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The Effects of CSR and Female Presence in Corporate Governance on Firm Tax Avoidance

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1. Introduction

The line between legal tax avoidance and illegal tax evasion is blurry. Tax evasion is an illegal activity in which an individual or firm avoids paying a true tax liability. In the case that one is caught evading taxes, they are generally subject to criminal charges and substantial penalties as willfully failing to pay taxes is a federal offense under the Internal Revenue Service (IRS) tax code (Kagan, 2019). Interestingly, a firm's likelihood to commit tax fraud may be related to their investment and belief in Corporate Social Responsibility (CSR) activities, gender diversity on the board of directors, and/or strength of corporate governance (Huseynov and Klamm, 2012). Understanding how tax evasion relates to the firm's investment in CSR practices and gender diversity on the board can help to create regulation policies that are more effective in preventing tax evasion in the future. Determining the factors that affect the likelihood of a firm evading corporate taxes and the impact of these factors on shareholders and society as a whole is important to all stakeholders of a business.

Because of the nature of tax evasion, it is very difficult to detect. For this reason, researchers use data from the United States Taxpayer Compliance Measurement Program (TCMP) which is conducted by the IRS to determine the factors that persuade a company's executives into committing the crime. This data set gives information on reported taxable income and what auditors later conclude to be true taxable income. That difference, also known as the tax gap, is examined further to draw conclusions on which effects hold most prominent when it comes to

corporate tax evasion (Slemrod, 2007). Furthermore, Slemrod finds that private companies have higher proposed deficiency rates than public companies. Slemrod (2007) studies the economics of tax evasion and finds that countries including Sweden and the United Kingdom have a similar tax gap to the United States.

Corporate Tax Avoidance as a Result of Corporate Governance Issues

Tax avoidance and tax evasion are very different concepts though they are often used interchangeably. The most notable difference is that tax avoidance is legal, while tax evasion is not and results in penalties when intentional. Furthermore, tax evasion is fraudulently concealing income or information from tax authorities to lessen the tax payment required of a firm. Tax avoidance, on the other hand, is strategically using income and investments to lessen tax liability and maximize after-tax income. Firms can take advantage of tax laws and investments to legally lower their required tax payment.

Armstrong, et. al. (2015) study the relationship between corporate governance, incentives and tax avoidance. The authors apply a stakeholder view to determine that various aspects of corporate governance influence the company’s level of tax avoidance. Those aspects include the incentive alignment between management and shareholders, board composition, ownership structure, capital market monitoring, audit, enforcement and government regulations as well as other stakeholders' pressures. The authors find that corporate governance institutions not only have potential to increase tax avoidance, but also to limit tax avoidance to a level in which the risks do not outweigh the benefits. A corporate governance institution is essentially constructed of the repeated mechanisms that allocate authority among the board of directors, senior managers and shareholders that affect and control the decisions made at the top of the firm (Armstrong, et. al,

2015). Further findings indicate that effective corporate governance mechanisms steer tax avoidance at its firm-specific optimal level.

More research examines the link between corporate governance, managerial incentives and corporate tax avoidance. Like other investment opportunities that involve risky expected cash flows, unresolved problems within the firm may pressure managers to engage in more tax avoidance than shareholders would prefer (Kovermann and Velte, 2019). This study on the impact of corporate governance on corporate tax avoidance uses quantile regression to determine that there is a positive relationship between the independence of the board and financial sophistication for low levels of tax avoidance, but also a negative relation for high levels of tax avoidance. The results indicate that these governance attributes have a stronger relation with more extreme levels of tax avoidance, which are more likely to be symptomatic of both overinvestment and underinvestment by managers. Because net benefits of tax avoidance differ at different levels of tax avoidance according to the study, researchers find it important to note shifts in the relation as certain governance mechanisms are likely to exhibit different relations within tax avoidance at different points in the distribution (Kovermann and Velte, 2019).

The same study examines the idea that managers anticipate greater personal benefits from increased tax avoidance based on the premise that they are saving the company money and should effectively be compensated for the benefit they are creating for the firm. The study finds evidence that risk-taking equity incentives are positively related to tax avoidance, which is consistent with the notion that relatively high levels of risk-taking equity incentives have the potential to motivate managers to invest in risky tax avoidance beyond what is desired by shareholders (Kovermann and Velte, 2019). The study also concludes, based on its findings, that more financially sophisticated directors and boards with greater independence mitigate agency problems related to extreme levels

of tax aggressiveness. Based on the risks and returns the study addresses, researchers determine that the optimal level of tax avoidance, the point where marginal costs and benefits are equivalent, for an individual firm is difficult to determine empirically (Kovermann and Velte, 2019).

Lanis and Richardson (2018) study the influence of outside directors on tax aggressiveness and CSR and find that governance is significantly associated with tax policy. The Australian based study determines that boards made up of a greater proportion of outside members reduces the likelihood of tax aggressiveness. In their results, effective corporate governance, no matter the make-up of the independence of the board of directors, has the tendency to reduce extremely high levels of tax aggressiveness and increase extremely low levels of tax aggressiveness. They also find evidence that indicates that the negative association between CSR performance and tax aggressiveness is magnified when there are outside directors on the board. In short, corporate governance determines the strategies of tax management and investment in CSR and so effectively has a role in the firm's involvement in one more than the other (Lanis and Richardson, 2018).

CSR as a component of Tax Avoidance

Tax avoidance of a firm stems from its efforts to reduce tax requirements based on taxable income. Companies may avoid higher amounts owed by utilizing investment accounts that provide favorable tax treatment or making purchases or investments that effectively lower taxable income (Chyz, 2013). An example of this may be a company investing heavily in Corporate Social Responsibility (CSR). CSR is a business model that helps a company to be socially accountable. It integrates sustainability, social impact, and most importantly in this case, ethics into regular business operations (Huseynov and Klamm, 2012). Huseynov and Klamm find that because a company is placing importance on strong morals and the society as the big picture, that same company is much less likely to commit tax evasion or be highly tax aggressive. Essentially, they

determine that investing in ethical practices decreases a firm's likelihood to commit any form of tax fraud.

Furthermore, Rego (2010)examines the effect of CSR on tax avoidance for firms and concludes that a larger presence of CSR within a company leads to a lower probability of the same company avoiding taxes. Tax avoidance being the legal arrangement of a company's financial transactions to minimize tax liability. The author also finds that there is an overlap in strong CSR and corporate governance within a company because firms are held responsible not only by internal stakeholders, but also by external stakeholders and society in general. Firms that strategize to lower tax expenses may be seen as "cheating the government and cheating shareholders," however the strong governance, community or diversity associated with the morals backed by the company's investment in CSR activities dispel this notion (Rego, 2010).

Sari and Tjen (2016) study CSR disclosure, environmental performance and tax aggressiveness and look at the influence of CSR disclosure and environmental performance on the firm's level of tax aggressiveness. The authors define tax aggressiveness as the extent to which firms use ambiguity in the tax law to reduce their tax payments. By using a sample taken of non-financial companies listed on the Indonesian Stock Exchange during 2009-2012, the study finds that the higher the level of CSR disclosure, the lower the company's tax aggressiveness. Interestingly at this time, the Indonesian government had implemented law making certain CSR expenses tax deductible. In summary, a donation to benefit the greater community was eligible to be deducted from gross income with some requirements (Sari and Tjen, 2016). Therefore, a company would feel immediate remediation for its investment in criteria meeting CSR activities. The study's findings also determine that when CSR is involved in a company's mission or values, the firm has established that they have rights and obligations to the society and so the firm has a

much higher tendency to obey the obligation to pay what is owed and is not involved in overly aggressive tax management.

Gender Diversity on the Board of Directors as it relates to Tax Aggressiveness

A firm's tax aggressiveness may be viewed as positive or negative by the company's shareholders. It is important for shareholders to understand in which ways the board of directors impacts tax aggressiveness and ultimately how the gender diversity of the board can affect this. The board of directors is responsible for the oversight of tax affairs for the firm and is held accountable by its shareholders. A study by Lanis, Richardson and Taylor (2017) finds a negative and statistically significant association between female representation on the board and tax aggressiveness. This suggests that an increased percentage of female board members reduces the tax aggressiveness of the firm.

A similar study based in Australia finds that if a firm has more than one female board member as opposed to solely one female board member, the likelihood of tax aggressiveness is reduced even further (Richardson, Taylor & Lanis, 2016). Essentially, an increased number or percentage of females on the board results in less aggressive tax strategies by the firm as a whole. Not all states in the United States have policies on board gender diversity and so the shareholders of a company determine via voting in the appropriate individual to meet their personal tax aggressiveness goals for that company.

Furthermore, Chen, Gramlich, and Houser (2019) examine the effect of board gender diversity on corporate risk strategies. They specifically investigated the association between board gender diversity and financial risk. By using S&P 500 data, they find that board gender diversity is negatively associated with tax avoidance which suggests that firms with gender diverse boards

are more cautious about potential risks associated with aggressive tax strategies. These results were very similar to those in the study previously stated by Richardson, Taylor & Lanis (2016).

Board Gender Diversity and CSR

A study conducted by Boulouta (2013), examines whether and how female board directors may affect corporate social performance (CSP). Very similar to CSR, CSP is defined as a firm's configuration of principles of social responsibility, responsiveness, and observable outcomes as they relate to the organization's societal relationships. The study draws on social role theory and literature about feminist ethics. The author finds that board gender diversity significantly affects CSP depending on the social performance metric under investigation. The study determines that more gender diverse boards have stronger influence on CSP metrics focusing on 'negative' business practices. This result was due to CSP ratings having the potential to induce higher levels of 'empathic caring', which strongly appealed to the female directors examined (Boulouta, 2013). This study has important implications for managers and socially responsible investors.

Another study by Rao and Tilt (2016) aims to critically review existing literature on the relationship between corporate governance, in particular board diversity, and CSR and CSR reporting. The authors look to draw conclusions on prior research and suggest avenues for future research in the area. The study examines boards' decision-making processes with regard to CSR and proposes that this would provide more insight into the link between board diversity and CSR, assuming that both CSR and CSR reporting are outcomes of the boards' decisions. The study finds evidence and arguments that indicate that female directors are more likely to have a positive influence on CSR outcomes, their influence might be limited or even none (Rao and Tilt, 2016).

Galbreath (2018) conducts a study that focuses on board gender diversity and financial performance through the facet of CSR. The study follows the stakeholder theory which argues that

women on a boards' attunement to stakeholder interests leads them to influence their firm's prosocial actions, which results in higher levels of CSR investment. The author relies on a sample of Australia's largest publicly traded firms and finds results that demonstrate that there is a positive correlation between women on boards and CSR activity investment (Galbreath, 2018).

Finding the Optimal Level

The optimal level of tax avoidance for a company varies based on the industry and various firm-specific financial measures. In a study conducted by Kim, et al. (2019), researchers determine that "each firm has a unique optimal level of tax avoidance". This study focuses on the amount of time it takes for the average firm to move toward its optimal level of avoidance. Depending on model specifications, the study finds that a typical firm moves toward its optimal level at a rate ranging from 69 to 84 percent over a three-year period. This study also examines some of the factors that prevent firms from adjusting completely to their optimum (Kim, et al., 2019). It is important to understand that each firm has a different optimal level and that managers and the board are tasked with weighing the direct benefits of tax avoidance against the associated nontax costs to balance this unique level of tax avoidance.

Based on the above findings it can be determined that there is controversy in the immediate factors affecting tax avoidance of a firm. This stems from the question of whether the firm is profit maximizing or socially responsible. It is essential that firms identify the right balance in maximizing profit while remaining socially responsible or in other words, minimizing tax expenses and fulfilling responsibilities to stakeholders. Whether Corporate Social Responsibility or a firm's corporate governance effect tax evasion is difficult to determine but it is evident that both factors affect tax strategy whether it be beneficial to society or beneficial to the firm. It is important to note that based on the literature reviewed above, tax avoidance, aggressiveness and sheltering are

all legal in practice however shareholders may disagree with the means and ways company management goes about achieving their goals to minimize tax liability. In summary, a firm's ability to evade taxes is utilizable at any time however the implementation of strong CSR initiatives and an inviolable corporate governance have the tendency to mitigate involvement in tax evasion practices.

2. Hypothesis Development

It is possible that a company avoids taxes by investing in CSR (and substitutes); strong ethics and morals increase spending in CSR and effectively lower tax expenses. On the other hand, it is also possible that firms with high CSR spending view paying taxes as another aspect of their socially responsible behavior and are thus more likely to curb tax avoidance. Given this debate in the literature, studies have emerged that allow the relation between CSR and tax avoidance to be conditional - positive in some firms and negative in others. Our contribution would be to shed light on this debate by examining how the presence of women on the board moderate the CSR – tax avoidance relation. To that end, we investigate the association between a board gender diversity, tax aggressiveness and the interaction with CSR spending. We hypothesize that boards that have women and high CSR spending avoid taxes in fewer instances. We also expect that companies with boards comprised of all men use CSR and tax avoidance as substitutes. We also examine this interaction over time to see if the association has become stronger, weaker or remained the same as time has passed. In testing this hypothesis, we begin by establishing the effect of board gender diversity and CSR on tax avoidance. Then, we allow for the CSR-tax avoidance relation to be conditional on our board gender diversity measure and also test for the presence of time trends in those effects.

3. Data and Methodology

Following Kim et. al. (2019), we use a firm's cash effective tax rate calculated over a three-year period (*CashETR*) as the primary measure of tax avoidance:

$$CashETR_{i,t} = \frac{\sum_{t=1}^{N} Cash\ Taxes\ Paid_{i,t}}{\sum_{t=1}^{N}(Pretax\ Book\ Income_{i,t} - Special\ Items_{i,t})}$$

In all our models, the firm's tax avoidance is a function of a set of variables that determine the firm's ability and need to avoid taxes as well as the likelihood of detection by authorities. To test the hypothesis outlined above, we include the firm's CSR score and board gender diversity measures in our main model:

$$CashETR_{i,(t,t+2)} = \beta_1 * Gender\ Diversity_{i,t-1} + \beta_2 * CSR_{i,t-1} + \gamma * X_{i,(t-3,t-1)}$$

where *CashETR* is firm *i*'s level of tax avoidance and *X* is a vector of firm characteristics, specifically size, foreign income, leverage, capital intensity, R&D, advertising expenditures, ROA, net operating loss carryforwards, loss intensity, equity income, aggregate special items, and MB ratio. We estimate the model with OLS and includes industry and year fixed effects. For robustness, we also include firm fixed effects to account for any firm-specific, time-invariant omitted factors.

Our goal is to investigate the effect that our main variables of interest – board gender diversity and CSR – have on the level of tax aggressiveness, as well as to determine if those effects have changed over time. We measure board gender diversity as the percentage of female directors serving on the firm's board or as a dummy variable that equals 1 if the firm has at least one female on the board. We assess the firm's engagement in CSR based on Thomson Reuters ESG (Environmental, Social, and Governance) scores for each company.

The data for this study comes from secondary sources. The base sample starts with all U.S. incorporated industrial firms covered in the intersection of ISS (RiskMetrics) and Compustat

databases from 1996 to 2018. Industrial firms are defined as companies with SIC codes outside the ranges 4900-4949 (utilities) and 6000-6999 (financials). The ISS database contains information on the board of directors, including director gender, the number of board members, fraction of independent directors, and director tenure. Annual firm-level financial statement data is collected from Compustat North America Annual files. Firms with values of total assets or sales less than one million dollars are excluded from the sample. To mitigate the effect of outliers and incorrectly recorded data, all continuous variables are winsorized at the top one percent and, if the variable takes on negative values, bottom one percent as well.

4. Results

In this section we report the results of the empirical analysis of the data. Table 1 provides the summary statistics for all variables used in our regression analysis. These statistics are based on data from 2002 to 2017. Table 2 provides summary statistics of the main variables over time. The values in Table 2 can be better depicted in Figures 1, 2 and 3. Figure 1 and Figure 2 show the mean and median of Cash ETR and CSR respectively. As depicted in Figure 1, Cash ETR has slight fluctuations but overall remains the same through the years we examine. Figure 2 shows an increasing and then decreasing trend in CSR investment over the same period. The mean and median CSR values are roughly the same in 2002 as in 2017 and we see a peak in 2012. Figure 3 shows the mean and median fraction of females on the Board of Directors. The fraction of females on a firm's board has consistently increased over time. Similarly, and expectedly, the proportion of firms with at least two females on their board follows an increasing trend though the percentage of firm's with at least one female on its board remains relatively unchanged, as described in Table 2.

Table 3 compares tax avoidance when there are at least two females on a firm's board of directors as opposed to having a board consisting of all male members. For the earlier half of our data set, the difference in tax avoidance was relatively high (15.8%) as compared to the difference in later years (0.1%). In the more recent years, board gender diversity has a negligible effect on tax avoidance of the firm. This suggests that as time has passed, the effect of a gender diverse board on the firm's tax avoidance has become less so which could be for a few reasons: female board members are becoming more tax aggressive, male board members are becoming less tax aggressive or a combination of the two.

Table 4 compares CSR investment when there are at least two females on a company's board as opposed to a board consisting of all males. As reported in Table 2, there is an increasing number of females on the boards of the firms in our data set so there should be a negative CSR-tax relationship in the second period of data. As shown in the table, there is a large discrepancy in CSR investments depending on board gender diversity of the firm. The investment in CSR by companies with at least two females on the board has increased over time, the average moving from 54.5 in years 2002-2009 to 59.6 during 2010-2017. Meanwhile, CSR spending by companies with no board gender diversity has decreased, the average in data collected between 2002 and 2009 was 40.2 and in later years (2010-2017) the average decreased to 38.4. The combination of these results has increased the difference between the two over time.

Table 5 contains the regression analysis of our main model testing the effects of CSR initiatives and board gender diversity on tax avoidance. We find that CSR and tax avoidance are not related but board gender diversity and tax avoidance are. There is a significant association between the gender make-up of a firm's board and that same firm's tax aggressiveness. We employ two models in this empirical analysis – we first estimate the regression with OLS and include

industry and year fixed effects. The coefficients of the OLS estimation are reported in columns 1 and 2. To account for the effect of any time-invariant omitted variables, we also employ a firm fixed effects estimation in columns 3 and 4 of Table 5. The results of both models indicate that there is a negative and significant effect of board gender diversity on tax avoidance. We also do not find any significant association between CSR and tax avoidance in our data.

In Table 6 we allow for the coefficients on the two main variables of interest to vary over time. There is a decreasing trend in the relation between gender diversity on a company's board and CashETR. In the first year, the effect of board gender diversity is positive (0.045) and in each of the following years, it decreases by (0.0038). We also see that there is no change in the relation between tax avoidance and CSR spending over time. In contrast to the literature reviewed above, which determined there was either a positive or negative association, we find that there is no relation between CSR spending and tax avoidance in our sample.

The effect of gender diversity on tax aggressiveness is decreasing overtime, as shown in Table 6. This could be because female board members are becoming more tax aggressive as in their tax aggressiveness levels are becoming more so like their male counterparts, male board members are becoming less tax aggressive similar to that shown by females or a combination of the two. In Table 7, we examine whether the effect of CSR on tax avoidance is moderated by board gender diversity. In firms with at least one female board member, CSR and tax avoidance are used as complements in the early years of our sample, but that effect is changing over time. In later years, the effect of CSR on tax avoidance turns negative for those firms. This could be explained by the fact that the investment in CSR activities of firms with gender diverse boards are significantly increased in later years, ultimately decreasing the effect of gender diversity on tax avoidance over time. Furthermore, the coefficients reported in Table 7 show that there is no tax

avoidance-CSR effect when the board is comprised only of males, and this does not change over time.

5. Conclusion

By conducting an analysis on the effect of CSR and female presence on a firm's board of directors on the firm's tax avoidance we find results that both follow and contradict those results of prior research. Literature on the effects of CSR on firm tax avoidance has been one sided, though not consistent, whether the relationship between the two variables is positive or negative. Alternatively, our empirical analysis finds CSR investment and tax avoidance to be unrelated.

On the other hand, the results we find on the average effect of female presence on the board of directors on the firm's tax avoidance strategy is in-line with prior literature. However, we also document that the correlation between the number of female board members and tax avoidance has become close to zero in recent years as the presence and number of females on company boards has increased over the time period studied. This would lead one to assume that the tax aggressiveness in males and females has become more aligned whether it be because females have become more tax aggressive or men less so, or a combination of those two factors.

The results in our analysis of the relationship between CSR investment of a firm and female presence on the firm's board was the opposite, however. A company with more females on the board of directors invests more into CSR activities than a company with no females on its board. Our results show this relationship and disparity is increasing over time. Essentially, all male boards invest less in CSR than boards with at least one female at an increasing rate in recent years.

References

Armstrong, Christopher S., Blouin, Jennifer, Jagolinzer, Alan D., and Larcker, David F.. (2015, March 14). “Corporate Governance, Incentives, and Tax Avoidance.” *Journal of Accounting and Economics*, North-Holland. www.sciencedirect.com/science/article/pii/S0165410115000178?via%3Dihub#s0075.

Boulouta, I. (2013). Hidden Connections: The Link Between Board Gender Diversity and Corporate Social Performance. *J Bus Ethics* 113, 185–197. https://doi.org/10.1007/s10551-012-1293-7

Chen, L.H., Gramlich, J., and Houser, K.A. (2019), The effects of board gender diversity on a firm's risk strategies. Account Finance, 59: 991-1031. doi:10.1111/acfi.12283

Chyz, J.A.. (2013, September 3). “Personally tax aggressive executives and corporate tax sheltering.” Journal of Accounting and Economics, 56 pp. 311-328, 10.1016/j.jacceco.2013.09.003.

Fisman, Raymond, and Shang-Jin Wei. (2004, April). "Tax Rates and Tax Evasion: Evidence from “Missing Imports” in China," Journal of Political Economy 112, no. 2: 471-496.

Galbreath, J. (2018). Is Board Gender Diversity Linked to Financial Performance? The Mediating Mechanism of CSR. *Business & Society*, *57*(5), 863–889. https://doi.org/10.1177/0007650316647967

Huseynov, Fariz, and Bonnie K. Klamm (2012, June 16). “Tax Avoidance, Tax Management and Corporate Social Responsibility.” *Journal of Corporate Finance*, North-Holland. www.sciencedirect.com/science/article/pii/S0929119912000569.

Kagan, Julia. (2019, November 18) “Tax Evasion.” *Investopedia*, Investopedia. www.investopedia.com/terms/t/taxevasion.asp.

Kim, J., McGuire, S.T., Savoy, S., Wilson, R. and Caskey, J. (2019), How Quickly Do Firms Adjust to Optimal Levels of Tax Avoidance?. Contemp Account Res, 36: 1824-1860. doi:10.1111/1911-3846.12481

Kovermann, Jost, and Patrick Velte (2019, August 13). "The Impact of Corporate Governance on Corporate Tax Avoidance-A Literature Review." *Journal of International Accounting, Auditing and Taxation*, JAI. www.sciencedirect.com/science/article/pii/S1061951818301071.

Lanis, R., & Richardson, G. (2018). Outside Directors, Corporate Social Responsibility Performance, and Corporate Tax Aggressiveness: An Empirical Analysis. *Journal of Accounting, Auditing & Finance*, *33*(2), 228–251. https://doi.org/10.1177/0148558X16654834

Lanis, R., Richardson, G. & Taylor, G. (2017). Board of Director Gender and Corporate Tax Aggressiveness: An Empirical Analysis. *J Bus Ethics* 144, 577–596.

Sari, Dahlia, and Christine Tjen. (2016). "Corporate Social Responsibility Disclosure, Environmental Performance, and Tax Aggressiveness." *INTERNATIONAL RESEARCH JOURNAL OF BUSINESS STUDIES*, www.irjbs.com/index.php/jurnalirjbs/article/view/1159/pdf.

Slemrod, Joel. (2007). "Cheating Ourselves: The Economics of Tax Evasion." Journal of Economic Perspectives, 21 (1): 25-48.

Stephenson, David and Vracheva, Veselina. (2015, November 13). Corporate Social Responsibility and Tax Avoidance: A Literature Review and Directions for Future Research.

Rao, K., Tilt, C. (2016). Board Composition and Corporate Social Responsibility: The Role of

Diversity, Gender, Strategy and Decision Making. *J Bus Ethics* 138, 327–347. https://doi.org/10.1007/s10551-015-2613-5

Rego, Sonja Olhoft. (2010, January 15). “Tax-Avoidance Activities of U.S. Multinational Corporations*.” *Wiley Online Library*, John Wiley & Sons, Ltd (10.1111). onlinelibrary.wiley.com/doi/epdf/10.1506/VANN-B7UB-GMFA-9E6W.

Richardson, G., Taylor, G. and Lanis, R. (2016), "Women on the board of directors and corporate tax aggressiveness in Australia: An empirical analysis", *Accounting Research Journal*, Vol. 29 No. 3, pp. 313-331.

Appendix

Variable definitions

CASHETR	The sum of cash taxes over three years divided by the sum of the pre-tax book income less special items over the same period
ROA	Sum of pre-tax income less extraordinary items over the three-year period divided by average total assets
Special Items	Sum of special items over the three-year period divided by average total assets
LEVERAGE	Average long-term debt over the three-year period scaled by average total assets
NOL	Indicator variable equal to one if the firm has a tax loss carryforward at any time during years t −3 to t −1, and zero otherwise
CNOL	Change in tax loss carryforward from beginning of year t−3 to end of year t−1 scaled by average total assets
FOREIGN INCOME	Sum of pre-tax foreign income over the three-year period (COMPUSTAT item PIFO) scaled by average total assets
Capital Intensity	Average net PPE over the three-year period (COMPUSTAT item PPENT) scaled by average total assets
Equity Income	Sum of equity income over the three-year period (COMPUSTAT item ESUB) scaled by average total assets
R&D	Sum of research and development expense over the three-year period (COMPUSTAT item XRD) scaled by average total assets

Advertising	Sum of advertising expense over the three-year period (COMPUSTAT item XAD) scaled by average total assets
MTB	The average of the market-to-book ratio at the beginning of year t−3 and at the end of year t−1. The market-to-book ratio is measured as market value of equity (COMPUSTAT item PRCC_F ×CSHO) divided by book value of equity
SIZE	Natural log of average total assets over the three-year period
Loss Intensity	Loss intensity over the previous four-year period defined as the number of years a firm has negative pre-tax book income (COMPUSTAT item PI) from year t −4 to year t−1 scaled to range from [0,1]
Domestic vs. MNC	A firm is considered multinational if it had any foreign income over the three-year measurement period
Firm Fixed Effects	Control variable used to ensure no alternative variable is driving test results

Exhibits:

Table 1

Table 1						
Summary Statistics of all variables (data is from 2002 to 2017)						
	N	**mean**	**sd**	**min**	**p50**	**max**
CashETR	7,567	0.239	0.125	0.000	0.240	0.997
CSR	7,567	51.143	19.596	0.000	48.417	98.705
%Female	7,567	0.153	0.099	0.000	0.143	0.750
At least 1 female	7,567	0.854	0.353	0.000	1.000	1.000
At least 2 females	7,567	0.492	0.500	0.000	0.000	1.000
ROA	7,498	0.302	0.211	-0.817	0.275	1.026
Special Items	7,536	-0.032	0.066	-0.620	-0.013	0.174
Leverage	7,562	0.207	0.144	0.000	0.199	0.979
NOL	7,567	0.575	0.494	0.000	1.000	1.000
CNOL	7,555	0.008	0.069	-0.580	0.000	1.548
Foreign Income	6,211	0.050	0.060	-0.040	0.023	0.199
Capital Intensity	7,567	0.278	0.222	0.000	0.204	0.927
Equity Income	7,429	0.003	0.009	-0.034	0.000	0.062
R&D	7,567	0.072	0.124	0.000	0.003	0.983
Advertising	7,538	0.039	0.080	0.000	0.000	0.557
Market-to-Book	7,397	2.038	0.994	0.680	1.749	6.094
Size	6,525	8.321	0.986	4.720	8.325	10.185
Loss Intensity	7,567	0.054	0.136	0.000	0.000	1.000
IndustryCashETR	7,567	0.169	0.090	-0.007	0.187	0.353

Table 2

Table 2									
Means and Medians of Main Variables of Interest over time									
						Females on the board			
		CashETR		CSR		Fraction of Females		At least 1	At least 2
fyear	#obs	Mean	Median	Mean	Median	Mean	Median	Mean	Mean
2002	264	0.25	0.24	45.21	42.29	0.13	0.11	0.86	0.39
2003	254	0.23	0.22	45.37	42.12	0.14	0.13	0.88	0.43
2004	325	0.21	0.21	47.55	44.48	0.14	0.13	0.83	0.43
2005	396	0.23	0.22	47.86	44.11	0.14	0.13	0.86	0.43
2006	416	0.25	0.24	48.96	44.83	0.14	0.13	0.87	0.46
2007	411	0.26	0.26	50.87	48.59	0.14	0.13	0.83	0.47
2008	496	0.26	0.26	50.87	47.62	0.14	0.13	0.84	0.48
2009	545	0.25	0.25	51.48	48.24	0.14	0.13	0.83	0.46
2010	538	0.24	0.24	54.01	53.62	0.14	0.13	0.83	0.46
2011	522	0.22	0.23	54.56	54.19	0.14	0.14	0.83	0.47
2012	528	0.22	0.23	54.66	54.65	0.15	0.14	0.85	0.49
2013	539	0.23	0.23	54.63	55.42	0.16	0.17	0.86	0.54
2014	533	0.24	0.25	54.59	55.15	0.17	0.17	0.90	0.55
2015	710	0.25	0.25	51.41	49.68	0.17	0.17	0.86	0.54
2016	861	0.24	0.24	49.65	46.93	0.18	0.18	0.86	0.56
2017	229	0.25	0.27	45.34	42.40	0.19	0.20	0.85	0.57
Total	7,567	0.24	0.24	51.14	48.42	0.15	0.14	0.85	0.49

Table 3

Table 3			
Tax avoidance and board gender diversity			
	Full Sample		
	At least 2 females	All males	% Difference
CashETR (mean)	0.241	0.227	6.1%
CashETR (median)	0.243	0.230	5.7%
	From 2002 to 2009 only		
CashETR (mean)	0.248	0.214	15.8%
CashETR (median)	0.247	0.218	13.6%
	From 2010 to 2017 only		
CashETR (mean)	0.237	0.236	0.1%
CashETR (median)	0.239	0.242	-1.2%

Table 4

Table 4			
CSR and board gender diversity			
	Full Sample		
	At least 2 females	**All males**	**% Difference**
CSR (mean)	57.6	39.2	47.2%
CSR (median)	58.9	37.2	58.5%
	From 2002 to 2009 only		
CSR (mean)	54.5	40.2	35.6%
CSR (median)	53.6	37.8	41.6%
	From 2010 to 2017 only		
CSR (mean)	59.6	38.4	55.0%
CSR (median)	61.6	36.1	71.0%

Table 5

Table 5				
Regression Analysis - The effects of CSR and Board Gender Diversity on Tax Avoidance				
	1	**2**	**3**	**4**
Model	**OLS**		**Firm Fixed Effects**	
Dep. Var.:	**$CashETR_{(t,t+2)}$**	**$CashETR_{(t,t+2)}$**	**$CashETR_{(t,t+2)}$**	**$CashETR_{(t,t+2)}$**
CSR	-0.0000659	-0.0000516	0.000205	0.00013
	[-0.43]	[-0.28]	[1.39]	[0.67]
At least 1 female	0.0159**	0.0172**	0.0208***	0.0206***
	[2.11]	[2.36]	[3.30]	[2.68]
Control variables	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	No	No
N	6181	4161	6181	4161
adj. R-sq	0.173	0.227	0.518	0.522

Table 6

Table 6		
Regression Analysis - Time trends in the effects of CSR and Board Gender Diversity on Tax Avoidance		
	1	**2**
Model	**OLS**	
Dep. Var.:	**$CashETR_{(t,t+2)}$**	**$CashETR_{(t,t+2)}$**
CSR	0.000259	0.000438
	[0.92]	[1.30]
CSR_time trend	-0.000039	-0.000059
	[-1.27]	[-1.57]
At least 1 female	0.0401***	0.0450***
	[2.89]	[3.19]
At least 1 female_time trend	-0.00338**	-0.00380**
	[-2.10]	[-2.28]
Time trend	0.00588***	0.00707***
	[3.01]	[3.22]
Control variables	No	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
N	6181	4161
adj. R-sq	0.175	0.229

Table 7

Table 7				
Regression Analysis - Time trends in the effect of CSR, conditional on board gender diversity				
	1	**2**	**3**	**4**
Model	**OLS**			
Subsample:	**All male**	**At least 1 female**	**Fraction of females below median**	**Fraction of females above median**
Dep. Var.:	**CashETR$_{(t,t+2)}$**	**CashETR$_{(t,t+2)}$**	**CashETR$_{(t,t+2)}$**	**CashETR$_{(t,t+2)}$**
CSR	-0.000608	0.000527*	0.000498	0.000617**
	[-0.54]	[1.94]	[1.01]	[1.98]
CSR_time trend	0.0000334	-0.0000699**	-0.0000842	-0.0000797**
	[0.24]	[-2.25]	[-1.61]	[-2.09]
Time trend	-0.000463	0.00431**	0.00461*	0.00540**
	[-0.08]	[2.57]	[1.82]	[2.42]
N	639	3522	1905	2256
adj. R-sq	0.269	0.227	0.264	0.226

Figure 1

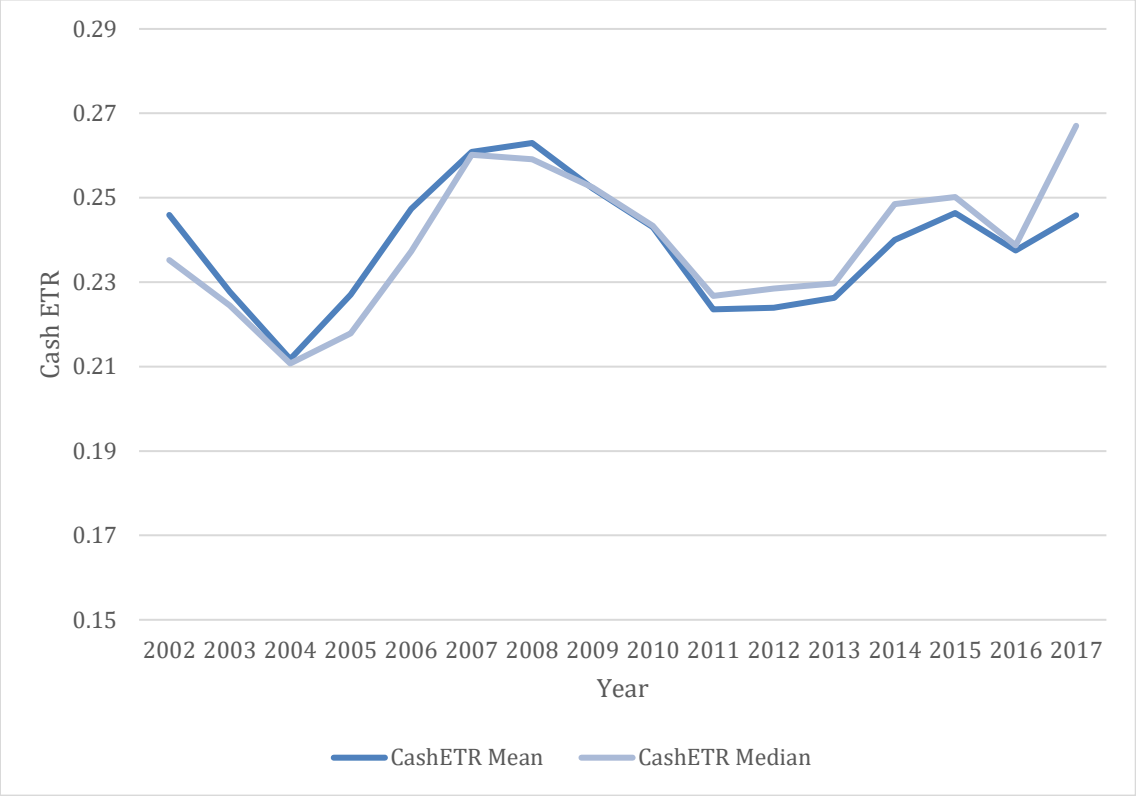


Figure 2

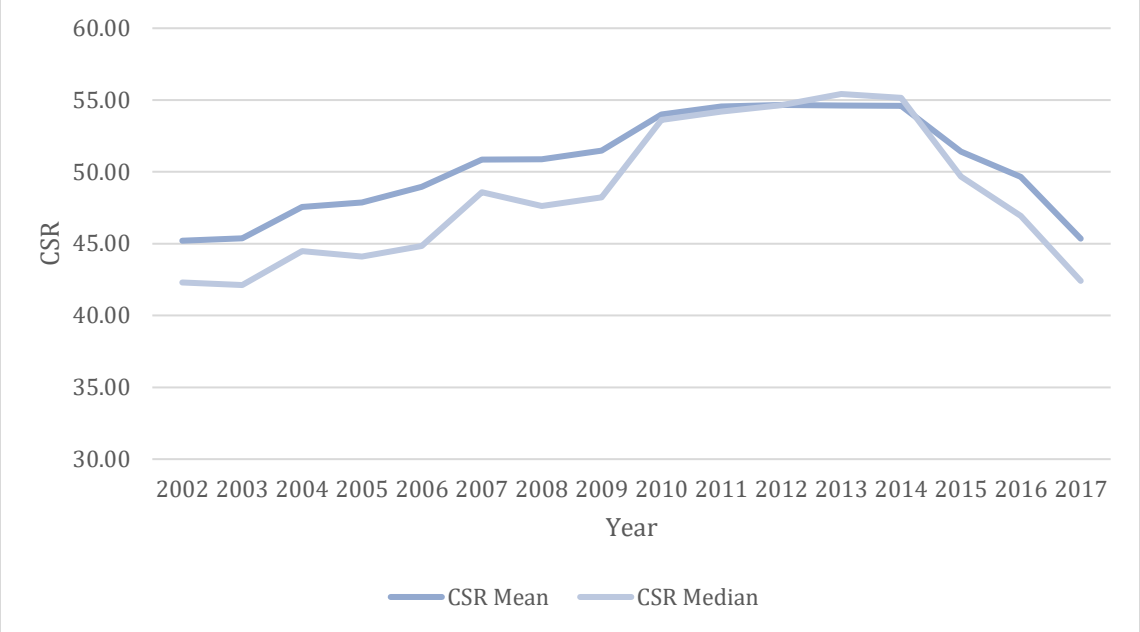
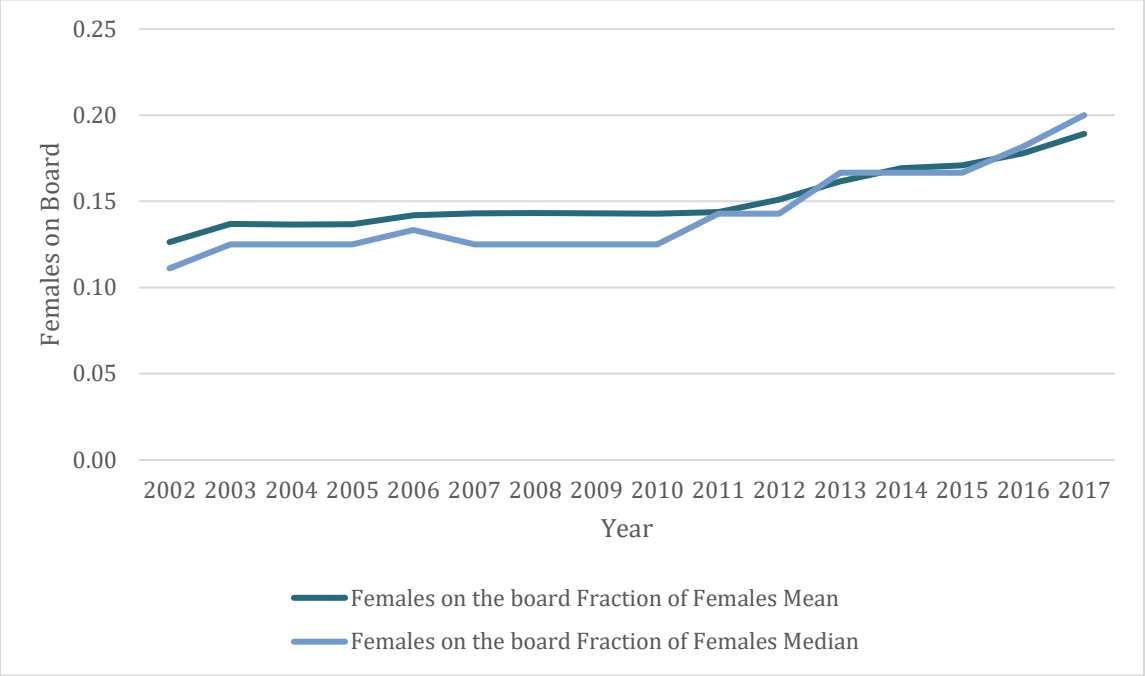


Figure 3


0.25
0.20
0.15
0.10
0.05
0.00
Females on Board
2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
Year
Females on the board Fraction of Females Mean
Females on the board Fraction of Females Median