Unveiling the Effects of Gender Discrimination and Gender Equality on Corporate Tax Aggressiveness

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Declaration of competing interest

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Data availability

Data will be made available on request.

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Highlights

- The presence of female directors on the audit committee significantly reduces corporate tax aggressiveness in gender-diverse and female-dominant environments.
- Female expertise drives the association between gender diversity on audit committees and tax aggressiveness.
- Discrimination against women in accessing directorship positions emerges as a signal of signal tax-aggressive corporate practices.
- The presence of female directors on audit committees is associated with increased tax aggressiveness in discriminating environments.

Abstract

In this paper, we analyze the influence of female directors on audit committees on corporate tax aggressiveness, by examining the complementarities between agency and resource dependence theories in explaining this relationship. We hypothesize and find that discrimination against women in accessing directorship positions, gender equality, and female expertise play a decisive role in understanding the contribution of female directors in addressing tax-risk issues at the audit committee level. Our findings suggest that the presence of female directors on the audit committee significantly reduces corporate tax aggressiveness in gender-diverse and female-dominant environments, driven by female expertise. Furthermore, we uncover that the presence of female directors is associated with increased tax aggressiveness in discriminating environments, indicating that gender discrimination and self-selection into less tax-aggressive firms can be a confounding factor when analyzing the influence of female directors on corporate tax practices.

Keywords: Corporate Governance; Gender Discrimination; Gender Equality; Tax Aggressiveness; Audit Committee.

Introduction

Previous research examining the relationship between board gender diversity and corporate tax aggressiveness, within the framework of the agency theory (Fama and Jensen, 1983), consistently indicates that the inclusion of female directors on corporate boards significantly reduces the probability of firms adopting tax aggressiveness policies (Richardson et al., 2016; Lanis et al., 2017; Khlif and Achek, 2017; Chen et al., 2019; Khaoula and Moez, 2019; Riguen et al., 2020). The underlying rationale for this impact is rooted in prior evidence highlighting overarching distinctions between females and males, which are then extended to the realm of economic behavior, leading to a lower likelihood of accepting tax aggressiveness policies (Garcia-Blandon et al., 2022).

However, an emerging literature questions whether the differences found in the general population apply to leadership positions, concluding that female leaders do not conform to general gender stereotypes (Adams and Funk 2012), and calling for further research. In this regard, some studies reported that women and men perform similarly in leadership positions (Gneezy et al. 2009; Bugeja et al. 2012), exhibiting similar levels of risk-aversion (Croson and Gneezy 2009; Sila et al. 2016), confidence (Deaves et al. 2009) and quality of financial statements monitoring (García-Lara et al. 2017). The results of these studies align with directors' advisory role (Adams and Ferreira, 2009; Baldenius et al., 2014; Al Lawati and Hussainey, 2021; Jiang and Laux, 2024), as they may prioritize protecting shareholders' interests while considering their risk preferences (Armstrong et al., 2015).

It remains unclear whether women and men behave similarly or differently in directorship positions, and whether a monitoring or an advisory role prevails when addressing tax-risk issues. In this regard, to properly examine the relationship between the presence of female directors and tax aggressiveness, the gender effect should be studied in gender-diverse

corporate environments, because the influence of female directors can be driven by discrimination against women in accessing directorship positions (García-Lara et al. 2017). Gender discrimination emerges as a confounding factor and a source of endogeneity, as firms that discriminate firms may have a suboptimal composition of the boardroom and firm-director matches (Ferreira, 2018) due to their preference for appointing male directors over better-qualified female candidates. Gender biases may signal weak corporate governance systems and generate a negative link between gender diversity on boards and tax compliance (Ortas & Gallego-Álvarez, 2020).

This paper aims to examine the influence of female directors on the audit committee (AC) on corporate tax aggressive strategies and assess whether this effect is driven by gender discrimination and the expertise of female directors.

This paper extends the previous study by Deslandes et al. (2020) and aims to contribute to the existing literature in several meaningful ways. First, unlike most previous research, and following Deslandes et al. (2020), we focus on the AC rather than the board and utilize a more recent period of analysis with a higher representation of female directors on the AC. Although the AC is the board committee that can better assess tax risks and detect tax aggressiveness strategies, it has received little attention in previous studies, with mixed results (Deslandes et al., 2020; Dang and Nguyen, 2022). According to Deslandes et al. (2020:275), the audit committee plays a crucial role in ensuring that tax-risk management receives proper attention from the board. Typically, financial and risk-related issues are addressed within the audit committee before reaching the board's awareness. According to Brown et al. (2009), the audit committee ought to oversee whether the company is effectively handling its risks aligned with the tax risk limits outlined in the board's strategy. In doing so, the committee should scrutinize areas where uncertainty and subjective judgment significantly impact the firm (Deloitte, 2016).

Furthermore, previous research suggests that female directors are particularly engaged in monitoring activities (Adams and Ferreira, 2009) and tend to sit on monitoring-related board committees (Chen et al. 2017), self-selecting in audit and governance committees (Carcello et al., 2002).

Second, this paper aims to offer a theoretical contribution by examining whether the resource dependence theory complements the classical agency theory approach in explaining the association between gender diversity and corporate tax strategies. According to agency theory, female directors play the monitoring role attributable to outside independent directors that may result in a reduction of tax aggressive policies. On the other hand, the resource dependence view posits that females may also act as tax advisors, a typical role of inside directors (Hsu et al., 2018; Jiang and Laux, 2024). A tax advisory role may lead to enhanced corporate tax efficiency through the engagement in tax aggressiveness practices that align better with shareholders' risk preferences.

Third, gender discrimination has been proven to be a determining and confounding factor that could explain the association between AC gender diversity and financial reporting quality (Garcia-Lara et al., 2017). This paper aims to examine whether this influence persists when evaluating corporate tax aggressive policies. Specifically, we aim to assess whether the impact of the presence of female directors on tax compliance is more pronounced in gender-diverse or gender-discriminating environments.

Fourth, this paper analyzes the impact of female directors on tax compliance in gender-diverse ACs to assess whether a gender effect exists in the absence of gender discrimination and if it is driven by a more prominent monitoring or advisory role. As documented by previous research, a critical mass of female directors is necessary to observe significant gender effects on corporate outcomes (Post et al., 2011; Joecks et al., 2013).

Fifth, this study examines whether the influence on the levels of tax compliance arises from female directors' expertise. Given that expertise affects whether directors perform more of a monitoring or an advisory role (Adams and Ferreira, 2009; Baldenius et al., 2014; Armstrong et al., 2015; Jiang and Laux, 2024) and comprehending tax policies requires specialized knowledge and expertise, we expect that female directors' expertise should explain the effectiveness of the committee in addressing tax matters. This dual role of female experts as monitors and advisors supports the usefulness of both, agency, and resource dependence theories in explaining the gender effect on tax aggressiveness.

We use a sample of large US firms that are constituents of the S&P Global index, for the period between 2017 and 2019. We consider the US setting suitable for the analysis conducted in the paper because there are no mandatory requirements for corporate boards to be gender diverse, which addresses the potential effects of a mandatory board gender quota regulation on corporate tax strategies (Garcia-Blandon et al., 2022). This results in companies avoiding restrictions to select better-qualified candidates that fit with the boards' needs, but it also may entail high levels of gender discrimination, given the relatively low representation of women in leadership positions.

In contrast to Deslandes et al. (2020), our findings indicate that the presence of female directors on the AC significantly reduces corporate tax aggressiveness in gender-diverse and female-dominant environments, driven by female expertise. These findings support the hypothesis of a monitoring role of female directors on the AC in constraining tax-aggressive practices, contradicting the assumption that females and males exhibit similar behaviors in directorship positions. Furthermore, we uncover that the presence of female directors is associated with increased tax aggressiveness in firms that discriminate against women in accessing the board, indicating that gender discrimination and women's self-selection into less tax-aggressive firms

can be confounding factors when analyzing the influence of female directors on shaping corporate tax strategies.

The remainder of the paper is organized as follows. Section 2 presents the previous research in the field and states the hypotheses. Section 3 outlines the research design and describes the data. Section 4 reports and discusses the results, while section 5 provides robustness tests and additional analyses. Finally, section 6 concludes the study.

Literature review and hypotheses development

Female directors on ACs and tax aggressiveness

It is argued that the attributes of the board influence corporate tax aggressiveness (Armstrong et al., 2015), and that board gender diversity is an attribute that can enhance boards' effectiveness by mitigating agency problems arising from tax-aggressive strategies, through the monitoring of managers' decision-making (Fama and Jensen, 1983). Prior studies that examined the relationship between the presence of female board members and tax aggressiveness, consistently found a negative association (Richardson et al., 2016; Lanis et al., 2017; Khlif and Achek, 2017; Chen et al., 2019; Khaoula and Moez, 2019; Riguen et al., 2020), and based their findings on general gender differences. This perspective portrays women as generally more risk-averse than men (Betz et al., 1989; Watson and McNaughton 2007; Croson and Gneezy, 2009; Hardies et al., 2013; Francis et al., 2014), and more inclined toward truthfulness and conservatism (Nehme and Jizi, 2018). These studies contend that females exhibit higher ethical standards (Peterson et al., 2010) and sensitivity than males (Simga-Mugan et al., 2005), which makes them more reluctant to engage in unethical behavior (Wahn, 2003; Roxas and Stoneback 2004), pay more attention to environmental and social responsibilities (Lamsa et al., 2008), and are considered more transparent (Gul et al., 2011) and independent when making decisions (Adams and Ferreira, 2009; Lanis et al., 2017). In addition, regarding

gender differences in tax compliance, women are seen as more compliant than men (Kastlunger et al., 2010). This has been interpreted as a positive contribution of gender diversity to align management with shareholders' preferences by improving monitoring effectiveness of corporate boards and, therefore, reducing agency costs (Chen et al., 2019).

However, when analyzing gender diversity at the board level, it becomes challenging to comprehend how female directors exert their influence over the decisions on corporate taxes. It appears more accurate to examine the impact of gender diversity on tax risk management at the AC level, as financial risk-related matters are typically closely monitored by the AC before being escalated to the board (Deslandes et al., 2020). In addition, there is evidence that female directors self-select in monitoring-related board committees (Adams and Ferreira, 2009; Chen et al. 2017), such as audit and governance committees (Carcello et al., 2002), which makes the AC a suitable committee for examining gender diversity. Research at the AC level is limited and has produced mixed results. Deslandes et al. (2020) failed to find a significant effect of the presence of female directors, which was attributed to the small number of women on AC (mean of 11.3 percent and median of 0) in Canadian firms for the period from 2011 to 2015. In contrast, Dang and Nguyen (2022) found evidence supporting a negative association between AC gender diversity and corporate tax avoidance practices, which they explained through overarching gender differences.

However, prior studies suggest that women and men generally exhibit similar behaviors in leadership roles, showing no substantial differences in risk-taking, decision-making, or overconfidence (Johnson and Powell, 1994; Atkinson et al., 2003; Croson and Gneezy, 2009; Deaves et al., 2009; Sila et al., 2016). Moreover, regarding tax risk behavior, evidence indicates that female tax professionals are as likely as males to offer aggressive tax advice (Bobek and Hatfield, 2004), implying similar ethical standards.

Furthermore, some studies suggest that board gender diversity corresponds to a greater inclination toward risk-taking (Adams and Ferreira, 2009; Muller-Kahle and Lewellyn, 2011; Østergaard et al., 2011; Berger et al., 2014; Adams and Ragunathan, 2017; Chen et al., 2019). The results of these studies align more with the directors' advisory role according to the resource dependence theory (Riguen et al., 2020; Al Lawati and Hussainey, 2021). These findings reveal that in companies with more female presence on boards, directors tend to receive a larger proportion of equity-based compensation (Adams and Ferreira, 2009), such boards facilitate effective decision-making for evaluating risky strategic options (Muller-Khale and Lewellyn, 2011), encourage managerial risk-taking for value enhancement (Chen et al., 2019), and correlate positively with increased risk-taking in financial institutions (Berger et al., 2014).

Therefore, it is unclear that gender-diverse boards are associated with increased risk aversion, and that agency theory prevails over the resource dependence view. Consequently, the impact of the presence of AC female directors on corporate tax risk management remains an empirical question. In line with previous research focused on the entire board, we aim to verify whether the presence of female directors on the AC is associated with less corporate tax aggressiveness:

> Hypothesis 1. *Female directors on the AC are negatively associated with corporate tax aggressiveness.*

Gender discrimination and tax aggressiveness

The existence of gender discrimination in the access to leadership positions may play a fundamental role in explaining the effects associated with the presence of female directors on the board and corporate outcomes. We define gender discrimination as previous related studies (Bilimoria and Piderit, 1994; Farrell and Hersch, 2005; García-Lara, et al., 2017) as the existence of gender biases in the appointment of directors and recruitment processes that favor men and, thus, are not entirely based on the skills of the candidate. According to García-Lara

et al. (2017), gender biases in hiring can impact corporate outcomes.[1] This connection happens in a few ways. First, biases against women could create a larger pool of skilled female candidates for board positions. Companies that do not discriminate can then hire the most talented candidates. Conversely, discriminating firms prefer appointing male directors over better-qualified female candidates, likely leading to a suboptimal composition of the boardroom and firm-director matches (Ferreira et al., 2017), and signaling low-quality corporate governance. Considering the negative relationship between the quality of corporate governance and firms' tax aggressiveness strategies (Ortas & Gallego-Álvarez, 2020), gender biases may generate a negative link between gender diversity on boards and tax compliance.

Second, because women face more hurdles to becoming directors, those who succeed may work harder than their male counterparts. They might be more concerned about their reputation and face more scrutiny, pushing for better results (Lee and James, 2007). Under this assumption, an advisory role of highly qualified female directors may prevail, resulting in increased tax-aggressive policies.

Lastly, having female directors could signal that a company has a strong governance system. Better-governed firms usually choose directors based on merit and clear criteria (e.g., Hutchinson et al., 2015), do not discriminate against women, and have fair director selection. If these firms are also more reluctant to engage in risky tax-aggressive behaviors, having more female directors on the board would reduce tax aggressiveness. Therefore, female directors may self-select into non-discriminating firms, which are, in turn, less tax-aggressive.

Consequently, the presence of female directors in discriminating environments may be associated with reduced corporate taxes. Therefore, our second hypothesis is as follows:

[1] Whereas the authors specifically refer to accounting quality, the reasoning generalizes to other corporate outcomes such as tax aggressiveness.

Hypothesis 2. In gender-discriminating firms, female directors on the AC show a positive association with corporate tax aggressiveness.

Gender equality on the AC and tax aggressiveness

A proper analysis of the influence of female directors on corporate outcomes requires a fair representation of females on corporate environments. Gender effects should be examined in gender-diverse boards and committees to confirm that the influence of female directors is not driven by women's self-selection into less tax-aggressive firms. Supporting this idea, previous studies contend that a critical mass of female directors is necessary to observe significant gender differences in corporate decisions (Post et al., 2011; Joecks et al., 2013).

Consequently, if general gender disparities, observed in the broader population, also hold true within directorship roles, including membership on ACs, then the assumption of a monitoring role for female directors will prevail in gender-diverse board committees, resulting in less corporate tax aggressiveness policies (Richardson et al., 2016; Lanis et al., 2017; Khlif and Achek, 2017; Chen et al., 2019; Khaoula and Moez, 2019; Riguen et al., 2020).

Conversely, if men and women perform similarly in directorial positions (Johnson and Powell, 1994; Atkinson et al., 2003; Bobek and Hatfield, 2004; Croson and Gneezy, 2009; Deaves et al., 2009; Sila et al., 2016), one should not expect a significant impact of the presence of female directors on tax aggressiveness in gender-diverse ACs.

In addition, some other studies indicate that, in contrast with gender differences in the general population, female directors are less security and tradition-oriented and care more about stimulation than male directors. They also appear to be slightly more risk-prone than their male peers (Adams and Funk, 2012). Hence, if female directors are more inclined toward risk-taking

(Adams and Ferreira, 2009; Adams and Funk, 2012), then an advisory role may prevail, leading to more aggressive tax strategies.

Previous research suggests that, according to the agency theory, the presence of female directors on boards leads to reduced tax aggressiveness owing to perceived differences between males and females. However, it is unclear that these general gender differences persist in directorial roles and that the presence of female directors on the AC contributes to constraining tax aggressiveness practices, by improving the monitoring effectiveness of the committee. In our third hypothesis, we aim to verify whether the monitoring role of female directors prevails in gender-diverse:

> *Hypothesis 3. In gender-diverse ACs, female directors show a negative association with corporate tax aggressiveness.*

Female expertise and tax aggressiveness

According to the resource dependence theory, the influence of gender diversity on corporate tax strategies should be attributed to the expertise and background of directors (Riguen et al., 2020; Al Lawati and Hussainey, 2021), as tax is a very specialized field (Deslandes et al., 2020). Accordingly, the expertise of female AC members may contribute to enhancing the effectiveness of the committee in monitoring and advising on tax risks (Fairchild and Li, 2005; Faleye et al., 2018).

It is argued that female directors possess the appropriate skills for effectively monitoring financial statements (Chung and Monroe 2001; O'Donnell and Johnson 2001; Niskanen et al. 2011; Ittonen et al. 2013; Garcia-Blandon et al. 2019). Therefore, the presence of female expert directors on the AC could contribute to enhancing the efficiency of corporate tax planning. This could be a channel to explain the link between gender diversity and corporate tax

aggressiveness. Consequently, we anticipate a significant association between expert female directors and tax aggressiveness.

Hypothesis 4. The influence of AC female directors on corporate tax aggressiveness is driven by female experts.

Methodology and sample selection

Research design

To test our first and fourth hypotheses, in line with previous studies, we regress various measures of tax aggressiveness on the presence of female directors on the AC. The empirical model is as follows:

$$TAgr_{i,t} = \propto + \beta_1 Fem\_director_{i,t} + \beta_n X_{i,t} + fixed\ effects + \varepsilon_t \qquad (1)$$

Given that the focus of the AC is on financial reporting, influencing financial numbers such as tax expense and tax assets and liabilities, we gauge tax aggressiveness (*TAgr*) using firms' GAAP effective tax rates (*GAAP_ETR*) and book-tax differences (*BTD*), as in prior research (Lanis and Richarson, 2015; Armstrong et al., 2015; Lanis et al., 2017; Hsu et al., 2018; Chen et al., 2019).

GAAP_ETR is calculated as the sum of total tax expense for a five-year rolling period from *t*-4 to *t*, divided by the sum of the firm's income before taxes for the same five-year period. We require firms to have positive income before taxes when summed over the five-year period (Dyreng et al., 2008). As usual in the related literature, we winsorize *GAAP_ETR* to the 0–1 range.

BTD captures tax-related activities that create permanent and temporary differences between accounting and taxable income and is calculated as income before taxes less taxable income,

divided by lagged total assets. Taxable income is derived by dividing income tax expense by the annual corporate statutory tax rate (Desai and Dharmapala, 2006; Francis et al., 2014; Lanis et al., 2017). Consistent with Lanis and Richardson (2015), we use raw values of *BTD*.

We use two variables to measure gender diversity on the AC *(Fem_director)*:

1. *Female*: the proportion of female directors on the AC.
2. *Female_Expert*: the percentage of female expert directors over the total amount of directors on the AC (Sultana et al. 2020; Abbasi et al. 2020). To classify female audit members as experts, we follow the Security Exchange Commission's (SEC) definition of "AC financial experts", by defining them as individuals with experience in preparing or auditing financial statements, as well as with experience in overseeing financial reports (SEC 2003).

We control for corporate governance and economic determinants of corporate tax planning by including control variables (*X*) in Equation *(1)* that are common in the tax literature (Armstrong et al., 2015; Lanis and Richardson, 2015; Davies et al., 2016; Lanis et al., 2017; Hsu et al., 2018; Deslandes et al., 2020; Garcia-Blandon et al., 2022). The Appendix provides detailed definitions of these variables.

As we describe in Section 2, we expect that the association between gender diversity and tax aggressiveness is mediated by the existence of gender discrimination. To identify firms that discriminate against women in the access to directorship positions, we follow the approach proposed by García-Lara et al. (2017), following Blum et al. (1994), Hillman et al. (2007) and Srinidhi et al. (2011). Accordingly, first we define a logit model to estimate the *ex-ante* probability of a firm appointing a female director:

$$Fem\_director_{i,t} = \propto + \beta_1 Size_{i,t} + \beta_2 AC_{Size_{i,t}} + \beta_3 Female\ participation_{i,t} + \beta_4 Regulation_i + \beta_5 Firm\ age_{i,t} + \beta_6 MB_{i,t} + \beta_7 ROA_{i,t} + \beta_8 RET_{i,t} + \beta_9 CONCENTRATION_{i,t} + Year\ control + \varepsilon_{i,t} \quad (2)$$

Where *Fem_director* is an indicator variable that equals 1 if there is at least one woman on the AC and 0 otherwise. *Size* is the natural log of total assets of company *i* at the end of each fiscal year *t*, because larger companies experience stronger pressure to meet social expectations and to comply with gender recommendations and regulations (Hillman et al. 2007). *ACsize* is the natural log of the number of AC members, since larger boards and committees are more likely to include female directors (García-Lara et al. 2017). *Female participation* is the percentage of women participating in management positions in each industry and year, according to ILOSTAT. *Regulation* is an indicator variable equaling 1 if the firm *i* belongs to regulated industries, which are more likely to include women in directorship positions (García-Lara et al. 2017). As in Hillman et al. (2007), we include *Firm age* (the natural log of the firm *i* age at the end of year *t*), and *MB* (market-to-book ratio). Finally, *ROA* and *RET* (shares' annual return) are also considered, because there is evidence that less profitable companies present a higher propensity of appointing women for their management teams (Haslam and Ryan 2008).

Second, we use estimated probabilities to define non-discriminating firm-year observations as those with at least the percentage of female directors on AC that corresponds to the annual median value (25% in 2017 and 2018, 28.6% in 2019), plus those other observations below this percentage having a low probability (less than 10%) of appointing a woman in the future given their specific characteristics. On the other hand, the firms that do not fulfil the former condition are classified as discriminating firms. This results in the variable *Gender_discrim* that equals 1 if the firm-year observation is classified as discriminating, and 0 otherwise. 40.3% of all observations (539) have been classified as discriminating, and 59.7% as non-discriminating observations (799).

This means that some companies with a percentage of female directors below the median are classified as non-discriminating firms, because the *ex-ante* probability of appointing females in

the future, based on their characteristics, is low. This approach helps to avoid some misclassifications that may occur when using a single method (such as the median value) to identify non-discriminating firms. Furthermore, using the median rather than more straightforward alternatives, such as having at least one female director on the AC, helps to prevent firms that discriminate (e.g., due to tokenism) from being incorrectly classified as non-discriminating.

To test our second hypothesis, we regress various measures of tax aggressiveness on the interaction term between the presence of female directors on the AC and gender discrimination. The empirical model is as follows:

$$TAgr_{i,t} = \propto + \beta_1 Fem\_director_{i,t} + \beta_2 Gender\_discrim_{i,t} + \beta_3 Fem\_director_{i,t} \times Gender\_discrim_{i,t} + \beta_n X_{i,t} + fixed\ effects + \varepsilon_t \quad (3)$$

According to our second hypothesis, we predict significant coefficients for the interaction term (*Fem_director x Gender_discrim*). This would indicate that gender discrimination influences the effect of female directors on corporate tax aggressiveness.

Finally, we aim to examine whether the effect of female directors on tax aggressiveness policies is driven by self-selection in better-governed and less tax-aggressive firms or by females' differential characteristics. To do this, we analyze the gender effect in firms with gender-diverse and female-dominant committees and define them (*Gender_diversity*) as those firms with at least 50% of female directors on the AC. *Gender_diversity* equals 1 if the firm-year observation is classified as gender-diverse or female-dominant (19.0%, 254 observations) and 0 otherwise (81.0%, 1084 observations).

To test our third and fourth hypotheses, we regress various measures of tax aggressiveness on the interaction term between female directors and gender diversity:

$$TAgr_{i,t} = \propto + \beta_1 Fem\_director_{i,t} + \beta_2 Gender\_diversity_{i,t} + \beta_3 Fem\_director_{i,t} \times Gender\_diversity_{i,t} + \beta_n X_{i,t} + fixed\ effects + \varepsilon_t \quad (4)$$

According to our third hypothesis, we predict significant coefficients for the interaction term (*Fem_director x Gender_diversity*). This would indicate that the presence of female directors affects corporate tax aggressiveness.

Sample and descriptive statistics

Sample

We conduct an empirical analysis using a balanced sample of US companies included in the S&P 1200 Global Index at the end of the 2017 fiscal year, after the implementation of the Tax Cuts and Jobs Acts (TCJA) of 2017 (CPL, 2017) that significantly reduced income tax rates for large companies. It covers the period between 2017 and 2019. The decision to work with relatively short periods is supported by the results of Nekhili et al. (2020) and Sultana et al. (2020), which highlight the accelerated process of incorporation of women in top management positions. The sample includes the 446 largest US companies and 1,338 firm-year observations[2].

Data on AC members' gender and financial expertise, as well as on directors' profiles, were hand-collected from the Bios information available in S&P Capital IQ database. Financial data was obtained from both S&P Capital IQ and Refinitiv databases.

3.2.2. Descriptive Statistics

Table 1 summarizes the descriptive statistics. As shown in Panel A in Table 1, the mean value of GAAP-ETR (*GAAP_ETR*) is 24.4%, somewhat lower than the 26.0% reported in Davies et

[2] We started with 486 firms and 1,458 observations and removed 40 firms and 120 observations with a negative income before taxes when summed over the five-year period *t* to *t-4*.

al. (2016) and the 26.7% in Lanis et al. (2017). The mean value of book-tax differences (*BTD*) is 0.09, noticeably higher than the0.02 reported by Hsu et al. (2018) for the period 2004-2012.

The composition of ACs in large US companies is predominantly male-dominated. As shown in Panel A of Table 1, less than one third (28.7%) of AC directors are women (*Female*), on average during the period 2017 to 2019. However, it is worth noting that 81.6% of the firms in our sample have appointed at least one woman as an AC member (not tabulated). The representation of female expert directors (*Female_Expert*) on ACs is significantly lower. On average, only 12.6% of expert directors on ACs are women.

Panel B of Table 1 presents the percentage of cases for control dummy variables (*Gender_discrim*, *Gender_diversity*, *CEO_Director*, and *Loss*). 40.3% of observations have been classified as discriminating environments, and only 19.0% of firms present at least 50% of female directors on their AC. Interestingly, in 53.3% of cases, the CEO of the company is also the chair of the board (*CEO_Chair*), indicating that in larger companies, top management seeks to exert some control over the firm's monitoring body.

Table 1 about here

Panel C of Table 1 presents the descriptive statistics for the continuous control variables used in Equation *(1)*. Consistent with prior research, we winsorize continuous variables at the top and bottom 1%. The average proportion of financial experts (*Expert*) is 42.3% and the average percentage of independent directors (*Independent*) is 85.8%. The average size of ACs (*AC_Size*), with an average of 4.36 members.

Table 2 presents pairwise correlation coefficients for the variables in Equation *(1)*. The proportion of female directors on the AC (*Female*) and the percentage of female experts over the total amount of directors (*Female_Expert*) show positive correlations with *GAAP_ETR* and

negative with *BTD*, suggesting that female representation on the AC is associated with lower tax aggressiveness. However, the correlation coefficients are not significant. As anticipated, firms classified as discriminating (*Gender_discrim* = 1) present a negative and significant correlation with the proportion of female directors (*Female*) and female experts (*Female_Expert*) on the AC, while the correlation coefficients with *Gender_diversity* are positive and significant. Interestingly, the size of the AC (*AC_Size*) is positively and significantly correlated with effective tax rates (*GAAP_ETR*), suggesting that larger ACs are more effective in preventing tax aggressiveness practices. The correlation matrix also reveals potential multicollinearity issues between firms' size (*Size*), cash flows from operations (*CF*) and return on assets (ROA), as well as between ROA and the existence of a net operating loss carryforward (*Loss*). Therefore, we will address potential multicollinearity in our estimations.

Table 2 about here

Results and discussion

We present the results of the multivariate analysis in this section. Consistent with previous related research (Desai and Dharmapala, 2009; Dyreng et al. 2010) and following the results of the Hausman test (untabulated), the estimates are obtained using firm and year-fixed effects. The *F* tests indicate that all the estimations are globally significant at the usual statistical levels (p-value < 0.01).

Female directors on ACs and tax aggressiveness

Table 3 presents the results of estimating Equation *(1)*. R-square values range between 6.0% and 34.8%. All variance inflation factors (VIFs) for all variables are below 2, except for *CF* and *ROA*. To ensure the robustness of our findings, we re-run the regression excluding *CF*[3] and

[3] After dropping this variable, all VIF values are below 2.

found that our main results remain unchanged, indicating that they are not significantly affected by multicollinearity.

Table 3 about here

In Column (1) of Table 3, we present the results of the analysis examining the relationship between the percentage of female directors (*Female*) on the AC and corporate effective tax rates (*GAAP_ETR*). In contrast to Deslandes et al. (2020), we do find evidence indicating that the presence of women on the AC is associated with lower tax-aggressive practices (β_1 = 0.135, *p*-value = 0.007, Table 3, Column (1)), which suggests that female directors play a monitoring role when assessing corporate tax strategies at the AC level. This result appears to be driven by the expertise and background of female directors (Column (2)), as the percentage of female experts on the AC (*Female_Expert*) presents a positive and significant coefficient (β_1 = -0.344, *p*-value = 0.007, Table 3, Column (2)).

We find dissimilar results when assessing the association between female directors (*Female*) and female experts (*Female_Expert*) and book-tax differences (*BTD*). We do not find a significant relationship between the percentage of female directors on the AC and recognized tax assets and liabilities in the balance sheet (Column (3)). However, we observe that the presence of female experts influences corporate tax aggressiveness practices by reducing book-tax differences (β_1 = -0.378, *p*-value = 0.027, Table 3, Column (4)).

Taken together, the results presented in Table 3 support the notion that the presence of female directors on the AC constrains corporate tax-aggressive behavior, aligning with the prevalence of a monitoring role over an advisory role of female directors. Additionally, our findings

provide an interesting insight into the role of expertise in shaping tax practices. In line with Armstrong et al. (2015) and Hsu et al. (2018), technical expertise appears to play a critical role when addressing tax issues at the AC level, as we document empirical evidence supporting a significant effect of female directors on corporate tax aggressiveness driven by the presence of female experts. This result suggests that the gender influence on tax aggressiveness may be driven by directors' expertise rather than gender diversity. Collectively, the results in Table 3 support our first and fourth hypotheses.

Gender discrimination and tax aggressiveness

We regress on Equation *(3)* to examine whether the effect of female directors on tax aggressiveness is driven by gender discrimination, i.e., by women's self-selection into better-governed and less tax-aggressive firms.

The results of estimating Equation *(3)* are displayed in Table 4. R-square values range between 6.7% and 36.5%. All variance inflation factors (VIFs) for all variables are below 2, except for *Female*, *Gender_discrim*, *CF* and *ROA*. To ensure the robustness of our findings, we re-run the regression excluding *CF*[4] and found that our main results remain unchanged, indicating that they are not significantly affected by multicollinearity.

Table 4 about here

The interaction term between the percentage of AC female directors and gender discrimination (*Female x Gender_discrim*) reveals that the presence of female directors on AC in discriminating firms is associated with higher levels of tax aggressiveness (β_3 = -0.345, *p*-value = 0.005, Table 4, Column (1); β_3 = 0.490, *p*-value = 0.007, Table 4, Column (3)).

[4] After dropping this variable, all VIF values are below 2.

Interestingly, when we introduce the interaction term between the percentage of female experts and gender discrimination (*Female_Expert x Gender_discrim*) we find that the influence of female directors on reduced effective tax rates (β_3 = -0.353, *p*-value = 0.028, Table 4, Column (2)) and increased book-tax differences (β_3 = 0.633, *p*-value = 0.030, Table 4, Column (4)) is driven by expertise. These results also suggest that female experts may play an advisory role in discriminating firms, which aligns with the assumptions of the resource dependence theory.

Collectively, these results support our second hypothesis, as they suggest that the effect of female directors on reduced tax aggressiveness at the AC level may be driven by females' self-selection in less tax-aggressive firms.

Gender equality on the AC and tax aggressiveness

Finally, we estimate Equation *(4)* to assess whether the influence of female directors on tax aggressiveness is driven by gender discrimination and self-selection or by the differential characteristics of women as AC directors. In addition, this estimation allows us to examine whether female directors exert a more pronounced monitoring or advisory role at the AC level.

The results of estimating Equation *(4)* are presented in Table 5. R-square values range between 6.7% and 36.5%. All variance inflation factors (VIFs) for all variables are below 2, except for *Female*, *Gender_diversity*, *CF* and *ROA*. To ensure the robustness of our findings, we re-run the regression excluding *CF*[5] and found that our main results remain unchanged, indicating that they are not significantly affected by multicollinearity.

Table 5 about here
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[5] After dropping this variable, all VIF values are below 2.

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When we examine the effect of female directors on tax aggressiveness in gender-diverse and female-dominant ACs, we obtain mixed results. We find evidence that the significant influence of females on increased corporate tax rates holds in these environments ($\beta_3 = 0.340$, p-value = 0.025, Table 5, Column (1)), suggesting that female directors may be more risk-averse, conservative, tax-compliant, and reluctant to engage in unethical behavior than their male counterparts. This results in a higher likelihood of constraining corporate aggressive practices and may lead to improved monitoring effectiveness of the AC and reduced agency costs, which align with the assumptions of the agency theory.

As expected, the type of expertise is a significant factor in the relationship between gender diversity and tax aggressiveness. We observe that the participation of female experts (*Female_Expert*) is positively associated with accrued taxes (*GAAP_ETR*) in gender-diverse and female-dominant committees ($\beta_3 = 0.305$, p-value = 0.005, Table 5, Column (2)).

We also observe a negative association between the presence of female directors and female experts and book-tax differences (*BTD*). However, we fail to find significant coefficients (Table 5; Columns (3) and (4). These results can have at least two interpretations. First, they may indicate that self-selection in less tax-aggressive firms drives the association between the presence of female directors and corporate tax behavior. Second, they also suggest that women may play an advisory role and engage in the same types of tax-aggressive strategies as male directors, through tax deductions on investments and tax credits, to enhance corporate tax efficiency, which may align better with shareholders' risk preferences.

Taken together, these findings do not allow us to accept our fourth hypothesis, as we do not find strong evidence of a female influence in constraining corporate tax-aggressive strategies. This may indicate that gender discrimination can still be a factor in explaining gender diversity effects at the AC level.

Robustness tests and additional analyses

We conducted a series of tests to ensure the soundness of our results.

An alternative measure of tax aggressiveness

Firstly, since tax aggressiveness is unobservable, we use an alternative proxy of *TAgr* to examine whether our results are sensitive to the choice of tax aggressiveness proxies. Accordingly, we perform our tests using Cash ETR (*cash_ETR)*.

Consistent with previous related studies (Dyreng et al., 2008; Davis et al., 2016; Deslandes et al., 2020), we calculate *Cash_ETR* as the sum of cash taxes paid for a five-year rolling period from *t*-4 to *t*, divided by the sum of the firm's income before taxes for the same five-year period. Following standard practice in the related literature, we winsorize it to the 0–1 range.

Table 6 presents the results of estimating Equations *(3)* and *(4)* with *cash_ETR* as the proxy of corporate tax aggressiveness, using firm and year fixed effects. The *F* tests indicate that all the estimations are globally significant at the usual statistical levels (p-value < 0.01). R-square values range between 4.8% and 5.9%.

Table 6 about here

We find similar results to those obtained when regressing Equations *(3)* and *(4)* using GAAP ETR as a proxy of tax aggressiveness as presented in Tables 4 and 5. These results support our findings suggesting that females self-select in less tax-aggressive firms, but also indicate that female directors play a monitoring role on the AC role by contributing to constrain tax aggressiveness practices in non-discriminating firms.

Endogeneity

Secondly, we addressed potential endogeneity in the estimations, as we recognize that AC gender diversity may be endogenously determined. As emphasized by Abdallah et al. (2015), endogeneity is a major concern in analyses of this nature, as the models may be influenced by reverse causality. Therefore, it is possible that a self-selection issue arises in our estimations. If better-governed companies are more likely to appoint women as directors, and if well-performing boards influence corporate tax planning (Ortas & Gallego-Álvarez, 2020), then gender diversity may generate a significant link with corporate tax practices (Garcia-Blandon et al., 2022). Furthermore, our estimates may be subject to measurement errors that can lead to biased and inconsistent parameter estimates in panel data regressions (Baum et al., 2007).

To address these potential threats to the soundness of our results, we employed instrumental variables to regress Equation *(1)* using panel data two-stage least squares (2SLS) with firm and year-fixed effects. We aimed to verify whether our findings in Table 3 hold after accounting for endogeneity. We employ the annual industry-level average percentage of female directors on boards (*Board female directors*) as our instrumental variable. This variable influences the representation of women on the AC but is theoretically assumed to not affect corporate tax planning. Subsequent testing confirmed that *Board female directors* was an appropriate instrument, as indicated by C-D, S-Y and Sargan tests (Table 7).

Table 7 about here

Regression results indicate the presence of biased parameter estimates in our main findings (Table 3) after controlling for endogeneity. We observe that the association between the proportion of female directors (*Female*) and female experts (*Female_Expert*) on ACs and tax aggressiveness remains significant for effective tax rates (*GAAP_ETR*; Table 7, Columns (1) and (2)), but becomes insignificant for book-tax differences (*BTD*; Table 7, Columns (3) and (4)). These results indicate that the estimates of a gender diversity effect on corporate tax-

aggressive policies may be driven by several sources of endogeneity, such women's self-selection into less tax-aggressive firms.

Interestingly, the results in Table 7 are similar to those presented in Table 5 when examining the influence of female directors in gender-diverse and female-dominant committees. This suggests that the research design based on gender-diverse environments can be effective in addressing some endogeneity concerns. Moreover, it also indicates the monitoring effect of female directors on effective tax rates holds true after controlling for endogeneity.

Conclusion and implications

The study expands the existing literature on the determinants of AC effectiveness in overseeing corporate tax matters by examining potential confounding factors that may drive the association between gender diversity and corporate tax aggressiveness. In particular, drawing on previous research (García-Lara et al., 2017), we examine the influence of gender discrimination on the observed gender effect in previous studies. Additionally, we analyze the impact of female directors on the AC on corporate tax strategies in gender-diverse and female-dominant environments and the role of expertise as a potential driver of this association.

In contrast to Deslandes et al. (2020), our findings indicate that the presence of female directors on the AC is associated with decreased corporate tax aggressiveness. Furthermore, building upon previous research, we uncover that this positive effect on tax aggressiveness can be attributable to gender discrimination and women's self-selection into less tax-aggressive firms. Specifically, the presence of female directors in discriminating firms is associated with a reduction in effective tax rates and the amount of taxes paid, and an increase in book-tax differences. This result casts doubts on the findings of previous studies suggesting a negative effect of female directors on tax avoidance at the board level (Lanis et al., 2017; Chen et al., 2019; Riguen et al., 2020), as it indicates that gender discrimination and self-selection may

drive the gender effect and generate biased estimates. These findings can also be viewed through the lens of a complementary approach of agency and resource dependence theories, suggesting that female directors combine monitoring and advisory roles to ensure the level of tax avoidance preferred by shareholders.

However, the influence of female directors on increased effective tax rates and taxes paid holds in gender-diverse and female-dominant AC, suggesting that even if females self-select in better-governed and less tax-aggressive firms, they still exert a monitoring role that significantly reduces corporate tax-aggressive practices. Furthermore, consistent with a joint influence of agency and resource dependence theories, the expertise of female directors plays a crucial role in this association, as female experts drive the gender effect on corporate tax aggressiveness.

Collectively, these findings support the hypothesis of a monitoring role of female directors on the AC in constraining tax-aggressive practices, contradicting the assumption that females and males exhibit similar behaviors in directorship positions. Furthermore, they emphasize the importance of expertise as a driver of the influence of female directors on tax aggressiveness and highlight the role of gender discrimination and self-selection as potential confounding factors in this association.

Our findings may be of interest to academics, managers, directors, shareholders, and regulators, as they suggest that gender discrimination is a signal of increased tax-aggressive practices and that gender-diverse ACs are associated with enhanced oversight of tax-risk policies and reduced corporate tax aggressiveness.

Our study is not without of limitations, which in turn suggest avenues for future research. First, since there is no consensus on the best proxy for tax aggressiveness, it would be valuable to consider different measures to test the results found in this study using GAAP tax rates, book-tax differences, and cash tax rates. Second, our findings raise the need for more qualitative

research to examine the factors that explain how the gender effect on ACs operates in practice, including the presence of a glass ceiling effect, "socialization", or tokenism. Third, it is important to explore whether the effects identified in this paper are contingent upon specific characteristics of female directors, such as age, culture, and education, as these factors may influence the relationship between gender diversity and tax aggressiveness. Fourth, it would be interesting to broaden the analysis to include other forms of diversity and levels of the organization, such as the executive board or the top management team, as they are also involved in shaping and monitoring tax strategies. Finally, it would be valuable to investigate the role of country differences in the gender effect.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used ChatGPT for proofreading. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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Tables

Table 1

Descriptive Statistics.

Panel A: measures of tax avoidance and female directors

Variable	*n*	Mean	Median	Minimum	Maximum	Standard deviation
GAAP_ETR	1,338	0.24	0.26	0.00	1.00	0.14
BTD	1,338	0.09	0.02	-1.25	0.63	0.22
Female	1,338	0.29	0.25	0.00	1.00	0.19
Female_Expert	1,338	0.13	0.00	0.00	0.67	0.16

Panel B: indicator variables (percent)

Variable	*N*	1	0
Gender_discrim	1,338	40.33	59.67
Gender_diversity	1,338	19.04	80.96
CEO_Chair	1,338	53.32	46.68
Loss	1,338	6.72	93.28

Panel C: control variables

Variable	*n*	Mean	Median	Minimum	Maximum	Standard deviation
Expert	1,338	0.42	0.40	0.00	1.00	0.23
Independent	1,338	0.86	1.00	0.00	1.00	0.22
*AC_Size**	1,338	4.36	4.00	2.00	8.00	1.16
CEO_Own	1,338	0.19	0.08	0.00	0.93	0.25
Inst_ownership	1,338	0.82	0.85	0.00	1.00	0.14
Size	1,338	10.11	9.94	7.77	14.33	1.28
CF	1,338	0.10	0.09	-0.04	0.30	0.07
ROA	1,338	0.06	0.05	-0.12	0.25	0.06
Lev	1,338	0.32	0.31	0.00	0.96	0.19
MB	1,338	3.97	2.65	-14.96	27.59	6.11
PPE	1,338	0.42	0.15	0.00	6.11	0.84
AbAccr	1,338	-0.11	-0.07	-0.99	0.94	0.31

GAAP_ETR (effective tax rates) and *BTD* (book-tax differences) are the dependent variables; the variables of interest are: *Female* (proportion of female directors on the AC); *Female_Expert* (percentage of female expert directors over the total amount of directors of the AC); *Gender_discrim* (1 if the firm-year observation is classified as discriminating, and 0 otherwise); and *Gender_diversity* (1 if the firm-year observation is classified as gender-diverse or female-dominant, and 0 otherwise); control variables are as defined in the Appendix.

* *AC_Size* is expressed as the total number of members on the AC for clarity.

Table 2

Pearson Correlations.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(1) *GAAP_ETR*	1.000																			
(2) *BTD*	-0.108*	1.000																		
(3) *Female*	0.037	-0.003	1.000																	
(4) *Female_Expert*	0.017	-0.022	0.542*	1.000																
(5) *Gender_discrim*	-0.034	0.020	-0.745*	-0.414*	1.000															
(6) *Gender_diversity*	0.046	-0.012	0.739*	0.420*	-0.399*	1.000														
(7) *Expert*	-0.017	-0.027	0.091*	0.442*	-0.091*	0.110*	1.000													
(8) *Independent*	-0.018	-0.008	0.093*	0.069*	-0.073*	0.068*	0.048	1.000												
(9) *AC_Size*	0.067*	0.009	-0.047	-0.099*	0.146*	-0.156*	-0.197*	-0.070*	1.000											
(10) *CEO_Chair*	-0.001	-0.010	0.041	0.010	0.022	-0.004	-0.088*	0.061*	0.165*	1.000										
(11) *CEO_Own*	0.063*	0.008	-0.028	0.017	-0.003	-0.029	-0.052	-0.057	-0.090*	-0.015	1.000									
(12) *Inst_ownership*	-0.053	-0.003	-0.055	-0.035	0.048	-0.052	0.023	-0.064*	-0.041	-0.025	0.015	1.000								
(13) *Size*	-0.009	-0.055	0.022	-0.012	-0.023	-0.015	-0.051	0.092*	0.140*	0.162*	-0.079*	-0.201*	1.000							
(14) *CF*	0.022	0.197*	0.025	-0.001	-0.041	0.031	-0.009	0.013	-0.087*	-0.110*	0.065*	0.008	-0.431*	1.000						
(15) *ROA*	-0.016	0.263*	0.025	-0.013	-0.015	0.023	-0.021	0.047	-0.019	-0.041	0.020	-0.036	-0.294*	0.690*	1.000					
(16) *Lev*	-0.046	-0.032	0.025	-0.009	0.000	0.040	-0.052	-0.074*	0.005	-0.034	0.078*	0.093*	-0.291*	0.112*	0.035	1.000				
(17) *MB*	0.012	0.052	0.010	-0.035	-0.015	0.002	-0.024	0.018	-0.004	0.011	0.058	-0.028	-0.155*	0.296*	0.295*	-0.003	1.000			
(18) *Loss*	0.052	-0.114*	-0.016	0.021	-0.023	-0.021	0.050	-0.040	-0.060*	-0.071*	-0.030	0.051	-0.013	-0.153*	-0.529*	0.034	-0.116*	1.000		
(19) *PPE*	-0.016	0.073*	-0.007	-0.013	-0.009	-0.004	-0.019	0.013	-0.031	-0.013	0.055	-0.036	0.210*	0.000	-0.080*	-0.097*	-0.052	0.048	1.000	
(20) *Abaccr*	0.007	0.033	-0.003	-0.018	0.026	-0.026	0.016	-0.013	0.030	0.016	-0.034	-0.037	0.061*	-0.168*	0.062*	-0.046	-0.018	-0.132*	-0.353*	1.000

* Statistically significant at a 1% level;

GAAP_ETR (effective tax rates) and *BTD* (book-tax differences) are the dependent variables; the variables of interest are: *Female* (proportion of female directors on the AC); *Female_Expert* (percentage of female expert directors over the total amount of directors of the AC); *Gender_discrim* (1 if the firm-year observation is classified as discriminating, and 0 otherwise); and *Gender_diversity* (1 if the firm-year observation is classified as gender-diverse or female-dominant, and 0 otherwise); control variables are as defined in the Appendix.

Table 3
Female Directors and Tax Aggressiveness

	(1)	(2)	(3)	(4)
	GAAP_ETR	*GAAP_ETR*	*BTD*	*BTD*
Female	**.135*** **		.027	
	(.05)		(.109)	
Female_Expert		**.344*** **		**-.378** **
		(.127)		**(.171)**
Expert	-.035	-.187**	.064	.189*
	(.045)	(.084)	(.097)	(.112)
Independent	-.042	-.101**	-.025	-.025
	(.027)	(.043)	(.058)	(.058)
AC_Size	.056	.022	.008	.036
	(.04)	(.065)	(.087)	(.087)
CEO_Chair	-.002	-.023	-.034	-.038
	(.017)	(.027)	(.036)	(.036)
CEO_Own	-.014	-.184*	-.099	-.1
	(.069)	(.111)	(.15)	(.149)
Inst_ownership	-.034	-.033	.042	.042
	(.039)	(.063)	(.085)	(.085)
Size	.008	.013	.052	.054
	(.02)	(.033)	(.044)	(.044)
CF	.266	.703**	1.078***	1.115***
	(.182)	(.295)	(.396)	(.395)
ROA	-.064	-.451*	.874***	.858***
	(.152)	(.246)	(.331)	(.33)
Lev	.327***	.359***	.059	.036
	(.085)	(.138)	(.185)	(.185)
MB	.001	.001	-.002	-.001
	(.001)	(.002)	(.003)	(.003)
Loss	.045*	-.007	.083	.082
	(.027)	(.043)	(.058)	(.058)
PPE	-.004	-.012	.028**	.027**
	(.006)	(.01)	(.014)	(.013)
Abaccr	-.008	-.029	.029	.026
	(.015)	(.024)	(.032)	(.032)
Firm fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Obs.	1338	1338	1338	1338
R-squared	.065	.06	.344	.348

Standard errors are in parenthesis
*** *p<0.01, ** p<0.05, * p<0.1*
Results of estimating Equation *(1)*: $TAgr_{i,t} = \propto + \beta_1 Fem\_director_{i,t} + \beta_n X_{i,t} + fixed\ effects + \varepsilon_t$. *GAAP_ETR* (effective tax rates) and *BTD* (book-tax differences) are the dependent variables; the variables of interest are *Female* (proportion of female directors on the AC) and *Female_Expert* (percentage of female expert directors over the total amount of directors of the AC); control variables are as defined in the Appendix.

Table 4
Gender Discrimination and Tax Aggressiveness

	(1) *GAAP_ETR*	(2) *GAAP_ETR*	(3) *BTD*	(4) *BTD*
Female	.418***		-.07	
	(.107)		(.107)	
Gender_discrim	.156***	.021	-.115**	-.067
	(.052)	(.041)	(.057)	(.05)
Female x Gender_discrim	**-.345*** **		**.49*** **	
	(.122)		**(.181)**	
Female_Expert		.495***		-.354**
		(.16)		(.164)
Female_Expert x Gender_discrim		**-.353** **		**.633** **
		(.16)		**(.292)**
Expert	-.043	-.191**	.11	.208*
	(.045)	(.084)	(.093)	(.107)
Independent	-.039	-.106**	-.01	-.025
	(.027)	(.043)	(.056)	(.056)
AC_Size	.085**	.005	-.083	-.072
	(.042)	(.068)	(.084)	(.085)
CEO_Chair	-.003	-.025	-.039	-.042
	(.017)	(.027)	(.035)	(.035)
CEO_Own	-.017	-.189*	-.08	-.073
	(.068)	(.111)	(.147)	(.147)
Inst_ownership	-.034	-.039	.049	.055
	(.039)	(.063)	(.081)	(.081)
Size	.01	.012	.059	.065
	(.02)	(.033)	(.042)	(.042)
CF	.297	.72**	1.156***	1.208***
	(.181)	(.294)	(.382)	(.382)
ROA	-.077	-.487**	.999***	.988***
	(.151)	(.246)	(.319)	(.319)
Lev	.328***	.351**	.071	.072
	(.085)	(.138)	(.179)	(.179)
MB	.001	.001	-.002	-.001
	(.001)	(.002)	(.003)	(.003)
Loss	.043	-.008	.088	.082
	(.026)	(.043)	(.055)	(.055)
PPE	-.005	-.013	.022*	.019
	(.006)	(.01)	(.013)	(.013)
Abaccr	-.008	-.028	-.006	-.01
	(.015)	(.024)	(.031)	(.031)
Firm fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Obs.	1338	1338	1338	1338
R-squared	.075	.067	.364	.365

Standard errors are in parenthesis
*** *p<0.01, ** p<0.05, * p<0.1*

Results of estimating Equation *(3)*: $TAgr_{i,t} = \propto + \beta_1 Fem\_director_{i,t} + \beta_2 Gender\_discrim_{i,t} + \beta_3 Fem\_director_{i,t} \times Gender\_discrim_{i,t} + \beta_n X_{i,t} + fixed\ effects + \varepsilon_t$. *GAAP_ETR* (effective tax rates) and *BTD* (book-tax differences) are the dependent variables; the variables of interest are: *Female x Gender_discrim* (*Female* is the proportion of female directors on the AC; *Gender_discrim* is an indicator variable that equals 1 if the firm-year observation is classified as discriminating, and 0 otherwise); and *Female_Expert x Gender discrim* (*Female_Expert* is the percentage of female expert directors over the total amount of directors of the AC); control variables are as defined in the Appendix.

Table 5
Gender Diversity and Tax Aggressiveness

	(1) *GAAP_ETR*	(2) *GAAP_ETR*	(3) *BTD*	(4) *BTD*
Female	.047		-.12	
	(.067)		(.146)	
Gender_diversity	-.156**	-.038	.195	.187***
	(.079)	(.031)	(.171)	(.067)
Female x Gender_diversity	**.34****		**-.136**	
	(.152)		**(.33)**	
Female_Expert		.067		-.43**
		(.087)		(.188)
Female_Expert x Gender_diversity		**.305*****		**-.276**
		(.108)		**(.233)**
Expert	-.031	-.103**	.056	.242**
	(.045)	(.052)	(.097)	(.113)
Independent	-.037	-.054**	-.031	-.017
	(.027)	(.027)	(.058)	(.058)
AC_Size	.081*	.053	.023	.062
	(.041)	(.04)	(.09)	(.087)
CEO_Chair	-.004	-.004	-.037	-.039
	(.017)	(.017)	(.036)	(.036)
CEO_Own	-.02	-.024	-.097	-.089
	(.069)	(.068)	(.149)	(.148)
Inst_ownership	-.03	-.035	.044	.047
	(.039)	(.039)	(.085)	(.085)
Size	.011	.007	.052	.055
	(.02)	(.02)	(.044)	(.043)
CF	.281	.287	1.094***	1.115***
	(.181)	(.181)	(.395)	(.393)
ROA	-.066	-.1	.877***	.899***
	(.152)	(.152)	(.33)	(.329)
Lev	.331***	.323***	.049	.035
	(.085)	(.085)	(.185)	(.184)
MB	.001	.001	-.002	-.001
	(.001)	(.001)	(.003)	(.003)
Loss	.046*	.039	.09	.097*
	(.027)	(.027)	(.058)	(.058)
PPE	-.005	-.005	.028**	.028**
	(.006)	(.006)	(.013)	(.013)
Abaccr	-.009	-.008	.033	.032
	(.015)	(.015)	(.032)	(.032)
Firm fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Obs.	1338	1338	1338	1338
R-squared	.071	.074	.349	.356

Standard errors are in parenthesis
*** *p<0.01,* ** *p<0.05,* * *p<0.1*

Results of estimating Equation *(4)*: $TAgr_{i,t} = \propto + \beta_1 Fem\_director_{i,t} + \beta_2 Gender\_diversity_{i,t} + \beta_3 Fem\_director_{i,t} \times Gender\_diversity_{i,t} + \beta_n X_{i,t} + fixed\ effects + \varepsilon_t$. *GAAP_ETR* (effective tax rates) and *BTD* (book-tax differences) are the dependent variables; the variables of interest are: *Female x Gender_diversity* (*Female* is the proportion of female directors on the AC; *Gender_diversity* is an indicator variable that equals 1 if the firm-year observation is classified as gender-diverse or female-dominant, and 0 otherwise); and *Female_Expert x Gender_diversity* (*Female_Expert* is the percentage of female expert directors over the total amount of directors of the AC); control variables are as defined in the Appendix..

Table 6
Regression Results for *Cash ETR*

	(1)	(2)	(3)	(4)
Female	.378***		-.221***	
	(.101)		(.072)	
Gender_discrim	.236***	.116***		
	(.052)	(.034)		
Female x Gender_discrim	**-.582*** **			
	(.127)			
Female_Expert		.252**		-.032
		(.103)		(.089)
Female_Expert x Gender_discrim		**-.342*** **		
		(.096)		
Gender_diversity			-.26***	-.181**
			(.085)	(.081)
Female x Gender_diversity			**.643*** **	
			(.164)	
Female_Expert x Gender_diversity				**.414*** **
				(.146)
Expert	.071	-.019	.075	.086
	(.048)	(.059)	(.048)	(.057)
Independent	.004	-.008	0	0
	(.029)	(.029)	(.029)	(.029)
AC_Size	.13***	.082*	.11**	.084*
	(.046)	(.045)	(.045)	(.045)
CEO_Chair	-.023	-.023	-.025	-.021
	(.018)	(.018)	(.018)	(.018)
CEO_Own	-.06	-.063	-.062	-.053
	(.074)	(.074)	(.074)	(.074)
Inst_ownership	.029	.026	.032	.03
	(.042)	(.042)	(.042)	(.042)
Size	-.005	-.008	-.003	-.006
	(.022)	(.022)	(.022)	(.022)
CF	-.186	-.222	-.184	-.202
	(.196)	(.197)	(.196)	(.197)
ROA	.226	.228	.23	.24
	(.163)	(.164)	(.163)	(.164)
Lev	.127	.129	.132	.136
	(.092)	(.092)	(.092)	(.092)
MB	0	0	0	0
	(.001)	(.001)	(.001)	(.001)
Loss	-.032	-.035	-.032	-.033
	(.029)	(.029)	(.029)	(.029)
PPE	-.006	-.006	-.006	-.006
	(.007)	(.007)	(.007)	(.007)
Abaccr	-.001	-.002	-.002	-.001
	(.016)	(.016)	(.016)	(.016)
Firm fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Obs.	1338	1338	1338	1338
R-squared	.059	.05	.058	.048

Standard errors are in parenthesis
**** p<0.01, ** p<0.05, * p<0.1*

Results of estimating Equations *(3)* and *(4)*. *cash_ETR* (cash taxes paid) is the dependent variable; the variables of interest are: *Female x Gender_discrim* (*Female* is the proportion of female directors on the AC; *Gender_discrim* is an indicator variable that equals 1 if the firm-year observation is classified as discriminating, and 0 otherwise); *Female_Expert x Gender discrim* (*Female_Expert* is the percentage of female expert directors over the total amount of directors of the AC); *Female x Gender_diversity*

(*Gender_diversity* is an indicator variable that equals 1 if the firm-year observation is classified as gender-diverse or female-dominant, and 0 otherwise); and *Female_Expert x Gender_diversity*; control variables are as defined in the Appendix.

Table 7
2SLS Regression Results

	(1) *GAAP_ETR*	(2) *GAAP_ETR*	(3) *BTD*	(4) BTD
Female	**.346****		**.177**	
	(.137)		**(.162)**	
Female_Expert		**1.048****		**.314**
		(.413)		**(.549)**
Expert	-.066	-.421***	-.133	-.041
	(.072)	(.155)	(.112)	(.206)
Independent	-.091**	-.101**	-.048	-.026
	(.043)	(.044)	(.058)	(.058)
AC_Size	.028	-.027	.09	-.012
	(.064)	(.071)	(.098)	(.095)
CEO_Chair	-.021	-.016	-.052	-.031
	(.027)	(.028)	(.037)	(.037)
CEO_Own	-.171	-.185*	-.086	-.101
	(.11)	(.112)	(.14)	(.149)
Inst_ownership	-.032	-.033	.034	.042
	(.063)	(.064)	(.086)	(.085)
Size	.014	.01	.029	.051
	(.032)	(.033)	(.058)	(.044)
CF	.717**	.638**	1.135***	1.051***
	(.291)	(.299)	(.39)	(.398)
ROA	-.439*	-.424*	1.466***	.884***
	(.244)	(.248)	(.35)	(.33)
Lev	.358***	.4***	.05	.076
	(.137)	(.141)	(.207)	(.187)
MB	.001	0	-.003	-.002
	(.002)	(.002)	(.003)	(.003)
Loss	-.003	-.006	.139**	.083
	(.043)	(.043)	(.055)	(.058)
PPE	-.012	-.012	.018	.028**
	(.01)	(.01)	(.013)	(.014)
Abaccr	-.027	-.025	.011	.03
	(.024)	(.024)	(.032)	(.032)
Firm fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES
Underidentification test:				
Anderson LM statistic	291.85	82.50	425.08	82.50
Chi-sq p-val	0.00	0.00	0.00	0.00
Weak identification test:				
Cragg-Donald Wald F	217.14	44.71	568.72	44.71
Stock-Yogo weak ID test:				
10% maximal IV size	19.93	19.93	19.93	19.93
15% maximal IV size	11.59	11.59	11.59	11.59
20% maximal IV size	8.75	8.75	8.75	8.75
25% maximal IV size	7.25	7.25	7.25	7.25
Overidentification test:				
Sargan statistic	0.31	0.02	0.22	0.67
Chi-sq p-val	0.59	0.88	0.64	0.41
Obs.	1338	1338	1338	1338
R-squared	.061	.056	.43	.335

Standard errors are in parenthesis

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Results of estimating Equation *(1)*: $TAgr_{i,t} = \propto + \beta_1 Fem\_director_{i,t} + \beta_n X_{i,t} + fixed\ effects + \varepsilon_t$ using instrumental variables (2SLS) with firm and year fixed effects. *cash_ETR* (cash taxes paid) is the dependent variable; the variables of interest are *Female* (proportion of female directors on the AC) and *Female_Expert* (percentage of female expert directors over the total amount of directors of the AC); control variables are as defined in the Appendix.

Appendix

Variable Definitions

Variables	*Definition*
GAAP_ETR	sum of total tax expense for a five-year rolling period from *t*-4 to *t*, divided by the sum of the firm's income before taxes for the same five-year period.
BTD	income before taxes less taxable income, divided by lagged total assets. Taxable income is derived by dividing income tax expense by the annual corporate statutory tax rate.
Cash_ETR	sum of cash taxes paid for a five-year rolling period from *t*-4 to *t*, divided by the sum of the firm's income before taxes for the same five-year period.
Female	percentage of female directors over the total number of directors on the AC
Female_Expert	percentage of female expert directors over the total number of directors on the AC.
Gender_discrim	indicator variable equal to 1 if the firm-year observation is classified as discriminating, and 0 otherwise.
Gender_diversity	Indicator variable that equals 1 if the firm-year observation is classified as gender-diverse or female-dominant
Expert	percentage of expert directors over the total members of the AC (Lanis et al. 2017; Hsu et al., 2018; Deslandes et al., 2020).
Independent	percentage of independent directors over the total members of the AC (Lanis and Richardson, 2015; Lanis et al. 2017; Hsu et al., 2018; Deslandes et al., 2020).
AC_Size	natural log of the number AC members (Hsu et al., 2018; Deslandes et al., 2020).
CEO_Chair	an indicator variable that equals 1 if the CEO is also the chairman of the board, and 0 otherwise (Lanis and Richardson, 2015; Lanis et al. 2017).
CEO_own	the percentage of shares owned by the CEO over the total amount of outstanding shares at the end of each fiscal year (Lanis and Richardson, 2015; Lanis et al. 2017).
Inst_ownership	percent of outstanding shares held by institutions (Lanis and Richardson, 2015; Lanis et al. 2017; Hsu et al., 2018).
Size	natural log of total assets at the end of the year. Large firms have higher accrual quality (Lanis and Richardson, 2015; Davies et al., 2016; Lanis et al. 2017; Hsu et al., 2018; Deslandes et al., 2020; Garcia-Blandon et al., 2022).
CF	operating cash flows scaled by lagged total assets. Poor operating cash flows are usually associated with low accrual quality and, thus,

	with higher levels of earnings management (Armstrong et al., 2015; Davies et al., 2016; Hsu et al., 2018).
ROA	return on total assets at the end of the year. More profitable firms are under more pressure to keep up their good performance figures through opportunistic earnings management (Davies et al., 2016; Lanis et al. 2017; Hsu et al., 2018; Deslandes et al., 2020; Garcia-Blandon et al., 2022) .
Lev	total liabilities divided by lagged total assets. Firms with higher financial risk may have more incentives to manipulate earnings (Lanis and Richardson, 2015; Davies et al., 2016; Lanis et al. 2017; Hsu et al., 2018; Deslandes et al., 2020; Garcia-Blandon et al., 2022).
MB	market value of equity divided by the book value of equity (Davies et al., 2016; Lanis et al. 2017; Deslandes et al., 2020; Garcia-Blandon et al., 2022).
Loss	dummy variable equalling 1 if a firm has a net operating loss carryforward and 0 otherwise (Davies et al., 2016).
PPE	net property, plant, and equipment divided by lagged total assets (Lanis and Richardson, 2015; Davies et al., 2016; Lanis et al. 2017; Hsu et al., 2018; Deslandes et al., 2020; Garcia-Blandon et al., 2022).
AbAccr	abnormal discretionary accruals estimated with he performance-adjusted modified Jones model (Hsu et al., 2018).