DOES EXECUTIVE COMPENSATION REFLECT EQUITY RISK INCENTIVES AND CORPORATE TAX AVOIDANCE? A JAPANESE PERSPECTIVE

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Abstract

This study examines corporate tax avoidance as a determinant of executive compensation on the basis of equity risk incentives. Previous research shows that equity risk incentives motivate managers to make more risky—but positive net present value—investment decisions. Through correlation analyses, this study demonstrates that the tax risk measures adopted in this study are negatively associated with both the adoption of stock options and tax aggressive measures. Through multivariate analyses, this study demonstrates that executive compensations are significantly associated with our measures of tax risk positions despite the inclusion of several control variables. Moreover, this study finds consistent evidence that executive equity risk incentives are significantly associated with aggressive tax positions, regardless of the estimation method and the strength of the corporate governance function, and across several tax risk measures.

Keywords: Tax Avoidance; Executive Compensation; Risk Incentive; Corporate Governance

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1 Introduction

During 1990s and 2000s, despite the increase in aggressive tax shelter strategies, little was known about the relationship between CEO compensation practices and aggressive tax avoidance, if any. In terms of such a corporate practice, prior accounting research shows that corporate tax avoidance is systematically associated with certain firm attributes, such as profitability, extent of foreign operations, intangible assets, research and development (R&D) expenditures, leverage, the attribute of corporate governance, and financial reporting aggressiveness (e.g., Gupta and Newberry [1997]; Rego [2003]; Graham and Tucker [2006]; Desai and Dharmapala [2006]; Frank, Lynch, and Rego [2009]; Desai and Dharmapala [2009]; Wilson [2009]; Rego and Wilson [2012]). Shevlin [2007] suggests that individuals, such as accounting academics, practitioners, and regulators, have an incomplete understanding of why and how some firms are more tax aggressive than others.

This study examines the relationship between equity risk incentives and executive compensation as a determinant of corporate tax avoidance. Dyreng, Hanlon, and Maydew [2010] conclude that individual managers influence their firms' tax avoidance even after controlling for several firm characteristics. Previous research examine the association of income tax avoidance with corporate compensation practices, however, yielding mixed results (e.g., Phillips [2003]; Hanlon, Mills, and Slemrod [2005]; Desai and Dharmapala [2006]; Armstrong, Blouin, and Larcker [2010]). I argue that tax avoidance is a risky activity that imposes costs on both firms and managers. Therefore, managers must be motivated to engage in tax avoidance that involves uncertain outcomes.

Equity risk incentives capture the relationship convexity between a manager's wealth and stock price, measured as the change in value of a manager's stock option portfolio for a given change in stock return volatility (e.g., Guay [1999]). In short, equity risk incentives reflect how changes in stock return volatility affect managerial wealth. Previous research shows that equity risk incentives motivate managers to make more risky—but positive net present value (NPV)—investment decisions (e.g., Guay [1999]; Rajgopal and Shevlin [2002]; Coles, Daniel, and Naveen [2006]). However, these studies do not examine the relationship between equity risk incentives and risky tax planning.[14] In this regard, Rego and Wilson [2012] argue that just as equity risk incentives motivate managers to make more risky

[14] "Risky tax planning," is also referred to as "risky tax avoidance" and/or "aggressive tax positions." This study uses these terms interchangeably.

investment decisions, they also motivate managers to undertake more aggressive (i.e., risky) tax positions, thereby accounting for some variation in tax aggressiveness across firms.

The benefits of aggressive tax positions are apparent. They reduce tax liabilities, thereby increasing cash flows and net income after tax, consequently increasing corporate value. However, aggressive tax positions impose significant costs on firm and management. Stakeholders primarily require managers to invest substantial resources in the form of fees paid to accountants and attorneys; moreover, they require their employees to devote time toward planning for and resolving audits with tax authorities. Associated costs can significantly increase if tax authorities successfully challenge an aggressive tax position.

Therefore, in the absence of equity risk incentives, risk-averse managers are likely to undertake less risky tax planning, while risk-neutral shareholders are likely to want managers to undertake every positive NPV tax strategy, regardless of risk. Consistent with previous research (Jensen and Meckling [1976]; Smith and Stulz [1985]), I assume that firms are dependent on equity-based compensation to align managerial incentives with those of shareholders. Therefore, I predict that equity risk incentives motivate managers to undertake risky but positive NPV tax strategies. Few previous studies examine the relationship between corporate tax avoidance and executive compensation practices. Using compensation data obtained in a survey of corporate executives, Phillips [2003] finds that compensating division managers (business-unit (BU) managers, but not CEOs) on an after-tax basis results in greater tax-planning effectiveness. Hanlon, Mills, and Slemrod [2005] find a positive relationship between various equity incentive measures (pay-for-performance sensitivity) and proposed IRS (Internal Revenue Service) deficiencies. In contrast, Desai and Dharmapala [2006] find that increases in the ratio of incentive compensation to total compensation for the five highest-paid executives led to a reduction in tax avoidance at firms with weak corporate governance. Nevertheless, the relationship between changes in stock return volatility and determination of executive compensation is still unclear.

Armstrong, Blouin, and Larcker [2010] find an association of tax director compensation with lower GAAP effective tax rates (ETR); however, they find no association of CEO or CFO compensation with any measure of corporate tax avoidance. In this regard, this study considers a previously overlooked determinant of corporate tax avoidance—equity risk incentives via stock options.

If equity risk incentives are known to mitigate the risk-related incentive problem by motivating managers to undertake risky but positive NPV tax strategies, then one would expect a positive association between equity risk incentives and measures of risky tax avoidance over a large sample of firms. Because equity risk incentives and risk-taking behaviors are likely to be endogenously related (e.g., Rajgopal and Shevlin [2002]; Hanlon, Rajgopal, and Shevlin [2003]; Coles et al. [2006]), I use a system of simultaneous equations to model the relationship between equity risk incentives and managerial tax choices. Furthermore, this study focuses on whether the sample firms adopt equity risk incentives via stock options.

The study's empirical results are consistent with expectations. Through a correlation analyses, I demonstrate that this study's tax risk measures are negatively associated with both the adoption of stock options and tax aggressive measures, consistent with equity risk incentives that motivate managers to undertake risky tax strategies, which decrease their tax burden. Through multivariate analyses, I find that executive compensation remains positively associated with our tax risk measures, namely book tax differences (BTD), and negatively associated with ETR and cash ETR despite the inclusion of several control variables, such as firm performance measures, stock option proxies, size, future growth possibility, corporate governance measures, investment opportunities, leverage, and Tobin's Q. Moreover, larger firms with greater investment opportunities and higher CEO cash compensation rely on more equity risk incentives than other firms.

The results of this analysis are robust to the supplemental analyses, including alternative estimation methods of the positive relationship between equity risk incentives and risky tax avoidance that vary by strength of corporate governance. In short, I find consistent evidence that executive equity risk incentives are significantly associated with aggressive tax positions, regardless of estimation method and corporate governance strength, and across several tax risk measures.

The study proceeds as follows. Section 2 discusses prior research and develops hypotheses. Section 3 explains the research design, while Section 4 discusses the sample selection method and empirical results. Section 5 presents supplemental analyses and Section 6 concludes.

2 Literature Review and Hypothesis Development

Prior accounting research identifies several firm characteristics as sources of variation in ETR and other tax avoidance measures across firms. Many studies investigate the relationship between ETRs and firm size, resulting in conflicting results, based on the method of ETR measurement, the analyzed time period, and the model specification (Zimmerman [1983]; Shevlin and Porter [1992];

Rego [2003]). Gupta and Newberry [1997] provide evidence that lower ETRs are associated with lower profitability, but higher leverage and capital intensity. Recent accounting research also investigates the relationship between different ownership structures and corporate tax avoidance. Chen, Chen, Cheng, and Shevlin [2010] provide evidence that family firms are less tax-aggressive than their non-family counterparts. They argue that the difference between family and non-family firms in terms of tax aggressiveness depends on the impact of the differential characteristics of family owners versus managers in non-family firms on the benefits and costs of tax aggressiveness. Because family owners have significantly higher holdings, they benefit more from tax savings or rent extraction that can be concealed by tax aggressive activities; however, the corresponding potential price discount is more costly for them. In addition, because of their much larger equity ownership and their much longer investment horizons, family owners are more concerned with the potential penalty imposed by the IRS and the reputation damage from being involved in a tax-related lawsuit. Thus, they suggest that both the benefits and costs appear to be higher for family owners than for managers in non-family firms.

McGuire, Wang, and Wilson [2011] find that firms with dual class stock ownership engage in less tax avoidance than other firms, consistent with managers insulated from takeovers, thereby avoiding the costly effort associated with increased tax avoidance.

Despite all of these previous research findings, I still do not fully understand the factors that encourage tax avoidance among firms. A possible determinant of corporate tax avoidance that has not been fully explored involves managers and corporate compensation practices. Therefore, this study focuses on executive compensation practices.

Relatively few studies have examined the relationship between executive compensation practices and corporate tax avoidance. Crocker and Slemrod [2005] develop an analytical model of the contractual relationship between shareholders of a firm and the tax director, and examine how compensation contracts affect tax avoidance. They demonstrate that a CFO's incentives to engage in tax avoidance are influenced by the nature of his/her compensation arrangement. In addition, they describe how the board of directors, acting on behalf of shareholders, structure tax directors' compensation contract to align their incentives with those of the shareholders. It is in the shareholders' interest for the tax director to reduce the firm's tax liabilities, net costs of doing so, which would include any expected penalties incurred due to detected tax evasion. To align incentives, Crocker and Slemrod [2005] suggest that it may be appropriate for the tax officer's salary to depend (inversely) on the ETR achieved.

Phillips [2003] investigates whether compensating CEOs and BU managers using after-tax accounting-based performance measures results in lower ETRs—the empirical proxy used for tax-planning effectiveness. Based on a surveyed sample of 209 corporate executives, Phillips [2003] shows that compensating BU managers, but not CEOs, on an after-tax basis directly results in lower ETRs. However, he also notes that after-tax CEO performance measures may have an indirect effect on ETRs, because CEOs that are compensated on an after-tax basis are more likely to compensate their BU managers on an after-tax basis.

Henderson et al. [2010] examine the association between layoffs and CEO compensation. Due to the public scrutiny and political pressures associated with both CEO compensation and layoffs, they expect firms to alter CEO compensation by reducing bonuses and increasing equity-based compensation with an increase in the magnitude of layoffs. Consistent with the predicted substitution, Henderson et al. [2010] find that as layoffs intensify, bonus compensation to CEOs decreases, while their equity-based compensation increases. On considering whether these compensation adjustments vary with CEO power, they find that with an increase in the layoff magnitude, relatively more powerful CEOs experience smaller reductions in bonus payments, a higher likelihood of receiving a bonus, and comparable increases in equity compensation. Finally, Henderson et al. [2010] report evidence that post-layoff market performance of firms led by more powerful CEOs is not superior to that of firms led by less powerful CEOs.

Cheng et al.[2012] examines the impact of hedge fund activism on corporate tax avoidance. They find that relative to matched control firms, businesses targeted by hedge fund activists' exhibit lower tax avoidance levels prior to hedge fund intervention, but experience of hedge fund intervention increases in tax avoidance after the intervention. Moreover, their findings suggest that the increase in tax avoidance is greater when activists have a successful track record of implementing tax changes and possess tax interest or knowledge as indicated by their Securities and Exchange Commission (SEC) 13D filings. Besides, they also find that these greater tax savings do not seem to result from an increased use of high-risk and potentially illegal tax strategies, such as sheltering. In total, the results suggest that shareholder monitoring of firms, in the form of hedge fund activism, improves tax efficiency.

In terms of incentive compensation, Desai and Dharmapala [2006] examine how stock-based compensation influences tax sheltering decisions.

They depend on two competing theories on how incentive compensation should influence tax sheltering. The first theory predicts a positive relationship between incentive compensation and tax sheltering, because the former ought to align managerial incentives with those of shareholders, inducing managers to execute a tax avoidance strategy, thereby increasing firm value. The second theory argues that tax sheltering facilitates managerial rent extraction. In this case, corporate governance structure should moderate the relationship between incentive compensation and tax sheltering, because weak corporate governance should allow greater managerial rent extraction through tax sheltering. Taken together, these two theories generate an ambiguous prediction of the net impact of incentive compensation on tax sheltering (i.e., increasing incentive compensation should increase tax sheltering, thereby increasing the firm value, however, decreasing the tax sheltering associated with managerial rent extraction). Desai and Dharmapala [2006] examine their model across well-governed and weaker-governed firms and find that increases in incentive compensation for the five highest-paid executives reduce the level of tax sheltering, and that this negative effect is driven by weaker-governed firms. They conclude that incentive compensation aligns managers' incentives with those of shareholders and reduces opportunistic tax sheltering. Besides, the results in Desai and Dharmapala [2006] are contrary to those in Hanlon, Mills, and Slemrod [2005], who find that pay-for-performance sensitivities for the five highest-paid executives are positively associated with proposed IRS audit deficiencies.[15]

The reason why this study focuses on Japanese settings is because of the uncertainty of whether weakness of corporate governance in Japanese companies triggers corporate tax avoidance. Recently, some Japanese companies have been in the radar because of corporate governance scandals involving ex-executive officers (e.g., Daiou paper Inc., Olympus Corporation). The Japanese business community on the whole is weary of the spread of a negative reputation that most Japanese corporations indulge in serious governance concerns. Therefore, this study mainly investigates the role of corporate governance on the determinants of executive compensation, especially in Japanese settings.

Executive compensation plays a key role in the constraints of corporate practice, thereby motivating managers to execute appropriate business strategies and disincentivizing unethical practices, among others. I propose that a potential missing relationship between executive compensation and corporate tax avoidance depends on equity risk incentives incorporated with the extent of corporate governance. Previous research shows how stock options provide managers with incentives that mitigate the risk-related incentive problem between managers and shareholders (Jensen and Meckling [1976]; Smith and Stulz [1985]; Guay [1999], Core et al.[1999]). In particular, stock options motivate managers to undertake risky but positive NPV projects because option value increases with both stock price (Rego and Wilson [2012] refer to this as the slope effect)[16] and stock return (Rego and Wilson [2012] also refer to this as the risk incentive effect) volatilities.[17] While the slope effect motivates managers to undertake positive NPV projects, the risk incentive effect motivates managers to increase stock return volatility by undertaking risky projects. Keeping the slope effect constant, managers with larger equity risk incentives have greater incentive to undertake actions that increase firm risk, because option values increase with stock return volatility. Previous studies find that greater equity risk incentives are associated with greater managerial risk-taking, particularly in terms of investment decisions (Guay [1999]).

Rajgopal and Shevlin [2002] find evidence consistent with greater equity risk incentives resulting in higher future exploration risk-taking in the oil and gas industry. Coles et al. [2006] show that higher equity risk incentives are associated with riskier corporate policy choices, such as greater R&D investment, lower capital expenditures, higher leverage, more concentrated market, and industry focus. Cohen, Dey, and Lys [2007] show that equity risk incentives are associated with greater managerial risk taking; however, they conclude that the magnitude of that association has declined since the passing of the Sarbanes-Oxley Act of 2002, perhaps because of a decrease in option compensation over the same time period.

This study examines the impact of equity risk incentives on managers' choices with respect to risky tax strategies. Consistent with previous research, I assume that firms utilize equity-based compensation to align managerial incentives with

[15] However, the results in Desai and Dharmapala [2006] and Hanlon, Mills, and Slemrod [2005] are not directly comparable because they use different data sets (Compustat vs. IRS data), different tax avoidance measures (discretionary book-tax differences vs. proposed IRS audit deficiencies), and different compensation variables (the ratio of the value of stock option grants to total compensation vs. pay-for-performance sensitivities), among other differences.

[16] "Slope effect" refers to the slope of the relationship between a manager's wealth and stock price. It is also referred to as a manager's pay-for-performance sensitivity and/or "delta."

[17] "Risk incentive effect" refers to the convexity (or curvature) of the relationship between a manager's wealth and stock price; it is also referred to as the sensitivity of a manager's wealth to stock return volatility and/or "vega."

those of shareholders (Jensen and Meckling [1976]; Smith and Stulz [1985]). Hence, I estimate that greater equity risk incentives motivate managers to undertake more risky tax strategies to increase stock return volatility.

Risky tax avoidance strategies should be positively related to stock return volatility because more risky tax planning increases the uncertainty surrounding future tax outcomes. This greater uncertainty should increase a firm's stock return volatility, as investor expectations span a broader range of possible outcomes. This study chooses ETR as a primary measure of risky tax positions to enable higher-risk positions to translate into lower ETRs. Thus, the formal hypothesis posits that greater equity risk incentives motivate managers to adopt risky tax strategies.

H1: Executive compensation is significantly related to risk avoidance activity.

Moreover, I consider the possibility that the strength of a corporate governance structure affects the attitude toward tax avoidance. Desai and Dharmapala [2006] conclude that well-governed firms provide less scope than weaker-governed firms for rent diversion reductions, and hence for offsetting reductions in sheltering (as initial diversion levels are lower, by definition, for well-governed firms). Consequently, the impact of higher-powered incentives toward tax avoidance resulting in greater tax evasion should be greater in well-governed firms than in weaker-governed firms. Their model is thus consistent with either a positive or negative relationship between high-powered incentives and tax avoidance, but is clear about the role of the governance environment in mediating those effects. The next hypothesis shows that the determination of executive compensation interacts with the extent of the governance environment.

H2: Executive Compensation is significantly related to the strength and weakness of the state of corporate governance.

H3: The more aggressive the tax avoidance activity, the more significantly is executive compensation related to the strength and weakness of the state of corporate governance.

3 Research design

3.1 Proxies for risky tax avoidance

This study uses several measures of tax avoidance as no single measure perfectly captures the underlying construct (i.e., risky tax planning). I employ three existing tax avoidance measures to measure the tax avoidance magnitude: ETR, cash ETR (Cash_ETR), and Manzon–Plesko BTD (MPBT) (Manzon and Plesko, [2002]). cash_ETR captures a broad range of tax planning activities with both certain and uncertain outcomes; however, it is widely used in the tax literature and thus should provide insights into the consistency of our results across several measures of tax risk. See Appendix A for details on the calculation of each of these tax avoidance measures.[18]

With regard to MPBT, it is difficult to compute taxable income correctly; therefore, I estimate it by using corporate ETRs. While these measures of tax risk are theoretically similar to the underlying construct of interest (i.e., risky tax positions), they also may contain measurement errors. Therefore, to the extent that I obtain similar results across these three measures of tax risk, they should be confident that this result is robust.[19]

3.2 Designing executive compensation with risky tax avoidance

H1 predicts that executive compensation is associated with risky tax avoidance. Executive compensation includes cash payment and equity-based compensation. Recently, this type of equity-based compensation (e.g., stock options) has played an important role in executive compensation, making executive compensation more subject to equity risk taking. Similar to other studies that examine the relationship between equity risk incentives and managerial risk taking (e.g., Rajgopal and Shevlin [2002]; Coles et al. [2006]), this study argues that equity risk incentives and risky tax avoidance are likely to be endogenously related. In particular, not only should equity risk incentives motivate managers to undertake risky tax strategies, but current tax strategies also may be associated with equity risk incentives imposed on managers.

In particular, previous studies, especially Rego and Wilson [2012], suggest that tax risk is endogenous in an equity risk incentives regression because compensation based on equity risk incentives can motivate managers to undertake risky but positive NPV projects. Thus, I test H1 by adapting the models of equity risk incentives and managerial risk used by Rajgopal and Shevlin [2002] and Coles et al. [2006]. I demonstrate the

[18] In Japan, there are three types of taxes imposed directly or indirectly on corporate taxable income. First, corporation tax is a national income tax on corporations, and is imposed on corporate taxable income. Second, corporation inhabitants' tax, which includes a prefecture tax and a municipality tax on corporations, is a local tax imposed on a corporation. Third, corporation enterprise tax is also a local tax imposed on corporate taxable income. Income tax expense in Japan comprises these three taxes. For example, in the simplest case, current tax expense is calculated as follows: Current tax expense = {(1 + corporation tax rate)* corporation inhabitants' tax rate + corporation enterprise tax rate}* corporate taxable income.

[19] In this research, I assume that firms with no income have no incentive to employ risky tax planning. I also Winsorize ETR and Current_ETR to fit between 0 and 1 to minimize outliers.

following simultaneous system of equations, where executive compensation (*Total_comp*) and equity risk incentives (*TAX*) are the endogenous dependent variables. This study estimates the parameters for our system of equations using two-stage least squares (2SLSs) (where firm and time subscripts are omitted for convenience):

$$\begin{aligned} Total\ compi = {} & \alpha_0 + \alpha_1\, TAXi + \alpha_2 SOi \\ & + \alpha_3 Insti + \alpha_4\, idrtoi \\ & + \alpha_5\, epsi + \alpha_6\, Ln\_TAi \\ & + \alpha_7\, Setsubii + \alpha_8\, levi \\ & + \alpha_9 tobin\_q_i + \alpha_{10} PBR_i \\ & + \varepsilon i \end{aligned} \quad (1)$$

$$\begin{aligned} \mathrm{TAX}i = {} & \beta_0 + \beta_1 Total\ Compi + \beta_2 Soi \\ & + \beta_3\, Insti + \beta_4 idrtoi \\ & + \beta_5 epsi + \beta_6 Ln\_TA\, i \\ & + \beta_7 Setsubii + \beta_8 levi \\ & + \beta_9 tobin\_q_i + \alpha_{10} PBR_i \\ & + \beta_{11} Ctrdummyi \\ & + \beta_{12} Taxcarryforward \\ & + \varepsilon i \end{aligned} \quad (2)$$

As previously indicated, the proxies for risky tax avoidance in this study are ETR, Cash_ETR, and MPBT. A negative coefficient (α_1) on Tax_i with ETR and Cash_ETR, and a positive coefficient (α_1) on Tax_i with MPBT in the *Total_Comp* regressions, support our hypothesis that equity risk incentives motivate managers to engage in risky tax strategies that increase stock return as well as the stock option portfolio and firm values.

Equation (1) models executive compensation (*Total_comp*) as a function of equity risk incentives (*SO*), the number of shares held by institutional investors (*Inst*), and the number of outside directors on the board of directors *(Idrto*) as corporate governance variables. It models earnings per share (*eps*), the natural log of total assets (*ln_TA*), R&D and capital expenditures (*Setsubi*), leverage *(Lev*), and Tobin's Q (*tobin_q*) as a market index, and price–book ratio (*PBR*) as an indicator of growth possibility.[20]

A 2SLS estimation requires each equation in the system to have at least one unique instrument that is not related to other endogenous variables. In my research setting, it is difficult to identify firm characteristics that are significantly associated with tax risk but not equity risk incentives, and vice versa. Hence, this paper adopts *Ctrdummy* and *Taxlosscarryforward* as instrumental variables in equation (2), because they should exhibit little if any correlation with the other endogenous variable in our system of equations. *Ctrdummy* is an indicator variable that takes unity if the company chooses the consolidated tax return system, and 0 otherwise. *Taxlosscarryforward* controls only for the determination of tax payment, which exhibits the amount of net operating loss carry-forwards in previous years.

Results in Guay [1999] and Coles et al. [2006] show that equity risk incentives and pay-for-performance sensitivity are positively related. Thus, I include *SO* in equation (1) to control for the association between tax risk and the performance incentive that *Total_comp* might otherwise capture. Equation (3) is based on models of equity risk incentives in Rajgopal and Shevlin [2002], Coles et al. [2006], Cohen et al. [2009], and Rego and Wilson [2012]. This model includes *Total_comp* in equation (3) due to the endogenous relationship between managerial risk-taking, in this case, risky tax avoidance, and equity risk incentives.

Finally, in this model I expect firms whose managers are sensitive to wealth change to have greater risk incentives (Rajgopal and Shevlin [2002]), so equation (1) includes *SO* to reflect the managers' attitudes toward risk incentives.

4 Data and Empirical Results

4.1 Sample selection

I obtain data from several sources to empirically test H1. Data on CEO compensation and corporate governance is obtained from Nikkei Needs C-ges, and financial statement data[21] and non-narrative information from Nikkei Needs Financial Quest 2.0. In terms of corporate governance data, I focus especially on CEO and executive compensation and on the percentage of outside directors on the board of directors. For a firm-year observation to be included in our sample, it must contain all data necessary to calculate the variables included in equations (1) and (2). In addition, this research requires firms to have positive pre-tax income over the five-year period ending in year *t*. Firms with negative pre-tax income are not included because I expect the association between equity risk incentives and risky tax avoidance to be attenuated for firms that are not profitable. As a result, my analysis focuses on firms where tax planning is likely to be a priority. The sample for the first set of tests consists of 16,895 year-observations from 2006 to 2010.

Table 1 provides a summary of descriptive statistics. Equation (1) includes the year effects and industry effects to show the transitional consequence on the sample. With respect to *TAX* variables, Table 1 provides ETR and Cash_ETR as measures of tax aggressiveness. Furthermore, I calculate MPBT using Nikkei FQ firm-years data

[20] I intentionally scale all variables by beginning-of-the-year total assets to control for heteroscedasticity.

[21] In this research, I collect the consolidated financial statements data. In terms of estimation of the taxable income, ideally the individual financial statements data should have been utilized.

from 2005 to 2010 that have the requisite data. Table 1 shows several tax attributes including ETR and Cash_ETR. This table shows a 35% average ETR of firms in Japan. This indicates that average Japanese firms work hard to reduce their tax burden.

Table 1. Descriptive Statistics

Variable	Mean	SD	Min	25%	Median	75%	Max
Total_comp	0.00803	0.01781	0	0	0.001118	0.008884	0.385113
SO	0.36287	0.480842	0	0	0	1	1
Inst	13.14617	14.90421	0	1.02	7.325	21.12	85.6
Idrto	9.605185	14.26629	0	0	0	16.66667	86.66667
eps	758.407	14656.92	−116691	3.82	33.36	106.18	1395521
ln_TA	10.31935	1.732011	4.234107	9.156306	10.17053	11.30898	17.29905
Setsubi	0.045314	0.102794	0	0.009997	0.026791	0.055678	6.202214
Lev	0.543872	1.053429	0	0.33477	0.511481	0.67779	78.37471
aveq	1.070052	0.757424	0	0.78792	0.94013	1.14384	23.75101
PBR	1.275096	3.520076	0	0.54249	0.840015	1.36721	314.496
Ctrdummy	0.012852	0.11264	0	0	0	0	1
Taxlosscarryforward	0.04317	0.276321	0	0	0.003391	0.020967	17.38556
ETR	0.356018	0.241227	0	0.173251	0.405063	0.466987	1
Cash_ETR	0.333107	0.250041	0	0.09375	0.369794	0.467213	1
MPBT	−0.0214	0.121448	−8.64346	−0.02529	−0.00626	0.005944	1.83594

Table 2 presents univariate correlations for the aggregate sample with Pearson (Spearman) correlations reported below (above) the diagonal.

Table 2. Correlation Matrix

	totalcomp	so	inst	idrto	eps	ln_TA	setsubi	lev	aveq	pbr	ctrdummy	taxlosscarry	etr	current_etr	mpbt
totalcomp	1	0.0821	-0.3187	-0.0903	0.0774	-0.5413	-0.0781	-0.1007	-0.0075	0.0073	-0.0728	-0.1122	0.0557	0.0632	-0.1236
so	0.1672	1	0.0602	0.142	0.0991	-0.1562	0.0624	-0.067	0.2196	0.2243	-0.0164	0.132	-0.0444	-0.019	-0.1381
inst	-0.2198	0.073	1	0.0952	0.2031	0.6659	0.2068	-0.1097	0.2621	0.2841	0.0461	-0.0387	0.0308	0.0861	0.1259
idrto	0.0039	0.1663	0.1067	1	0.0026	0.047	0.0432	0.0047	0.1513	0.154	0.046	0.1121	-0.056	-0.0464	-0.0154
eps	0.0446	-0.0217	0.0041	-0.0181	1	0.0341	0.155	-0.0406	0.2348	0.2575	-0.0242	-0.4196	0.28	0.4322	0.3454
ln_TA	-0.5176	-0.1387	0.6509	0.0333	-0.0235	1	0.1643	0.1385	0.0839	0.0663	0.074	-0.0122	0.0527	0.0558	0.2301
setsubi	0.0724	0.0553	0.0612	0.0283	0.0161	-0.0179	1	0.0915	0.1979	0.2141	-0.0186	-0.0822	0.084	0.1155	0.0274
lev	0.0196	-0.0179	-0.0079	0.0114	0.0184	0.0116	0.6887	1	0.2216	0.1244	0.0578	0.1037	0.0225	0.0313	0.0095
aveq	0.1607	0.2072	0.1454	0.1193	0.004	-0.0701	0.0782	0.01	1	0.9408	0.0234	0.0419	-0.0203	0.06	-0.0016
pbr	0.0945	0.1014	0.0416	0.057	-0.0072	-0.0532	0.0545	0.029	0.3744	1	0.0232	0.0173	0.0024	0.0796	0.0204
ctrdummy	-0.0257	-0.0164	0.0491	0.0423	-0.0035	0.0846	-0.0107	0.0183	-0.0052	-0.002	1	0.0835	-0.0411	-0.0316	0.0475
taxlosscarry	0.1767	0.079	-0.07	0.0637	-0.0297	-0.1555	0.0416	0.0196	0.0999	0.1006	0.0428	1	-0.385	-0.4483	-0.1195
etr	-0.0427	-0.0516	0.0605	-0.0662	0.073	0.0997	0.032	0.0058	-0.0077	-0.0433	-0.0297	-0.1626	1	0.704	0.0427
current_etr	-0.0105	-0.0214	0.0855	-0.0564	0.0937	0.0819	0.049	0.0163	0.0271	-0.0253	-0.0235	-0.1499	0.7024	1	-0.1172
mpbt	-0.2507	-0.148	0.0974	-0.082	0.1327	0.2087	-0.037	-0.0731	-0.1827	-0.1162	0.021	-0.2621	0.2053	0.13461	1

Table 2 exhibits the correlation among test variables. Note the positive association between total compensation and the indicator variable regarding adoption of stock options. This indicator variable for the introduction of stock options also negatively relates to my tax measures. This result implies that lower tax rate firms adopt stock options because of their attitude toward tax aggressiveness. However, according to Table 2, no serious correlation among variables is visible.

4.2 Results for 2SLS estimations

I predict that the risk incentive effect associated with stock option compensation motivates managers to increase the firm's stock return by undertaking risky projects, including risky tax strategies. I evaluate H1 by solving a two-equation system of equations, with risky tax avoidance and equity risk incentives as the endogenous dependent variables. I estimate that the coefficients of *TAX* in

the tax risk regression indicators of ETR, Cash_ETR, and MPBT are positive and significant.

Table 3 shows the results for the estimated system of equations based on the CEO sample, indicating that the coefficients of *TAX* are all significant in the predicted sign, consistent with equity risk incentives motivating CEOs to undertake risky tax strategies. This result implies that risky projects related to tax payments encourage firms to boost CEO compensation. The result in Table 3 supports H1, suggesting that CEO equity risk incentives cause managers to avoid more income taxes; however, greater tax avoidance is not necessarily associated with higher CEO equity risk incentives. The result in Table 3 reflects the fact that a system of performance-based payment for CEOs is introduced to a number of Japanese firms.

Table 3. Results for 2SLS Regressions for CEO Compensation Sample

Total_comp	Coef.	z	Coef.	z	Coef.	z
ETR	−0.0424	−10.64***				
Cash_ETR			−0.0451	−10.21***		
MPBT					0.2582	5.39***
SO	0.0014	4.48***	0.0016	5***	0.0037	4.04***
Inst	0.0002	14.03***	0.0002	15.74***	0.0001	4.61***
Idrto	−0.0001	−5.73***	−0.0001	−5.77***	0.0000	−0.74
eps	0.0000	8.23***	0.0000	8.85***	0.0000	−4.22***
ln_TA	−0.0056	−44.49***	−0.0058	−47.53***	−0.0088	−22.23***
Setsubi	0.0153	7.1***	0.0165	7.35***	−0.0059	−1.33
Lev	−0.0006	−2.4**	−0.0005	−2.16**	0.0030	4.04***
aveq	0.0021	9.99***	0.0023	10.43***	0.0021	5.38***
PBR	0.0000	−0.35	0.0000	−0.21	0.0002	3.42***
_cons	0.0755	53.19***	0.0774	48.74***	0.0979	22.59***
Observations	16895		16895		16922	
Adjusted R^2	0.1434		0.1228		0.014	

Analyzing the relationship between corporate governance factors (CG) and compensation determinations, the coefficients of *Inst* and *Idrto* are significant with the predicted signs (In addition, the coefficients of SO is significant and this suggests adoption of stock option is positively associated with the CEO payment in general, therefore, this result suggests that stock option compensation scheme motivates the management to increase their efforts for performance improvement), indicating that smaller firms (*ln_TA*) with more institutional investors (*Inst*), greater current period investment activities (*Setsubi*), and high growth opportunities (*aveq*) provide CEOs with more compensation, consistent with the outside governance function hypothesis. Moreover, smaller firms (*ln_TA*) with more outside directors on their boards of directors provide CEOs with less compensation, suggesting that more institutional investors motivate management to boost their performance, and more outside directors restrain them from overpayment. From the management control perspective, it seems that outside directors play the moderate role of controlling management's arbitrary activities through the compensation scheme.

Nonetheless, some coefficients of control variables are not significant for this regression. Equations (1) and (2) weakly suggest that management compensation reflects the circumstances of corporate governance in firms.

5 Supplemental analysis

5.1 Model development

As previously mentioned, a tax risk incentive motivates managers to increase their compensation. However, previous research does not reveal that a tax risk incentive impacts corporate governance structure. Thus, I predict that in tax aggressive firms that undertake risky tax projects, executive compensation is significantly associated with the extent of corporate governance, based on H2 and H3 (Rego and Wilson [2012]).

To test H3, I interact *Inst* or *Idrto* with the tax aggressiveness level, and compute the following model:

$$Total\ compi=\alpha_0+\alpha_1\ TAXi+\alpha_2 SOi+\alpha_3 Insti+\alpha_4+\alpha_{10} d\_TAXi+\alpha_{11} d\_TAXi*Insti+\alpha_{12} d\_TAXi*Idrtoi+\varepsilon i Idrtoi+\alpha_5\ epsi+\alpha_6\ Ln\_TAi+\alpha_7\ Setsubii+\alpha_8\ levi+\alpha_9 \sum Marketi \quad (3)$$

I investigate the interaction among tax aggressiveness, strength of corporate governance, and determination of executive compensation. To examine whether certain firms take risky tax positions, I set *d_TAX* as an indicator variable that takes 1 when their tax positions are below average and 0 otherwise (To observe the magnitude of tax aggressiveness, only ETR and Current_ETR are chosen as tax risk variables, because I hope to see comparable results). The variable definitions are the same as previously defined.

In terms of governance variables, Carcello et al. (2002) recognize that the association between audit fees and board characteristics, such as independence (percentage of non-management board members), diligence (number of board meetings), and expertise (average number of outside directorships in other firms held by outside directors) could be either positive or negative. Moreover, they posit a counterargument that more independent, diligent, and expert stakeholders could reduce the auditor's assessment of control risk and the extent of audit procedures performed. They posit that a vigilant, independent board may place higher expectations on the auditor, demanding a high-quality audit. Thus, I focus on the number of independent directors and rigorous outside institutional investors.

This research setting adopts 2SLS estimation to clarify the association, requiring each equation in this system to have at least one unique instrument that is not related to other endogenous variables. I select *Ctrdummy* and *Taxlosscarryforward* as instrumental variables in equations (3) and (1) because these variables should exhibit little if any correlation with the other endogenous variables in our system of equations.

5.2 Results for supplemental analysis

Table 4 reports the results of equation (3) for the panel data model.

Table 4. Results for 2SLS Regressions for Tax Aggressive Samples

	(1)		(2)		(3)		(4)	
Total_comp	Coef.	z	Coef.	z	Coef.	z	Coef.	z
ETR	−0.173	−4.69***	−0.207	−3.49***				
Cash_ETR					−0.187	−4.77***	−0.236	−4.03***
So	0.003	5.13***	0.003	4.68***	0.003	4.96***	0.003	4.5***
Inst	0.000	2.38**	0.000	−2.21**	0.000	3.15***	0.000	−2.67***
Idrto	0.000	−1.6	0.000	−2.23**	0.000	−0.11	0.000	−1.66*
ln_tat1	−0.004	−9.25***	−0.004	−6.27***	−0.004	−10.65***	−0.004	−7.37***
Setsubi	0.008	2.38**	0.006	1.45	0.008	2.27**	0.006	1.5
Lev	0.000	0.35	0.000	0.89	0.001	1.43	0.001	1.7*
PBR	0.000	−0.2	0.000	−0.12	0.000	−0.17	0.000	−0.29
aveq	0.000	0.92	0.000	0.84	0.001	1.24	0.001	1.18
eps	0.000	3.34***	0.000	2.57**	0.000	4.33***	0.000	3.61***
d_ETR	−0.068	−4.74***	−0.094	−3.54***				
d_Cash_ETR					−0.076	−4.83***	−0.108	−4.1***
d_ETR*Idrto	0.000	−0.31						
d_ETR*Inst			0.001	3.66***				
d_Cash_ETR*Idrto					0.000	−1.47		
d_Cash_ETR*Inst							0.001	4.37***
_cons	0.137	9.07***	0.157	6.06***	0.146	8.73***	0.174	6.54***
observations	16895		16895		16895		16895	
adjusted R^2	0.0294		0.0331		0.03155		0.03755	

In sum, the results in Table 4 provide a positive relationship between equity risk incentives and risky tax avoidance that systematically varies by strength of corporate governance. Aggressive tax avoidance is assumed as a highly risky project; therefore, it is reflected as a positive NPV project. Thus, a coefficient of these proxies consistently shows a positive relationship with determination of executive compensation. This result indicates that the coefficients of *d_TAX* are significant.

While the extent of tax aggressiveness is significantly positively and negatively related to determination of executive compensation, strength of corporate governance structure is weakly associated with executive compensation, not all being significant, and with the predicted sign. In

short, I find that the percentage of shareholdings by institutional investors (*Inst*) is significantly positively associated with the amount of executive compensation because of stress from outside monitoring, while the number of outside directors (*Idrto*) is not necessarily associated with constraints of executives' overpayment.

Overall, the results in Tables 3 and 4 provide a strong basis for my prediction that equity risk incentives motivate top executives to increase or decrease their compensation by undertaking risky tax strategies. Specifically, institutional investors play an important role in monitoring management, although outside directors on the board of directors play a limited role in corporate governance. In sum, firms with risky tax incentives have more institutional investors, consistent with the theory of Desai and Dharmapala [2006, 2009].

6 Conclusions

This article investigates whether executive compensation of tax aggressive firms reflects their risky attitude. In this respect, despite the increase in aggressive tax shelter strategies during the 1990s and early 2000s in Japan, little is known about the relationship (if any) between CEO compensation practices and aggressive tax avoidance. Based on Guay's [1999] theory of equity risk incentives, it is predicted that equity risk incentives motivate managers to undertake risky tax strategies. Three existing measures of tax avoidance are used (ETR, Current_ETR, and MPBT). To evaluate the relationship between tax aggressiveness and executive compensation, I apply 2SLSs to control for the risk sensitivity of tax aggressiveness.

These results consistently indicate that greater equity risk incentives are associated with higher tax risk. These findings are robust to alternate tax aggressive measures. I find little evidence that the relationship between equity risk incentives and risky tax avoidance varies by strength of corporate governance because the association between tax aggressive attitudes and the roles of outside directors is still unclear despite my research. Overall, I suggest that equity risk incentives induce managers to undertake risky tax strategies in an effort to increase CEO compensation, and thus the value of their option portfolios.

This study follows previous researches that investigate whether equity risk incentives motivate managers to undertake risky projects, including investment decisions (Guay [1999]; Rajgopal and Shevlin [2002]). Moreover, it extends studies that investigate the relationship between ETR, tax sheltering, and executive compensation practices (Phillips [2003]; Desai and Dharmapala [2006]; Armstrong et al. [2010]) in Japan. My results suggest the need for future research that directly investigates whether tax avoidance is conducive to managers extracting rents from the firm. But the theory of rent extraction based on the results in Table 4 posited by Desai and Dharmapala (2006) does not seem applicable in the Japanese context.

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Appendix A. Proxy for tax risk variables

ETR is defined as total tax expense divided by pre-tax income. Subscripts *i* and *t* represent a firm and a year, respectively.

$$ETR_{i,t} = \frac{\text{Total Tax Expense}_{i,t}}{\text{Pretax Income}_{i,t}} \quad (1)$$

Cash_ETR is defined as current tax expense divided by pre-tax income.

$$Current\_ETR_{i,t} = \frac{\text{Current Tax Expense}_{i,t}}{\text{Pretax Income}_{i,t}} \quad (2)$$

ETR and Cash_ETR are set as missing when the denominator is 0 or negative, and are truncated to 0 when the calculation result is 0 or negative, or 1 when it is 1 or more.

MPBT is defined as the difference between pre-tax book income and taxable income divided by the beginning-of-the-year total assets.

$$MPBT_{i,t} = \frac{\text{Pretax Income}_{i,t} - \text{Taxable Income}_{i,t}}{\text{Total Assets}_{i,t-1}} \quad (3)$$