TAX AVOIDANCE AND EQUITY INCENTIVES

Chunwei Xian
Northeastern Illinois University

Qifeng Li
Shandong University

Phillip Neal
Northeastern Illinois University

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Abstract

This study investigates the impact of equity incentives on the degree of tax avoidance. Equity incentives for executives align the interests of executives and shareholders because the former receive awards that share firm value with stockholders. In general, managerial behavior to minimize corporate tax obligations can increase firm value and shareholder wealth. Thus, we expect equity incentives to promote more effective tax avoidance activities. We test two empirical hypotheses: (1) whether the level of tax avoidance is positively related to the equity-based pay of executives; (2) whether executives with higher equity-based pay prefer tax avoidance activities related to permanent differences more than those related to temporary differences. We use a sample of 10,933 firm-year observations (1,107 firms) spanning the period 1992-2011 obtained from

ExecuComp, and Compustat. Our results support both hypotheses. We find a larger book-tax difference and a lower effective tax rate in companies with higher equity incentives. We also document that companies' tax avoidance is more likely to be related to permanent rather than temporary differences when executives receive more equity incentives.

I. INTRODUCTION

Most corporations owe income taxes at the federal, state and local levels. In our sample, the effective tax rate is 31 percent on average, which means that the government takes away nearly a one-third share of pre-tax income. Thus, it is important for corporate executives to practice tax avoidance activities to retain shareholder wealth. Prior empirical studies address the impact of equity incentives on managerial behavior as it pertains to earnings management and investments etc. (Cheng and Warfield, 2005; Hall and Murphy, 2002; Bryan et al. 2000; Kwon and Yin, 2006). In this study, we examine whether equity-based pay promotes a high level of tax avoidance.

Incentive contracts are designed to align the interests of executives and shareholders. Equity-based compensation, which includes stock options and restricted stock, often reduces the conflict of interest between agents and principals (Cheng, 2004, Kang et al., 2006, Datta et al., 2001) and may provide incentives for managers to engage in tax avoidance activities to increase firm value. Therefore, we expect that executives with more equity-based pay engage in more effective tax avoidance to maximize firm value and their own wealth.

We divide tax avoidance activities into two categories: tax avoidance related to permanent differences and tax avoidance related to temporary differences. The motivations for these two kinds of tax avoidance are not the same, considering that managers can use temporary differences to manage short-term earnings.

Equity incentives can reduce managerial opportunistic behavior because they are usually considered long-term. Most previous studies exclude temporary differences when they estimate effective tax rates (Desai and Dharmapala 2006; Phillips 2003) because temporary differences do not impact a firm's after-tax accounting earnings. We study temporary differences separately for the following two reasons: (1) The temporary differences apparently have a reverse effect in later years, which may hurt the after-tax performance in long run. Therefore, their tax saving effect is very limited. (2) Many of the temporary differences are automatically generated through various accounting standards and tax regulations. They more relate to corporate characteristics such as investment, growth, and long-term sales rather than to planned tax avoidance activities.

Using 10,933 firm-year observations from COMPUSTAT and ExecuComp databases during the period 1992—2011, we examine the determinants of tax avoidance. We regress the two sets of measures for tax avoidance on equity incentives and other control variables associated with tax avoidance in prior studies. The first set of measures includes three variables: book-tax differences, permanent differences, and temporary differences. The second set of measures incorporates cash effective tax rates, effective tax rates, and deferred tax rates. We control for firm effects such as income from foreign segments, market-to-book ratio, and accounting earnings.

Our study contributes to the existing accounting literature on tax avoidance by focusing on the effects of equity incentives. Phillips (2003) and Desai and Dharmapala (2006) conducted studies on the similar topic. Phillips (2003) documents that after-tax performance-based incentives are sufficient to motivate business-unit managers to become involved in tax-avoidance activities that lower a firm's effective tax rates. Desai and Dharmapala (2006) demonstrate that the value of stock options granted to a firm's top five executives is negatively associated with the level of tax sheltering in companies with relatively weak corporate governance.

This paper focuses on the relation between equity incentives and tax avoidance activities. Our main results demonstrate that the level of tax avoidance is positively related to the equity-based incentives of executives. Companies have lower effective tax rates when CEOs are rewarded a larger portion of equity-based pay. Our regression results show that executives granted more equity incentives prefer to engage in tax avoidance activities related to permanent rather than temporary differences.

The remainder of the study is organized as follows: in the next section, we review the literature and develop hypotheses and in the third section we explain our sample selection criteria and descriptive statistics. The fourth section describes our empirical models and the fifth section reports the results from the main regressions and the robustness tests. To conclude, the sixth section summarizes our findings.

II. LITERATURE REVIEW AND DEVELOPMENT OF HYPOTHESES

Tax avoidance activity by corporations, generally viewed as benefiting shareholders, consists of reducing tax liability through a decrease in taxable income or an increase in tax credits (Hanlon and Slemrod, 2009). For instance, companies may obtain tax credits for research and development expenditures or investing in tax-exempt municipal bonds (Dyreng et al., 2008). Prior studies document that the level of tax avoidance is associated with a firm's multinational status, its profitability, its leverage, its capital intensity and its size (Lisowsky, 2010; Rego, 2003; Phillips, 2003). Desai and Dharmapala (2009) find that "the effect of tax avoidance on firm value is positive for well-governed firms". Effective tax avoidance can save taxes and increase the after-tax wealth of firm shareholders (Hanlon and Heitzman, 2010).

Incentive contracts reduce agency conflicts between agents and principals (Kang et al., 2006; Cheng, 2004; Datta et al., 2001). For example, Mehran (1995) finds that firm performance improves when compensation contracts are based on company financial performance. Equity-based compensation is one of the most

efficient ways to motivate managers to work hard on behalf of shareholders (Jensen and Meckling, 1976). Stock option plans can "give executives a greater incentive to act in the interests of shareholders by providing a direct link between realized compensation and company stock-price performance" (Hall and Murphy, 2003). In a review of tax research, Hanlon and Heitzman (2010) state "risk-neutral shareholders expect managers acting on their behalf to focus on profit maximization, which includes going after opportunities to reduce tax liabilities as long as the expected incremental benefit exceeds the incremental cost." Thus, we deduce that the level of tax avoidance increases with the equity incentives of executives because they motivate managers to engage in tax avoidance activities to increase firm value and benefit shareholders. From an empirical perspective, the higher the book-tax differences, the higher the level of tax avoidance a corporation engages in. Book-tax differences can signal a level of tax avoidance because firms can often purposely manipulate their taxable income through certain tax avoidance activities. We expect equity incentives to promote more effective tax avoidance activities.

Therefore, we state our first hypothesis in the alternative form:

H1: The level of tax avoidance is positively related to the equity incentives corporate executives receive.

Book-tax differences include both temporary and permanent differences. Our data analysis shows that less than half of book-tax differences are attributable to temporary differences such as depreciation accounting and stock options. The other portion of book-tax differences is explained by any tax avoidance activities that generate permanent differences. The temporary differences will bring future tax benefits or future tax liabilities depending on the nature of the differences. However, many of the tax saving techniques are employed merely to defer the tax due date and thus any current tax avoidance most likely increases the risk of a future tax liability.

Equity-based compensation helps to shift a CEO's focus from short-term performance to the long-term since they cannot exercise their options or restricted stock immediately. The vesting period for stock options and restricted stock is three to five years on average (Hall and Murphy, 2002). Equity-based compensation plays an important role in avoiding opportunistic behavior by executives (Kwon and Yin, 2006; Xian et al. 2011). We expect that executives with more equity incentives are more likely to engage in tax avoidance with permanent rather than temporary differences since the latter relate more to short term performance.

Thus, we state our hypothesis in the alternative form:

H2: The permanent difference between book income and taxable income is more positively related to equity incentives of executives than the temporary difference.

III. METHODOLOGY

The following three models (1)-(3) are used to test our hypotheses.

$$\begin{aligned} BTD_{i,t} = {} & \beta_0 + \beta_1 EQUITYMIX_{i,t} + \beta_2 PPE_{i,t} + \beta_3 INTANG_{i,t} \\ & + \beta_4 FI_{i,t} + \beta_5 NOL_{i,t} + \beta_6 DEBT_{i,t} + \beta_7 ROA_{i,t} \\ & + \beta_8 MB + \beta_9 TA + year\ dummies \\ & + industry\ dummies + \varepsilon_{i,t} \end{aligned} \quad (1)$$

$$\begin{aligned} DPERM_{i,t} = {} & \beta_0 + \beta_1 EQUITYMIX_{i,t} + \beta_2 PPE_{i,t} + \beta_3 INTANG_{i,t} \\ & + \beta_4 FI_{i,t} + \beta_5 NOL_{i,t} + \beta_6 DEBT_{i,t} + \beta_7 ROA_{i,t} \\ & + \beta_8 MB + \beta_9 TA + year\ dummies \\ & + industry\ dummies + \varepsilon_{i,t} \end{aligned} \quad (2)$$

$$DTEMP_{i,t} = \beta_0 + \beta_1 EQUITYMIX_{i,t} + \beta_2 PPE_{i,t} + \beta_3 INTANG_{i,t} + \beta_4 FI_{i,t} + \beta_5 NOL_{i,t} + \beta_6 DEBT_{i,t} + \beta_7 ROA_{i,t} + \beta_8 MB + \beta_9 TA + year\ dummies + industry\ dummies + \varepsilon_{i,t} \quad (3)$$

Where the subscript *i* stands for the companies, and the subscript *t* stands for the year.

Table 1 lists the definitions of the variables. We regress the three variables of the level of tax avoidance activities on equity incentives and other control variables. The three variables of tax avoidance are book-tax differences, permanent differences and temporary differences. Generally, the more effective tax avoidance activities that a firm has, the higher the book-tax income difference. The total book-tax income difference is calculated to measure the level of tax avoidance activities. Following Chen et al. (2010), we calculate book-tax difference (BTD) as pre-tax book income minus estimated taxable income, where estimated taxable income equals the sum of current federal tax expenses, current foreign income tax expenses, state income taxes, and other income taxes, divided by the statutory tax rate. We decompose the book-tax difference to two components: temporary book-tax difference (TEMP) and permanent book-tax difference (PERM). Temporary book-tax difference is calculated as deferred tax expenses divided by the statutory tax rate. Permanent book-tax difference is calculated as the difference between BTD and TEMP. All above three variables are scaled by the beginning balance of total assets.

Our main testing variable is EQUITYMIX, the ratio of CEO equity incentives to total CEO compensation. It reflects the proportion of CEO compensation paid in the form of equity. The equity incentives are the sum of stock options and restricted stock. Stock options are valued using the Black-Scholes model. Total CEO compensation includes salary, bonus, stock options, restricted stock, and other long-term incentives. The control variables are the property, plant, and equipment (PPE), intangible assets (INTANG), foreign income (FI), loss carryforward (NOL), the

ratio of total liabilities and total assets (DEBT), return on assets (ROA), market-to-book ratio (MB), and total assets (TA). These control variables are found to associate with tax avoidance in prior studies.

TABLE 1 Variables Definition

Variables	Definition
BTD	Book-tax difference scaled by the beginning balance of total assets, which is calculated as pretax book income minus estimated taxable income, where estimated taxable income=(current federal tax expenses + current foreign income tax expense + state income taxes + other income taxes)/statutory tax rate. Compustat Items{PI-[(TXFED+TXFO+ TXS+TXO)/statutory tax rate]/lag(AT)}
DTEMP	Temporary book-tax difference scaled by the beginning balance of total assets, which is calculated as deferred tax expenses divided by the statutory tax rate. Compustat item (TXDI/ statutory tax rate)/ lag(AT)
DPERM	Permanent book-tax difference scaled by the beginning balance of total assets, which is calculated as the difference between BTD and DTEMP. (BTD-DTEMP)/ lag(AT)
CETR	Cash effective tax rate, which is calculated as cash taxes paid divided by pre-tax income (Compustat item TXPD/PI).
ETR	Effective tax rate, which is calculated as total income tax expense divided by pre-tax income (Compustat item TXT/PI).
DTR	Deferred tax rate, which is calculated as deferred tax expenses divided by pre-tax income (Compustat item TXDI/PI).
EQUITYMIX	The sum of granted stock options (Black and Scholes value) and restricted stock divided by the total CEO compensation.
PPE	The net value of Property, Plant, and Equipment (PPE) scaled by the beginning balance of total assets.
INTANG	The intangible assets (Compustat Item INTAN) scaled by the beginning balance of total assets.
FI	An indicator variable coded as one if the firm has foreign income (Compustat Item PIFO); and 0 otherwise.
DEBT	Total liabilities scaled by the beginning balance of total assets.
ROA	The income before extraordinary items divided by average total assets.

NOL	An indicator variable coded as one if loss carryforward (Compustat item TLCF) is more than zero at the beginning of the fiscal year is positive; and zero otherwise.
MB	The ratio of market value of equity to book value of equity at the beginning of the fiscal year.
TA	The natural logarithm of total assets at the beginning of the fiscal year.

Our first hypothesis expects positive signs on EQUITYMIX in all three models. Firms should have more effective tax avoidance if they pay executives more stock-based compensation. The second hypothesis is tested by comparing the results from model 2 and model 3. We expect the coefficient on EQUITYMIX in model 2 to be significantly larger than that in model 3. We argue that executives with high equity incentives tend to become involved with tax avoidance activities, leading to more permanent than temporary differences.

IV. SAMPLE SELECTION AND DATA DESCRIPTION

CEO compensation data are obtained from ExecuComp. We first eliminate companies in financial industries (with two-digit SIC codes 60-69) and merge this sample with COMPUSTAT, where we get financial statement information to estimate the level of tax avoidance activities. We delete all the continuous variables at the one percent and 99 percent levels to avoid outlier problems. Our final sample includes 1107 companies covering 10,933 company-years for the period 1992-2011.

Table 2, which presents descriptive statistics for CEO total compensation, equity-based compensation, and other firm characteristics, shows that mean values for total CEO compensation and equity-based compensation are $4,674,300 and $2,066,950, respectively. On average, 32.5 percent of total CEO compensation comprises equity-based pay, with the upper quartile of 54.1 percent. On average, total assets are $5,394 million. The

mean ROA is 0.094. On average, 24.8 percent of a firm's total assets are financed with debt.

Table 3 represents the Pearson correlations among the variables. There are two correlation coefficients greater than .4. The correlation coefficient between book-tax difference (BTD) and ROA is 0.605, which indicates that more profitable companies have a higher probability of being involved with tax shelter activities. The correlation coefficient between PPE and DEBT is 0.561, showing that a firm with more investment opportunities tends to have a greater liability-to-asset ratio. All the remaining coefficients are lower than 0.4. The maximum variance inflation factor (VIF) for the three models is 2.115. The multi-collinearity problems are not severe since the VIF factor is lower than the benchmark 10. Among these relatively low correlation coefficients, the correlation between PPE and BTD is 0.307, indicating that book-tax differences are greater in firms with higher investment levels. The correlation between DEBT and BTD is 0.231, showing that book tax differences are positively correlated with the liability to asset ratio.

V. EMPIRICAL RESULTS

Table 4 shows the OLS regression results for models 1, 2, and 3. The results support both of hypotheses. The first column of Table 4 shows the results of model 1. The coefficient of EQUITYMIX is significantly positive (t-value=5.66), which supports the first hypothesis that there is a positive relation between the tax avoidance level and the equity incentives granted to executives. CEOs with high equity-based incentives are more likely to become involved with tax avoidance activities. The second column of Table 4 presents the results of model 2. The coefficient of EQUITYMIX is positive and significant (t-value=5.69), which proves that executives with more equity-based pay tend to engage in tax avoidance related to permanent differences.

Table 2
Descriptive Statistics

Variable	Mean	Std. Dev.	Lower Quartile	Median	Upper Quartile
BTD	0.041	0.048	0.012	0.027	0.051
DPERM	0.031	0.039	0.011	0.020	0.047
DTEMP	0.02	0.041	0	0.014	0.033
CETR	0.214	0.167	0.108	0.225	0.313
ETR	0.310	0.111	0.276	0.343	0.378
DTR	0.287	0.185	0.230	0.319	0.368
EQUITYMIX	0.325	0.280	0	0.295	0.541
TOTALPAY ($thousands)	4674.300	9823.020	1228.93	2624.540	5396.800
EQUITYPAY ($thousands)	2066.950	8742.220	0	680.307	2085.030
PPE	0.351	0.354	0.120	0.248	0.468
INTANG	0.207	0.252	0.016	0.118	0.310
FI	0.575	0.494	0	1	1
NOL	0.352	0.478	0	0	1
DEBT	0.248	0.275	0.041	0.201	0.348
ROA	0.094	0.077	0.045	0.075	0.118
MB	3.387	2.880	1.738	2.561	3.902
TA	7.232	1.530	6.122	7.100	8.215
Total assets ($millions)	5394.228	20047.905	501.060	1282.711	3748.116

This panel reports the descriptive statistics of CEO compensation and corporate financial characteristics for 10933 firm-year observations from 1992 to 2011. Total compensation is measured in $000. To alleviate outlier problems, we delete observations with continuous variables at the bottom 1% and the top 1% levels.

Table 3 Pearson Correlation

Pearson Correlation Coefficients, N = 10933 Prob > |r| under H0: Rho=0									
	EQUITYMIX	PPE	INTANG	FI	NOL	DEBT	ROA	MB	TA
BTD	0.057***	0.307***	0.072***	0.029***	0.055***	0.213***	0.605***	0.133***	-0.156***
EQUITY MIX	1	-0.007	0.030***	0.045***	-0.007	0.037***	0.061***	0.145***	0.086***
PPE		1	-0.085***	-0.162***	-0.114***	0.561***	0.266***	-0.055***	-0.056***
INTANG			1	0.091***	0.157***	0.385***	0.062***	-0.039***	0.050***
FI				1	0.201***	-0.030***	0.027***	0.041***	0.235***
NOL					1	0.038***	-0.044***	-0.015	0.088***
DEBT						1	0.142***	0.031***	0.067***
ROA							1	0.321***	-0.251***
MB								1	0.028***
TA									1

This table reports the Pearson correlation matrix between the CEO total compensation and the independent variables for 10933 firm-year observations. ***, ** and * indicate significance at the 1 percent, 5 percent and 10 percent levels respectively, two-tailed.

The third column of Table 4 presents the results of model 3. The coefficient on EQUITYMIX in the third column is not significant (t-value=-0.41). Combining the above two results, we deduce that companies that grant more stock options or restricted stock are more likely to cut their tax liabilities through tax avoidance related to permanent differences than through temporary differences. Thus, our second hypothesis receives strong support from the data analysis.

The results for the control variables are generally consistent with the findings in prior tax avoidance studies, such as those of Chen et al. (2010), Phillips (2003), and Lisowsky (2010). The coefficients of PPE, FI, NOL, DEBT, and ROA are positive and significant in all three models, indicating that the likelihood of using tax shelters is positively related to specific firm characteristics such as foreign income, leverage and profit, giving these firms more chance to engage in tax shelter activities. But the market-to-book ratio (MB) and firm size (TA) are negatively related to the level of tax avoidance activities, and firms with more growth opportunities are less likely to practice tax avoidance activities. The larger the firm, the less it practices tax avoidance activities. One explanation for this result is that large firms readily attract scrutiny from regulators and they may pay a higher price for aggressive tax planning.

Robustness Tests

In addition to book-tax differences, we employ three different ratios to evaluate the level of tax avoidance: CETR, ETR, and DTR. The first measure is the cash effective tax rate (CETR), calculated as cash taxes paid divided by pre-tax income. The second measure, ETR is calculated as total income tax expense divided by pre-tax income. The total income tax expense does not reflect temporary differences of tax income and book income and only reflects permanent book-tax differences. CETR and ETR are commonly used to measure the tax avoidance level in prior studies (Callihan 1994; Mills et al. 1998; Yin 2003; Chen et al. 2010). The third measure, DTR, is calculated as deferred tax expenses divided by pre-tax income, a measure introduced by our study.

Table 4
OLS Regression Results for Equation (1)--(3)

	I BTD		II DPERM		III DTEMP	
Variable	Parameter Estimate	t Value	Parameter Estimate	t Value	Parameter Estimate	t Value
INTERCEPT	-0.002	-0.91	-0.002	-1.10	0.011***	5.14
EQUITYMIX	0.008***	5.66	0.008***	5.69	-0.001	-0.41
PPE	0.019***	13.67	0.019***	13.59	0.039***	26.57
INTANG	0.001	0.46	0.001	0.38	0.024***	13.13
FI	0.002**	2.41	0.002**	2.40	-0.006***	-7.12
NOL	0.008***	10.08	0.008***	10.11	0.001	1.16
DEBT	0.010***	5.10	0.010***	5.24	-0.006***	-2.92
ROA	0.349***	64.35	0.352***	64.71	-0.011**	-2.03
MB	-0.001***	-5.82	-0.001***	-5.96	0.0001	1.06
TA	-0.001***	-3.36	-0.001***	-3.28	0.0005*	-1.71
Year dummies	Not reported					
Industry dummies	Not reported					
Nobs	10933		10933		10933	
Adj. R2	0.410		0.410		0.120	

This table reports the OLS regression results for equation (1)--(3) on BTD, DPERM and DTEMP. The largest VIF factor is 2.115 which shows that the regressions do not have serious multi-linearity problems. White's (1980) heteroscedasticity tests show the models are not in violation of the assumption of the homoscedastic errors. *, **, and *** indicate statistical significance levels at 10 percent, 5 percent, and 1 percent respectively, in two-tailed tests. To alleviate outlier problems, we delete the observations with continuous variables at the bottom 1% and the top 1% levels.

Generally, the more that effective tax avoidance activities are employed, the more likely that a firm has a much lower effective tax rate. Thus, our predicted signs on EQUITYMIX are negative in all the three models.

$$\begin{aligned} CETR_{i,t} = {} & \beta_0 + \beta_1 EQUITYMIX_{i,t} + \beta_2 PPE_{i,t} + \beta_3 INTANG_{i,t} \\ & + \beta_4 FI_{i,t} + \beta_5 NOL_{i,t} + \beta_6 DEBT_{i,t} + \beta_7 ROA_{i,t} \\ & + \beta_8 MB + \beta_9 TA + year\ dummies \\ & + industry\ dummies + \varepsilon_{i,t} \end{aligned} \quad (4)$$

$$\begin{aligned} ETR_{i,t} = {} & \beta_0 + \beta_1 EQUITYMIX_{i,t} + \beta_2 PPE_{i,t} + \beta_3 INTANG_{i,t} \\ & + \beta_4 FI_{i,t} + \beta_5 NOL_{i,t} + \beta_6 DEBT_{i,t} + \beta_7 ROA_{i,t} \\ & + \beta_8 MB + \beta_9 TA + year\ dummies \\ & + industry\ dummies + \varepsilon_{i,t} \end{aligned} \quad (5)$$

$$\begin{aligned} DTR_{i,t} = {} & \beta_0 + \beta_1 EQUITYMIX_{i,t} + \beta_2 PPE_{i,t} + \beta_3 INTANG_{i,t} \\ & + \beta_4 FI_{i,t} + \beta_5 NOL_{i,t} + \beta_6 DEBT_{i,t} + \beta_7 ROA_{i,t} \\ & + \beta_8 MB + \beta_9 TA + year\ dummies \\ & + industry\ dummies + \varepsilon_{i,t} \end{aligned} \quad (6)$$

Table 5 presents the OLS regression results for models 4, 5, and 6. The results are qualitatively similar to the results in Table 4. The first column of Table 5 shows the results of model 4. The coefficient on EQUITYMIX is significant and negative (t-value=-8.27). This result, which means a lower effective tax rate occurs when executives receive more equity pay, is consistent with our first hypothesis. The coefficient on EQUITYMIX in model 5 is negative and significant, and the coefficient on EQUITYMIX in model 6 is insignificant, supporting our second hypothesis that companies which provide high equity incentives reply more on tax avoidance activities related to permanent differences.

Table 5
OLS Regression Results for Equation (4)--(6)

	I CETR		II ETR		III DTR	
Variable	Parameter Estimate	t Value	Parameter Estimate	t Value	Parameter Estimate	t Value
INTERCEPT	0.193***	23.18	0.270***	50.77	0.275***	30.71
EQUITYMIX	-0.047***	-8.27	-0.024***	-6.55	0.012	1.95
PPE	-0.034***	-4.88	0.038***	8.70	-0.096***	-12.83
INTANG	0.041***	5.19	0.060***	11.69	-0.021	-2.42
FI	0.001	0.18	-0.030***	-14.47	0.031***	8.63
NOL	-0.040***	-12.32	-0.020***	-9.58	-0.012	-3.34
DEBT	-0.019	-2.02	0.015	2.49	-0.040***	-4.04
ROA	0.231***	12.05	0.159***	12.98	0.388***	18.72
MB	-0.003***	-5.33	-0.003***	-8.76	0.002	3.57
TA	0.007***	6.13	0.007***	10.57	-0.003	-3.04
Year dummies	Not reported					
Industry dummies	Not reported					
Nobs	10933		10933		10933	
Adj. R^2	0.0406		0.1093		0.0941	

This table reports the OLS regression results for equation (4)—(6) on CETR, ETR, and DTR. The largest VIF factor is 1.60 which shows that the regressions do not have serious multi-linearity problems. White's (1980) heteroscedasticity tests show the models are not in violation of the assumption of the homoscedastic errors. *, **, and *** indicate statistical significance levels at 10 percent, 5 percent, and 1 percent respectively, in two-tailed tests. To alleviate outlier problems, we delete the observations with continuous variables at the bottom 1% and the top 1% levels.

In additional robustness tests, we replace the EQUITYMIX with CEO ownership in models 1, 2, and 3, with results qualitatively similar to the main results in Table 4. CEO ownership of common shares is an explicit and direct link between executives' personal wealth and corporate financial performance. Thus, the more shares a CEO owns, the fewer conflicts exist between shareholders and executives. As with equity-based incentives, we find a positive relationship between CEO ownership and the level of tax avoidance.

VI. CONCLUSION

This paper investigates whether equity incentives motivate executives to exert more effort in tax avoidance to lower effective tax rates. Effective tax avoidance can reduce tax liability and increase cash flows. Usually, a firm's market value increases with future cash flows, and shareholder wealth increases when corporate managers spend time and effort in tax shelter activities. We study whether equity-based compensation effectively motivate managers to avoid a higher level of tax liability. We also examine whether executives rely more on permanent differences than on temporary differences when given more stock-based compensation.

We document larger book-tax differences or lower effective tax rates when executives receive more stock options or restricted stock. This indicates that equity incentives are useful in motivating executives to focus on effective tax avoidance and thus increase long-term company value.

We show that executives with more equity incentives have more of a tendency to use tax shelters related to permanent differences rather than temporary ones. To some extent, our study validates that previous studies, which use the effective tax rate, reflect only permanent differences as a proxy for tax avoidance levels (Mills et al. 1998; Yin 2003; Chen et al. 2010).

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