity TSR	The number of specific words by total number of tax strategy words in the dedicated tax strategy report (TSR). Following Hope et al. (2016) specific words are defined as: entity names, including names of persons, locations, and organizations; quantitative values in percentages; money values; times; and dates as captured by the Stanford Named Entity Recognition (NER) tool. The TSR is usually a standalone report in our sample. In one case the dedicated tax strategy report was integrated in the annual report and the firm did not publish a standalone report. In all other cases the standalone report is used.
Impossible Disclosure GPGR	From Bailey et al. [2022]. An indicator variable equal to one if the sign of the median pay gap conflicts with the sign implied by same employer year quartile gender balance statistics.
Cash ETR	The ratio of tax paid over pre-tax income, set to one if above 1 or if tax paid is positive and pre-tax income negative and set to zero if tax paid is negative. Set to missing in loss years.
Book ETR	The ratio of tax expense over pre-tax income, set to one if above 1 or if tax paid is positive and pre-tax income negative and set to missing if tax paid is negative. Set to missing in loss years.

Law/Mills Tax Haven Activity	An indicator variable equal to one if a tax haven country and a key offshore input/output word appear within 25 words of each other in the firm's annual report of a given year. The Tax havens list is taken from Law and Mills [2022] and the offshore input/output terms are from Hoberg Moon [2017; 2019].
Law/Mills Dot Haven Activity	An indicator variable equal to one if a tax haven country and a key offshore input/output word appear within 25 words of each other in the firm's annual report of a given year. The Tax havens list is limited to Dot havens from Dyreng et al. [2020] and the offshore input/output terms are from Hoberg Moon [2017; 2019].
Law/Mills Big7 Haven Activity	An indicator variable equal to one if a tax haven country and a key offshore input/output word appear within 25 words of each other in the firm's annual report of a given year. The Tax havens list is limited to Big7 havens from Dyreng et al. [2020] and the offshore input/output terms are from Hoberg Moon [2017; 2019].
Size	The natural logarithm of market value of equity.
Leverage	The ratio of long-term debt over total assets.
Loss	A dummy equal to one if the firm has negative profit/loss before taxes for the majority of the selected period.
Age	The natural logarithm of the number of years the firm has been listed on Datastream.
Geographic Complexity	The sum of squares of each geographical segment's sales as a percentage of the total firm sales.
Mkt to Book Ratio	The ratio of the market value of assets to the book value of assets.
Std Dev of Sales	The standard deviation of annual sales computed over the previous five years (or less than five years, if less than five previous years are available).
Analyst Following	The log of the number of analysts following the firm.
Std Dev of Returns	The log of the standard deviation of returns computed over three years.
Media Attention	News coverage in a firm-year computed as the maximum counts of distinct news events about a firm in a 91 days window as stated in Ravenpack.
Tax/Accounting Board Members	Binary variable equal to one if a firm has at least a board member with a tax/accounting background.
Controversy Adj. CSR Score	This is the ESG C Score. From Refinitiv definition "*the main objective of this score is to discount the ESG performance score based on negative media stories. It does this by incorporating the impact of significant, material ESG controversies in the overall ESGC score*".
Appendix Only Variables	
Leverage Intensity	Five-year average of the ratio of long-term debt to total assets
R&D Intensity	R&D expenses over total assets
Intangible Intensity	Intangible assets over total assets
Industry-Size Adjusted Cash (Book) Tax Aggressiveness (TA)	The difference between the 3-year Cash (Book) ETR and the median Cash (Book) ETR of the industry-size cohort to which the firm belongs to (where the median is a within 3-year median), taken from Balakrishnan et al. (2019). Industry is measured based on the Fama French 48 industry classification.

B. Naïve Bayes Classifier - Statistics and Outcomes

In this Appendix, we describe in detail how we construct the volume of tax strategy disclosure in the annual report. We start by selecting a sub-sample of 450 annual reports from firms listed in the FTSE100 for the period 2010-2016 as our training set. We explicitly select annual reports from this group of firms to maximize the volume of detected tax strategy sentences. Partitioning the annual reports into sentences leads to 1,116,411 million sentences from which we exclude all sentences not containing the three letters "tax" when appearing sequentially. This enables us to preserve sentences containing the word "tax" as well as sentences containing the word "taxation". We then eliminate sentences in which the only time the three letters "tax" appear is for the words "pre-tax", "net of tax", "before income tax", "after tax", "before tax", "tax free". We end up with 41,683 tax sentences.[57] Out of this set of sentences, we then manually select tax strategy sentences and remove duplicates to obtain a final sample of 2,534 tax strategy sentences.

Next, we chose sentences in which the firm does not discuss its tax strategy, but which have a high degree of semantic similarity to the tax strategy sentences. For this purpose, we perform a cosine similarity analysis between all sentences in the training set, which contain the word tax and the manually selected tax strategy sentences.[58] This is a crucial step to ensure that once we proceed with the machine learning approach, we can train the algorithm on non-tax strategy sentences for which the risk of misclassification is the highest. Our final sample is a balanced sample of 2,534 tax strategy sentences (sentences discussing a firm's approach to tax or tax governance) and 2,534 non-tax strategy sentences (sentences not discussing a firm's approach to tax or tax governance, but semantically similar to the sentences discussing a firm's approach to tax or tax governance).

We use this sample of sentences to train the naïve Bayes algorithm, which is a supervised machine learning methodology. We use naïve Bayes to classify all sentences in our complete sample of annual reports that contain the word "tax".[59] This approach relies on a prediction model, where the input variables

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[57] This enables us to minimize the risk of false positives (Type I Error), by restricting our analysis to a subset of sentences where tax strategy sentences are most likely to appear. The drawback of our filtering approach is the increase in the risk of false negative (or Type II Error) since we might not capture sentences in which a firm discusses its tax strategy without explicitly using words "tax".

[58] For the cosine similarity exercise, we use tf-idf (term frequency-inverse document frequency) as weighting scheme.

[59] Also, for the naïve Bayes, we use tf-idf (term frequency-inverse document frequency) as weighting scheme.

are the words in the document and the predicted value is the probability of a certain category. In the context of our study, the sentence categories are sentences containing information on a firm's tax strategy and sentences not containing information on a firm's tax strategy. The conditional probabilities of a word occurrence given a sentence category are learned based on the set of manually labeled sentences on which a machine learning model is trained. Since naïve Bayes is machine-based, it facilitates the analysis of a large corpus and avoids possible biases induced by the researcher's subjectivity.[60]Overall, naïve Bayes represents a fairly straightforward approach, which delivers consistently good classification accuracy, and thus it is the single most used classifier in the finance and accounting literature (El-Haj et al. [2019]).

Our final sample of annual reports is made of 1,875,696 sentences of which 57,076 contain the three letters "tax" when written sequentially after excluding those sentences in which the only time the three letters "tax" appear is for words "pre-tax", "net of tax", "before income tax", "after tax", "before tax", "tax free". We classify them into 6,863 tax strategy sentences and 50,213 non-tax strategy sentences using the trained naïve Bayes classifier. Our naïve Bayes approach achieves a classification accuracy of 91 percent in the in-sample validation test, which is in line with the related literature (Huang et al. [2014]).[61]

Below, we present the key statistics on the performance of our naïve Bayes classifier based on the average of 50 naïve Bayes models (iterations). We first present the result of the confusion matrix, which is built using our training set (Tables A1 and A2). These tables show how many sentences are predicted to be tax strategy sentences (true) and are actually tax strategy sentences and the same for non-tax strategy sentences (false). Precision indicates the fraction of true tax strategy sentences over the total Tax Strategy Sentences classified as tax strategy sentences (that is the sum of true tax strategy sentences and false tax strategy sentences). Thus, it is the ability of our classifier to avoid classifying a sentence as a tax strategy sentence when in reality it is a non-tax strategy sentence. Recall indicates the fraction of true tax strategy sentences over the total number of correctly classified sentences. Thus, it is the ability of our classifier to find all true tax strategy sentences. F1-score is the average between precision and recall. Support is the

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[60] For the formal derivation of naïve Bayes, see Antweiler and Frank [2004].
[61] We manually inspected a sample of randomly selected tax-strategy and non-tax strategy sentences to check the validity of our out-of-sample results.

total number of considered sentences. Our accuracy score is 91.56 percent which is the average between the F1 score of the tax strategy sentences and non-tax strategy sentences.

We also compared the accuracy of our model to the one we would obtain using alternative approaches. We use two alternative supervised machine learning classifiers, SVM and the random forest, which are also used in the finance and accounting literature. Using either, we achieve similar accuracy levels as with naïve Bayes, but slightly lower in the case of SVM (90%). Second, we offer a representative set of examples of sentences captured under the category "Tax Strategy Sentences" versus the one captured under the category "Non-Tax Strategy Sentences".

Overall, since some tax strategy sentences can be hard to identify clearly, we construct a rather conservative measure of tax strategy disclosure in annual reports to avoid false positives. Specifically, we do not count sentences as tax strategy sentences as soon as the classified probability of being a tax strategy sentence vs. a non-tax strategy sentence lies just above 50%, instead we chose a cut-off value of 99%.

Table A1: Confusion Matrix

actual \predicted	FALSE	TRUE
FALSE	426.28	24.62
TRUE	47	351.1

Table A2: Naïve Bayes (10 iterations for each model)

Model	Class	Precision	Recall	F1-score	Support
4009*2	FALSE	0.9	0.95	0.92	450.9
	TRUE	0.93	0.88	0.91	398.1

Examples of Tax Strategy Sentences
tax planning is always aligned with our commercial and economic activity.
taxation: the audit committee reviewed the group tax risk policy which sets out compliance with relevant jurisdictional legislation, identifying areas of tax risk for appropriate focus and managing the overall group tax risk.
where appropriate, the group enters into consultation with tax authorities to help shape proposed legislation and future tax policy.
we also used our own tax specialists to critically assess the appropriateness of the future tax planning strategies.
our board continues to work toward being assessed as 'low risk' by hmrc and ensures that the group adheres to the revised tax policy adopted in 2014 of not undertaking tax planning or making use of tax havens.
an open dialogue is maintained with HMRC involving regular meetings to review tax issues and brief them on business issues.
the group takes a responsible approach to the management and control of its tax affairs and is cooperative in its dealings with the tax authorities.
our principal activities are UK-based and we have regular meetings with hm revenue and customs to discuss tax matters and business developments.
we will pay the right and fair amount of tax in each territory we trade from in accordance with the letter and spirit of local laws and regimes.
the board is regularly updated on tax matters, and any tax implications of commercial activities are highlighted to the board with the use of a risk matrix to assess the appropriateness of a proposal.

Examples of Non-Tax Strategy Sentences
these shares may be withdrawn at any point during years four and five, but income tax and national insurance would then be payable on any amounts withdrawn.
deferred income tax assets and liabilities are offset when there is a legally enforceable right to offset current tax assets against current tax liabilities and when the deferred income taxes and liabilities relate to income taxes levied by the same taxation authority on either the taxable entity or different taxable entities when there is an intention to settle the balance on a net basis.
these discount rates are derived from the group's post-tax weighted average cost of capital as adjusted for the specific risks relating to each geographical region.
retail sales and delivery receipts are recorded net of returns, relevant vouchers, and value added tax and recognised upon dispatch from the warehouse at which point title and risk passes to the customer.
the group provides for potential tax liabilities that may arise on the basis of the amounts expected to be paid to the tax authorities.
the carrying amount of deferred tax assets is reviewed at each statement of financial position date and reduced to the extent that it is no longer probable that sufficient taxable income will be available to allow all or part of the asset to be recovered.
this revenue growth reflected the strength of tax and accounting's product offerings and demand in the global tax and accounting market.
the discount rates used reflect the post-tax yields to maturity that can be obtained on government bonds with similar maturity dates and currencies to those of the deferred tax assets or liabilities.
there is no time restriction over the utilisation of tax losses.
impairment of assets the carrying amounts of the group's non-financial assets, other than inventories (see accounting policy 'inventories') and deferred tax balances (see accounting policy 'deferred taxation'), are reviewed at each balance sheet date to determine whether there is an indication of impairment.

C. Illustrative Examples – Quality of Tax Strategy Disclosure

Boilerplate - The bold words in the following sentences extracted from annual reports of treated firms in our sample identify common phrases that are captured by our boilerplate measure.

we always aim to pay the right **amount of tax** in all the territories in which we operate and we believe in maintaining a transparent and professional working relationship with hm revenue customs hmrc and other tax authorities
we maintain an open and cooperative relationship with the uk tax authorities and pay the correct **amount of tax** as it falls due
we follow the laws of the relevant country and our group tax strategy so that we pay the correct and appropriate **amount of tax** at the right time
we also have a responsibility to shareholders to ensure we pay the right **amount of tax** and ensure compliance with the tax rules in each country in which we operate

Specificity - The bold words in the following sentences extracted from annual reports of treated firms in our sample identify specific words that are captured by our specificity measure.

as described in note 13 to the consolidated financial statements, we are facing a number of tax investigations at subsidiary level, including a disputed tax assessment in **poland** relating to pre-ipo intellectual property restructuring and deductibility of certain management re-charges
tax and treasury committee meets twice a year - chaired by **wendy pallot**
the group operates in a complex multinational tax environment in relation to direct and indirect taxes and there are a number of open tax matters with tax authorities, especially in the **uk, us** and **canada**
deploying our us tax specialists, we evaluated the key judgements, assumptions and interpretations used by management to assess the impact of **us** tax reform

D. Anecdotal Evidence of Tax Strategy Report Changes Over Time

For our main analysis, we collect the tax strategy reports for the treated companies in our sample in 2019. We made the same search in 2023 and collect the tax strategy reports for the same list of companies. Not all companies still have a tax strategy report in 2023. Of the 75-tax strategy reports we had for 2019, we are able to find 68 tax strategy reports. For the 7 companies, we are currently missing the tax strategy report either because they are now below the thresholds of UK operations (5 of them) or have been acquired by another company (2 of them).

We manually review cases where we detected changes in the content of the tax strategy reports across years. We find three main reasons that determine differences in the content of the tax strategy reports:

- **Changes in the title** of the unit or person responsible for the tax strategy report.

- **Added context** (typically as in the example below, to make sure that the statement is not misunderstood as aggressive tax planning). One interesting case is where the company changed from stating that it is acting in the interest of shareholders to stating that it is acting in the interest of stakeholders including shareholders, clients, employees, and tax authorities.

- Few cases provide **less specific information** on 1. the person's name who signs the report (see example below, it used to be a signature and then it disappears) 2. Entity name, the list of subsidiaries or entities covered in the report (see example below – still not numerical disclosure but entity name).

GB0004270301 HILL & SMITH PLC

Old

Our focus on costs includes consideration of tax costs. As such, we seek to conduct our business efficiently from a tax perspective which may include:

- responding to government tax incentives (both in the UK and internationally); and

- structuring arrangements in a tax efficient manner.

New

- "Our focus on costs includes consideration of tax costs. As such, we seek to conduct our business efficiently from a tax perspective, which may include responding to government tax incentives (both in the UK and internationally) and structuring arrangements in a tax efficient manner. However, we commit not to transfer value created to low tax jurisdictions, not to use tax structures intended for tax avoidance and not to use secrecy jurisdictions or so-called 'tax havens'."

GB00B1VZ0M25 - Hargreaves

Old

"The Group has an obligation to act in the interest of its shareholders and will maximise any legitimate tax planning opportunities to the extent to which the legislation intends."

New

"The Group has an obligation to act in the interest of all stakeholders, including shareholders, clients, employees, and tax authorities, and will maximise any legitimate tax planning opportunities to the extent to which the legislation intends."

GB00BYYW3C20 Forterra

Old

List of entities covered by this Tax Strategy at publication:

- Forterra plc
- Forterra Holdings Limited
- Forterra Building Products Limited
- Red Bank Limited*
- London Brick Company Limited*
- Cradley Special Brick Company Limited*
- Butterley Brick Limited*
- Formpave Limited*
- Bison Precast Limited*

   *Dormant company

New

It used to have the list of entities covered by the tax strategy report and no longer has it.

GB0002668464 - U & I

Old

Signed at the end as

"Marcus Shepherd, Chief Financial Office, 7 July 2020"

New

There is no signature.

E. Anecdotal Evidence of Tax Sentences in Earning Calls

ISIN	Company Name	Transcript Date	Tax Sentence
GB0000946276	Consort Medical plc	10.jan.19	this increase in profit combined with the lower effective tax rate has resulted in overall earnings per share increasing by 6 8 to 30 31 3p
GB0001001592	BTG Limited	16.apr.13	but as we have the tax charge as we are making profits we have to recognize a tax charge for the period
GB0001001592	BTG Limited	22may2013	one consequence of sustained profitability is actually the payment of tax which we are now seeing to come through and we also have our contributions to defined benefit pension scheme
GB0001001592	BTG Limited	13.nov.14	one good underlying eps growth in itself but we ve also benefited from a tax credit in the period
GB0001001592	BTG Limited	21may2014	you will see here that our effective tax rate has come down
GB0001826634	Diploma PLC	11.jan.19	the driver to this is clearly the reduction of the corporate tax rate in the u s from 35 to 21 effective from 1 january 2018
GB0004300496	Pan African Resources PLC	16oct2018	and we will look at obviously tax structuring within what is allowable
GB0007323586	Renishaw plc	29.jul.15	we are still getting good benefit from the patent box incentives and we continue to get good r d tax credits
GB00BYM8GJ06	Ascential plc	27.feb.18	we had an effective tax rate last year of 24 slightly better than we d originally anticipated
GB00BYN59130	Domino's Pizza Group plc	20.aug.18	we re expecting the second half to be more challenging because many statutory costs such as living wage apprentice levy carbon tax and auto enrollment were increased by the government at the beginning of April
GB00BYN59130	Domino's Pizza Group plc	12.aug.19	the underlying effective tax rate in the first half was 22 2 which is 2 5 percentage points higher than the prior period as we ve not recognized the tax credit for the norwegian and swiss tax losses in the international segment
GB00BYWWHR75	Equiniti Group Limited	28.jul.18	when we look at our tax assets they remain very substantial just under gbp 780 million
GB00BYXJC278	Ibstock plc	16.aug.17	in 2016 we benefited from primarily the one off costs associated with the ipo so that meant the cash tax payments in the first half of last year was 0
GB00BYXJC278	Ibstock plc	16.aug.17	and the taxation charge which is higher than the statutory figure because we don t take account of the fair value depreciation and amortization uplift and also the interest write off that i mentioned under the exceptional item
GB00BYXJC278	Ibstock plc	28.aug.18	the effective tax rate has benefited from gbp 1 million from a gbp 1 million deferred tax credit which relates to the pension scheme surplus
GB00BYZN9041	Future plc	13.jan.19	we spent gbp 4 million on tax

F. Investigating Change in Tax Planning Strategies.

Table F1: Changes in Investment and Financing Strategies Related to Tax Planning.

Dep.Var.	(1) PPE Intensive	(2) Intangible Intensive	(3) RnD Intensity	(4) Leverage
Treated * Post	0.000254	0.00504	-0.00501	-0.00280
	(0.00990)	(0.0112)	(0.00401)	(0.00982)
Observations	1,101	1,105	444	1,089
R-squared	0.969	0.949	0.935	0.944
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
Clustering	firm	firm	firm	firm
Number of Firms	211	211	87	209

Note: This Table summarizes the effect of the reform on investment choices and financing strategies relevant to tax planning. The dependent variable is displayed at the top of each column, respectively. Note that many firms do not report RnD expenses for which reasons the number of observations is much lower in column (3). Treated denotes a dummy equal 1 for firms that are required by Schedule 2019 of the Finance Act 2016 to publish a tax strategy report. Post denotes dummy equal 1 for all periods from 2016. In all columns we control for lagged: Size, Leverage (not in Column 4, where Leverage is the dependent variable), Age, Geographic Complexity, Loss, Market-to-Book Ratio, Standard Deviation of Sales, Analyst Following, Return Volatility, Media Attention, and Tax and Accounting Board Members. All variables are defined in Appendix A. Standard errors are clustered at firm level and are reported in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table F2: Measuring Tax Planning by Region and Country Tax Rates in Unconsolidated Accounts

Dep.Var.	(1) All	(2) UK	(3) Non-UK	(4) Non-UK High Tax	(5) Non-UK Low Tax	(6) Non-UK Tax Haven
Panel A: Outcome: Cash ETR						
Treated × Post	-0.012	-0.006	-0.029	0.002	- 0.119***	- 0.019
	(0.009)	(0.010)	(0.018)	(0.021)	(0.041)	(0.045)
R-squared	0.31	0.25	0.40	0.37	0.45	0.57
Observations	27,419	19,316	8,103	4,683	1,965	1,270
N. of Subsidiaries	3,567	2,483	1,084	631	355	264
Panel B: Outcome: Book ETR						
Treated × Post	0.005	0.011	-0.015	0.000	-0.022	-0.058
	(0.008)	(0.010)	(0.016)	(0.025)	(0.020)	(0.037)
R-squared	0.42	0.36	0.47	0.47	0.48	0.44
Observations	28,984	16,147	12,837	6,750	5,940	1,667
N. of Subsidiaries	4,541	2,346	2,195	1,267	1,126	299
Firm FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Clustering	subsidiary	subsidiary	subsidiary	subsidiary	subsidiary	subsidiary

Note: This Table summarizes the effect of the reform on cash and book ETRs in Panels A and B, respectively. The unit of observation here is a subsidiary of the MNE. Treated denotes a dummy equal 1 for subsidiaries that belong to firms that are required by Schedule 2019 of the Finance Act 2016 to publish a tax strategy report. Post denotes dummy equal 1 for all periods from 2016. We do not include any control variables. All variables are defined in Appendix A. Standard errors are clustered at subsidiary level and are reported in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

G. Mechanism tests

Table G1: The Effect of Mandatory Qualitative Tax Disclosure Regulation by Pre-Reform Media Attention

Dep.Var.	(1) Tax Strategy Words	(2) Tax Strategy Sentences	(3) Boilerplate	(4) Specificity	(5) Cash ETR	(7) Book ETR	(8) Law/Mills Measure
Panel A: Pre-Reform High Media Attention							
Treated × Post	74.612**	1.679**	0.057**	0.004	-0.002	0.014	-0.000
	(33.480)	(0.769)	(0.027)	(0.005)	(0.038)	(0.027)	(0.068)
R-squared	0.789	0.847	0.738	0.528	0.500	0.569	0.497
Observations	550	550	500	500	448	450	550
N. of Firms	87	87	84	84	83	83	87
Outcome Pre-Reform Mean	228.444	5.582	0.171	0.042	0.246	0.227	0.306
Panel A: Pre-Reform Low Media Attention							
Treated × Post	40.022	0.822	0.076*	0.003	-0.017	-0.005	-0.080
	(46.872)	(0.975)	(0.045)	(0.006)	(0.035)	(0.019)	(0.132)
R-squared	0.754	0.802	0.708	0.553	0.452	0.424	0.437
Observations	513	513	451	451	447	447	513
N. of Firms	80	80	76	76	76	76	80
Outcome Pre-Reform Mean	137.218	3.318	0.239	0.040	0.216	0.211	0.286
Diff Coeff. P-Value	**0.540**	**0.474**	**0.747**	**0.934**	**0.733**	**0.542**	**0.633**
Firm FE	X	X	X	X	X	X	X
Year FE	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X
Clustering	firm	firm	firm	firm	firm	firm	firm

Note: This Table summarizes the results on the effect of the reform on volume and quality of tax disclosure and on tax planning. In panel A (B) the sample is restricted to firms with above (below) median pre-treatment media attention. The dependent variable is displayed at the top of each column, respectively. Treated denotes a dummy equal 1 for firms that are required by Schedule 2019 of the Finance Act 2016 to publish a tax strategy report. Post denotes dummy equal 1 for all periods from 2016. In all columns we control for: Size, Leverage, Age, Geographic Complexity, Loss, Market-to-Book Ratio, Standard Deviation of Sales, Analyst Following and Return Volatility. Columns (3)-(4) have fewer observations than columns (1)-(2) because zero tax strategy sentences lead to missing observations for the Boilerplate and Specificity measures. To test for the difference in statistical significance of the interaction coefficients on treated times post dummies between the two sub-samples , we estimate a triple difference-in-differences regression, as follows: $ReformOutcomes_{it} = \alpha + \boldsymbol{\beta_1} Post_t \times TaxStrategyReport_i \times Split_i + \beta_2 Post_t \times TaxStrategyReport_i + BX_{it} + BX_{it} \times Split_i + \gamma_i Split_i + \delta_t + \varepsilon_{it}$, where $Split_i$ is a dummy equal to 1 for high media attention firms. We report the p-value of the coefficient β_1 on the triple-difference to evaluate the significance of the difference between the interaction coefficients in the split sample analysis. All variables are defined in Appendix A. Standard errors are clustered at firm level and are reported in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table G2: The Effect of Mandatory Qualitative Tax Disclosure Regulation by Pre-Reform controversy-adjusted CSR Rating

Dep.Var.	(1) Tax Strategy Words	(2) Tax Strategy Sentences	(3) Boilerplate	(4) Specificity	(5) Cash ETR	(7) Book ETR	(8) Law/Mills Measure
Panel A: Pre-Reform High CSR Rating (controversy adjusted)							
Treated × Post	50.316	0.596	0.030	0.002	0.004	0.004	-0.021
	(56.979)	(1.327)	(0.040)	(0.008)	(0.043)	(0.040)	(0.097)
R-squared	0.767	0.818	0.763	0.336	0.644	0.682	0.560
Observations	241	241	235	235	225	226	241
N. of Firms	40	40	40	40	39	39	40
Outcome Pre-Reform Mean	326.710	8.097	0.105	0.043	0.239	0.226	0.301
Panel A: Pre-Reform Low CSR Rating (controversy adjusted)							
Treated × Post	22.785	0.756	0.100***	-0.000	-0.009	-0.011	-0.023
	(54.118)	(1.291)	(0.036)	(0.009)	(0.049)	(0.027)	(0.142)
R-squared	0.855	0.884	0.782	0.681	0.488	0.432	0.505
Observations	250	250	238	238	219	219	250
N. of Firms	47	47	47	47	45	45	47
Outcome Pre-Reform Mean	195.362	5.108	0.181	0.041	0.244	0.201	0.349
Diff Coeff. P-Value	**0.725**	**0.931**	**0.188**	**0.888**	**0.838**	**0.755**	**0.991**
Firm FE	X	X	X	X	X	X	X
Year FE	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X
Clustering	firm	firm	firm	firm	firm	firm	firm

Note: This Table summarizes the results on the effect of the reform on volume and quality of tax disclosure and on tax planning. In panel A (B) the sample is restricted to firms with above (below) median pre-treatment CSR rating. The dependent variable is displayed at the top of each column, respectively. Treated denotes a dummy equal 1 for firms that are required by Schedule 2019 of the Finance Act 2016 to publish a tax strategy report. Post denotes dummy equal 1 for all periods from 2016. In all columns we control for: Size, Leverage, Age, Geographic Complexity, Loss, Market-to-Book Ratio, Standard Deviation of Sales, Analyst Following and Return Volatility. Columns (3)-(4) have fewer observations than columns (1)-(2) because zero tax strategy sentences lead to missing observations for the Boilerplate and Specificity measures. To test for the difference in statistical significance of the interaction coefficients on treated times post dummies between the two sub-samples , we estimate a triple difference-in-differences regression, as follows: $ReformOutcomes_{it} = \alpha + \beta_1 Post_t \times TaxStrategyReport_i \times Split_i + \beta_2 Post_t \times TaxStrategyReport_i + BX_{it} + BX_{it} \times Split_i + \gamma_i Split_i + \delta_t + \varepsilon_{it}$, where $Split_i$ is a dummy equal to 1 for high media attention firms. We report the p-value of the coefficient β_1 on the triple-difference to evaluate the significance of the difference between the interaction coefficients in the split sample analysis. All variables are defined in Appendix A. Standard errors are clustered at firm level and are reported in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table G3: The Effect of Mandatory Qualitative Tax Disclosure Regulation by Pre-Reform Tax Aggressiveness

Dep.Var.	(1) Tax Strategy Words	(2) Tax Strategy Sentences	(3) Boilerplate	(4) Specificity	(5) Cash ETR	(7) Book ETR	(8) Law/Mills Measure
Panel A: Pre-Reform Low Tax Aggressiveness							
Treated × Post	62.100*	1.523**	0.057	0.003	-0.037	-0.019	-0.005
	(35.000)	(0.764)	(0.036)	(0.005)	(0.040)	(0.032)	(0.081)
R-squared	0.787	0.843	0.730	0.625	0.415	0.542	0.483
Observations	673	673	611	611	552	553	673
N. of Firms	125	125	119	119	115	115	125
Outcome Pre-Reform Mean	176.539	4.470	0.223	0.041	0.352	0.268	0.325
Panel A: Pre-Reform High Tax Aggressiveness							
Treated × Post	95.912***	2.036**	0.060**	0.004	0.007	0.009	-0.018
	(33.828)	(0.818)	(0.029)	(0.006)	(0.023)	(0.017)	(0.092)
R-squared	0.816	0.854	0.709	0.402	0.430	0.416	510
Observations	510	510	452	452	450	451	0.489
N. of Firms	81	81	78	78	79	79	81
Outcome Pre-Reform Mean	192.096	4.491	0.181	0.040	0.109	0.169	0.266
Diff Coeff. P-Value	**0.487**	**0.646**	**0.950**	**0.883**	**0.344**	**0.443**	**0.913**
Firm FE	X	X	X	X	X	X	X
Year FE	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X
Clustering	firm	firm	firm	firm	firm	firm	firm

Note: This Table summarizes the results on the effect of the reform on volume and quality of tax disclosure and on tax planning. In panel A (B) the sample is restricted to firms with above (below) median pre-treatment Cash ETR. The dependent variable is displayed at the top of each column, respectively. Treated denotes a dummy equal 1 for firms that are required by Schedule 2019 of the Finance Act 2016 to publish a tax strategy report. Post denotes dummy equal 1 for all periods from 2016. In all columns we control for: Size, Leverage, Age, Geographic Complexity, Loss, Market-to-Book Ratio, Standard Deviation of Sales, Analyst Following and Return Volatility. Columns (3)-(4) have fewer observations than columns (1)-(2) because zero tax strategy sentences lead to missing observations for the Boilerplate and Specificity measures. To test for the difference in statistical significance of the interaction coefficients on treated times post dummies between the two sub-samples, we estimate a triple difference-in-differences regression, as follows: $ReformOutcomes_{it} = \alpha + \beta_1 Post_t \times TaxStrategyReport_i \times Split_i + \beta_2 Post_t \times TaxStrategyReport_i + BX_{it} + BX_{it} \times Split_i + \gamma_i Split_i + \delta_t + \varepsilon_{it}$, where $Split_i$ is a dummy equal to 1 for high media attention firms. We report the p-value of the coefficient β_1 on the triple-difference to evaluate the significance of the difference between the interaction coefficients in the split sample analysis. All variables are defined in Appendix A. Standard errors are clustered at firm level and are reported in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table H1: Firm characteristics: comparing the quality of disclosure in annual reports and tax strategy reports,

Panel A: Specificity differences

	Low Specificity Difference	High Specificity Difference	Difference
Cash ETR	0.281	.282	-0.002
Size	13.518	13.058	0.461***
Leverage	0.156	.195	-0.038*
Age	2.924	3.156	-0.233***
GEO Complexity	0.629	18.069	-17.441
Loss Firm	0.090	.09	0
MTB Ratio	1.800	1.756	0.044
Sales Volatility	10.577	10.356	.221***
Analyst Following	1.929	1.8	0.129**
Media Attention	37.733	29.416	8.318***
Board Tax/Acc	0.234	.27	-0.036***
CSR Rating	0.470	.401	0.069***
B2C Industry	0.798	.914	-0.116***
Words (TSR)	771.940	838.816	-66.876
Sentences (TSR)	41.300	44.279	-2.978
Boilerplate (TSR)	0.254	.275	-0.021***
Specificity (TSR)	0.073	.12	-0.046***
Words (AR)	436.618	294.133	142.485***
Sentences (AR)	10.927	7.262	3.665***
Boilerplate (AR)	0.142	.151	-0.01
Specificity (AR)	0.049	.035	0.014***

Panel B: Boilerplate differences

	Low Boilerplate Difference	High Boilerplate Difference	Difference
Cash ETR	0.287	.276	0.011
Size	13.372	13.206	0.166
Leverage	0.171	.179	-0.009
Age	3.026	3.054	-0.028
GEO Complexity	17.680	1.018	16.663
Loss Firm	0.099	.082	0.017
MTB Ratio	1.695	1.863	-0.169
Sales Volatility	10.496	10.438	0.058
Analyst Following	1.906	1.826	0.081
Media Attention	37.150	29.963	7.188**
Board Tax/Acc	0.237	.266	-0.029**
CSR Rating	0.440	.434	0.005
B2C Industry	0.880	.833	0.047
Words (TSR)	803.859	806.897	-3.038
Sentences (TSR)	44.773	40.807	3.966
Boilerplate (TSR)	0.240	.289	-0.05***
Specificity (TSR)	0.092	.102	-0.009***
Words (AR)	416.524	314.228	102.296***
Sentences (AR)	10.635	7.554	3.082***
Boilerplate (AR)	0.151	.142	0.01
Specificity (AR)	0.043	.041	0.002

Note: This Table describes the firm-level characteristics of treated firms. Here, we compare firm characteristics for all of the 75 treated firms with tax strategy reports of which 69 are included in the final regression sample. Panel A, provides descriptive characteristics for firms with low and high differences in specificity between disclosure in tax strategy reports and annual reports. Panel B, provides descriptive characteristics for firms with low and high differences in boilerplate between disclosure in tax strategy reports and annual reports. We measure firm characteristics and disclosure characteristics in the annual report (AR) over the period 2013-2019. We measure disclosure characteristics for the tax strategy report (TSR) in 2019. High (low) specificity/boilerplate difference means above (below) median level specificity/boilerplate difference. *** p<0.01, ** p<0.05, * p<0.1. All variables are defined in Appendix A.