

The effect of tax regime changes on the market valuation of tax avoidance?

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ABSTRACT

The study examines how the market rewarded firms' tax avoidance after the tax environment changes of the early 2000s and whether firms' governance strength influenced those rewards. A panel of U.S. firms for the period 1997–2005 is used to implement a differences-in-differences analysis. Results from association tests on the effect of tax avoidance and regulatory changes on stock returns indicate that, on average, tax avoidance received a lower valuation in the high-regulation period (years 2003–2005) relative to the low-regulation period (years 1997–2000). In addition, results provide marginal support to the argument that managers of weak governance firms may use tax avoidance to extract rents from their shareholders. The results indicate the tighter tax regime may have resulted in costlier compliance that investors have discounted the value they assigned to tax avoidance even though the tighter environment should have reduced market uncertainty regarding the returns to investments in firms' tax avoidance activities. This study furthers our understanding of investors' perceptions of corporate tax avoidance and tax regulation.

Keywords: Tax regimes, stock returns, tax avoidance, effective tax rates, corporate governance

1. INTRODUCTION

The study investigates how the change in the tax and regulatory regimes in the period of 2001–2002 affected investors' perception of firms' tax avoidance activities. This study provides evidence about whether the regulatory changes that occurred at the beginning of the 2000s (e.g., listed transactions reporting, Schedule M-3, Sarbanes-Oxley) reduced investors' uncertainty about firms' tax avoidance activities or resulted in investors discounting the value they assigned to such activities. Further, the study analyses whether firms' governance structures prior to the regulatory changes affect the investors' valuation of tax avoidance. Although practitioners have discussed the effects of the tighter regulatory regime on firms and their investors (Cox and McKenna 2006; O'Sullivan 2005), it is unclear whether investors revised their priors regarding the value of firms' tax avoidance activities. The analysis exploits the inter-temporal variation generated by the tax environment changes from the early 2000s to provide evidence on how a change in the tax environment affects investors' valuation of tax avoidance activities.

Tax avoidance is defined as a reduction of taxable income through tax planning activities, regardless of whether or not it violates tax statutes. Studying the market implications of tax avoidance is important because tax planning activities presumably increase firms' after tax cash flows (Slemrod 2004). But given the separation of ownership and control that characterizes the United States corporate environment and the complexity of the tax system, it is not clear to what extent investors value such actions when making pricing and investing decisions either because they are not certain about the cost and risks associated with those activities or the opportunities managers may have to use tax planning to extract rents from the firm.

The study analyzes the association between tax avoidance and market returns over the period of the late 1990s to the mid-2000s because the later part of the 1990s was presumably marked by an increase in corporate tax avoidance (U.S. Treasury 1999). Many argue that the spread of extreme corporate tax avoidance during the late 1990s was due to the weak IRS's enforcement efforts, managers' search to maximize profits and cash flows, and an increase in the availability of tax planning vehicles (Crenshaw 1999). Although it is clear that tax avoidance increases firms' after tax cash flows, it is not as clear the extent to which the benefits of the alleged increase in corporate tax avoidance of the late 1990s accrued to shareholders.

In response to the presumed increase in corporate tax avoidance of the late 1990s, the IRS, the U.S. Congress, and the U.S. Treasury took actions to curb that behavior starting early in the 2000s. In addition, the enactment of the Sarbanes-Oxley Act of 2002 (SOX, hereafter) affected firms' tax planning and compliance activities because it imposed new reporting requirements on internal control mechanisms and financial reporting (KPMG 2006).

The aforementioned changes in the tax environment potentially increased the costs of corporate tax avoidance in the form of higher compliance costs and detection risks, which should have affected firms' tax planning strategies. If investors perceived the changes to the tax and regulatory regimes increased firms' tax compliance costs and risks¹ then they would revise stock prices downward.

Alternatively, investors may base their beliefs about tax avoidance on a less efficient view where the complexity and obscurity of the tax system creates uncertainty about the potential net benefits of tax avoidance activities (Desai and Dharmapala 2009a). Under this view, the changes in the tax regime would result in an upward revision of the value stockholders attach

¹ *Tax risk* refers to the overall risk of a tax position resulting in an unexpected outcome for the taxpayer such as a tax audit.

to any remaining tax avoidance activities in the period after the tax regulatory changes. The potential upward revision in the value of tax avoidance stems from two sources. First, the increased cost of compliance under the new tax regime should have prompted firms to take less risky tax positions even if the level of tax avoidance remained constant. Second, the increase in monitoring by the taxing and other regulatory authorities (i.e., improved external governance mechanisms) should reduce managers' opportunities to engage in rent extraction activities through tax planning vehicles. Therefore, examining whether investors revised their valuation of tax avoidance in response to the tax regime changes provides important evidence about investors' beliefs regarding the perceived costs and benefits of tax avoidance around this period.

The study uses a differences-in-differences design for the period 1997–2005 on a panel of U.S. firms to test associations between firms' market performance and tax avoidance. Firms' market performance is measured using a three-year as well as annual returns. The low- and high-regulation regimes are identified by eliminating the transition years 2001–2002 and defining years 1997–2000 and 2003–2005 as the low- and high-regulation regimes, respectively. The study uses long-run (Dyreng et al. 2008) and annual cash effective tax rates (ETRs), and estimated book-tax differences (Frank et al. 2009) as proxies for tax avoidance.

Results indicate a negative association between firms' long-run stock returns and long-run tax avoidance for the high-regulation period. The evidence is consistent with a decrease in investors' valuation of tax avoidance because of the increased tax avoidance costs under the tighter regulatory regime. Results also provide weak support for the hypothesis that investors' valuation of tax avoidance depends on firms' governance strength (Desai et al. 2007).

The study contributes to the stream of research that focuses on the effect of changes in tax regulatory regimes on tax avoidance. It provides evidence regarding investors' perceptions about the effect of the tax and other regulatory changes that occurred early in the 2000s (one of the largest regulatory shifts in recent decades). The evidence in this study complements findings by Desai and Dharmapala (2009a) and Wilson (2009) by providing additional evidence on investors' valuation of tax avoidance activities. It also improves our understanding of investors' beliefs about tax regime changes and their effect on tax avoidance costs and risks.

The next section discusses the background and hypotheses development. I describe empirical methods and data in sections 3 and 4. Multivariate results are presented in section 5; and concluding remarks and limitations of the study in section 6.

2. BACKGROUND AND HYPOTHESES DEVELOPMENT

United States Tax Environment in the Late 1990s and the effects of Tax Avoidance

During the late 1990s, the U.S. Treasury (1999) and other stakeholders raised concerns regarding the growth in corporate tax avoidance. The U.S. Treasury (1999) indicated that the alleged increase in aggressive tax behavior stressed the IRS's revenue collection efforts and undermined the public's perception of the tax system. The General Accounting Office (GAO) documented that the percentage of large U.S.-controlled corporations reporting no tax liabilities increased from 29.1% in 1996 to 37.5% in 2000 (GAO 2004). Others (e.g., Novack and Saunders 1998) suggested corporate tax-sheltering activities of the late 1990s accounted for at least \$10 billion in lost Federal revenues per year.

Academic research documents patterns consistent with an increase in the gap between financial statement and taxable income during the 1990s; this gap is often interpreted as an

increase in corporate tax avoidance. Desai (2003) argues that earnings management and/or stock option deductions alone cannot explain the reduction in the correlation between the financial statements income and estimated taxable income during the 1990s and suggests an increase in corporate tax sheltering as a plausible explanation. Plesko (2007) analyzes tax return data and finds evidence indicating corporate managers can undertake substantial book income increasing activities that have little impact on tax reporting costs, which may partially explain the book-tax gap. Therefore, evidence from regulatory authorities, academic studies, and other sources is consistent with an increase in tax avoidance during the late 1990s. However, the extent that such an increase in tax avoidance resulted in higher after-tax returns for shareholders is not clear.

Tax Regime Changes of the Early 2000s

During the early 2000s, the U.S. taxing authorities took actions in an effort to curb corporate tax avoidance. The IRS and Congress improved their tax enforcement efforts starting in 2003 as the IRS shifted resources to the audit and enforcement functions, the U.S. Treasury approved the final regulations on reportable transactions, and Mark Everson—who prioritized the increase in IRS enforcement efforts—was appointed IRS Commissioner.² In 2003, renewed enforcement efforts resulted in a 35 percent increase in the number of cases referred to the Justice Department for prosecution when compared to 2000.³ For fiscal year 2004, audit rates on large businesses (corporations with assets \$10 million and above) increased for the first time since the mid-1990s (Everson 2004). In addition, the corporate tax function experienced additional scrutiny due to the increased monitoring of internal controls and financial reporting brought by SOX (Ernst & Young 2004, 2006; Neubig and Sangha 2004; Levin et al. 2006).

The improved enforcement efforts by the IRS, Congress, and the U.S. Treasury created an environment with increased costs of tax avoidance stemming from the new reporting requirements and external monitoring that could result in penalties, criminal indictments, and potential political costs for firms involved in tax aggressive transactions. At the same time, the changes to the tax regime improved firms' external governance strength, which should have mitigated managers' opportunities to use tax avoidance activities to obscure the financial reporting process in a way that could have a negative effect on shareholders' wealth (Desai and Dharmapala 2009a). Therefore, companies (and their managers) facing the tighter tax environment may have modified their tax avoidance strategy due to a potential shift in the risks and rewards of various tax strategies under the new regime (O'Sullivan 2005).

Hypothesis Development

Increases in corporate tax avoidance during the late 1990s should have resulted in a transfer of wealth from the government to corporate taxpayers and their shareholders. This assumes that, in equilibrium, firms' exhibit tax avoidance levels that reflect the point where the marginal benefits of tax planning (e.g., higher after tax cash flows) equal the marginal costs (e.g., non-compliance, and political costs) of such activities thereby maximizing shareholders' expected returns. Research suggests, however, that the complexity of the tax system and the separation of ownership and control may create uncertainty about how managers' decisions

² See Mark W. Everson Testimony before the Joint Review on IRS Reform (May 20, 2003).

³ See "U.S. Reports Jump in Tax-Law Cases," *The Wall Street Journal* (April 7, 2004).

regarding firms' tax planning activities translate to higher after-tax returns for shareholders.⁴ Desai and Dharmapala (2006, 2009a, 2009b) argue that managers of weakly governed firms can exploit the complexity of the tax system and their informational advantage to engage in tax transactions that allow them to extract rents from the firm, therefore, reducing shareholder returns. For example, tax-aggressive positions may help managers to achieve short-term compensation goals that may result in an increased the probability of future IRS investigations and penalties and reduce shareholders' expected returns.

Recent empirical evidence supports the argument that tax avoidance activities may not result in higher returns for shareholders. Hanlon and Slemrod (2009) examined the market reaction to tax-sheltering news and documented a decline in firms' stock prices when news about their involvement in tax-sheltering activities became public. The authors found the decline in stock prices to be smaller for strong governance firms than for weak governance firms, however. Wilson (2009) found that weak governance firms exhibit lower abnormal returns than strong governance firms during the period in which those firms were engaged in tax sheltering activities. Desai and Dharmapala (2009a) found a positive association between book-tax differences and Tobin's Q only for firms classified as strong-governance. Their evidence suggests that investors value tax avoidance depending on firms' corporate governance strength. Thus, prior research indicates that investors will value firms' tax avoidance activities depending on their belief of whom—shareholders or managers—capture the benefits of such activities.

Evidence in El Ghoul, Guedhami and Pittman (2010) is consistent with increased external monitoring in the form of stronger IRS's enforcement leading to a reduction on firms' cost of capital because it reduces the information asymmetry between managers and shareholders. Similarly, this study argues that the tighter tax regime in the high-regulation period should have prompted investors to revise their beliefs about the value they assign to tax avoidance because improvements in tax enforcement should discourage managers from taking risky tax positions. Hence, if investors perceive that the new tax regime reduced the uncertainty about the returns to investments in tax avoidance activities then a higher valuation for tax avoidance during the high-regulation period should be expected, leading to following hypothesis:

HYPOTHESIS 1A. The association between stock returns and tax avoidance is more positive in the high-regulation period, relative to the low-regulation period.

Alternatively, if the costs of the high-regulation tax environment exceeded the benefits of investing in tax planning then shareholders will assign a lower value to tax avoidance activities due to the higher cost of compliance and tax-risk. This leads to the following hypothesis:

HYPOTHESIS 1B The association between stock returns and tax avoidance is less positive in the high-regulation period, relative to the low-regulation period.

Failure to find support for Hypotheses 1A and 1B will be consistent with investors perceiving that, at the margin, a dollar of tax avoidance in the high-regulation period is valued exactly the same as a dollar of tax avoidance in the low-regulation period. A probable explanation for this behavior is that the increase in the tighter tax regime was not perceived by investors to be severe enough to cause a significant change in corporate taxpayers' tax avoidance

⁴ Chen and Chu (2005) and Crocker and Slemrod (2005) demonstrate that inducing managers to engage in tax-aggressive transactions increases firms' costs of control (i.e., compensation and monitoring costs).

practices. According to Davis et al. (2003), relatively non-compliant taxpayers will respond drastically to increased tax enforcement (and become compliant) only when there is a meaningful increase in tax enforcement. Otherwise, any increases in enforcement by the taxing authorities will only gradually increase compliance. Data on the IRS Audit Coverage for corporations (Transactional Records Access Clearing House 2008) indicates that between 2003 and 2005 the IRS put more efforts in auditing corporate taxpayers but that those efforts may have not been significant enough to make corporate taxpayers shifting their tax avoidance behavior.

The study further explores the effects of the changes in the tax environment on investors' perception of corporate tax avoidance by focusing on firms' corporate governance strength prior to the regulatory changes. Research documents a positive association between tax avoidance and firms' governance strength (e.g., Moore 2012; Desai and Dharmapala 2009a). Desai et al. (2007) predict that improvement in tax enforcement may benefit shareholders if the reduction in after-tax returns for the increased payments to the taxing authorities is offset by the benefits of additional external monitoring that reduces managers' rent extraction opportunities. Since, all else equal, weakly governed firms should benefit more from improvements in any corporate governance dimension; it is an empirical question whether investors of firms that had weak corporate governance during the low-regulation period increased the value they assign to such firms' tax avoidance activities after the tax environment changes. This leads to the following hypothesis:

HYPOTHESIS 2. The association between stock returns and tax avoidance is more positive in the high-regulation period than in the low-regulation period for firms that had weak governance characteristics during the late 1990s as compared to other firms.

3. METHOD

Identifying Tax Regimes

The sample spans the period from 1997 to 2005 to identify the periods just prior and just after the tax environment changes of the early 2000s. The sample period is partitioned into the transition (years 2001–2002), the low-regulation (years 1997–2000), and the high-regulation (years 2003–2005) periods. The transition period includes the early years after the IRS's reorganization, the discovery period that led to the increase in tax enforcement, and SOX's enactment year. The low-regulation period includes the late 1990s when corporate tax avoidance was presumably at its height (U.S. Treasury 1999). The high-regulation period begins in the year when the IRS re-focused its enforcement efforts. Thus, the high-regulation period is free from firms' anticipatory actions and initial reactions to the new tax-sheltering rules and captures the average effect of the tax environment changes. Observations in the transition period are eliminated creating a discontinuity in the time series to allow for a cleaner implementation of the differences-in-differences research design used in the analyses.

Operationalization of Tax Avoidance

In the primary analyses the long-run effective tax rate (Dyreng et al. 2008) is the proxy for tax avoidance. The measure (*Ircashetr*) is defined as the sum of firm *i*'s total income taxes paid over a three-year period divided its total pre-tax income, net of the effects of special items, over

the same three-year period. Using the long-run effective tax rate increases the likelihood that the income included in the denominator matches the tax burden reflected by the taxes paid over the period. The *Ircashetr* captures permanent and deferral tax avoidance strategies and has the advantage of reducing the volatility in annual effective tax rates.

The analyses also use annual measures of tax avoidance such as the annual cash effective tax rate as well as permanent book-tax differences and discretionary book-tax differences (Frank et al. 2009). These annual measures follow the stream of literature that focuses on corporate tax avoidance (e.g., Frank et al., 2009; Donohoe and McGill 2011; and McGuire, Omer and Wang 2012). The annual cash effective tax rate (*cashetr*) is defined as the ratio of taxes paid and pre-tax income net of special items for firm *i* in year *t*. An estimate of permanent book-tax differences (*permbtd*) is computed following Frank et al. (2009).⁵

To further explore the effect of the tax environment changes on the valuation of tax avoidance the discretionary book-tax difference (*dtax*) measure developed in Frank et al. (2009) is used as alternative proxy for tax avoidance. This measure is meant to capture tax avoidance that is not explained by known factors that affect firms' tax burdens but that are generally considered *normal* within firms' operations such as the presence of booked intangibles.⁶

The annual measures of tax avoidance used in the analyses are imperfect proxies of tax avoidance that capture tax avoidance at different levels (Hanlon and Heitzman 2010). The annual cash effective tax rate (*cashetr*) has the advantage of reflecting both permanent and deferral tax strategies but it is subject to measurement noise as it may include taxes paid from prior periods. Both *permbtd* and *dtax* reflect only the effect of non-conforming tax avoidance and their use in the literature is tied to the claim that an "ideal tax shelter is one that generates a permanent difference" and that permanent differences reflect the most egregious type of tax avoidance (Hanlon and Heitzman 2010). Frank et al. (2009) validate the *dtax* measure as a proxy for "aggressive tax avoidance" by showing it predicts tax sheltering activity.

Operationalization of Corporate Governance Strength

Two measures are used to identify firms that were weakly governed during the late 1990s. The Gompers, Ishii and Metrick (2003) shareholder rights index (*G-Index*, hereafter) is used as a measure of shareholders' legal protection. Gompers et al. (2003) document a positive relation between strong-governance and firms' performance. Firms are identified as weakly governed if the *G-Index* is greater than nine (*lowshprot*) using 1998 as the base period.

The second measure uses attributes of firms' board of directors (BOD) to construct a score (*bodscore*) that captures the strength of internal corporate governance mechanisms. Consistent with DeFond et al. (2005) and Dhaliwal et al. (2010), the score includes the following attributes: CEO-Chair separation, BOD's independence, directors' block holdings, directors' attendance, and audit committee's independence. Firms are identified as weakly governed if the sum of the indicator variables related to each BOD's attribute is less than three (*weakbod*).⁷

Using multiple proxies to operationalize corporate governance strength is in line with Schleifer and Vishny's (1997) view that corporate governance is a combination of mechanisms that prevent managers from expropriating shareholders' wealth. In addition, using several corporate governance measures provides robustness to the analyses.

⁵ See table 1 (appendix 3) for details.

⁶ Details on the computation of *dtax* are in Appendix 1.

⁷ See Appendix 2 for details.

Measuring Market Performance

Firm performance is measured as the firm specific stock returns $R_{i,t}$ as follows:

$$R_{i,t} = \frac{(P_{i,t} + \sum_t D_{i,t}) - P_{i,t-1}}{P_{i,t-1}} \quad (1)$$

where $P_{i,t}$ represents firm i 's stock price at the end of period t and $D_{i,t}$ represents firm i dividends paid during period t . Stock returns are computed over a three-year period to allow the market performance measure to align with both the separate regulatory regimes and tax avoidance measures. The approach follows Easton et al. (1992).

Empirical Specifications

Equation 2 is estimated using OLS for the primary test of Hypotheses 1A and 1 B. The model regresses firms' market performance on the proxies for tax regime and tax avoidance:

$$R_{i,t} = \alpha_0 + \beta_1 highreg_t + \beta_2 lrcashetr_{i,t} + \beta_3 (lrcashetr_{i,t} \times highreg_t) + \psi_1 pi_{i,t} + \psi_2 \Delta pi_i + \psi_3 stdret_{i,t} + \sum_j \phi_j industry + \varepsilon_{i,t} \quad (2)$$

where $R_{i,t}$ is return computed over a three year horizon in each of the low-regulation and high-regulation period.⁸ The indicator variable *highreg* is equaled to one if the observation falls in the high-regulation period and it is equaled to zero otherwise. The variable *lrcashetr* represents the three-year long-run cash effective tax rate ending in year t . The level (pi) and change (Δpi) of pre-tax income before special items (both deflated by stock price at the end of period $t-1$) are included to control for firms' pre-tax performance. The standard deviation of firm i 's returns over the 60 month horizon ending in year $t-1$ (*stdret*) controls for firm-specific risk. The model also includes industry dummies to control for industry-specific shocks.

The specification follows Easton et al. (1992), which exploits the fundamental accrual accounting attributes of aggregation of earnings over periods and potentially reduces measurement error as the aggregation period increases. This estimation procedure also reduces the volatility of annual stock returns and accounting measures while increasing the estimation precision of the association between stock returns, tax avoidance and tax regimes changes.

The variable of interest for Hypotheses 1A and 1B is the interaction between *highreg* and *lrcashetr*. A negative estimate of the interaction would be consistent with Hypothesis 1A's argument that the tighter tax regime in the high-regulation period prompted investors to increase the weight they assigned to tax avoidance because the tax regime changes reduced the uncertainty about the returns to investments in tax avoidance activities. A positive estimate of the interaction will indicate that investors believed that the tighter tax regime increased the costs of compliance to the point that reduced the returns of investing of tax avoidance even after considering the reduction in uncertainty about firms' tax avoidance activities.

For the primary test of Hypothesis 2, equation 2 is augmented by including one of the measures of corporate governance (i.e., *lowshprot* or *weakbod*) as follows:

$$R_{i,t} = \alpha_0 + \beta_1 highreg_{i,t} + \beta_2 lrcashetr_{i,t} + \beta_3 (lrcashetr_{i,t} \times highreg_t) + \beta_4 weakgov_i + \beta_5 (lrcashetr_{i,t} \times weakgov_i) + \beta_6 (lrcashetr_{i,t} \times weakgov_i \times highreg_t) \quad (3)$$

⁸ Period t ends in 2000 (2005) with 61 (80) percent of the observations in the low-(high-) regulation period.

$$+\psi_1 pi_{i,t} + \psi_2 \Delta pi_{i-p} + \psi_3 stdret_{i,t} + \sum_j \phi_j industry + \varepsilon_{i,t}$$

The variable of interest for Hypothesis 2 is the three-way interaction between *highreg*, *lrcashetr* and *weakgov*. A negative sign on the estimate of the interaction would offer support to Hypothesis 2. Such finding would be consistent with the argument that weak-governance firms should benefit more from improvements in any corporate governance dimension (Desai et al. 2007) including improvements to external monitoring.

Equation 4 is estimated using OLS to test Hypotheses 1A and 1B using annual data:

$$R_{i,t} = \alpha_0 + \beta_1 tav_{i,t} + \beta_2 (tav_{i,t} \times highreg_t) + \psi_1 pi_{i,t} + \psi_2 \Delta pi_{i,t} + \psi_3 stdret_{i,t} + \sum_t \tau_t year + \sum_j \phi_j industry + \varepsilon_{i,t} \quad (4)$$

The equation differs from equation 2 in two main respects. First, it uses annual measures of stock returns, tax avoidance, and control variables following Easton and Harris (1991). Second, it includes year dummies to control for macroeconomic effects on firms' annual returns. It also excludes the *highreg* linear term because it will be collinear with the year dummies. As in the case of equation 2, the variable of interest for Hypotheses 1A and 1B is the interaction between *highreg* and *tav* (one of the annual measures of tax avoidance).

Equation 5 is used to test Hypothesis 2 using annual stock returns as dependent variable:

$$R_{i,t} = \alpha_0 + \beta_1 tav_{i,t} + \beta_2 (tav_{i,t} \times highreg_t) + \beta_3 weakgov_i + \beta_4 (tav_{i,t} \times weakgov_i) + \beta_5 (tav_{i,t} \times weakgov_i \times highreg_t) + \psi_1 pi_{i,t} + \psi_2 \Delta pi_{i-p} + \psi_3 stdret_{i,t} + \sum_t \tau_t year + \sum_j \phi_j industry + \varepsilon_{i,t} \quad (5)$$

Inferences from equation 5 are similar to those discussed for the estimation of equation 3.

In each of the estimations, it is expected a positive association between tax avoidance and firm value. The estimation of equations 2 and 3 should exhibit a negative estimate of *lrcashetr* because larger values of long-run cash ETRs imply larger tax burdens; similarly for equations 4 and 5 when the annual cash ETR is the proxy for tax avoidance. The estimation of equations 4 and 5 where *permbtd* and *dtax* are the tax avoidance measures should exhibit a positive estimate of *tav* since larger book-tax differences have been associated with larger tax avoidance (e.g., Mills 1998), thus, larger stock returns.

4. DATA AND DESCRIPTIVE STATISTICS

Sample Selection

Data are obtained from the following databases: COMPUSTAT, the Center for Research in Security Prices (CRSP), and Risk Metrics' Historical Governance and Historical Directors. The observations used in the analyses belong to the period 1997–2005 (excluding years 2001–2002) and are constrained to U.S. corporations outside the financial services and utilities industries.

The number of observations for the main analyses is 1,906 (1,347 unique firms) with enough data to compute the long-run stock returns and tax avoidance measures. The number of observations is reduced to 1,000 for the analyses using the shareholder rights and to 894 for the analyses using the BOD score.

Descriptive statistics

Data in Panel A of Table 2 (Appendix 3) indicate the mean (median) three-year stock return is 30.4 (12.4) percent. The mean (median) long-run cash effective tax rate is 27.9 (27.9) percent well below the top Federal statutory rate of 35 percent. Data also indicate both governance measures identify slightly less than fifty percent of the sample as weakly governed in the low-regulation period. There are 44.55 percent of firms having low shareholder protection and 49.44 percent have weak boards for the long-run analyses sample. Data in Panel B indicate a reduction of five percent in the long-run cash effective tax rate (*lrcashetr*) from the low-regulation to the high-regulation period, suggesting an increase in tax avoidance in the high-regulation an observation that is at odds with the change to a stricter tax regime.

Data in Panel C indicates the mean (median) annual stock return is 11.5 (9.00) percent. The cash effective tax rate (*cashetr*) has a mean (median) of 31.7 (29.4) percent. Data in Panel D indicates the cash effective tax rate went from 33.5 percent in 1997 to a low of 27.5 percent in 2004 and then up to 30.8 percent in 2005, consistent with the trend observed for the long-run measure. Further, there is an increasing trend for the permanent book-tax differences that goes from \$16.9 million in 1997 to a high of \$101.3 million in 2005. This univariate evidence is consistent with a continuous increase in tax avoidance from the low-regulation to the high-regulation period despite the stricter regime of the early to mid-2000s relative to the late 1990s.

5. MULTIVARIATE RESULTS

Long-Run Analyses

Column A of Table 3 (Appendix 3) shows the results of the long-run tests of Hypotheses 1A and 1B on the full sample. The estimate of *lrcashetr* is negative and significant (-0.771, p -value < 0.001) consistent with lower values of long-run cash ETR (i.e., higher tax avoidance levels) being positively associated with firm performance. The estimate of the interaction between *lrcashetr* and *highreg* is positive and significant (0.517, p -value = 0.094) indicating a reduction in the association between tax avoidance and firm performance in the high-regulation period relative to the low-regulation period, consistent with Hypothesis 1B. The result suggests that investors believe that the tighter tax regime increased compliance costs and tax risk to the point that reduced the returns to investments in tax avoidance notwithstanding the potential reduction in the uncertainty about firms' tax avoidance activities. Specifically, the average five percent decrease in *lrcashetr* (see footnote 11) from the low-regulation period to the high-regulation period represented an average stock return reduction of 2.5 percent on the high-regulation period. Evidence from the governance subsamples (Columns B and D) provides to similar inferences.

Column C of Table 3 (Appendix 3) reports the tests of Hypothesis 2 using the *G-Index* as the proxy for corporate governance. The estimate of the three-way interaction between *lrcashetr*, *highreg* and *lowshprot* is negative and significant (-1.196, p -value = 0.063), consistent with Hypothesis 2. The result indicates that, at the margin, the association between tax avoidance and stock returns increased for those firms that had low shareholder protection in the low-regulation period. This is consistent with the argument that the improvement in external monitoring reduced managers' opportunities to use tax avoidance for rent extraction purposes and reap more of the

benefits of tax avoidance activities from weakly-governed firms. Results in Column E where the BOD score is used to identify weak-governance firms fail to provide support for Hypothesis 2.

Results using the long-run measures of stock returns and tax avoidance suggest that investors perceived the changes in the tax environment as an increase in the cost of tax avoidance activities, even after considering that the changes should have reduced the uncertainty associated the return to investments in these activities. Further, the results provide only partial support for the prediction that the stricter tax regime will enhance the value investors assign to tax avoidance activities of firms characterized as weakly-governed prior to the tax environment changes.

Annual Analyses

Table 4 (Appendix 3) presents the results of the tests of Hypotheses 1A and 1B using annual stock returns as the dependent variables and the three measures of tax avoidance: cash effective tax rate (Column A), permanent book-tax differences (Column B) and discretionary permanent book-tax differences (Column C). The results in Column A are consistent with those reported for the long-run analyses and show a positive and significant estimate of the interaction between *cashetr* and *highreg* (0.158, p -value = 0.04). This indicates a reduction in the association between tax avoidance and firm performance in the high-regulation period relative to the low-regulation period and suggests that investors reduced the value they assign to tax avoidance activities under the stricter tax regime due to the increased tax avoidance costs. Results in Column B where, *permbtd* is the proxy for tax avoidance fail to achieve significance.

Results in Column C present an interesting contrast. The estimate of the interaction between *dtax* and *highreg* is positive and marginally significant (0.628, p -value = 0.09) indicating an increase in the association between tax avoidance and stock returns in the high-regulation period relative to the low-regulation period. Moreover, the estimate of *dtax* fails to achieve significance. Taken together, the evidence in Column C indicate that, to the extent that *dtax* captures riskier tax avoidance strategies, investors' uncertainty regarding the returns to investment in such riskier activities was mitigated as the result of the tax regime improvements, consistent with Hypothesis 1B.

Results of the test of Hypothesis 2 (untabulated) for the annual analyses do not support the argument that stricter tax regimes mitigate investors' uncertainty about firms' tax avoidance activities given that none of the coefficient estimates of the three-way interactions between *highreg*, each tax avoidance proxy, and each weak governance proxy are significant at conventional levels.

Results from the annual analyses suggest, at the margin, that investors reduced the value they attach to tax avoidance activities in the high-regulation period relative to the low-regulation period. This could be explained by the increased costs and risks associated with engaging in tax avoidance brought by the stricter tax and financial reporting regime that have been characterized as overly burdensome for many companies (Levin et al. 2006).

6. CONCLUDING REMARKS

The study examines how the changes in the tax regime initiated in 2001–2002 affected investors' beliefs about firms' tax avoidance activities. The study contributes to the understanding about how tax regime changes affect investors' valuation of corporate tax avoidance activities. This research should be of interest to academics interested in understanding

the consequences of corporate tax avoidance. It should be also interesting to investors and regulators who want to understand the impact of one of the largest and more extensive regulatory changes in recent history.

Results show a negative association between firms' long-run stock returns and their long-run tax avoidance for the high-regulation period. The evidence is consistent with a decrease in investors' valuation of tax avoidance resulting from the increased tax avoidance costs under the tighter regulatory environment. Results also present weak evidence consistent with investors increasing their valuation of tax avoidance activities on firms that had weak-governance in the period prior to the change in regulatory regime. This suggests that governance may be a second order effect in the weight that investors assign to tax avoidance activities.

The study is subject to several limitations. First, financial statement data are used to infer tax avoidance, which introduces measurement error to the analyses because the measures may be affected by things that may not be considered tax avoidance. Second, corporate governance measures are far from perfect and partitioning firms into two groups assumes the researcher knows the exact cut-off that identifies weakly governed firms for each measure. Third, parameter estimates generalize only to large firms, which compose most of the sample.

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APPENDIX 1—ESTIMATING DISCRETIONARY BOOK-TAX DIFFERENCES

Estimating discretionary permanent book-tax differences (*dtax*) follows by Frank et al. (2009) using the following regression model:

$$\begin{aligned} \text{permbtd}_{i,t} = & \alpha_0 + \lambda_1 \text{intang}_{i,t} + \lambda_2 \text{uncon}_{i,t} + \lambda_3 \text{statetax}_{i,t} + \lambda_4 \text{mii}_{i,t} \\ & + \lambda_5 \Delta \text{nol}_{i,t} + \lambda_6 \text{permbtd}_{i,t-1} + \varepsilon_{i,t} \end{aligned} \quad (\text{A-1})$$

where *permbtd* is total permanent book-tax differences firm *i* in year *t*.⁹ The model includes controls for non-discretionary items that are known to cause permanent differences: intangible assets (*intan*), earnings reported under the equity method (*uncon*), and state income taxes (*statetax*), minority interests (*mii*), change in net operating losses (Δnol) and lagged *permbtd*.

The model is estimated using ordinary least squares for each year and industry combination with at least 40 observations.¹⁰ Then, *dtax* is computed as the residual from the regression model as:

$$\text{dtax}_{i,t} = \text{permbtd}_{i,t} - \text{permbtd}_{i,t} \quad (\text{A-2}).$$

APPENDIX 2—BOARD OF DIRECTORS STRENGTH SCORE

I use a variation of the corporate governance proxies proposed by DeFond et al. (2005) and Dhaliwal et al. (2010) to measure the board of directors' (BOD) monitoring strength. I construct a score incorporating attributes of the BOD by prior studies as indicators of corporate governance strength (e.g., Beasley, 1996; Dechow et al., 1996; Anderson et al., 2004; Collins et al., 2009). Indicator variables identifying the conditions that indicate a strong-governance environment for each attribute are defined as follows:

BOD Attributes:

- **Independence**—Prior research argues outside or independent directors have more incentives to carry out their monitoring tasks (Fama and Jensen 1983) than other members of the board. Although evidence on the effects of BOD's independence is mixed, the widespread view suggests a higher proportion of outside directors is associated with strong-governance and financial statement integrity (e.g., Dechow et al. 1996; Collins et al. 2009). An outside director is identified as a director with no significant affiliations with the firm (e.g., firm employees, providers of services, major customers). Following prior studies an indicator variable is equaled to one if 60 percent or more of a firm's directors are outsiders (DeFond et al. 2005; Dhaliwal et al. 2010); zero otherwise.
- **CEO-Chair Separation**—Jensen (1993) suggests the position of CEO and Chair of the BOD should be separated because a critical function of the later is to oversee the performance of the former. Existing empirical evidence suggests an association between *Duality* (i.e., CEO and Chairman of the BOD held by the same person) and higher instances of Securities Exchange Commission (SEC) accounting enforcement actions (Dechow et al. 1996). An indicator variable is equaled to one for firms without *Duality*; zero otherwise.

⁹ Variable definitions follow those described in Table 1.

¹⁰ I classify industries using the Fama-French 48-industry classification scheme.

- Blockholder—Prior studies document that BOD's members who are block holders improve corporate governance through better external monitoring (Beasley 1996; Dechow et al. 1996; Klein 2002). Therefore, an indicator variable is equaled to one for firms where at least one director owns more than five percent of the firm's outstanding shares; zero otherwise.
- Attendance—The level of commitment of members of the BOD is important for effective monitoring. Brown and Caylor (2006) documents one of the key drivers of the relation between governance strength and firm valuation is that all directors attend more than 75 percent of board meetings. Building on that finding, an indicator variable is equaled to one if all firm's directors attended at least 75 percent of the board's meetings; zero otherwise.
- AC independence—Firms with more independent AC are less likely to experience fraud, SEC enforcement actions, material restatements, and earnings management than those with less independent AC (Klein 2002; Abbott et al. 2004; Bédard et al. 2004). Also, the Blue Ribbon Committee (1999) recommended all large listed companies should have AC composed entirely of independent directors. Therefore, an indicator variable is equaled to one if a firm's AC is composed of independent directors; zero otherwise.

For each firm-year in the sample, I calculate *bodscore* by adding the five indicator variables belonging to each BOD attribute. Then, I use a cutoff of two to determine whether a firm has weak-governance based on the total *bodscore*. Finally, I equal *weakbod* to one if a firm has a *bodscore* of two or less for years 1999 and 2000; *weakbod* is zero otherwise.¹¹

¹¹ If *bodscore* is not available for both years 1999 and 2000, the *bodscore* for 1999 or 2000 is used to define *weakbod*.

APPENDIX 3—TABLES

Table 1. Variable measurement

Variable name	Definition (COMPUSTAT data items in parentheses)
$R_{i,t}$	Difference between dividend adjusted stock price at the end of year t minus stock price at the end of year $t-j$ divided stock price at the end of year $t-j$; j equals three for the long-run stock returns; it equals one for the annual stock returns. Stock prices are split adjusted.
<i>highreg</i>	Indicator variable equal to one if year is 2003 or beyond; zero otherwise.
Tax avoidance <i>lrcashetr</i>	Sum of firm i 's income taxes paid (<i>txpd</i>) over a three-year period divided by the sum of its total pretax income (<i>pi</i>) net of the effects of special items (<i>spi</i>) over the same three-year period. If the sum of the adjusted pre-tax income over period is negative the observation is deleted; values greater than one are reset to one; negative values are reset to zero.
<i>cashetr</i>	Income tax paid (<i>txpd</i>) divided by pre-tax income (<i>pi</i>) net of the effects of special items (<i>spi</i>) for firm i in year t ; if taxes paid is negative, then <i>cashetr</i> is equaled to zero; if taxes paid is positive and adjusted pre-tax income is negative, then <i>cashetr</i> is equaled to one; any remaining observations where <i>cashetr</i> is greater than one are reset to one.
<i>permbtd</i>	Difference between pre-tax financial income (<i>pi</i>) and estimated taxable income (sum of federal (<i>fedte</i>) and foreign (<i>forte</i>) income taxes divided by the top statutory rate) minus temporary book-tax differences (sum of federal (<i>txdf</i>) and foreign (<i>txdfo</i>) deferred tax expense divided by the top statutory rate) for firm i in year t .
<i>dtax</i>	Discretionary permanent book-tax differences estimated using the method described in Appendix 1.
Weak-governance <i>lowshprot</i>	Indicator variable equaled to one if the <i>G-Index</i> is greater than nine; zero otherwise for firm i in the low-regulation period.
<i>weakbod</i>	Indicator variable equaled to one if <i>bodscore</i> is less than three; zero otherwise for firm i in years 1999 and 2000; <i>bodscore</i> based on five attributes of the board of directors as described in Appendix 2.
Control variables <i>pi</i>	Pre-tax income (<i>pi</i>) minus special items (<i>spi</i>) for firm i in year t divided stock price (split adjusted) at the end of year $t-j$ where j is equal to three for the long-run analyses and one for the annual analyses.
Δpi	Change in adjusted pre-tax income ($pi - spi$) for firm i from year $t-j$ to year t divided by stock price at the end of year $t-j$.
<i>stdret</i>	Standard deviation of size adjusted monthly returns for firm i during year t .

Table 2. Descriptive Statistics

Panel A: Variables used in long-run analyses (full sample, n=1,906)							
			Percentiles				
	Mean	Std. Dev.	1 st	25 th	50 th	75 th	99 th
$R_{i,t}$	0.304	0.928	-0.787	-0.196	0.124	0.496	5.862
$lrcashetr_{i,t}$	0.279	0.151	0.000	0.188	0.279	0.353	0.914
$pi_{i,t}$	29.058	62.387	0.147	3.068	8.435	24.846	456.636
$\Delta pi_{i,t}$	8.797	30.956	-58.078	-0.421	1.384	7.459	210.381
$stdret_{i,t}$	0.407	0.185	0.166	0.275	0.362	0.491	1.150
$lowshprot$	0.445	---	---	---	---	---	---
$weakbod$	0.494	---	---	---	---	---	---
Panel B: Mean long-run tax avoidance trend							
	1997-2000	2003-2005					
$lrtav_{i,t}$	29.8%	24.9%					
Panel C: Variables used in annual analyses (full sample, n=4,063)							
			Percentiles				
	Mean	Std Dev.	1 st	25 th	50 th	75 th	99 th
$R_{i,t}$	0.115	0.505	-1.998	-0.139	0.090	0.338	1.848
$cashetr_{i,t}$	0.317	0.220	0.000	0.194	0.294	0.379	1.000
$permbtd_{i,t}$	0.008	0.032	-0.167	0.000	0.008	0.019	0.106
$dtax_{i,t}$	0.012	0.046	-0.172	-0.007	0.011	0.031	0.161
$pi_{i,t}$	12.948	29.501	-15.191	1.008	3.413	10.893	191.752
$\Delta pi_{i,t}$	1.513	10.134	-34.924	-0.457	0.285	1.851	55.192
$stdret_{i,t}$	0.356	0.137	0.163	0.260	0.327	0.417	0.882
$lowshprot$	0.465	---	---	---	---	---	---
$weakbod$	0.480	---	---	---	---	---	---
Panel D: Mean annual tax avoidance measures trend (full sample, annual measures)							
	1997	1998	1999	2000	2003	2004	2005
Cash ETR	33.5%	33.8%	32.1%	33.6%	27.9%	27.5%	30.8%
Permanent book-tax diff. (\$million)	16.9	40.5	27.5	39.0	74.4	97.0	101.3
Discretionary book-tax diff. (\$million)	64.1	79.5	39.2	70.3	85.6	56.1	99.9

Sample period is 1997–2000 (low-regulation) and 2003–2005 (high-regulation). Long-run analyses use a three-year period from each of the low- and high-regulation period to compute stock returns, tax avoidance and control variables; annual analyses use one year measures of stock returns, tax avoidance and control variables in the analyses. Variables are defined in Table 1.

Table 3. Regressions of changes in tax regimes, tax avoidance and governance on stock returns

		Dependent variable: Three-year stock return.				
		(A)	(B)	(C)	(D)	(E)
		<i>weakgov</i>				
		<i>lowshprot</i>			<i>weakbod</i>	
Independent variables	Pred. Sign	<i>H1A</i> & <i>H1B</i>	<i>H1A</i> & <i>H1B</i>	<i>H2</i>	<i>H1A</i> & <i>H1B</i>	<i>H2</i>
<i>highreg</i>	+/-	0.013 <i>0.121</i>	-0.222 * <i>-1.739</i>	-0.442 ** <i>-2.268</i>	-0.521 *** <i>-3.426</i>	-0.265 <i>-1.564</i>
<i>lrcashetr</i>	-	-0.771 ‡ <i>-4.176</i>	-0.814 ‡ <i>-2.593</i>	-1.226 ‡ <i>-2.451</i>	-1.318 ‡ <i>-3.610</i>	-0.933 ‡ <i>-2.353</i>
<i>lrcashetr</i> × <i>highreg</i>	+/-	0.517 * <i>1.678</i>	0.958 ** <i>2.416</i>	1.502 ** <i>2.424</i>	1.624 *** <i>3.537</i>	1.179 ** <i>2.096</i>
<i>weakgov</i>	-	---	---	-0.333 + <i>-1.618</i>	---	0.458 <i>1.736</i>
<i>weakgov</i> × <i>highreg</i>	+/-	---	---	0.485 ** <i>1.967</i>	---	-0.514 * <i>-1.718</i>
<i>lrcashetr</i> × <i>weakgov</i>	+/-	---	---	0.932 <i>1.497</i>	---	-0.762 <i>-0.971</i>
<i>lrcashetr</i> × <i>weakgov</i> × <i>highr</i>	-	---	---	-1.196 + <i>-1.534</i>	---	0.884 <i>0.927</i>
<i>pi</i>	+	-0.004 *** <i>-6.207</i>	-0.003 *** <i>-5.589</i>	-0.003 *** <i>-5.656</i>	-0.003 *** <i>-5.052</i>	-0.003 *** <i>-5.224</i>
Δpi	+	0.010 *** <i>6.527</i>	0.007 *** <i>5.800</i>	0.007 *** <i>5.864</i>	0.008 *** <i>5.444</i>	0.008 *** <i>5.616</i>
<i>volatility</i>	-	0.104 <i>0.697</i>	0.304 <i>1.070</i>	0.280 <i>0.981</i>	0.878 *** <i>2.934</i>	0.900 *** <i>3.038</i>
<i>intercept</i>	+/-	0.446 *** <i>4.996</i>	0.461 *** <i>3.344</i>	0.617 *** <i>3.300</i>	0.442 *** <i>3.176</i>	0.207 <i>1.230</i>
N		1,906	1,000	1,000	894	894
Adjusted R-Squared		0.128	0.173	0.175	0.162	0.173
F-Stat		18.809	10.868	7.325	11.926	8.067

***, **, * Indicate significance at the 1, 5 and 10 percent levels, respectively, based on two-sided. ‡, †, +

Indicate one-sided significance at the 1, 5 and 10 percent levels, respectively. Standard errors are clustered-robust at the firm level. Sample period is 1997–2000 (low-regulation) and 2003–2005 (high-regulation). Continuous variables were winzORIZED at the first and 99th percentiles. The dependent variable is three-year stock return for the period ending in year *t*; *highreg* is equal to one if fiscal year is 2003 or beyond; *lrcashetr* is the long-run cash ETR computed over the three-year period ending in year *t*. Weak governance (*weakgov*) is equal to one if the firm had low shareholder protection (*lowshprot*, Column C) or weak BOD (*weakbod*, Column E) in the low-regulation period. All estimations include industry fixed effects. Variables are defined in Table 1.

Table 4. Regressions examining the effect of changes in tax regime and tax avoidance on annual stock returns (Hypotheses 1A and 1B).

Independent Variables	Pred. Sign	Dependent variable: Annual stock return.			
		(A)	Pred. Sign	(B)	(C)
		<i>cashetr</i>		<i>permbtd</i>	<i>dtax</i>
<i>tav</i>	–	-0.303 ‡ -6.011	+	1.601 ‡ 4.372	-0.249 -1.056
<i>tav</i> × <i>highreg</i>	+/-	0.158 ** 2.052	+/-	-0.574 -1.086	0.628 * 1.689
<i>pi</i>	+/-	0.001 *** 3.162	+/-	0.001 *** 2.996	0.001 *** 3.373
Δpi	+/-	0.007 *** 6.782	+/-	0.007 *** 6.483	0.007 *** 7.180
<i>volatility</i>	+/-	0.226 *** 2.844	+/-	0.220 *** 2.755	0.206 ** 2.576
<i>intercept</i>	+/-	0.248 *** 7.418	+/-	0.156 *** 4.992	0.173 *** 5.515
N		4,063		4,063	4,063
Adjusted R-Squared		0.130		0.126	0.120
F-Stat		42.260		38.216	35.650

***, **, * Indicate significance at the 1, 5 and 10 percent levels, respectively, based on two-sided clustered-robust standard errors at the firm level. ‡, †, + Indicate significance at the 1, 5 and 10 percent levels, respectively, based on one-sided clustered-robust standard errors at the firm level. Sample period is 1997–2000 (low-regulation) and 2003–2005 (high-regulation). Continuous variables were winzorized at the first and 99th percentiles. The dependent variable is: annual stock return (dividend adjusted); *highreg* equals to one if fiscal year is 2003 or beyond. Tax avoidance (*tav*) is measured as one of the following three variables: *cashetr* defined as the ratio of taxes paid in year *t* to pre-tax income (adjusted for special items), *permbtd* defined as total book-tax differences minus temporary book-tax differences; *dtax* defined as discretionary permanent book-tax difference. All estimations include year and industry fixed effects. Variables are defined in Table 1.