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# Does the presence of a sustainability committee strengthen the impact of ESG disclosure on tax aggressiveness? Insights from North America

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## Abstract

We investigate the influence of ESG disclosure on tax aggressiveness within the North American Travel and Leisure (T&L) sectors, specifically examining the role of sustainability committees in this relationship. Our analysis utilizes longitudinal panel data from the USA B3000 and Canadian S&P/TSX indices over the period from 2010 to 2020. Employing fixed-effects panel quantile regression with two distinct measures of tax aggressiveness, our findings indicate that firms with a focus on ESG tend to display higher levels of tax aggressiveness. This suggests that some companies might use strong ESG performance as a facade to obscure aggressive tax strategies. Moreover, our research introduces new evidence that the existence of sustainability committees can both hinder corporate tax aggressiveness and foster an ethical corporate culture, which aligns higher ESG engagement with lower tax aggressiveness. Our study underscores the importance of fostering tax compliance in T&L companies, emphasizing that individuals and corporations, which often seek direct state benefits, regard robust public services as essential for encouraging adherence to tax regulations. Furthermore, sustainability committees play a crucial role in enabling firms to address broader social issues, including tackling tax aggressiveness, thus shaping their sustainability agendas.

**Keywords** Environmental, social and corporate governance (ESG) disclosure · Sustainability committee · Sustainability · Travel and leisure sector · North America · Tax aggressiveness

**JEL Classifications** H26 · M14 · G34 · M49 · Q01

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# 1 Introduction

The business landscape today is undergoing significant shifts driven by climate change, biodiversity loss, the impact of COVID-19, and heightened calls for racial equality. These changes have led to evolving expectations regarding the role of corporations, prompting companies to disclose more information about their sustainability activities. This trend has given rise to sustainability reporting, which includes disclosures on environmental concerns (e.g., climate change and toxic releases), social aspects (e.g., workplace health and safety), and governance matters (e.g., board structure and accountability). These elements are encapsulated within ESG (Environmental, Social, and Governance) imperatives. The concept of ESG gained mainstream attention in the 2004 United Nations report “Who Cares Wins,” initiated by UN Secretary-General Kofi Annan, which involved collaboration among financial institutions to integrate ESG issues into financial services (UN-Global-Compact 2004).

Given the increasing significance of ESG disclosure, it is essential to examine its application in specific industries, such as the travel and leisure (T&L) sector. In 2022, the T&L sector contributed approximately 8% to the global GDP (Statista-Research-Department 2024b). This sector is uniquely positioned due to its intrinsic connection to biodiversity and natural environments, with over half of its demand stemming from a desire to experience nature (World Travel and Tourism Council, 2024). It is one of six major economic sectors where more than 80% of goods and services are highly dependent on natural resources (World Travel and Tourism Council, 2024). This interdependence places the T&L sector in a distinctive role as a potential “Guardian of Nature” (World Travel and Tourism Council, 2024).

Ironically, despite this unique position, the T&L sector significantly impacts the environment. According to the World Travel & Tourism Council (2024), the T&L sector contributes approximately 8% to global GHG emissions, making it one of the prominent global emitters. Additionally, the sector’s extensive resource consumption, including high levels of water and energy usage, exacerbates its environmental footprint, with hotels and resorts notably consuming substantial resources.

On the social dimension, the T&L sector is integral to socio-economic development, providing significant job creation and infrastructure investment, and supporting the UN’s Sustainable Development Goals (SDGs) through responsible tourism practices (Davidson and Sahli 2015; Pérez and del Bosque 2014). However, irresponsible practices can lead to adverse social outcomes, such as seasonal employment, low wages, displacement of local residents, and environmental degradation (Agarwal 2002; Holden 2005; Rhou and Singal 2020). Therefore, sustainability and ESG imperatives are vital in this sector (Gerged et al. 2022).

Despite the importance of responsible practices, the travel and leisure (T&L) sector often deviates from these standards, exhibiting significant tax aggressiveness. For instance, Greece’s tourism sector is noted as one of the top tax evaders (GTP-Editing-Team 2020), while multinational T&L companies in Germany have accumulated substantial tax-loss carry-forwards (Ambrosie 2017). This issue is exacerbated by the sector’s extensive international transactions and frequent use of offshore tax havens, which further complicate tax compliance and enforcement. Corporate taxation now serves as a potent indicator of a company’s commitment to societal engagement and dedication to its mission, representing the

“S” in ESG. Corporate tax aggressiveness<sup>1</sup>, which broadly refers to actions – *encompassing legal, illegal or in-between gray area* – that reduce a company’s explicit tax payments, is considered socially irresponsible (Lanis and Richardson 2012b, 2015, 2018). Many corporations engage in tax-aggressive practices, leading to significant losses in government revenue (Rappeport 2021; Sculthorpe 2016). Efforts to curb tax aggressiveness, such as the OECD minimum corporate tax rate agreement, have been met with skepticism regarding their effectiveness (Agyemang 2021). Given the financial challenges resulting from the COVID-19 crisis, governments should prioritize curbing tax-aggressive practices by corporations (Athira and Ramesh 2023).

This study explores how corporate tax payments are associated with ESG disclosure in the T&L sector. Previous research has predominantly focused on Corporate Social Responsibility (CSR) and its impact on corporate tax payments, yielding inconclusive findings due to differing viewpoints (Davis et al. 2016; Hoi et al. 2013; Lanis and Richardson 2012b, 2015). Drawing from the stakeholder view of CSR, some argue that firms with higher CSR engagement tend to engage in fewer tax-aggressive practices (Gribnau 2015). Conversely, others believe that paying taxes may hinder investment and economic development (Davis et al. 2016). Another perspective, the risk management view, suggests that firms engaged in tax aggressiveness may increase their CSR efforts to enhance their public image (Abdelfattah and Aboud 2020; Col 2017; Col and Patel 2019). This aligns with legitimacy theory, further suggesting a positive association between CSR and tax aggressiveness (Lanis and Richardson 2012a).

We extend beyond the traditional focus on CSR to explore the broader concept of Environmental, Social, and Governance (ESG) disclosure, examining its various dimensions. Specifically, firms aiming for high environmental performance often incur significant upfront costs due to investments in clean technologies, eco-friendly processes, and emissions reductions (Feng et al. 2022; Souguir et al. 2024). To manage these financial pressures, some companies may engage in tax aggressive strategies to improve cash flow or profitability (Desai and Dharmapala 2006; Feng et al. 2022). Additionally, high environmental performance might be used as a smokescreen to obscure aggressive tax practices, reflecting an opportunistic relationship similar to that seen with high CSR activities. Conversely, effective governance mechanisms—such as board independence, gender diversity, audit committees, and executive compensation—are associated with reduced tax aggressiveness (Armstrong et al. 2012, 2015; Desai and Dharmapala 2006; Kovermann and Velte 2019; Lanis and Richardson 2011, 2012a, 2015; Lanis et al. 2017; Richardson et al. 2013).

Thus, our study aims to analyze the relationship between ESG disclosure and tax aggressiveness in the T&L sector, with a focus on North America due to its prominent position in the global T&L sector (Statista-Research-Department 2024a, b). The study also introduces the presence of a sustainability committee as a moderating variable. While prior research has explored the influence of corporate governance on tax aggressiveness (Armstrong et al. 2012, 2015; Desai and Dharmapala 2006; Huseynov et al. 2017), the role of a dedicated sustainability committee has been understudied. We argue that a sustainability committee can discourage tax-aggressive practices by enhancing the firm’s reputation and stakeholder relationships (Dixon-Fowler et al. 2017; Hillman and Dalziel 2003).

<sup>1</sup> Consistent with Lanis and Richardson (2012; 2015; 2018), we use the term of Tax aggressiveness throughout the paper, but it can be used interchangeably with tax avoidance and tax management.

Our analysis of 3,150 company-year records from non-financial T&L firms in the USA and Canada from 2010 to 2020 indicates that ESG-conscious firms in the T&L sector engage in more tax-aggressive practices. This aligns with literature suggesting a positive association between CSR and tax aggressiveness. Our findings reveal that the presence of a sustainability committee not only reduces tax aggressiveness but also strengthens the relationship between ESG disclosure and reduced tax aggressiveness, fostering a corporate culture of ethical conduct (Dixon-Fowler et al. 2017).

This study makes four significant contributions to the existing literature. First, it extends the focus from CSR to ESG disclosure within the literature on ESG disclosure, corporate governance, and tax aggressiveness, offering a more comprehensive measure of a company's sustainability performance and exploring the underexplored T&L sector. While the impact of a firm's social responsibility on tax strategies has been previously examined (e.g., Lanis and Richardson 2012b, 2015, 2018), the effects of other ESG components, particularly the environmental element, remain understudied. Second, this study contributes to the ongoing debate on the impact of sustainability committees on a firm's tax aggressiveness, an emerging area of research. Third, it highlights the moderating role of sustainability committees in the ESG-tax aggressiveness relationship, providing valuable insights for academic researchers and policymakers into governance mechanisms and agency conflicts. Finally, by employing a fixed-effects panel quantile regression (FEPQR) model, this study utilizes a more suitable estimation approach to offer a deeper analysis of the ESG-TA relationship compared to previous research (e.g., Armstrong et al. 2015; Desai and Dharmapala 2006; Kovermann and Velte 2019; Lanis and Richardson 2018), which was limited to traditional panel regression methods such as the least-squares approach. The FEPQR model provides greater robustness to outliers (Canay 2011; Li 2015) and avoids assumptions about the parametric distribution of the error term, making it a more flexible and accurate method (Powell 2022).

The structure of this study includes a literature review for hypotheses development (Sect. 2), methodology (Sect. 3), findings and discussion (Sect. 4), and conclusions with practical implications (Sect. 5).

## 2 Literature review

### 2.1 ESG disclosure and tax aggressiveness

Research into the impact of CSR, a key element of ESG, on tax aggressiveness, has surged over the last decade. Despite the growing interest, findings remain mixed and largely inconclusive. The existing literature primarily probes whether tax payments enhance social welfare, with varied conclusions.

#### 2.1.1 Tax contributions and social welfare

Numerous studies suggest that corporate tax payments support broader societal benefits by funding public services, fostering innovation, and enhancing worker productivity (Gribnau 2015). Aggressive tax strategies are thus viewed as socially irresponsible (Lanis and Richardson 2012b, 2015). Corporations with strong CSR commitments are likely to exhibit

lower levels of tax aggressiveness. This perspective is supported by theoretical frameworks that associate strong corporate moral values with reduced tax aggressiveness (Col and Patel 2019; Hoi et al. 2013) and suggest a broader societal obligation beyond shareholder interests (Avi-Yonah 2008; Schön 2008). Conversely, agency theory proposes that tax aggressiveness in tax havens could facilitate managerial misconduct, potentially disguised as tax aggressiveness (Col 2017). Furthermore, firms may adopt CSR or ESG practices to mitigate reputational risks associated with tax aggressiveness (Abdelfattah and Aboud 2020; Col and Patel 2019), suggesting a complex, potentially opportunistic relationship between CSR and tax strategies.

### 2.1.2 Challenging the paradigm: tax payments as a hindrance to social welfare

Contrary to the aforementioned view, some scholars argue that private entities manage resources more efficiently than governments, suggesting that retaining resources in the private sector could more effectively enhance social welfare through job creation and infrastructure investments (Davis et al. 2016; McGee 2010).

### 2.1.3 The impact of firm environmental and governance dimensions on tax aggressiveness

When examining the impact of the environmental dimension of ESG on tax aggressiveness, it becomes clear that firms striving for high environmental performance—which includes not just carbon emissions but also resource management and green innovation—often face significant upfront costs due to investments in clean technologies, eco-friendly processes, and emissions reductions (Feng et al. 2022; Souguir et al. 2024). To ease these financial pressures, some companies may turn to tax aggressive strategies to improve cash flow or profitability (Desai and Dharmapala 2006; Feng et al. 2022). This behavior can be influenced by the complexity of tax regulations. Companies with high environmental performance targets often have more intricate tax structures to account for specific tax incentives, deductions, and obligations. This complexity can elevate the risk of unintentional tax errors and potential disputes with tax authorities (Souguir et al. 2024).

Additionally, research underscores that effective governance mechanisms—such as board independence, gender diversity, audit committees, and executive compensation—significantly influence corporate tax aggressiveness (Armstrong et al. 2012, 2015; Desai and Dharmapala 2006; Lanis and Richardson 2011; Lanis et al. 2017; Richardson et al. 2013). These aspects of governance will be examined in detail later in the next section.

Given these diverse perspectives, we hypothesize:

**H1** There is a significant relationship between a firm's ESG disclosure and its tax aggressiveness.

## 2.2 The role of sustainability committees

While the effects of internal corporate governance mechanisms like executive compensation (Armstrong et al. 2012, 2015; Desai and Dharmapala 2006) and board composition (Lanis

and Richardson 2011, 2015) on tax practices are well-documented (Kovermann and Velte 2019; Richardson et al. 2013), the specific role of sustainability committees in influencing corporate tax aggressiveness has been largely overlooked.

### 2.2.1 Theoretical arguments

From a resource-dependence perspective, a sustainability committee could be crucial in securing external resources to enhance corporate legitimacy and manage stakeholder relations (Pfeffer 1987). Such committees could discourage aggressive tax practices to maintain a firm's reputation and align with its sustainability goals. Enhanced corporate governance through such committees could, therefore, be expected to curb tax aggressiveness and support sustainability (Burke et al. 2019). Hence, we hypothesize the following:

**H2** The presence of a dedicated sustainability committee lowers corporate tax aggressiveness.

### 2.3 Moderating effects of sustainability committees

While sustainability committees often symbolize a firm's commitment to ESG principles, their actual impact on performance is debated. Some studies find no direct link between committee presence and environmental performance, suggesting they might serve more as symbolic (Burke et al. 2019; Rodrigue et al. 2013) or for impression management. However, others note that such committees positively affect performance by fostering better environmental disclosures and engaging with relevant stakeholders (Dixon-Fowler et al. 2017; Gerged et al. 2022). Considering these insights, we propose:

**H3** A sustainability committee negatively moderates the relationship between ESG disclosure and corporate tax aggressiveness.

This critical examination of the literature establishes a foundational framework for analyzing the nuanced interplay between ESG disclosure, tax aggressiveness, and the modulating role of sustainability committees, aiming to contribute significant insights to the discourse on corporate governance and sustainability practices.

## 3 Data and methods

### 3.1 Sample composition and data sources

Our sample consists of the entire T&L sector in the USA B3000 index and the Canadian S&P/TSX index for the eleven-year window of 2010–2020. We retrieve from Bloomberg the annual list of observations for both indices as of December 31st every year in the sample period. Then, we apply the Industry Classification Benchmark (ICB) to identify companies in the T&L sector and compile them into an unbalanced panel design. This sampling approach presents us with three main advantages. First, the unbalanced longitudinal panel design assembles all firm-year observations with available data, limiting potential survival

bias. Second, the post-crisis setting of the sample allows us to mitigate the confounding effects of the 2008 financial meltdown. Third, sampling the T&L sector in the USA B3000 index and the Canadian S&P/TSX index allows us to focus on the largest listed firms by market capitalization in the North American continent. The sample composition by year and market index is detailed in Table 1.

For each firm, all relevant data for estimating our study variables were collected from the Bloomberg database individually. The following sections motivate our study variables and empirical modelling approach.

### 3.2 Dependent variable (tax aggressiveness)

Variables are operationally defined in Table 2. Following Lanis and Richardson (2012b) we employ the relative tax expense to cash flows from operations (TECFO), as a proxy for tax aggressiveness. The ratio of tax expense to cash flows from operations demonstrates tax payment; thus, in this study's context, a lower ratio would suggest higher engagement in aggressive tax-aggressive practices and vice versa.

To check for the robustness of empirical results, we use an alternative measure of tax aggressiveness, the average Effective Tax Rate (ETR), defined as the relative income tax expense payable for the financial year to pre-tax accounting income, as proposed by Gupta and Newberry (1997); Lanis and Richardson (2012b); Richardson and Lanis (2007). Given that the numerator of the definition is the current tax liability generated by the taxable income and the denominator is the pre-tax income estimated under the generally accepted accounting principles (GAAP), the ETRs capture the aptitude of corporations in reducing their current tax liabilities (Lanis and Richardson 2012b; Richardson and Lanis 2007) and, as such, indicating the relative tax burden across firms (Rego 2003). That being said, corporations that avoid taxes by reducing the taxable income while maintaining the GAAP-based accounting income tend to reduce ETRs with a range of tax-motivated transactions (e.g., deferral of income recognition, tax credits, foreign sales and tax-exempt income) (Lanis and Richardson 2012b; Rego 2003).

### 3.3 Key variables (ESG disclosure, sustainability committee, and the interaction effect)

We analyze the impact of two main independent variables: ESG disclosure scores and the presence of a sustainability committee, as well as their interaction. Consistent with prior research (e.g., Gerged, Tran, et al., 2023a; Lai et al. 2016; Lueg and Pesheva 2021; Nollet et al. 2016), we use Bloomberg's ESG scores as a proxy for firms' ESG disclosure. These scores, which range from 0 to 100%, are derived from publicly available information, such as company annual reports and CSR documents. Bloomberg's scoring methodology is sector-specific and covers environmental, social, and governance aspects. The scores are regarded as equivalent to third-party ESG ratings, showing strong correlations with other recognized ratings like those from RobecoSAM and Sustainalytics (Zumente and Lăce 2021).

The second independent variable, Sustainability, is binary-coded as 1 if a firm's board has a sustainability committee and 0 otherwise, following Bradbury et al. (2022). Our empirical model uses ESG scores (ESG) and the binary (Sustainability) variable to test the first and second hypotheses. Additionally, the interaction term (ESG\*Sustainability) is employed to



**Table 1** Sample distribution by year and by market index

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
<i>US B3000</i>	88	93	93	94	94	107	108	107	101	97	96	1078
<i>CND S&amp;P/TSX</i>	4	2	2	2	5	5	6	7	8	7	4	52
Annual Obs.	92	95	95	96	99	112	114	114	109	104	100	1,130

test the third hypothesis. Since the presence of a sustainability committee may be reflected in the governance component of ESG scores, potentially introducing collinearity bias, we also validate our findings by retesting the first and third hypotheses using the environmental (ENV) and social (SOC) sub-scores.

### 3.4 Control variables

Consistent with prior research, we include several control variables known to influence corporate tax aggressiveness. Large firms, due to their significant economic and political influence, tend to exhibit higher tax aggressiveness (Lanis and Richardson 2012b; Richardson and Lanis 2007). Additionally, higher profitability is associated with increased tax aggressiveness (Gupta and Newberry 1997; Richardson and Lanis 2007). Thus, we control for firm size (Size) using the logarithm of total assets and profitability (ROA) as measured by the return on total assets ratio.

We also account for financial leverage (Leverage) by including the ratio of total debt to total assets, as higher leverage is linked to greater tax aggressiveness (Gupta and Newberry 1997). To capture diverse growth opportunities, we include the market-to-book ratio (M2B) and the forecasted long-term earnings growth rate (Growth) that reflect market growth opportunities and analyst expectations of future growth prospects, respectively (Gupta and Newberry 1997; Richardson and Lanis 2007).

To address differences in intangible investments, we use the ratio of R&D expenditure to net sales (R&D2Sales), since higher R&D spending is associated with increased risks and tax aggressiveness (Gupta and Newberry 1997). Finally, we control for analyst coverage (Analysts), measured by the annual count of financial analysts actively following the firm and issuing EPS forecasts. Greater analyst coverage can reduce tax aggressiveness by increasing firm visibility (Allen et al. 2016; Bradshaw et al. 2004; Bushee and Miller 2012).

Prior literature suggests that board characteristics, including board independence and gender diversity, significantly influence tax behavior. Specifically, Lanis and Richardson (2011) find that a higher proportion of independent directors is associated with reduced tax aggressiveness, while Lanis et al. (2017) show that increased female representation on boards correlates with lower tax aggressiveness. Therefore, we include controls for board characteristics: Board Size (number of board members), Board Independence (percentage of independent directors), and Board Gender Diversity (percentage of female directors).

Additionally, the audit committee's role in overseeing tax strategies is crucial (Kovermann and Velte 2019; Richardson et al. 2013). To account for this, we include controls for Audit Committee Size (number of audit committee members) and Audit Committee Diligence (attendance percentage at audit committee meetings during the year).

### 3.5 Model specification and empirical strategy

To evaluate our hypotheses, we introduce empirical models utilizing fixed-effects panel quantile regression (FEPQR). In contrast to standard panel regression models, which rely on the least-squares method to determine the conditional *mean* of the target variable across various predictor values, FEPQR estimates the conditional *median* (Li 2015; Powell 2022). This approach allows for a deeper exploration of the ESG-TA relationship compared to earlier studies (e.g., Armstrong et al. 2015; Desai and Dharmapala 2006; Kovermann and

**Table 2** Operational definition of research variables

Variable	Definition
TECFO	A proxy of corporate tax aggressiveness capturing the relative tax expense (benefit) to cash flows from operations
ETR	The average effective tax rate as an alternative measure of corporate tax aggressiveness; calculated as the relative of annual income tax expense to pre-tax accounting income
ESG	Bloomberg's overall index for environmental, social, and governance disclosure scores
ENV	Bloomberg's index for environmental disclosure score
SOC	Bloomberg's index for social disclosure score
Sustainability	A binary coded 1 if the firm's board has a CSR or a sustainability committee and 0 otherwise.
Size (in millions of US\$)	The book value of total assets (in millions of US\$) as reported by the firm
M2B	The ratio of the closing market value of equity to the closing book value of equity
Leverage	The total debt to total assets ratio
ROA	The total return to total assets ratio
R&D2Sales	The relative of R&D expenditure to net sales
Growth	The average analysts' forecasts of the long-term growth rate of earnings
Analysts	A proxy for the firms' visibility captured by the total number of analysts following the firm in a given year
Board Size	The number of directors serving on the board
Board Gender Diversity	The percentage of female directors on the board
Board Independence	The percentage of independent directors on the board
Size of Audit Committee	The number of board directors serving on the audit committee
Audit Committee Diligence	A proxy for the due diligence of the audit committee captured by the percentage of audit committee meetings attended by members during the year

Velte 2019), which employed traditional panel regression techniques like OLS and fixed-effects models, etc. FEPQR offers two key advantages: it is more resilient to outliers than least-squares regression (Canay 2011; Li 2015), and it is semiparametric, thereby avoiding assumptions about the parametric distribution of the error term (Powell 2022). As such the FEPQR models can be specified as follows:

$$TECFO_{it} = \beta_0 + \beta_1 ESG_{it-1} + \beta_2 Sustainability_{it-1} + \beta_{3-14}(Controls)_{it-1} + \sum_n \beta_n \text{Year Controls} + \sum_i \beta_i \text{Firm Controls} + \epsilon_{it} \quad (1)$$

$$TECFO_{it} = \beta_0 + \beta_1 ESG_{it-1} + \beta_2 Sustainability_{it-1} + \beta_3 ESG * Sustainability_{it-1} + \beta_{4-15}(Controls)_{it-1} + \sum_n \beta_n \text{Year Controls} + \sum_i \beta_i \text{Firm Controls} + \epsilon_{it} \quad (2)$$

Where TECFO is the relative tax expense to cash flows from operations for firm  $i$  in year  $t$ . In Eq. 1, the variables of interest are *ESG* - scores obtained from Bloomberg (e.g., Gerged, Tran, et al., 2023a; Lai et al. 2016; Lueg and Pesheva 2021; Nollet et al. 2016) and *Sustainability*, a binary variable which equals 1 if a firm's board has a sustainability committee and 0 otherwise (Bradbury et al. 2022). According to  $H_1$ , we expect either a positive or a

negative sign for the *ESG* coefficient. We expect a positive sign for the *Sustainability* coefficient to correspond with less tax aggressiveness (i.e. a higher TECFO) as conjectured in **H<sub>2</sub>**. Equation 2 is designed to test for the interaction effect (**H<sub>3</sub>**) with the expectation of a positive coefficient of *ESG\*Sustainability*, implying less tax aggressiveness.

It is worth noting that the unbalanced panel design of our sample controls for survivorship bias, as we include all firm-year observations with available data. We utilise the fixed effects panel quantile regression (FEPQR) according to (Canay 2011). The applied FEPQR estimation verifies the robustness of the results for the following concerns. First, the quantile regression describes the entire conditional distribution of the dependent variable instead of just summarising the average coefficients as in the conventional fixed effects (FE) regressions; this can prove beneficial in the presence of extreme outliers and heavy-tailed distributions (Li 2015). Second, it employs fixed-effects estimation with firm controls and year controls, which mitigates endogeneity bias caused by omitted variables<sup>2</sup>. The firm-fixed effects control for time-invariant omitted variables, while year-fixed effects control for time-varying omitted variables that are constant across firms (Wooldridge 2010). Third, it entails a two-stage regression which further controls for endogeneity concerns (Wooldridge 2010). Fourth, it enables the use of lagged independent variables, which mitigates endogeneity bias from reverse causality. Fifth, the FEPQR estimation enables the use of robust standard errors clustered at the firm level, which addresses heteroscedasticity and serial correlation biases (Petersen 2009; Wooldridge 2010).

## 4 Findings and discussion

### 4.1 Empirical analysis

Descriptive statistics and the Pearson correlation matrix of our variables are provided in Tables 3 and 4, respectively. Given the US corporate tax rates of 35% pre-2018 and 21% post-2018, the mean and median ETR are 36.65% and 29.84%, respectively, across the 768 firm-year observations in our predominantly U.S. T&L sampled firms for the period spanning 2010–2020. This generally indicates a relatively low level of corporate tax aggressiveness. The ESG score's mean (median) of 21.58% (16.27%) across 982 observations for T&L firms implies relatively low ESG ratings, possibly indicating limited engagement in ESG initiatives and poor sustainability performance in this sector. The Sustainability variable's mean (median) of 0.127 (0) across the 1013 observations is because only 129 firm-year observations within the sample featured the presence of a sustainability committee at the board level during 2010–2020. This might be due to the fact that setting up sustainability committees is an emerging trend, but it also goes to show how shallow is the ESG/CSR commitment in the North American T&L sector.

Results in Table 5 report the Canay-based (2011) quantile regressions for the effect of ESG disclosure (*ESG*), sustainability committee (*Sustainability*), and the interaction term (*ESG\*Sustainability*) on corporate tax aggressiveness (measured as the relative of tax expense to cashflows from operations). Panel A of Table 5 presents the FEPQR baseline results according to Eq. 1, while Panel B of Table 5 introduces the interaction term accord-

<sup>2</sup> The Hausman test suggests that the fixed effects estimation is a better fit than the estimation of the random effects.

**Table 3** Descriptive statistics

Stats	Obs.	Mean	Median	St.dev	Min	Max
TECFO	1098	0.071	0.117	1.615	-35.414	12.748
ETR	768	36.651	29.840	99.672	-437.000	2063.460
ESG	982	21.584	16.270	12.094	6.610	57.850
Sustainability	1013	0.127	0.000	0.334	0.000	1.000
Size (in millions of US\$)	1101	6530.287	2077.700	10931.720	25.600	71,996
M2B	1099	152.465	2.510	1948.192	-1030.480	30942.200
Leverage	1102	45.250	38.645	41.851	-64.200	389.200
ROA	1097	6.546	4.410	43.014	-69.540	1305.020
R&D2Sales	1051	0.969	0.000	4.983	0.000	86.700
Growth	848	78.564	13.000	731.471	-385.260	10,502
Analysts	1101	11.065	9.000	8.160	0.000	36.000
Board Size	803	9.171	9.000	2.335	4.000	17.000
Board Gender Diversity	1014	15.656	14.290	11.653	0.000	80.000
Board Independence	1014	99.250	100.000	7.883	1.000	100.000
Size of Audit Committee	1008	3.652	3.000	0.857	2.000	8.000
Audit Committee Diligence	949	77.068	75.000	9.400	3.000	100.000

Note: Variables are operationally defined in Table 2

ing to Eq. 2. The Canay-based (2011) quantile regression involves a two-stage estimation procedure with firm-fixed effects, year-fixed effects, robust standard errors clustered at the firm level and lagged independent variables.

The results in Panel A of Table 5 report significant evidence that ESG disclosure is associated with a lower ratio of tax expense to cash flows from operations, indicating more corporate tax-aggressiveness. The significant negative effect, as shown from the third to the seventh conditional distribution quantiles, indicates that higher ESG disclosure is associated with less tax payment (i.e. lower ratio of tax expense to cash flows from operations) and, hence, more engagement with tax-aggressive practices. This supports the positive direction of  $H_1$ ; that the firm's ESG disclosure is positively associated with corporate tax aggressiveness. As noted, this may be because firms adopt CSR or ESG practices to mitigate the reputational risks linked to tax aggressiveness (Abdelfattah and Aboud 2020; Col and Patel 2019), or because they believe that retaining resources within the private sector can more effectively enhance social welfare through job creation and infrastructure investments (Davis et al. 2016; McGee 2010).

The presence of a sustainability committee (*Sustainability*), as shown in Panel A of Table 5, is significantly and positively associated with the ratio of tax expense to cash flows from operations in the conditional distributions from the first to the eighth distribution quantiles, indicating less tax-aggressiveness. This result extends sufficient support to  $H_2$ ; that the presence of a sustainability committee is negatively associated with corporate tax-aggressiveness. As sustainability committees can be held accountable for their actions, they strive to meet stakeholder demands and create shared value by paying their fair share of taxes, which ensures regulatory compliance, builds stakeholder trust, enhances brand reputation, and mitigates legal and financial risks. This approach supports their role as good corporate citizens and contributes to economic value for shareholders (Burke et al. 2019).

Finally, the interaction term ( $ESG * Sustainability$ ), is introduced in Panel B of Table 5, to test the third hypothesis. The coefficient of the interaction term is positive and statistically

**Table 4** Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) TECFO	1.000																	
(2) ETR	0.099*	1.000																
(3) ESGD	0.034	-0.073*	1.000															
(4) CSR	0.016	-0.050	0.343*	1.000														
(5) ENV	0.013	-0.069	0.840*	0.369*	1.000													
(6) SOCD	0.021	-0.059	0.880*	0.324*	0.773*	1.000												
(7) GOVD	0.048	-0.047	0.723*	0.117*	0.357*	0.492*	1.000											
(8) Size	-0.032	-0.024	0.500*	0.388*	0.549*	0.508*	0.087*	1.000										
(9) M2B	-0.000	0.078*	-0.112*	-0.029	0.160*	-	-	-	1.000									
						0.068*	0.106*	0.164*										
(10) Leverage	-0.000	-0.017	-0.033	-0.026	-0.046	0.005	-	0.021	-	1.000								
							0.069*		0.097*									
(11) ROA	0.006	-0.038	-0.022	-0.006	0.210*	-0.011	0.030	-	0.706*	0.009	1.000							
								0.125*										
(12) RD2Sales	0.007	-0.027	-0.117*	-0.055	0.040	-	-	-	0.289*	-0.018	0.422*	1.000						
						0.072*	0.086*	0.068*										
(13) Growth	-0.002	0.046	-0.131*	-0.036	0.215*	-	-	-	0.937*	-	0.724*	0.384*	1.000					
						0.080*	0.107*	0.206*		0.097*								
(14) Analysts	0.026	-0.067	0.389*	0.267*	0.373*	0.369*	0.174*	0.492*	-	0.073*	-0.006	0.004	-	1.000				
									0.104*				0.143*					
(15) Board Size	0.032	-0.033	0.299*	0.209*	0.236*	0.359*	0.126*	0.350*	-	0.101*	-	0.001	-	0.252*	1.000			
									0.114*		0.072*		0.128*					
(16) Board Gender Diversity	0.033	-0.062	0.382*	0.229*	0.231*	0.357*	0.377*	0.078*	-	0.012	-0.018	-0.052	-	0.207*	0.226*	1.000		
									0.092*				0.117*					
(17) Board Independence	0.055	-0.036	0.485*	0.127*	0.133*	0.317*	0.806*	0.014	-	-	-	-	-	0.127*	0.065*	0.407*	1.000	
									0.248*	0.099*	0.094*	0.147*	0.319*					
(18) Size of Audit Committee	0.059*	-0.072*	0.557*	0.313*	0.301*	0.398*	0.693*	0.208*	-	-	-	-	-	0.230*	0.159*	0.423*	0.812*	1.000
									0.195*	0.067*	0.067*	0.143*	0.240*					

**Table 4** (continued)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(19) Audit Committee Diligence	0.040	-0.043	0.422*	0.146*	0.120*	0.252*	0.714*	-	-	-	-0.044	-	-	0.142*	0.038	0.390*	0.753*	0.665*
								0.062*	0.163*	0.065*		0.103*	0.213*					

\* shows significance at the 0.05 level

**Table 5** ESG disclosure, sustainability committee and the moderating impact of ESG disclosure and sustainability committee on tax aggressiveness using fixed effects panel quantile regression

Tax Expense/Cash Flows from Operations (TECFO)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variables	0.10	0.20	0.30	0.40	0.5	0.60	0.70	0.80	0.90	0.95
<b>Panel A: the impact of ESG Disclosure and Sustainability Committee on Tax Aggressiveness</b>										
ESG	-0.0095** (0.0038)	-0.0050** (0.0021)	-0.0038 (0.0038)	-0.0035*** (0.0012)	-0.0033*** (0.0010)	-0.0033*** (0.0010)	-0.0027** (0.0011)	-0.0024 (0.0017)	-0.0015 (0.0029)	0.0001 (0.0225)
Sustainability	0.2607** (0.1227)	0.1785 (0.1285)	0.1158 (0.1150)	0.1337*** (0.0372)	0.1322*** (0.0245)	0.1274*** (0.0238)	0.1030*** (0.0251)	0.1033*** (0.0367)	0.0522 (0.0879)	0.0201 (0.4167)
Constant	4.5612*** (1.6497)	4.4676*** (0.4315)	4.5675*** (0.4983)	4.5949*** (0.1066)	4.6412*** (0.0909)	4.6494*** (0.1344)	4.7523*** (0.2767)	5.2682 (4.1577)	5.3781*** (0.3455)	6.0753 (5.0932)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	729	729	729	729	729	729	729	729	729	729
<b>Panel B: the moderating impact of ESG Disclosure and Sustainability Committee on Tax Aggressiveness</b>										
ESG	-0.0129** (0.0053)	-0.0059* (0.0030)	-0.0070* (0.0040)	-0.0057*** (0.0013)	-0.0045*** (0.0011)	-0.0041*** (0.0010)	-0.0046*** (0.0011)	-0.0035** (0.0017)	-0.0015 (0.0029)	-0.0002 (0.0302)
Sustainability	-0.1087 (0.2192)	-0.1106 (0.1007)	-0.1747 (0.1503)	-0.0392 (0.1137)	0.0098 (0.0707)	0.0129 (0.0488)	0.0148 (0.0596)	0.0526 (0.1006)	0.029 (0.1355)	-0.1751 (0.7510)
ESG*Sustainability	0.0121* (0.0071)	0.0093*** (0.0029)	0.0095*** (0.0032)	0.0056** (0.0028)	0.0045** (0.0019)	0.0038*** (0.0013)	0.0034** (0.0017)	0.0016 (0.0028)	-0.0002 (0.0051)	0.0054 (0.0236)
Constant	4.5114* (2.4773)	4.5271*** (0.6355)	4.5840*** (0.3886)	4.6108*** (0.3826)	4.7070*** (0.0901)	4.7125*** (0.1830)	4.8064*** (0.2616)	5.2840*** (0.2095)	5.4144*** (0.4444)	6.1175 (4.9429)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	729	729	729	729	729	729	729	729	729	729

Note: Robust standard errors clustered at the firm level are in parenthesis; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ . All independent variables are one-year lagged to control for reverse causality. Variables are operationally defined in Table 2



significant from the first to seventh distribution quantiles (i.e. less tax-aggressive). Therefore, This provides sufficient evidence to support  $H_3$  (i.e., the presence of a sustainability committee negatively moderates the relationship between ESG disclosure and corporate tax aggressive practices). This shows that the presence of a sustainability committee, can foster an ethical corporate culture and a genuinely ESG-focused strategy, which may discourage tax aggressiveness.

However, as ESG encompasses various components—Environmental, Social, and Governance—the relationship between ESG disclosure and tax aggressiveness may be complex and not immediately clear. Therefore, in the next section, we will conduct further analysis by decomposing the ESG measure to better understand its relationship with tax aggressiveness.

## 4.2 Supplementary analysis

The ESG score serves as a composite measure assessing a firm's performance across environmental, social and governance pillars. Thus, as noted, its association with tax aggressiveness may be masked and the presence of a sustainability committee may already be captured in the governance component of the ESG score, which could have confounded our results with collinearity bias. Hence, to validate our results, we re-estimate our hypotheses with the ESG sub-scores for environmental (*ENV*) and social (*SOC*) disclosures. Utilising sub-scores rather than overall ESG scores allows for a more nuanced examination, enriching our understanding of the channels through which ESG scores influence tax aggressiveness.

Tables 6 and 7 replicate the empirical modelling of Table 5 by substituting the environmental (*ENV*) and social (*SOC*) disclosures scores, respectively, for the overall ESG scores to investigate their impact on the ratio of tax expense to cash flows from operations. The results in Tables 6 and 7 remain qualitatively consistent. Similar to the overall ESG disclosures, there is a significant negative effect of the environmental (*ENV*) and social (*SOC*) disclosures for most of the distribution quantiles (i.e. disclosure associates with more tax-aggressiveness according to the positive direction of  $H_1$ ). The positive relationship may stem from an opportunistic link between environmental and social disclosures and tax aggressiveness, with firms possibly using these disclosures as a smokescreen for aggressive tax strategies or to manage the financial pressures of high environmental performance. However, the presence of the sustainability committee (*Sustainability*) displays a significant positive effect in most of the distribution quantiles (i.e. less tax-aggressive according to  $H_2$ ), underscoring the crucial role that effective governance mechanisms play in curbing tax aggressiveness.

Both interaction terms *ENV\*Sustainability* in Panel B of Table 6 and *SOC\*Sustainability* in Panel B of Table 7, support the moderation effect in proposed in  $H_3$ . *ENV\*Sustainability* displays a significant positive effect across the second to the sixth distribution quantiles, while *SOC\*Sustainability* exhibits significance from the second to seventh quantile. This suggests that presence of a sustainability committee fosters a genuine ESG culture, which aligns with lower levels of corporate tax aggressiveness.

## 4.3 Robustness checks

To validate the baseline results, as noted above, we use an alternative measure of tax aggressiveness. Following prior research (Gupta and Newberry 1997; Lanis and Richardson

**Table 6** Environmental disclosure, sustainability committee and the moderating impact of environmental disclosure and sustainability committee on tax aggressiveness using fixed effects panel quantile regression

TECFO										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variables	0.10	0.20	0.30	0.40	0.5	0.60	0.70	0.80	0.90	0.95
<b>Panel A: the impact of Environmental Disclosure and Sustainability Committee on Tax Aggressiveness</b>										
ENV	-0.0087** (0.0036)	-0.0042 (0.0069)	-0.0043 (0.0034)	-0.0036*** (0.0010)	-0.0033*** (0.0008)	-0.0038*** (0.0008)	-0.0031*** (0.0009)	-0.0026 (0.0018)	-0.0020 (0.0025)	0.0063 (0.0240)
Sustainability	0.2114** (0.1000)	0.1826 (0.2041)	0.1089 (0.1072)	0.1243*** (0.0375)	0.1269*** (0.0256)	0.1171*** (0.0232)	0.1034** (0.0478)	0.0901*** (0.0316)	0.034 (0.0985)	0.0669 (0.4874)
Constant	2.9187 (4.0791)	3.7059 (0.0000)	3.6742*** (0.9894)	3.7071*** (0.3655)	3.632 (2.2101)	5.0439** (2.2413)	5.1694 (48.5441)	5.0159 (115.5964)	4.8714*** (1.0127)	3.8149 (4.4808)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	725	725	725	725	725	725	725	725	725	725
<b>Panel B: the moderating impact of Environmental Disclosure and Sustainability Committee on Tax Aggressiveness</b>										
ENV	-0.0104** (0.0042)	-0.0055 (0.0053)	-0.0063** (0.0028)	-0.0051*** (0.0012)	-0.0042*** (0.0010)	-0.0042*** (0.0009)	-0.0037*** (0.0012)	-0.0028* (0.0016)	-0.0016 (0.0045)	0.0146 (0.0432)
Sustainability	0.1248 (0.1484)	0.002 (0.0860)	-0.0296 (0.1002)	0.0335 (0.0732)	0.0559 (0.0511)	0.0591** (0.0284)	0.0497 (0.0401)	0.0542 (0.0738)	0.0096 (0.1280)	0.0017 (0.5196)
ENV*Sustainability	0.0074 (0.0065)	0.0081*** (0.0017)	0.0076*** (0.0027)	0.0053** (0.0023)	0.0043*** (0.0016)	0.0039*** (0.0010)	0.0032** (0.0016)	0.0021 (0.0021)	0.0012 (0.0060)	-0.0057 (0.0289)
Constant	2.9714 (4.2803)	3.7365*** (0.5408)	3.8108* (2.0039)	3.8113*** (0.1900)	3.6855* (2.1594)	5.1552** (2.2399)	5.2462 (48.6851)	5.1985 (124.3790)	4.9597 (171.0936)	3.7374 (2862.71)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	725	725	725	725	725	725	725	725	725	725

Note: Robust standard errors clustered at the firm level are in parenthesis; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ . All independent variables are one-year lagged to control for reverse causality. Variables are operationally defined in Table 2

**Table 7** Social disclosure, sustainability committee and the moderating impact of social disclosure and sustainability committee on tax aggressiveness using fixed effects panel quantile regression

TECFO										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variables	0.10	0.20	0.30	0.40	0.5	0.60	0.70	0.80	0.90	0.95
<b>Panel A: the impact of Social Disclosure and Sustainability Committee on Tax Aggressiveness</b>										
SOC	-0.0057* (0.0033)	-0.0046 (0.0125)	-0.0043 (0.0042)	-0.0029*** (0.0010)	-0.0019** (0.0009)	-0.0017* (0.0009)	-0.0016 (0.0023)	-0.0013 (0.0013)	-0.0021 (0.0044)	-0.0077 (0.0163)
Sustainability	0.1986** (0.0921)	0.1644 (0.1845)	0.1258 (0.0845)	0.1312*** (0.0338)	0.1437*** (0.0263)	0.1321*** (0.0259)	0.1367*** (0.0352)	0.1322** (0.0566)	0.0624 (0.1171)	0.0306 (0.4845)
Constant	2.8449 (3.7862)	3.5837 (2.7963)	3.6562*** (0.9454)	3.7799*** (0.2932)	3.6649* (2.1311)	5.0970** (2.3292)	5.238 (37.0905)	5.108 (112.4446)	4.8544 (190.6344)	4.0246 (12.0964)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	725	725	725	725	725	725	725	725	725	725
<b>Panel B: the moderating impact of Social Disclosure and Sustainability Committee on Tax Aggressiveness</b>										
SOC	-0.0073** (0.0036)	-0.0072 (0.0057)	-0.006 (0.0044)	-0.0044*** (0.0012)	-0.0034*** (0.0010)	-0.0028*** (0.0009)	-0.0028 (0.0024)	-0.0021 (0.0013)	-0.0022 (0.0067)	-0.0084 (0.0178)
Sustainability	0.0101 (0.2155)	-0.0883 (0.1119)	-0.1020* (0.0618)	-0.0066 (0.0782)	0.0068 (0.0555)	0.0037 (0.0329)	0.0039 (0.0569)	-0.0051 (0.0705)	-0.0176 (0.1367)	-0.21 (0.6452)
SOC*Sustainability	0.0092 (0.0076)	0.0112*** (0.0029)	0.0090*** (0.0025)	0.0064*** (0.0024)	0.0061*** (0.0015)	0.0050*** (0.0010)	0.0042* (0.0023)	0.0049** (0.0022)	0.0031 (0.0087)	0.0142 (0.0211)
Constant	3.0147 (5.2008)	3.6627 (3.4473)	3.6937** (1.5470)	3.7881*** (0.3172)	3.7734* (2.2275)	5.2023** (2.2435)	5.261 (75.4604)	5.0751 (111.3143)	4.8944 (252.2122)	4.1215 (3.6294)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	725	725	725	725	725	725	725	725	725	725

Note: Robust standard errors clustered at the firm level are in parenthesis; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ . All independent variables are one-year lagged to control for reverse causality. Variables are operationally defined in Table 2

2012b; Richardson and Lanis 2007), we utilize average effective tax rates (ETRs) as our alternative dependent variable for several reasons. First, prior empirical evidence reports that ETRs encapsulate corporate tax aggressiveness (Dyreng et al. 2008; Robinson et al. 2010). Second, academics commonly use ETRs to proxy for corporate tax aggressiveness in the tax research field (Dyreng et al. 2008; Phillips 2003; Rego 2003).

The reported results in Table 8 show qualitatively consistent evidence with those reported in Panel A of Table 5. Precisely, Table 8 displays significant negative and positive effects of *ESG disclosure* and the presence of a *Sustainability Committee* respectively, on ETR. This indicates that ESG disclosure associates with reduced tax payments while the presence of a sustainability committee associates with higher tax payments, thus reflecting more (less) corporate engagement with aggressive tax policies. This further supports both - the positive direction of  $H_1$  (i.e., the firm's ESG disclosure is positively associated with corporate tax aggressiveness), and supports  $H_2$  (i.e., the presence of the sustainability committee is negatively related to corporate tax aggressive practices). The only observed difference from the baseline results refers to evidence of  $H_3$ . Panel B of Table 8 reports no significant evidence to support  $H_3$ .

The baseline results depicted in Table 5, which are further reinforced by the detailed breakdown analysis of ESG scores into environmental and social pillars in Tables 6 and 7, diverge from the robustness findings in Table 8. This disparity extends further empirical credence to prior arguments that the use of ETR can be problematic and should be supplemented with alternative measures (Hanlon and Heitzman 2010; Lanis and Richardson 2015).

In the next check, we constructed a new binary measure for ESG disclosure (*ESG\_High*), following Gerged, Salem, et al. (2023). *ESG\_High* is coded as 1 if a company's ESG disclosure score exceeds the industry-year median value of ESG disclosure, and 0 otherwise. The results of using the binary measure, reported in Table 9, are consistent with the baseline FEPQR regressions in Table 5 of the main manuscript.

#### 4.4 Channel analysis – reputational risks with increased analyst following

Consistent with Bilyay-Erdogan et al. (2023) and Jiang et al. (2024), we investigate the reputational risks from increased analyst followings as an underlying channel through which ESG disclosures and sustainability committees affect tax aggressiveness<sup>3</sup>. We apply a two-step regression to conduct the channel analysis. In the first step, we examine whether ESG disclosures and sustainability committees promote firm visibility through higher analyst followings (*Analysts*). Firms with higher analyst followings are likely to endure greater reputational risks from tax aggressiveness due to the intense external supervision by capital markets (Allen et al. 2016; Bradshaw et al. 2004; Bushee and Miller 2012; Jiang et al. 2024).

In the second step, we use the predicted values from the first step (*Analysts\_hat*) to estimate tax aggressiveness across the full distributional quantiles of the dependent variable (*TECFO*). The results, reported in Table 10, indicate that higher ESG disclosures and the presence of a sustainability committee may improve analyst followings, as evidenced by the positive albeit insignificant coefficients in the first-step regression. However, the predicted values in the second-step regressions show that the potentially increased analyst

<sup>3</sup> We thank the anonymous reviewer for this insightful suggestion.

**Table 8** Employing an alternative dependent variable (ETR)

Effective Tax Rates (ETR)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variables	0.10	0.20	0.30	0.40	0.5	0.60	0.70	0.80	0.90	0.95
<b>Panel A: the impact of ESG Disclosure and Sustainability Committee on Tax Aggressiveness</b>										
ESG	-0.1074 (0.1068)	-0.0876 (0.4534)	-0.0859** (0.0369)	-0.0963*** (0.0244)	-0.1074*** (0.0326)	-0.0929** (0.0361)	-0.0851* (0.0458)	-0.0592 (0.0426)	-0.1273 (0.1069)	-0.2111 (0.2206)
Sustainability	8.9116* (4.7396)	6.8990*** (2.2343)	5.6937*** (0.8694)	4.4955*** (1.4998)	4.1464*** (1.0571)	3.4868*** (0.8361)	2.8663** (1.1650)	2.2261* (1.2356)	2.688 (2.8493)	-0.8822 (3.8238)
Constant	52.9899 (34.9165)	58.3974 (51.9713)	59.9061*** (4.4637)	56.0090*** (15.3998)	57.9034*** (5.5307)	60.9931*** (5.8155)	57.5120*** (12.5888)	55.6198*** (13.9949)	57.9131 (44.1262)	84.8839 (262.0504)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	538	538	538	538	538	538	538	538	538	538
<b>Panel B: the moderating impact of ESG Disclosure and Sustainability Committee on Tax Aggressiveness</b>										
ESG	-0.111 (0.1479)	-0.0951 (0.3238)	-0.1098*** (0.0409)	-0.1180*** (0.0241)	-0.1179*** (0.0309)	-0.0890** (0.0387)	-0.1003* (0.0568)	-0.0845** (0.0409)	-0.1357 (0.1163)	-0.2338 (0.2249)
Sustainability	6.8379 (8.3770)	5.74 (8.5488)	3.8082* (2.2094)	3.3581** (1.6997)	3.1413 (1.9191)	2.3375* (1.2792)	1.7238 (3.4821)	-1.828 (2.6124)	-3.5005 (4.6792)	-8.0785 (12.3285)
ESG *Sustainability	0.0708 (0.2188)	0.052 (0.2287)	0.0605 (0.0579)	0.0441 (0.0538)	0.0367 (0.0452)	0.0428 (0.0500)	0.0415 (0.1300)	0.14 (0.0975)	0.1826 (0.1435)	0.2172 (0.4509)
Constant	53.6648 (32.9636)	58.3531 (44.8565)	59.0257*** (4.5978)	56.7127** (22.6951)	57.8834*** (7.0748)	60.6592*** (5.5797)	57.303 (3,533.8171)	55.0377*** (17.3733)	62.9855 (41.9418)	85.2646 (251.1218)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	538	538	538	538	538	538	538	538	538	538

Note: Robust standard errors clustered at the firm level are in parenthesis; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ . All independent variables are one-year lagged to control for reverse causality. Variables are operationally defined in Table 2

**Table 9** Employing an alternative independent variable for ESG Disclosure

TECFO										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variables	0.10	0.20	0.30	0.40	0.5	0.60	0.70	0.80	0.90	0.95
<b>Panel A: the impact of ESG Disclosure and Sustainability Committee on Tax Aggressiveness</b>										
ESG_High	-0.2860*** (0.0858)	-0.2501*** (0.0446)	-0.2580*** (0.0398)	-0.2464*** (0.0539)	-0.2185*** (0.0241)	-0.2026*** (0.0202)	-0.1845*** (0.0286)	-0.1506*** (0.0336)	-0.1209 (0.1117)	-0.2091 (0.5594)
Sustainability	0.2374** (0.1058)	0.2526*** (0.0584)	0.1997* (0.1066)	0.2238** (0.1052)	0.2166*** (0.0212)	0.1821*** (0.0216)	0.1437*** (0.0266)	0.1318*** (0.0412)	0.0755 (0.0754)	0.0327 (0.5041)
Constant	4.459 (2.9890)	4.4957*** (0.1708)	4.5171*** (0.1233)	4.5663*** (0.3375)	4.5999*** (0.1438)	4.6883*** (0.1096)	4.6466*** (0.2144)	4.7711*** (0.1571)	4.8035*** (0.2785)	4.8025 (4.4628)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	729	729	729	729	729	729	729	729	729	729
<b>Panel B: the moderating impact of ESG Disclosure and Sustainability Committee on Tax Aggressiveness</b>										
ESG_High	-0.3506*** (0.1002)	-0.3006*** (0.0364)	-0.2958*** (0.0627)	-0.2715*** (0.0388)	-0.2453*** (0.0279)	-0.2244*** (0.0263)	-0.2036*** (0.0312)	-0.1646*** (0.0602)	-0.1251* (0.0727)	-0.341 (0.5175)
Sustainability	0.021 (0.2364)	-0.0526 (0.1816)	-0.1067 (0.1566)	-0.0048 (0.1787)	0.0611 (0.0903)	0.0469 (0.0889)	0.0912 (0.0694)	0.004 (0.1720)	0.0173 (0.2679)	-0.2283 (0.9897)
ESG_High * Sustainability	0.3647 (0.2532)	0.4510** (0.1861)	0.4841*** (0.1717)	0.3391* (0.2032)	0.2664*** (0.0923)	0.2565*** (0.0908)	0.1659*** (0.0585)	0.2451* (0.1395)	0.1503 (0.2714)	0.4451 (0.9895)
Constant	4.3574 (3.0527)	4.5186*** (0.2323)	4.5613*** (0.2024)	4.5950*** (0.3228)	4.6383*** (0.1600)	4.7539*** (0.1401)	4.6731*** (0.2502)	4.8446*** (0.5935)	4.8494 (13.6201)	4.6022 (3.9023)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	729	729	729	729	729	729	729	729	729	729

Note: Robust standard errors clustered at the firm level are in parenthesis; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ . All independent variables are one-year lagged to control for reverse causality. ESG\_High is a binary coded 1 if the ESG Disclosure score is higher than the industry-year median observation and 0 otherwise. Variables are operationally defined in Table 2

followings lead to lower tax aggressiveness, given the positive and significant coefficients of *Analysts\_hat* across the first eight quantiles of *TECFO*.

## 5 Conclusion

This study examines how sustainability reporting, including ESG dimensions, influences tax aggressiveness in the T&L sector. Amidst significant shifts in the business landscape, there is increasing pressure on companies to disclose their sustainability activities comprehensively. Tax aggressiveness, though legal, involves strategies like exploiting loopholes and leveraging tax law discrepancies across countries, raising ethical concerns.

Evidence shows mixed effects of CSR on tax aggressiveness: some studies suggest CSR reduces it, while others view CSR as a smokescreen (Abdelfattah and Aboud 2020; Col 2017; Col and Patel 2019). We extend this analysis to Environmental, Social, and Governance (ESG) disclosure, highlighting that firms with high environmental performance may face significant costs, leading to potential tax aggressiveness and opportunistic use of environmental disclosures as a cover (Souguir et al. 2024). Conversely, strong governance mechanisms, like board independence and audit committees, are linked to reduced tax aggressiveness. This research broadens the scope beyond traditional CSR by evaluating ESG disclosures (both collectively and in their individual components), and their impact on tax strategies in North American T&L firms, with a focus on the moderating role of a sustainability committee.

We measure tax aggressiveness using two metrics: the tax expense to cash flows from operations (TECFO) ratio and the effective tax rate (ETR). Our analysis finds that firms with strong ESG disclosures often exhibit higher tax aggressiveness, aligning with theories that suggest firms use ESG efforts to enhance their reputations and distract from less socially responsible behaviors (Lanis and Richardson 2012a; Lin et al. 2017). However, the presence of a sustainability committee appears to mitigate this trend. Unlike prior claims that such committees only enhance image (Rodrigue et al. 2013), our results indicate they promote transparency and accountability, leading to reduced tax aggressiveness and potentially more ethical corporate behaviours (Burke et al. 2019).

The moderating effect of sustainability committees was more significant with the tax expense to cash flows ratio, suggesting these committees may influence firms to adopt less aggressive tax practices, aligning with a genuinely ESG-focused strategy. This finding underscores the potential of sustainability committees to ensure that ESG disclosures are not merely symbolic but part of a strategic approach to good corporate governance. However, results with the ETR measure were inconclusive, reflecting ongoing debate about its reliability as a tax aggressiveness proxy (Davis et al. 2016; Hanlon and Heitzman 2010; Lanis and Richardson 2015).

Policymakers should consider linking tax compliance to public service improvements to encourage adherence to tax regulations. Future research should explore how the characteristics of sustainability committees, such as age, education, gender, ethnicity, and religion impact their effectiveness in moderating the ESG-tax aggressiveness relationship globally. This could provide further insights into optimizing these committees for better corporate behavior.

**Table 10** Two-step regression results for channel analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st stage	2nd stage FEPQR results of <b>TECFO</b>									
	<b>Analysts</b>	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	0.95
ESG	0.044 (0.066)										
Sustainability	2.204 (1.471)										
ESG * Sustainability	0.030 (0.051)										
Size	2.429*** (0.855)	-0.145*** (0.028)	-0.105*** (0.006)	-0.047*** (0.001)	-0.032*** (0.002)	-0.030*** (0.001)	-0.029*** (0.001)	-0.041*** (0.005)	-0.027*** (0.002)	-0.057 (0.046)	0.001 (0.012)
M2B	0.000 (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	-0.000 (0.000)
Leverage	0.030*** (0.009)	-0.002*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	0.001*** (0.000)
ROA	0.003 (0.003)	0.005*** (0.000)	0.003*** (0.000)	0.004*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.003*** (0.001)	0.000 (0.000)
RD2Sales	-0.092 (0.057)	0.011** (0.005)	0.005*** (0.001)	0.001*** (0.000)	0.000 (0.000)	-0.002*** (0.000)	-0.003*** (0.000)	-0.004*** (0.000)	-0.005*** (0.000)	0.007 (0.005)	-0.005* (0.003)
Growth	-0.000 (0.001)	-0.001*** (0.000)	-0.001*** (0.000)	-0.002*** (0.000)	-0.002*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)	-0.001*** (0.000)	0.000 (0.000)
Board Size	0.040 (0.109)	0.017*** (0.002)	0.004*** (0.001)	0.003*** (0.000)	0.002*** (0.000)	0.001*** (0.000)	0.002*** (0.000)	0.004*** (0.000)	0.006*** (0.000)	0.007*** (0.001)	0.018*** (0.002)
Board Gender Diversity	0.018 (0.024)	-0.006*** (0.001)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.000*** (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000*** (0.000)	-0.000 (0.002)	0.001** (0.000)
Board Independence	-0.013 (0.020)	0.003*** (0.001)	0.002*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	-0.003*** (0.000)	-0.002*** (0.000)	-0.003*** (0.000)	-0.003*** (0.000)	-0.000 (0.001)	-0.001*** (0.000)
Size of Audit Committee	-0.237 (0.267)	-0.021*** (0.008)	-0.007*** (0.002)	0.008*** (0.000)	0.018*** (0.000)	0.018*** (0.000)	0.010*** (0.001)	0.002*** (0.000)	0.006*** (0.001)	0.021 (0.019)	0.049*** (0.011)



**Table 10** (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st stage	2nd stage FEPQR results of <b>TECFO</b>									
	<b>Analysts</b>	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	0.95
Audit Committee Diligence	0.033* (0.017)	-0.002*** (0.001)	-0.001*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	0.000*** (0.000)	0.001*** (0.000)	-0.000 (0.000)	-0.001** (0.001)	-0.001 (0.001)
Analysts_hat		0.045*** (0.008)	0.028*** (0.002)	0.008*** (0.000)	0.004*** (0.001)	0.004*** (0.000)	0.005*** (0.000)	0.011*** (0.002)	0.005*** (0.001)	0.011 (0.011)	-0.010*** (0.003)
_cons	-8.734 (6.733)										
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	734	729	729	729	729	729	729	729	729	729	729

Note: Robust standard errors clustered at the firm level are reported in parenthesis; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

All independent variables are one-year lagged to control for reverse causality. Variables are operationally defined in Table 2

**Author contributions** All authors contributed to the study conception and design. Supun Chandrasena and Lane Matthews performed the material preparation and data collection. Supun Chandrasena conducted the literature search and developed the hypotheses. Lane Matthews carried out the formal analysis and wrote the methods and discussion. Ali Meftah Gerged helped with the overall direction and planning, provided critical feedback and edited the final version of the manuscript with input from Supun and Lane.

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**Data availability** The data that support the findings of this study are available in a data repository.

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