

# THE ASSOCIATION BETWEEN TAX AGGRESSIVENESS AND ENVIRONMENTAL PROTECTION IN CHINESE PUBLIC FIRMS

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## ABSTRACT

*This study was motivated by a lack of understanding about whether firms trade off different components of corporate social responsibility (CSR) because CSR activities may compete with each other for investments. By investigating all public Chinese firms from 2010 to 2017, we found that firms exhibiting lower degrees of tax aggressiveness participated more in environmental protection activities. Our results suggest that good firms tend to perform well in different aspects of CSR. Additionally, we found that the relationship between tax aggressiveness and environmental protection activities is more pronounced in firms with politically connected management or board members, firms with a higher percentage of independent directors, and firms receiving fewer government bursaries.*

**JEL:** M4, H2

**KEYWORDS:** Tax Aggressiveness, Environmental Protection, Corporate Social Responsibility, China

## INTRODUCTION

Corporate social responsibility (CSR) has received increasing attention from the public, academia, and policymakers (Benson, Clarkson, Smith, & Tutticci, 2015; Christensen & Murphy, 2004; Li, Fetscherin, Alon, Lattemann, & Yeh, 2010; Minor, & Morgan, 2011; Park, Chidlow, & Choi, 2014; Yang & Rivers, 2009). Many studies have focused on firms' motivations to engage in CSR activities, but research on the relationships among CSR components is limited. This study is therefore an attempt to fill this void in the literature by addressing whether firms trade off different CSR components because CSR activities may compete with each other for investments. In other words, when firms invest more in one component of CSR (e.g., being less aggressive in tax planning and paying more taxes), do they decrease investment in another component (e.g., environmental protection)? More specifically, this study examines the association between firms' environmental protection activities and tax aggressiveness.

To test this research question, we chose to study Chinese public firms. China's environmental protection policies have evolved significantly in the past 20 years. For instance, China has recently pledged to stop releasing carbon emissions by 2060 (Chemnick & Storrow, 2020). Studying firms' environmental behaviors during the transition from a weak to a strong institutional setting will be especially interesting, because the findings will be applicable to many developing countries facing severe environmental issues. By studying all public nonfinancial Chinese firms from 2007 to 2017, we found that firms engaging in environmental protection activities exhibit a lower level of tax aggressiveness, suggesting that firms do not trade off between these two components of CSR. Moreover, we found that the relationship between the degree of tax aggressiveness and environmental protection activities is more pronounced in firms with politically

connected management or board members, firms with a higher percentage of independent directors, and firms receiving fewer government bursaries. The contributions of our findings are threefold. First, to the best of our knowledge, our study is among the first to investigate firms' choices among different components of CSR. Our empirical results show that good firms tend to perform well in different components of CSR, supporting corporate culture theories (Kreps, 1990). Second, we document a negative relationship between tax aggressiveness and environmental protection, which provides empirical evidence confirming the view of Lanis and Richardson (2012) that CSR is a core activity that can be used by a corporation to support its tax position. Third, our study contributes to the understanding of the CSR behaviors of Chinese public firms, which are becoming increasingly important participants in the world economy. Thus, a deeper understanding of these firms benefits global investors. The next section of the paper is a review of the relevant literature and an introduction to our hypotheses. The subsequent section is a description of our data and an introduction to our research methodology, which is followed by a section containing descriptive and regression results. In the last section of the paper, we present our conclusions.

## LITERATURE REVIEW

Two views exist regarding firms' attitudes toward CSR. Friedman's (1962) stockholder view suggested that firms should focus on the benefits of shareholders only and maximize shareholders' wealth by maximizing firm profits. Firms endorsing this view are expected to have weaker concerns for CSR. In contrast, Freeman's (1984) stakeholder view argued that firms should work on the benefits of comprehensive stakeholders and balance the interests of different stakeholders, such as investors, the government, and the environment. Firms supporting this view are likely to embrace all components of CSR. However, Smith (2003) pointed out that the two views are not mutually exclusive. For instance, neglecting CSR may raise public concerns and adversely affect firm value (Hanlon & Slemrod, 2009; Wilson, 2009). To address these concerns, firms can choose a few costless CSR components in which to invest for window dressing purposes (Davis, Guenther, Krull, and Williams, 2016; Deegan, 2002; Yin & Zhang, 2012). Moreover, firms devoted to CSR face high costs from CSR activities, which may reduce shareholders' wealth. Because of financial constraints, firms may need to trade off among CSR components.

Both paying a fair amount of taxes and engaging in environmental protection activities are costly CSR activities and are probably the activities that most attract investors' attention. Restricting aggressive tax planning (paying a fair amount of taxes) is an important element of CSR for stakeholders because taxes can be used for the public good, including but not limited to health care, national defense, infrastructure construction, and poverty elimination (Hanlon & Heitzman, 2010; Lin, Cheng, & Zhang, 2017). Environmental protection is another important component of CSR because we have only one earth and economic development should not proceed at the cost of polluting the environment (Williamson, Lynch-Wood, & Ramsay, 2006). Although no prior studies have investigated the association between tax aggressiveness and environmental protection, many researchers have studied the relationship between CSR and tax aggressiveness and have reported mixed results. Hoi, Wu, and Zhang (2013) claimed that, in theory, CSR and tax aggressiveness may be positively and negatively correlated. They use corporate culture theories (e.g., Kreps, 1990) to explain the potential negative relationship. CSR as a shared belief within a corporation motivates firms to be consistent in their behaviors, and therefore, firms engaging in more CSR are less likely to be tax aggressive. The authors also argued that firms may treat CSR activities as risk management tools to enhance their public image (Minor & Morgan, 2011). In this case, firms engaging in more CSR activities may be more likely to aggressively save taxes to restrict their overall costs. By studying U.S. public firms from 2003 to 2009, Hoi et al. (2013) found that firms engaging in irresponsible CSR activities show higher levels of tax aggressiveness (bad firms always perform poorly).

Consistent with this finding, Lanis and Richardson (2012) reported that a higher level of CSR disclosure corresponds to a lower level of tax aggressiveness in Australian firms (good firms always perform well). In contrast to these two studies, Davis et al. (2016) showed a positive relationship between CSR and tax

aggressiveness by examining U.S. firms. They found that firms with good CSR ratings pay less taxes because both CSR and tax payments can bolster firm reputation such that the two can be substituted for each other. Lin et al. (2017), whose empirical evidence is from China, reconciled the inconsistent results and found that firms in regions with lower institutional quality pay less taxes while claiming to be socially responsible, whereas firms in regions with higher institutional quality pay more taxes when claiming to be socially responsible. To summarize, both theories and evidence are mixed regarding the relationship between tax aggressiveness and CSR. Similarly, we argue that the relationship between tax aggressiveness and environmental protection is inconclusive. Firms paying fair taxes may be more likely to participate in environmental protection because good firms with a corporate culture to believe in CSR will perform well in different components of CSR (Kreps, 1990). Firms with strong CSR are expected to both protect the environment and comply with tax regulations. However, both of the CSR components of paying a fair amount of taxes and engaging in environmental protection activities may each require a significant cash investment, forcing firms to trade off between them; therefore, firms may need to choose just one of them on which to focus. Based on these arguments, we predicted that the degree of tax aggressiveness measured by the cash effective tax rate (cash ETR) would be significantly associated with environmental protection activities. However, we did not predict the sign (positive or negative) because theories support both. Please note higher cash ETR indicates a lower degree of tax aggressiveness. A negative (positive) relationship between tax aggressiveness and environmental protection activity means a positive (negative) relationship between cash ETR and environmental protection activity. Formally, our first hypothesis is as follows:

*H<sub>1</sub>: The cash ETR is significantly associated with environmental protection activity.*

We were also interested in the channels through which the relationship between the cash ETR and environmental protection was more pronounced. We first predicted political connections to be one of the channels. The Chinese government has advocated for environmental protection and released many strict regulations. Additionally, collecting taxes is always a government's key goal in supporting its operations (Zeng, 2010). Firms with political connections are likely to align government goals with their own targets (Fan, 2017; Fan & Song, 2019; Zeng, 2010). Therefore, we predicted that firms with political connections were less likely to engage in tax aggressiveness and more likely to engage in environmental protection activities than firms without political connections. Firms may obtain political connections via their management team or board members. Based on these observations, we developed the following two hypotheses:

*H<sub>2</sub>: The positive relationship between the cash ETR and environmental protection activity is more pronounced in firms with politically connected management than in firms without politically connected management.*

*H<sub>3</sub>: The positive relationship between the cash ETR and environmental protection activity is more pronounced in firms with politically connected boards than in firms without politically connected boards.*

Prior literature shows that firms with a higher percentage of independent directors performed better in CSR (Fan & Chen, 2017; Petra, 2005). Independent directors are more likely to require firms to comply with tax laws and environmental requirements. Therefore, we predicted that a positive relationship should exist between the cash ETR and environmental protection activities when firms have more independent directors. Formally, our fourth hypothesis is as follows:

*H<sub>4</sub>: The positive relationship between the cash ETR and environmental protection activity is more pronounced in firms with a higher percentage of independent directors.*

Another channel that we predicted that will influence the impact of environmental protection on tax aggressiveness was government bursary. On the one hand, firms that receive more government bursary

have more cash with which to pay taxes and invest in environmental protection, suggesting that a positive relationship between the cash ETR and environmental protection would be more pronounced in firms receiving more government bursaries. On the other hand, firms receiving fewer government bursaries may work harder to pay taxes and protect the environment to impress the government in order to receive more bursaries in the future, suggesting that a negative relationship between the cash ETR and environmental protection is more pronounced in firms receiving fewer government bursaries. Owing to the competing theories, our fifth hypothesis is nondirectional:

*H<sub>5</sub>: Government bursary moderates the relationship between the cash ETR and environmental protection activity.*

## DATA AND METHODOLOGY

Our sample construction started with all publicly traded firms listed on the Shanghai and Shenzhen stock exchanges for the period from 2007 to 2017. We excluded financial, government-regulated, and special-treatment firms, as well as non-profit organizations, from the sample because they are highly regulated and likely to behave differently compared to other firms. Our final sample included 4,451 firm-year observations from 868 individual firms. All variables were obtained from the China Stock Market & Accounting Research Database, except for background information regarding directors and executives, which was manually collected. We followed prior research (Peng, Sun and Markóczy 2015) and collected director and executive background information from the section “Profile of Directors and Senior Managers” in annual reports. Accordingly, we were able to distinguish politically and non-politically connected directors and executives. Politically connected directors or executives are those who worked in the government or military or are members of the National People’s Congress or the Chinese People’s Political Consultative Conference. Chinese public firms are required to disclose their environmental protection activities in their annual reports. We defined our variable of interest *Environment* as a dummy variable equal to 1 if a firm disclosed at least one environmental protection activity in year *t* and equal to 0 if a firm did not mention any environmental protection activity in its annual report in year *t*. Another variable of interest, *Cash\_ETR*, was calculated as income taxes paid divided by pre-tax income. Following the extant tax literature (Gupta & Newberry, 1997; Higgins, Omer and Phillips, 2015), we set the range of the ETR to be between 0 and 1. If the ETR was larger than 1, we reset it to 1; if the ETR was smaller than 0, we reset it to 0. To test *H<sub>1</sub>*, we used *Cash\_ETR* as our dependent variable and included factors that prior researchers found to influence the ETR (Higgins et al., 2015; Zeng, 2010). Then, we introduced the *Environment* dummy variable to the regression model (Equation 1).

$$Cash\_ETR_{it} = \beta_0 + \beta_0 Environment_{it} + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 Debt_{it} + \beta_4 Intan_{it} + \beta_5 Inventory_{it} + \beta_6 Cash_{it} + Year\ effects + Industry\ effects + \varepsilon_{it} \quad (equation\ 1)$$

Where:

*Cash\_ETR<sub>it</sub>* = income tax paid from the cashflow statement divided by the pre-tax income from the income statement;

*Environment<sub>it</sub>* = a dummy variable that equals to 1 if a firm disclosed in their annual report that it engaged in at least one environmental protection activity in year *t*, and equals to 0 otherwise;

*SIZE<sub>it</sub>* = natural log of total assets;

*ROA<sub>it</sub>* = the net income for firm *i* in year *t* divided by total asset for firm *i* in year *t*;

*Debt<sub>it</sub>* = the long-term debt for firm *i* in year *t* divided by total assets for firm *i* in year *t*;

$Intan_{it}$  = the value of intangible assets at the end of year t scaled by the total book value of the firm at the beginning of year t;

$Inventory_{it}$  = the value of inventory at the end of year t scaled by the total book value of the firm at the beginning of year t;

$Cash_{it}$  = the total value of cash at the end of year t scaled by the total book value of the firm at the beginning of year t.

As stated in  $H_1$ , we predicted  $\beta_1$  to be significant. However, we did not predict the sign because there are theories that support both positive and negative relationships. To test  $H_2-H_5$ , we divided the full sample into subgroups, such as politically connected and non-politically connected firms, and retested  $H_1$  for each subsample. Details are introduced in the next section.

**RESULTS**

Table 1 shows the summary statistics of the sample. Columns 2–4 show the number of observations, the mean, and the standard deviation for firm-year observations that did not participate in environmental protection activities ( $environment = 0$ ), respectively. Columns 5–7 show the same statistics for firm-year observations engaging in environmental protection activities ( $environment = 1$ ). The last column reports the p-value from a t-test comparing the means of the two subgroups. We found that firms participating in environmental protection paid more taxes, were larger, and had more intangible assets but were less profitable and held less cash and inventory. The high costs of environmental protection activities may have been the reason for the low profitability and cash holding.

Table 1: Summary Statistics Descriptive Statistics

Variables	Environment=0			Environment=1			T-test
	N	Mean	Std Dev	N	Mean	Std Dev	P-value
Cash_ETR	1,386	0.623	0.344	3,065	0.651	0.351	0.010
Size	1,386	22.570	1.291	3,065	23.100	1.398	0.000
ROA	1,386	0.047	0.052	3,065	0.043	0.053	0.009
Debt	1,386	0.086	0.127	3,065	0.089	0.120	0.393
Intan	1,386	0.055	0.084	3,065	0.060	0.073	0.043
Inventory	1,386	0.277	0.278	3,065	0.187	0.187	0.000
Cash	1,386	0.233	0.291	3,065	0.190	0.219	0.000

*This table presents statistics for the full sample of observations in the data. The data range from 2010 to 2017. Columns 2–4 show the number of observations, the mean, and the standard deviation for firm-year observations that did not participate in environmental protection activities ( $environment = 0$ ), respectively. Columns 5–7 show the same statistics for firm-year observations engaging in environmental protection activities ( $environment = 1$ ). The last column reports the p-value from a t-test comparing the means of the two subgroups.*

Both Pearson and Spearman correlations are shown in Table 2. No correlation was higher than 50%, suggesting that multicollinearity was likely not a main issue.

Table 2: Pearson and Spearman Correlations Correlation Coefficient

	Cash_ETR	Size	ROA	Debt	Intan	Inventory	Cash	Environment
Cash_ETR	1	0.11*	-0.16*	0.08*	-0.04*	0.16*	-0.03*	0.05*
Size	0.13*	1	-0.18*	0.46*	-0.05*	-0.00	-0.21*	0.17*
ROA	0.04*	-0.13*	1	-0.33*	0.06*	-0.06*	0.37*	-0.04*
Debt	0.05*	0.35*	-0.20*	1	-0.02	0.01	-0.29*	0.06*
Intan	-0.05*	0.02	0.03*	0.13*	1	-0.19*	0.00	0.13*
Inventory	0.17*	0.10*	-0.06*	0.20*	-0.14*	1	0.09*	-0.11*
Cash	-0.06*	-0.17*	0.25*	-0.04*	0.13*	0.15*	1	-0.08*
Environment	0.04*	0.18*	-0.04*	0.01	0.03*	-0.19*	-0.08*	1

This table presents correlation coefficients for the full sample data. The lower-triangular cells report Pearson's correlation coefficients, while the upper-triangular cells are Spearman's rank correlation. \* indicates that the correlations are statistically significant equal to or greater than 5%.

The following regression equation was estimated to identify determinants of *Cash\_ETR* and to test our five hypotheses. Fixed-effect estimates were obtained. The variable definition can be found in Table 3.

$$Cash\_ETR_{it} = \beta_0 + \beta_0 Environment_{it} + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 Debt_{it} + \beta_4 Intan_{it} + \beta_5 Inventory_{it} + \beta_6 Cash_{it} + Year\ effects + Industry\ effects + \varepsilon_{it} \quad (equation\ 1)$$

Table 3 presents the fixed effect model regression and Tobit model regression on the impact of *Environment* on *Cash ETR* (i.e.,  $H_1$ ). Column 1 presents the results for the regression model after controlling industry fixed effects. Columns 2 and 3 repeat the same model when controlling for year fixed effects and industry-year fixed effects, respectively. Column 4 presents the results of using the Tobit model. As we show in columns 1–3, *Environment* was positively and significantly associated with *Cash ETR* at the 10% level or lower, supporting  $H_1$ . The results suggest that firms do not need to focus on only one CSR component but, instead, can perform well in different aspects of CSR, which is consistent with corporate culture theories. Because the cash ETR was within the range of 0–1, we performed a robustness test using the Tobit model, and the results are shown in column 4. *Environment* was still positively and significantly associated with *Cash ETR* at the 10% level, again supporting  $H_1$ .

Tables 4–7 show the channels through which the relationship between firms' cash ETR and environmental protection activities was pronounced based on various firm characteristics, including the management's and board's politically connections, the percentage of independent directors, and the level of government bursary support. Table 4 presents the test results regarding whether management's political connections moderate the relationship between *Environment* and *Cash ETR* (i.e.,  $H_2$ ). We predicted in  $H_2$  that the relationship between *Cash ETR* and *Environment* would be stronger in firms with politically connected management. Column 1 presents the results for the regression model when using the subsample of firms with politically connected management, whereas column 2 presents the results for the regression model when using the subsample of firms without politically connected management. Table 4 shows that  $H_1$  was supported only in column 1 (i.e., firms with politically connected management), thus supporting  $H_2$ .

Table 3: Test of the Association between Cash ETR and Environmental Protection

	(1)	(2)	(3)	(4)
	Industry Fixed Effect Model	Year Fixed Effect Model	Industry-year Fixed Effect Model	Tobit Model
Environment	0.021* (0.080)	0.021* (0.080)	0.024** (0.048)	0.021* (0.077)
Size	0.020*** (0.000)	0.020*** (0.000)	0.021*** (0.000)	0.020*** (0.000)
ROA	0.377*** (0.000)	0.377*** (0.000)	0.249** (0.030)	0.377*** (0.000)
Debt	-0.031 (0.562)	-0.031 (0.562)	-0.080 (0.151)	-0.031 (0.558)
Intan	0.024 (0.762)	0.024 (0.762)	0.018 (0.831)	0.024 (0.760)
Inventory	0.263*** (0.000)	0.263*** (0.000)	0.276*** (0.000)	0.263*** (0.000)
Cash	-0.130*** (0.000)	-0.130*** (0.000)	-0.117*** (0.000)	-0.130*** (0.000)
Constant	0.174 (0.127)	-0.353*** (0.005)	0.105 (0.332)	-0.310** (0.019)
Industries	Fixed Effect	Included	Fixed Effect	Included
Years	Included	Fixed Effect	Fixed Effect	Included
Observations	4,451	4,451	4,451	4,451
R-squared	0.056	0.153	0.053	
Adjusted R <sup>2</sup>	0.028	0.137	0.026	
Pseudo R <sup>2</sup>				0.232

This table presents the fixed effect model regression and Tobit model regression on the impact of Environment on Cash ETR (i.e.,  $H_1$ ).  $Cash\_ETR_{it} = \beta_0 + \beta_0 Environment_{it} + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 Debt_{it} + \beta_4 Intan_{it} + \beta_5 Inventory_{it} + \beta_6 Cash_{it} + Year\ effects + Industry\ effects + \varepsilon_{it}$ , where the dependent variable is the Cash ETR, calculated as income tax paid by firm  $i$  in year  $t$  divided by pre-tax income in the same year; Environment is a dummy variable that equals to 1 if a firm disclosed in their annual report that it engaged in at least one environmental protection activity in year  $t$ , and equals to 0 otherwise; SIZE is the natural log of total assets; ROA is calculated as the net income for firm  $i$  in year  $t$  divided by total asset for firm  $i$  in year  $t$ ; Debt is the long-term debt for firm  $i$  in year  $t$  divided by total assets for firm  $i$  in year  $t$ ; Intan is calculated as the value of intangible assets at the end of year  $t$  scaled by the total book value of the firm at the beginning of year  $t$ ; Inventory is the value of inventory at the end of year  $t$  scaled by the total book value of the firm at the beginning of year  $t$ ; Cash is the total value of cash at the end of year  $t$  scaled by the total book value of the firm at the beginning of year  $t$ . Column 1 presents the results for the regression model after controlling industry fixed effects. Columns 2 and 3 repeat the same model when controlling for year fixed effects and industry-year fixed effects, respectively. Column 4 presents the results of using the Tobit model. \*, \*\* and \*\*\* denote statistical significance at the 10%, 5% and 1% levels, respectively. P-values are in parentheses.

Table 5 presents the test results regarding whether a board’s political connections moderate the relationship between Environment and Cash ETR (i.e.,  $H_3$ ). Similar to  $H_2$ , we predicted in  $H_3$  that the relationship between Cash ETR and Environment would be stronger in firms with politically connected boards. We focused on nonexecutive board members’ political connections to exclude the moderating effect of executive board members, which was tested in  $H_2$ . Therefore, we define a politically connected board as a board with at least one politically connected nonexecutive board member. Column 1 presents the results for the regression model when using the subsample of firms with politically connected boards, whereas column 2 presents the results for the regression model when using the subsample of firms without politically connected boards. Table 5 shows that  $H_1$  was supported only in column 1 (i.e., firms with politically connected boards), thus supporting  $H_3$ .

Table 4: Test of the Moderation Effect of Management's Political Connections

	(1)	(2)
	Subsample: Politically Connected Management	Subsample: Non-politically Connected Management
Environment	0.077** (0.020)	0.014 (0.283)
Size	-0.001 (0.956)	0.020*** (0.000)
ROA	-0.442 (0.136)	0.582*** (0.000)
Debt	0.090 (0.577)	-0.079 (0.190)
Intan	-0.158 (0.553)	0.073 (0.420)
Inventory	0.229** (0.013)	0.313*** (0.000)
Cash	-0.025 (0.658)	-0.153*** (0.000)
Constant	0.539 (0.107)	0.137 (0.250)
Industries	Fixed Effect	Fixed Effect
Years	Included	Included
Observations	518	3,571
R-squared	0.054	0.060
Adjusted R <sup>2</sup>	0.051	0.035

This table presents the test results regarding whether the management's political connection moderates the relationship between environment and cash ETR (i.e., hypothesis 2). The full sample is divided into two subgroups: firms with politically connected management and firms without politically connected management. The same regression model below is estimated in each subsample.  $Cash\_ETR_{it} = \beta_0 + \beta_0 Environment_{it} + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 Debt_{it} + \beta_4 Intan_{it} + \beta_5 Inventory_{it} + \beta_6 Cash_{it} + Year\ effects + Industry\ effects + \varepsilon_{it}$ . The definitions of all variables are illustrated in Table 3. Column 1 presents the results for the regression model when using the subsample of firms with politically connected management, whereas Column 2 presents the results for the regression model when using the subsample of firms without politically connected management. \*, \*\* and \*\*\* denote statistical significance at the 10%, 5% and 1% levels, respectively. P-values are in parentheses.

The third channel we tested was the percentage of independent directors. Table 6 presents the test results regarding whether the percentage of independent directors moderates the relationship between *Environment* and *Cash ETR* (i.e.,  $H_4$ ). In our sample, the average percentage of independent directors was 33.35%. Column 1 presents the results for the regression model when using the subsample of firms with above-average percentages of independent directors, whereas column 2 presents the results for the regression model when using the subsample of firms with below-average percentages of independent directors. Table 6 shows that *Cash ETR* was positively associated with *Environment* in firms with an above-average percentage of independent directors (column 1), whereas this relationship was nonsignificant in firms with a below-average percentage of independent directors (column 2), thus supporting  $H_4$ .



Table 5: Test of the Moderation Effect of Board’s Political Connections

	(1)	(2)
	Subsample: Politically Connected Board	Subsample: Non-politically Connected Board
Environment	0.034* (0.068)	0.009 (0.606)
Size	0.030*** (0.000)	0.013* (0.055)
ROA	0.124 (0.466)	0.743*** (0.000)
Debt	-0.135 (0.100)	0.020 (0.798)
Intan	-0.047 (0.700)	0.091 (0.442)
Inventory	0.243*** (0.000)	0.350*** (0.000)
Cash	-0.085** (0.017)	-0.162*** (0.000)
Constant	-0.089 (0.590)	0.269* (0.082)
Industries	Fixed Effect	Fixed Effect
Years	Included	Included
Observations	1,906	2,183
R-squared	0.065	0.059
Adjusted R <sup>2</sup>	0.031	0.040

This table presents the test results regarding whether the board’s political connection moderates the relationship between environment and cash ETR (i.e., hypothesis 3). We focus on non-executive board members’ political connection to exclude the moderation effect of executive board members, which has been tested in H2. The full sample is divided into two subgroups: firms with at least one politically connected independent board members and firms without politically connected independent board members. The same regression model below is estimated in each subsample

$Cash\_ETR_{it} = \beta_0 + \beta_0 Environment_{it} + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 Debt_{it} + \beta_4 Intan_{it} + \beta_5 Inventory_{it} + \beta_6 Cash_{it} + Year\ effects + Industry\ effects + \varepsilon_{it}$ . The definitions of all variables are illustrated in Table 3. Column 1 presents the results for the regression model when using the subsample of firms with politically connected board, whereas Column 2 presents the results for the regression model when using the subsample of firms without politically connected board. \*, \*\* and \*\*\* denote statistical significance at the 10%, 5% and 1% levels, respectively. P-values are in parentheses.

Finally, we tested how government bursary influences firms’ choices of tax aggressiveness and environmental protection activities. Table 7 presents the test results regarding whether government bursary moderates the relationship between *Environment* and *Cash ETR* (i.e.,  $H_5$ ). The average value of government bursary as a percentage of total assets was 0.396% in our sample. Column 1 presents the results for the regression model when using the subsample of firms with above-average government bursary, whereas column 2 presents the results for the regression model when using the subsample of firms with below-average government bursary. Consistent with  $H_5$ , we found that government bursary influenced the relationship between the cash ETR and firms’ environmental protection activities. When firms received a below-average government bursary as a percentage of total assets, the relationship between *Cash ETR* and *Environment* was positive and significant at the 10% level (column 2), probably because these firms tended to perform well in the hope of receiving more government bursary in the future. The relationship between *Cash ETR* and *Environment* was nonsignificant in column 1.

Table 6: Test of the Moderation Effect of Independent Directors

	(1)	(2)
	Subsample: Independent Directors % > Mean	Subsample: Independent Directors % ≤ Mean
Environment	0.027* (0.090)	0.006 (0.709)
Size	0.022*** (0.001)	0.015** (0.029)
ROA	0.227 (0.135)	0.566*** (0.000)
Debt	-0.069 (0.354)	0.046 (0.556)
Intan	0.123 (0.265)	-0.110 (0.360)
Inventory	0.308*** (0.000)	0.187*** (0.000)
Cash	-0.149*** (0.000)	-0.097*** (0.003)
Constant	0.132 (0.463)	0.290* (0.077)
Industries	Fixed Effect	Fixed Effect
Years	Included	Included
Observations	2,263	2,188
R-squared	0.065	0.055
Adjusted R <sup>2</sup>	0.037	0.027

This table presents the test results regarding whether the percentage of independent directors moderates the relationship between environment and cash ETR (i.e., hypothesis 4). The full sample is divided into two subgroups: firms with above-average percentage of independent directors and firms with below-average percentage of independent directors. The same regression model below is estimated in each subsample.

$Cash\_ETR_{it} = \beta_0 + \beta_1 Environment_{it} + \beta_2 SIZE_{it} + \beta_3 ROA_{it} + \beta_4 Debt_{it} + \beta_5 Intan_{it} + \beta_6 Inventory_{it} + \beta_7 Cash_{it} + Year\ effects + Industry\ effects + \epsilon_{it}$ . The definitions of all variables are illustrated in Table 3. Column 1 presents the results for the regression model when using the subsample of firms with above-average percentages of independent directors, whereas column 2 presents the results for the regression model when using the subsample of firms with below-average percentages of independent directors. \*, \*\* and \*\*\* denote statistical significance at the 10%, 5% and 1% levels, respectively. P-values are in parentheses.

Table 7: Test of the Moderation Effect of Government Bursary

	(1)	(2)
	Subsample: Gov Bursary ≥ Mean	Subsample: Gov Bursary < Mean
Environment	0.030 (0.173)	0.023* (0.089)
Size	0.019** (0.027)	0.014** (0.013)
ROA	0.837*** (0.000)	0.244* (0.054)
Debt	-0.240** (0.020)	0.050 (0.416)
Intan	0.260 (0.183)	-0.022 (0.801)
Inventory	0.239*** (0.001)	0.267*** (0.000)
Cash	-0.120*** (0.010)	-0.123*** (0.000)
Constant	0.149 (0.638)	0.291** (0.027)
Industries	Fixed Effect	Fixed Effect
Years	Included	Included
Observations	1,542	2,909
R-squared	0.048	0.071
Adjusted R <sup>2</sup>	0.036	0.031

This table presents the test results regarding whether the government bursary moderates the relationship between environment and cash ETR (i.e., hypothesis 5). The full sample is divided into two subgroups: firms with above-average government bursary as a percentage of total assets and firms with below-average government bursary as a percentage of total assets. The same regression model below is estimated in each subsample.

$Cash\_ETR_{it} = \beta_0 + \beta_1 Environment_{it} + \beta_2 SIZE_{it} + \beta_3 ROA_{it} + \beta_4 Debt_{it} + \beta_5 Intan_{it} + \beta_6 Inventory_{it} + \beta_7 Cash_{it} + Year\ effects + Industry\ effects + \epsilon_{it}$ . The definitions of all variables are illustrated in Table 3. Column 1 presents the results for the regression model when using the subsample of firms with above-average government bursary, while Column 2 presents the results for the regression model when using the subsample of firms with below-average government bursary. \*, \*\* and \*\*\* denote statistical significance at the 10%, 5% and 1% levels, respectively. P-values are in parentheses.

## CONCLUDING COMMENTS

This study was motivated by a lack of understanding about whether and how firms weigh different aspects of CSR activities. We examined two research questions in this study: first, whether and how tax aggressive and environmental protection activities as two costly CSR components are correlated and, second, the channels through which environmental protection activities affect tax aggressiveness. By investigating all public Chinese firms from 2010 to 2017, we found that tax aggressiveness and environmental protection were negatively associated with each other, suggesting that firms that perform well do so among different CSR components. Our results are robust to fixed-effects estimation and Tobit estimation. Additionally, we found that the negative relationship between tax aggressiveness and environmental protection activities is more pronounced in firms with politically connected management or board members, firms with a higher percentage of independent directors, and firms receiving fewer government bursaries. This study makes theoretical and practical contributions to the tax literature. First, our finding adds to the growing literature on the determinants of tax aggressiveness by showing that CSR such as environmental protection plays an important role. Firms performing well in environmental protection tend to be less aggressiveness in tax planning. Second, by documenting the moderating effect of political connections, we provide further evidence demonstrating the key role of government in deterring firms' tax behaviors in China. Our findings will be interesting to policymakers because we suggest a potential means to detect tax-aggressive firms. The findings will also be interesting to investors because many investors want to avoid tax-aggressive firms, which are believed to be risky. Similar to other related studies, one limitation of this study is the imperfect measure of tax aggressiveness. Because of the confidentiality of tax data, researchers can only estimate the extent of tax aggressiveness by using reported financial data. The Chinese firms in our sample report less information than their counterparts in the United States; for example, they do not report foreign income, which further lowers researchers' ability to accurately estimate tax aggressiveness.

We call for future studies to improve the measures of tax aggressiveness for Chinese firms. Moreover, we hope more researchers will investigate firms' choices of tax savings and other CSR components more comprehensively.

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