

**An Examination of Corporate Tax Shelter Participants**

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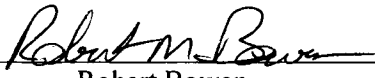
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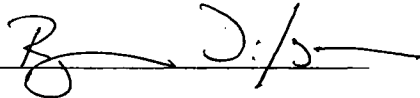
  
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**Abstract**

An Examination of Corporate Tax Shelter Participants

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Recent evidence suggests corporate tax shelters have become an important instrument for reducing the tax burden of many corporations. Despite the growing economic significance of tax shelters, previous research documents that it is difficult to determine when a firm is engaged in tax sheltering on the basis of financial statement examination. Based on a sample of firms identified ex post as having participated in tax shelters, I develop a profile of the type of firm that is likely to be engaged in tax sheltering. Developing this profile includes examining whether there is a connection between aggressive tax reporting, characterized by tax shelter participation, and aggressive financial reporting practices. I find that tax shelter participation is positively associated with firm size, large book-tax differences, the existence of foreign operations, and aggressive financial reporting practices. In addition, I use long-run measures of stock return performance during the period of active tax shelter participation to investigate whether tax sheltering is associated with managerial opportunism and rent extraction or firm value maximization. I find active tax shelter firms with strong corporate governance exhibit positive abnormal return performance while tax shelter firms with poor corporate governance exhibit significantly lower abnormal returns. These results are consistent with tax sheltering being a tool for wealth creation in well governed firms.

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**Dedication**

**To my wife Nicole and my parents James and Susan**

## **Introduction**

This study investigates the characteristics of a set of firms accused by the government of engaging in tax sheltering activity. I use these firms to develop and test a model to identify the type of firm likely to be engaged in corporate tax sheltering. The purpose of developing this model is twofold. First, the model identifies firm-specific characteristics that result from tax shelter participation such as large differences between financial reporting income and taxable income. Second, the model identifies characteristics that are associated with the type of firm likely to be engaged in tax sheltering activity such as firm size and a tendency to report aggressively for financial reporting purposes. I also use this set of tax shelter firms to examine whether the act of tax sheltering is consistent with managers maximizing shareholder value or whether tax sheltering provides a vehicle for managers to behave opportunistically.

Recent evidence suggests the late 1990's were characterized by a growing divergence between book and taxable income (book-tax differences). Plesko (2002) documents the difference between pre-tax book income and tax net income grew from \$92.5 billion in 1996 to more than \$159 billion in 1998. Desai (2003) finds that traditional drivers of book-tax differences such as stock option deductions, international operations, and depreciation explain less than 50 percent of these book-tax differences in 1998. More recently, in June of 2006 IRS Commissioner Mark Everson warned a U.S. Senate Panel that tax arbitrage strategies are on the rise, and among the most significant enforcement problems the agency faces (Drucker 2006). These statements and findings suggest rapid growth in the economic importance of tax sheltering activity beginning in the 1990's.

Despite evidence indicating that tax sheltering activity is an important instrument for reducing the tax burden of many corporations, it is difficult to identify whether a firm is actively participating in a tax shelter. Firms generally do not disclose their involvement in tax sheltering, and even when it is known ex post that a firm participated in a tax shelter, it is often impossible to determine the tax benefit derived from the sheltering activity through an analysis of the firm's financials statements (McGill and Outslay 2004). As a result, researchers have developed only a limited understanding of cross-sectional differences in the willingness of firms to engage in aggressive tax shelters.

A white paper issued by the U.S. Treasury in 1999 notes that "one hallmark of corporate tax shelters is a reduction in taxable income with no concomitant reduction in book income." This statement suggests one characteristic of firms engaged in tax sheltering would be large book-tax differences (hereafter BTDs). However, recent studies differ in their conclusions about what drives the difference between book and taxable income. Some research indicates this growing book-tax difference is attributable to aggressive financial reporting. Phillips, Pincus, and Rego (2003) find firms that avoid losses or have small earnings increases have larger temporary book-tax differences. Hanlon (2005) reports firms with large temporary BTDs have less persistent earnings than firms with small temporary BTDs. In contrast, Desai (2003) argues that the increase in BTDs is consistent with increasing levels of tax sheltering in the 1990's. Heltzer (2006) also reports results consistent with large positive BTDs being due to aggressive tax reporting rather than aggressive financial reporting.

I directly examine whether BTDs can serve as a useful proxy for aggressive tax reporting by testing whether they are positively associated with cases where it is clear ex

post that firms were aggressive in their tax reporting as evidenced by their participation in publicly identified tax shelters.<sup>1</sup> Identifying a positive association between BTDs and actual cases of tax sheltering is a necessary condition for BTDs to be an effective proxy for tax aggressiveness. However, it should be noted that this association alone does not rule out the possibility that BTDs reflect *both* tax and financial reporting aggressiveness.

In addition to examining whether tax shelter firms have larger positive BTDs than non-tax shelter firms, I also investigate the association between incidence of tax sheltering and additional proxies for tax aggressiveness. Pursuant to SFAS No. 5, firms must accrue a loss contingency on any uncertain tax positions if the loss is probable and reasonably estimable.<sup>2</sup> This loss contingency is commonly referred to as the “tax cushion.”<sup>3</sup> If the management of a tax shelter firm believe it is probable that at least a portion of the tax savings associated with their firm’s tax shelter will not be sustained under IRS examination, then it is likely they will record tax cushion associated with the shelter. I test whether a proxy for the change in tax cushion developed by Blouin and Tuna (2006) is positively associated with actual incidence of tax sheltering.<sup>4</sup> I also test whether incidence of tax sheltering is negatively associated with a firm’s long-run cash effective tax rate. The

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<sup>1</sup> I use an estimate of book-tax differences that is designed to reflect both temporary and permanent differences. I use this measure because different types of tax shelters can lead to either permanent or temporary differences. See Appendix (A) for a discussion of the financial reporting implications of the sample tax shelters.

<sup>2</sup> For a more complete discussion of the reporting for contingent tax liabilities see Gleason and Mills (2002).

<sup>3</sup> The tax cushion can be large for firms with significant uncertain tax positions. For example, Microsoft reported a contingent tax liability of \$4.1 billion in other long-term liabilities in its 2006 financial statements; this contingency represented 14% of the company’s total liabilities for 2006.

<sup>4</sup> Note that the tax cushion does not have to increase as a result of a firm taking an aggressive tax reporting position if management does not record a contingency for that position. As a result, changes in the tax cushion might not be an effective proxy for aggressive tax reporting. However, firms that take aggressive tax reporting positions should, *ceteris paribus*, be more likely to record additional tax cushion. This issue is discussed further in the following sections.

cash effective tax rate is a measure of long-run corporate tax avoidance developed by Dyreng, Hanlon, and Maydew (2006). The long-run cash effective tax rate is calculated as the actual cash taxes paid over a five-year period divided by pre-tax net income over the same period.

Next I examine a set of firm characteristics that, unlike large BTDs and the cash effective tax rate, do not result directly from the act of tax sheltering itself, but that I hypothesize will be associated with the type of firm likely to be engaging in aggressive tax sheltering. I begin by investigating whether the decision to engage in tax sheltering is a signal of an overall aggressive corporate environment. Specifically, I test whether firms that are engaged in tax sheltering also exhibit more aggressive financial reporting practices. Frank, Lynch, and Rego (2006) find that aggressive financial reporting is associated with aggressive tax reporting using unexplained permanent BTDs as their proxy for aggressive tax reporting. I extend this work by investigating the association between tax reporting aggressiveness and financial reporting aggressiveness in a setting where I can be relatively certain actual tax sheltering activity occurred.

I also test whether tax sheltering is associated with other signals of corporate aggressiveness. Bertrand and Schoar (2003) find that firms with CEOs who possess an MBA degree appear to manage more aggressively by choosing to hold more debt, engaging in higher levels of capital expenditures, and paying fewer dividends than firms with CEOs without MBA degrees. Similarly, the authors find that firms with younger CEOs appear to also engage in higher levels of capital expenditures and hold more debt. I extend this research on the impact of managerial heterogeneity to a new dimension of

corporate decision making by testing whether CEO age and education are also associated with the decision to engage in tax sheltering.

Beyond examining the characteristics of tax shelter firms and their managers, I also investigate whether tax sheltering is consistent with managers maximizing shareholder value, or whether tax sheltering is a signal of managerial opportunism. Effective tax planning can help maximize shareholder value. However, elaborate tax shelter schemes could also facilitate dishonesty on the part of management. Desai and Dharmapala (2006a) dissect one example of a real-world tax shelter to show how tax shelter products enable managers to manipulate earnings. They argue tax shelters are intentionally designed to obscure the economic substance of a transaction and therefore provide a shield for managers to engage in opportunistic behavior. To test whether the rent extraction associated with tax sheltering is economically meaningful I examine the performance of my tax shelter sample firms in the periods before, during, and after their participation in a tax shelter using both stock return and earnings based performance metrics.

In terms of the first analysis examining the characteristics of tax shelter firms, I find that BTDs are positively and significantly associated with incidence of tax sheltering activity. Documenting this association is an important step in determining whether BTDs can serve as a useful proxy for tax aggressiveness. I find no evidence of an association between incidence of tax sheltering and either an estimate of changes in tax cushion or a firm's long-run cash effective tax rate. However, I do find a positive association between a measure of accrual based earnings management and incidence of tax sheltering. This result is consistent with tax shelter firms also reporting more aggressively for financial reporting purposes. Also consistent with this conjecture, I find that firms engaged in tax sheltering

are more likely to restate their earnings in future periods.<sup>5</sup> Further, I find that tax shelter firms are more likely to have a CEO who is under the age of 55 and who possesses an MBA degree.

Finally, I examine the stock return performance of my sample firms for the periods before, during, and immediately after their tax shelter participation. Specifically I regress monthly returns (less the risk free rate) during those respective periods on the four factor Fama-French (1993) model.<sup>6</sup> The results are consistent with corporate governance being an important factor in determining whether tax sheltering is associated with wealth creation for shareholders. Tax shelter firms with strong corporate governance scores report significantly higher abnormal returns during the period of active tax shelter participation than tax shelter firms with poor corporate governance. The significant positive abnormal returns for tax shelter firms with strong corporate governance are consistent with managers using effective tax planning strategies that are reflective of incentive alignment between managers and shareholders.<sup>7</sup> These results are complimented by the tests examining the operating performance of the tax shelter sample. The results are consistent with well-governed tax shelter firms reporting higher after-tax earnings than poorly-governed tax shelter firms during the period of active tax shelter participation.

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<sup>5</sup> These tests use future earnings restatements as a proxy for aggressive financial reporting, and it is not necessarily the case that the earnings restatements were related to tax sheltering activity.

<sup>6</sup> Note that using stock returns as a measure of firm performance in an effort to identify rent extraction on the part of managers is a joint test of stock market efficiency and the alignment of manager and shareholder interests. These tests are subject to several limitations which are discussed in detail in the following sections.

<sup>7</sup> These findings are distinct from but complementary to the findings of Hanlon and Slemrod (2006) who examine the stock price reaction to the news that a firm was engaged in tax sheltering. Using short-window event study tests, they find the market reacts negatively to news of tax sheltering for firms with poor corporate governance. In contrast, my tests use long-run stock returns to measure firm performance during the period the firm was actually engaged in tax sheltering. I discuss the implications of the Hanlon and Slemrod study for this paper in greater detail in the following sections.

This study builds on the work of Graham and Tucker (2006) who develop a model of tax shelter participation and makes two key contributions to research. First, I develop a more comprehensive model of tax sheltering which includes additional firm characteristics such as the existence of foreign operations, book-tax differences, CEO characteristics, and financial reporting aggressiveness. Developing a model that effectively identifies aggressive corporate taxpayers is crucial for any study attempting to examine changes in the willingness of firms to engage in aggressive tax strategies as a result of changes in either financial reporting regulations or tax law. Second, this study provides insight into when tax sheltering is consistent with effective tax planning and when it is indicative of managerial opportunism. The cases of tax sheltering examined in this study are very large and the firms used in this analysis were either caught or filed suit regarding their tax shelter activity. It is possible the sample selection procedure has identified only the largest tax shelter cases, or tax shelters that differ in some other systematic way from the population of tax shelter firms. As a result, caution should be exercised in generalizing the findings from this study to the population of tax shelter firms.

The remainder of the paper proceeds as follows. The next section develops my hypotheses related to the characteristics of tax shelter firms. Section three discusses my hypotheses regarding the association between rent extraction and tax sheltering. Section four explains the sample selection procedures and provides summary statistics. Section five provides a description of the empirical methods used. Section six discusses the results and the final section concludes.



## **Chapter I: Characteristics of Tax Shelter Firms**

### *a. Book-tax differences*

The Joint Committee on Taxation (1999) defines a corporate tax shelter as a plan or arrangement that is designed principally to avoid or evade federal income tax without exposure to economic risk or loss. Bankman (1999) offers a more creative definition, “a tax shelter can be defined as a product whose useful life is apt to end soon after it is discovered by the Treasury.” Specifically, Bankman argues that tax shelters are tax motivated transactions based on a literal interpretation of government regulations that are inconsistent with the original intent of the legislation. For purposes of this study, I limit my analysis to a set of firms that were either accused by Treasury of tax sheltering or identified in the press as tax shelter participants. It is reasonable to assume that, at least from the perspective of the Treasury, these cases could be classified under Bankman’s definition of tax sheltering. However, even for these firms, where it is relatively clear they engaged in tax sheltering that resulted in a considerable reduction in their tax burden, it is difficult to detect tax shelter activity simply by examining their financial statements. In Appendix (B) I examine the tax footnotes of two of the sample tax shelter firms for the period when it is known the firms were engaged in sheltering to demonstrate the difficulty associated with detecting tax sheltering through financial statement analysis.

I begin developing a profile of a tax shelter firm by first examining three alternative proxies for tax aggressiveness: BTDs, changes in estimated tax cushion, and the cash effective tax rate. The difficulty of identifying aggressive tax reporting firms stems in part from the ongoing uncertainty regarding the causes of BTDs. Previous research has suggested that large positive BTDs are partially caused by aggressive financial reporting.

Hanlon (2005) finds that firms with large positive temporary BTDs have less persistent earnings and concludes that investors appear to view large BTDs as a “red flag” indicating low quality earnings. Lev and Nissim (2004) find that the ratio of tax-to-book income predicts earnings growth for up to five years ahead. They conclude that the increasing gap between book and tax income could have been a signal to investors of low quality earnings.

An additional difficulty in examining BTDs as a sign of aggressive tax reporting arises because BTDs can be caused by firm-specific characteristics that are independent of aggressive tax or book reporting strategies. Hanlon (2003) and McGill and Outslay (2004) identify a number of factors that make it difficult to draw inferences about the degree of sheltering activity in which a firm has engaged simply by examining the extent of a firm’s BTDs. Firm specific characteristics such as the extent of a firm’s foreign operations or the level of its capital expenditures can lead to large BTDs that could be unrelated to the type of aggressive tax reporting characterized by corporate tax shelters.

Despite the complexity associated with examining BTDs, some research suggests that large positive BTDs are a signal of tax aggressiveness. Desai (2003) argues that the divergence between book and tax income during the 1990’s was not attributable to traditional drivers of book-tax differences such as depreciation, but was actually caused by increased levels of tax sheltering. Heltzer (2006) finds results consistent with BTDs providing insight into a firm’s relative level of tax reporting aggressiveness, but not a firm’s relative level of financial reporting aggressiveness. Specifically, she examines the level of financial reporting and tax reporting conservatism for firms with large positive BTDs and finds that the financial reporting conservatism for these firms is similar to that of

other sample firms. However, applying the same measure of conservatism to taxable income, she finds that firms with large positive BTDs do exhibit more conservative (and therefore more aggressive from a tax perspective) tax reporting.<sup>8</sup> The current study provides additional insight into whether large positive BTDs can be interpreted as a signal of tax aggressiveness by directly testing whether there is a positive association between BTDs and actual incidence of tax sheltering. This leads to my first hypothesis:

**H1:** Firms identified as participating in tax sheltering activity will report larger positive book-tax differences than non-tax shelter firms.

*b. Tax Cushion*

Following SFAS No. 5, managers are required to record contingent liabilities (tax cushion) associated with uncertain tax positions when the liabilities are both probable and estimable. This practice is consistent with the matching principle where firms record additional liabilities for taxes beyond those due on the tax return so that any additional tax expense is matched to current year earnings (Erickson et al. 2004). The tax cushion is typically recorded as an increase in the current tax expense rather than an increase in the deferred tax expense (FASB 1992).<sup>9</sup> I use a measure of changes in tax cushion developed by Blouin and Tuna (2006). They find their estimate of changes in tax cushion is associated with the cash effective tax rate measure of long-term tax avoidance developed

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<sup>8</sup> Heltzer (2006) uses the Basu (1997) measure of conditional and unconditional conservatism.

<sup>9</sup> On July 13, 2006 the FASB issued Interpretation No. 48, Accounting for Uncertainty in Income Taxes: An Interpretation of FASB Statement No. 109, proposing a more restrictive approach to recognizing benefits associated with uncertain tax positions. However, FIN 48 is only effective for fiscal years beginning after December 15, 2006 and therefore will not impact the financial reporting of the tax shelters firms during the years examined in this study.

by Dyreng et al. (2006), and therefore conclude that it is a useful measure of cross-sectional variation in tax aggressiveness. I provide further evidence on the validity of this measure as a proxy for tax aggressiveness by testing its association with actual incidence of tax sheltering.

The benefits associated with the tax shelters employed by my sample of firms are likely to be deemed uncertain by management. The IRS challenges most of these tax shelters using judicial doctrines such as the *sham transaction doctrine* and the *economic substance doctrine* that require transactions have a valid business purpose.<sup>10</sup> Due to the complexity of many of the tax shelters employed by the firms in my sample, it is often difficult to determine whether there is an underlying business purpose associated with the tax shelter. For example, in the case of *United Parcel Service of America, Inc. ("UPS") v. Commissioner*, the Tax Court ruled that the shelter employed by UPS was a sham transaction with no underlying business purpose. However, the Eleventh Circuit Court reversed the Tax Court finding ruling that the transaction did have economic substance. This example illustrates the difficulty associated with determining whether or not the tax benefit associated with these shelters will be sustained. As such, I expect managers of tax shelter firms to record at least a partial contingent liability associated with these aggressive tax positions. If managers consistently record contingencies for aggressive tax positions then this measure of changes in tax cushion could be a useful measure of tax reporting aggressiveness. This leads to my second hypothesis:

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<sup>10</sup> See Graham and Tucker (2005) for a complete discussion of the judicial doctrines developed by the IRS to curb tax shelters.

**H2:** Firms identified as participating in tax sheltering activity will report larger changes in their tax cushion than non-tax shelter firms.

The recording of tax cushion associated with aggressive tax positions might at first seem inconsistent with the discussion below regarding the association between aggressive tax and financial reporting. However, significant tax contingencies could actually help to facilitate earnings management. Because there is a considerable amount of information asymmetry associated with uncertain tax positions and because the tax account is one of the last accounts closed prior to earnings announcements, large tax contingencies could be manipulated to meet earnings targets.<sup>11</sup> Consistent with this argument, Dhaliwal, Gleason, and Mills (2004) report evidence that firms lower their effective tax rate in an effort to meet consensus analyst forecasts.

*c. Cash effective tax rate*

The final measure of tax aggressiveness that I test is the cash effective tax rate introduced by Dyreng et al. (2006). The cash effective tax rate is a measure of long-run tax avoidance calculated as the five year sum of cash taxes paid over the five year sum of pre-tax income.<sup>12</sup> As discussed in Dyreng et al. (2006), this measure of tax aggressiveness has several advantages over the traditional effective tax rate (ETR) measure. First, the cash ETR measure is not affected by changes in the firm's tax cushion. Regardless of whether a

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<sup>11</sup> See Dhaliwal, Gleason, and Mills (2004) for a complete discussion of the advantages associated with using the tax expense to meet earnings targets.

<sup>12</sup> Cash taxes paid represents the actual taxes paid by the firm during a given year, and as a result could include estimated tax payments associated with the prior year's income. However, because I utilize a five-year measure of Cash ETR I expect the effect of the timing of estimated tax payments will add only a limited amount of noise to my measure of the Cash ETR.

firm records the benefit associated with an aggressive tax position in its financial statements during the period it engages in that position, the reduced cash tax payments that result from that aggressive position will be reflected in a lower cash ETR for the firm. Second, the traditional ETR measure cannot detect tax planning associated with timing differences between book and tax reporting. However, if firms are aggressively accelerating expenses or deferring income for tax purposes, this will be reflected in a lower cash ETR to the extent those timing differences do not reverse within a five-year period. Finally, the cash ETR measure will be reduced by the tax benefit associated with employee stock options and therefore provides a better measure of the firm's true tax burden than the tradition ETR measure. This leads to my third hypothesis:

**H3:** Firms identified as participating in tax sheltering activity will report lower cash effective tax rates than non-tax shelter firms.

It is possible that the decision to engage in tax sheltering is an endogenous choice made by the firm based on the firm having higher cash effective tax rates prior to entering into the tax shelter. If this is the case, then it would not be surprising to find that the tax shelter firms do not have significantly lower cash effective tax rates than the control firms. This is possible since I calculate the long-run cash effective tax rate using the five-year sum of cash taxes paid ending in the period of active tax sheltering. This would limit the usefulness of the cash effective tax rate as a measure of tax aggressiveness.

*d. The association between aggressive tax and financial reporting*

Shackelford and Shevlin (2001) note that many managerial decisions involve “weighing the tax incentives to lower taxable income against the financial reporting incentives to increase book income.” However, in summarizing the literature examining these trade-offs they note that “neither consideration appears to consistently dominate the other in decision-making.” For example, Erickson et al. (2004) find 27 firms cited by the SEC for financial reporting fraud paid additional taxes in order to overstate their book income. In contrast, Guenther et al. (1997) examine a set of cash-basis firms that deferred income recognition around the Tax Reform Act of 1986 in order to reduce their tax burden.

Researchers have also documented costs associated with nonconforming book and tax income. Hanlon (2005) finds evidence consistent with large positive BTDs being associated with less persistent earnings. Mills (1998) finds that IRS adjustments are positively associated with large BTDs. These findings indicate that BTDs can be a signal of both tax aggressiveness and financial reporting aggressiveness. However, little research has been done on the connection between aggressive financial and tax reporting. Frank, Lynch, and Rego (2006) are among the first to address this connection hypothesizing that some firms have a tendency toward aggressive corporate behavior, which simultaneously affects their financial and tax reporting systems. They report results which suggest that firms choosing to report aggressively for book purposes also report aggressively for tax purposes. In their study, they use performance-matched discretionary accruals as their proxy for financial reporting aggressiveness and the unexplained portion of permanent BTDs as their proxy for tax reporting aggressiveness. Brown (2006) also examines the connection between aggressive tax and financial reporting by examining whether there is

an association between firms that adopted corporate-owned life insurance (COLI) policies and a measure of discretionary accruals. Her results are consistent with firms with higher discretionary accruals being more likely to adopt a COLI shelter. See Appendix A for a description of the COLI tax shelter.

My examination of the connection between aggressive financial reporting and aggressive tax reporting differs in several important ways from the analysis conducted in Frank et al. (2006). First, I examine this relationship in a context where it is clear firms have been aggressive in their tax reporting through their participation in tax shelters. This extreme set of aggressive tax reporting firms provides a powerful setting for investigating this connection because it allows me to avoid the difficulties associated with using financial statement information to calculate a measure of aggressive tax reporting. Second, Frank et al. (2006) use a measure of aggressive tax reporting based only on permanent BTDs. While some types of aggressive tax reporting do give rise to permanent BTDs, several of the prominent tax shelters from the late 1990s such as the LIFO and CLAS tax shelters give rise to temporary BTDs.<sup>13</sup> By using actual cases of tax sheltering I am able to examine incidence of aggressive tax reporting that cause both permanent and temporary differences. Finally, this study extends the work of Brown (2006) by examining a broader sample of firms engaged in a variety of tax shelters. Specifically, I examine a sample of tax shelter firms that employed 16 distinct types of tax shelter vehicles (including COLIs) which allows for a more generalizable analysis of the relationship between aggressive tax and financial reporting.

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<sup>13</sup> See Appendix A for a complete discussion of the accounting for all of the tax shelters examined in this study.



I use the absolute value of discretionary accruals (DAP) as my first proxy for aggressive financial reporting. I use the absolute value of DAP consistent with the assumption that accruals are a function of shifts in a firm's operating activities such as revenues and fixed assets and any deviation from such fundamentals are due to managerial manipulation (Rajgopal and Venkatachalam 2005). These deviations could take the form of large negative discretionary accruals consistent with firm's aggressively writing-off items during periods where they fall far short of earnings targets, or large positive discretionary accruals, consistent with firms aggressively managing earnings upward to meet earnings targets. If the decision to engage in corporate tax sheltering is a signal of an overall aggressive corporate environment, then I would expect the absolute value of discretionary accruals to be positively associated with incidences of tax sheltering. This leads to my fourth hypothesis

**H4:** Firms identified as participating in tax sheltering activity will report higher absolute discretionary accruals than non-tax shelter firms.

Previous research has identified a number of problems associated with the Jones model and other accruals based measures of earnings management (Dechow et al. 1995; Kothari et al. 2005; Hribar and Nichols 2007). To avoid some of these problems and to provide additional evidence on the association between aggressive financial reporting and aggressive tax reporting, I test whether tax shelter participation is associated with future earnings restatements. If firms engaged in tax sheltering are also more aggressive in their

financial reporting then I would expect them to be more likely to be subject to subsequent earnings restatements. This leads to my fifth hypothesis:

**H5:** The decision to engage in tax sheltering is positively associated with the probability of a firm undertaking a future earnings restatement.

*e. Tax Shelter CEO Characteristics.*

Bertrand and Schoar (2003) examine the characteristics of managers who make aggressive financing and operating decisions. They find evidence consistent with managers who are younger and managers who hold an MBA degree making more aggressive operating and financing decisions. In their analysis, they examine a series of operating and financing decisions such as the level of a firm's debt holdings, the firm's interest coverage ratio, and the extent of R&D spending. In related studies, Chevalier and Ellison (1999) show that mutual fund managers from schools with higher SAT scores are more aggressive in their investment behavior and Graham and Harvey (2001) report that CFOs who hold an MBA degree use more sophisticated valuation techniques than those without an MBA.

I extend this previous research by looking at whether these characteristics, age and education, are also associated with aggressive tax reporting decisions. In order to capture the effects of the age characteristic on CEO decision making and to increase the power of my tests I categorize CEOs into two groups; those over 55 and those who are 55 and under. I choose to separate CEOs into two groups at age 55 because my investigation of firm

proxy statements would suggest that a CEO under age 55 represents a fairly young CEO.<sup>14</sup>

This leads to my sixth hypothesis:

**H6a:** Firms with CEOs who received an MBA degree will be more likely to be engaged in corporate tax sheltering than firms with CEOs who do not have an MBA.

**H6b:** Firms with CEOs who are age 55 and under will be more likely to be engaged in tax sheltering than firms with older CEOs.

*f. Other characteristics associated with tax sheltering*

In addition to testing the hypotheses described above, I also control for several additional firm-specific characteristics that previous research has suggested could be associated with aggressive tax reporting. Dyreng et al. (2006) find that long-run tax avoidance is associated with industry affiliation and firm size.<sup>15</sup> Because tax sheltering represents an extreme case of aggressive tax avoidance, I investigate whether firm size and industry affiliation are associated with tax shelter participation. Graham and Tucker (2006) find that firms engaged in tax sheltering use less debt, on average, than does a set of size and industry matched control firms. This result is consistent with firms using tax shelter deductions as a substitute for the interest deduction associated with debt. For this reason, I include a firm's leverage ratio in modeling tax shelter participation. I expect the leverage ratio to be negatively associated with incidence of tax sheltering.

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<sup>14</sup> The average age of CEOs in my sample is 56. I find similar results if the cut-off age is set at 50 and under.

<sup>15</sup> Dyreng et al. (2006) use a firm's cash effective tax rate (cash taxes paid over financial accounting income), calculated over periods ranging from one to ten years, as their measure of long-run tax avoidance.

Hanlon, Mills, and Slemrod (2005) use IRS operational audit and appeals data to examine tax noncompliance and find that multinational firms have greater deficiencies relative to non-multinational firms. This result is consistent with multinational firms having more opportunities to develop tax shelter strategies associated with their foreign activities. For this reason, I test for the association between the existence of foreign income and incidence of tax sheltering. In addition, Hanlon et al. (2005) predict that firms with greater intangible assets will have more opportunities for aggressive tax planning. Consistent with this argument they find a positive association between a firm's intangible assets and the size of the firm's tax deficiency. As a result, I also test for an association between the existence of intangible assets and incidence of tax sheltering.

## **Chapter II: Tax Sheltering and Rent Extraction**

Desai and Dharmapala (2006b) argue that there could be a connection between the decision by managers to enjoy the benefits of control by extracting rents from the firm and the decision to engage in corporate tax sheltering. They note that a critical element of a tax shelter is to design a transaction so as to obscure the underlying purpose of the transaction. They further note that such tax avoidance could “simultaneously provide a shield for managers engaging in a variety of diversionary activities” (Desai and Dharmapala 2006b). As a result, in some cases tax shelter participation might not be consistent with the alignment of manager and shareholder incentives. Desai and Dharmapala (2006b) suggest the possibility that tax shelters help facilitate rent extraction on the part of managers provides a potential explanation for the undersheltering puzzle. In other words, why is the use of tax shelters not more widespread given the relatively low likelihood of detection and low costs of implementation in comparison to the potential tax savings?

Desai and Dharmapala (2006a) examine the decision by managers to engage in tax sheltering within the principal agent framework and note that the desire by managers to engage in actions not in the interest of shareholders and the desire to shield income from tax authorities could be complementary. They provide a detailed examination of one specific tax shelter employed by Dynegy Inc. that helped managers manipulate the firm’s reported operating cash flows and minimize taxes. In this particular case, management was specifically interested in the tax shelter because it would help facilitate manipulation of the firm’s financial reports.

Hanlon and Slemrod (2006) directly test investors’ perception of tax shelter participation by examining the stock market reaction to news of tax sheltering. They find

that the average company's stock price declines when there is news about its involvement in a tax shelter. Hanlon and Slemrod (2006) acknowledge that in general this finding is not surprising given that news about expected tax shelter related penalties will almost certainly be viewed as negative. However, they do find some interesting cross-sectional variation in their results and note that the stock price decline associated with news about sheltering is much smaller than for accounting related misdeeds such as being accused of violating Generally Accepted Accounting Principles (GAAP) by the Securities and Exchange Commission (SEC). Hanlon and Slemrod (2006) suggest an additional explanation for the negative reaction to tax sheltering news could be that shareholders believe that if management is willing to cheat the IRS, then management might also be willing to cheat them. Consistent with this argument, they find that the stock price decline is smaller for firms with strong corporate governance. For these firms, news about tax shelter participation is less likely to cause shareholders to be concerned about management opportunism. Further, they find that for well-governed firms with especially high effective tax rates, news about tax shelter involvement is received favorably by the market. They contend that for firms where ex ante public information made it less likely investors would perceive the firm as tax aggressive, news about the firm's involvement in a tax shelter is received positively. This is consistent with investors viewing aggressive tax reporting positively for well governed firms.

I extend this analysis by examining the operating and stock return performance of tax shelter firms during the period they were actively engaged in tax sheltering, as well as the 24 month period prior to the initial year of tax sheltering, and the 24 month period following the final year of sheltering. Evidence of value destruction in tax shelter firms

with poor corporate governance during the period of active tax shelter participation would be consistent with the argument that managers of poorly governed firms use tax shelters as a means of engaging in diversionary activities. In contrast, if corporate governance mediates the extent to which tax shelters are used in a diversionary manner, then I would expect tax shelter firms with strong governance characteristics to outperform those with poor governance.

In interpreting the results of the stock return performance tests, I make the assumption that investors are aware that the tax shelter firms are aggressive corporate taxpayers. This does not necessarily imply investors are aware of the particulars of a firm's tax sheltering arrangement, or that news of a firm's tax shelter involvement does not convey some new information about the extent of the firm's tax reporting aggressiveness or potential penalties associated with the sheltering. However, I do assume that investors are aware that the tax shelter firms are engaged in aggressive corporate tax reporting schemes and incorporate this information into their valuation of the firm. To the extent that investors are completely unaware that the tax shelter firms are aggressive taxpayers during the time of active tax sheltering, then I would not expect to observe abnormal returns for the tax shelter firms during the period of active sheltering. Because it is difficult to discern when investors become aware the firm is planning to engage in aggressive corporate tax reporting I examine the 24 month periods surrounding the tax sheltering activity as well as the period when the firm was actively engaged in sheltering. This leads to my final hypothesis:

**H7a:** Firms with poor corporate governance that are actively engaged in tax sheltering will exhibit negative abnormal returns during the period of active tax shelter participation.

**H7b:** Firms actively engaged in tax sheltering with strong corporate governance will report significantly higher abnormal returns than active tax shelter firms with poor corporate governance during the period of active tax shelter participation.

In an effort to avoid some of the difficulties associated with long-window stock return tests and the assumptions regarding when investors incorporate information about firm's tax reporting behavior, I supplement my analysis of the performance of tax shelter firms by also examining their earnings performance over the same period. To the extent managers of poorly-governed firms are using tax shelters as a vehicle to inflate reported earnings, as was done in the cases of Dynegy and Enron, I would anticipate a decline in earnings following the conclusion of sheltering activity by these firms.<sup>16</sup> Earnings that have been inflated due to managerial manipulation through the use of tax shelter vehicles should not be sustainable following the conclusion of the tax sheltering activity. Unless these firms are able to engage in alternative forms of earnings manipulation following the conclusion of the tax sheltering activity, I should observe a decline in earnings for these firms in comparison to both the well-governed tax shelter firms and the control firms. As a result, I expect the poorly-governed tax shelter firms to under-perform both the well-governed tax shelter firms and the control firms in the two-years following the conclusion of sheltering activity.

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<sup>16</sup> See Desai and Dharmapala (2006b) for a discussion of the use of tax shelters by Enron to increase pre-tax earnings for financial reporting purposes. Also see the U.S. Congress Joint Committee on Taxation (2003) report on the investigation of Enron for a discussion of the role of financial reporting incentives in Enron's tax strategies.



### Chapter III: Sample Selection

#### *a. Tax Shelter Firms*

The cases of tax sheltering examined in this study are based on a combination of two samples. The first is a set of tax shelter firms identified by Graham and Tucker (2006).<sup>17</sup> They conducted a search of Tax Court dockets and the popular press to identify a set of firms that they are certain were accused by the government of sheltering. Their search yielded 43 public corporations accused of tax sheltering between 1975 and 2000.

The second sample is composed of a set of firms identified as participating in tax sheltering through a search of press articles in the Factiva Database. The observations collected from the Factiva search were restricted to cases not already identified in the Graham and Tucker (2005) sample where the article makes reference to either an accusation or announcement that a firm engaged in tax sheltering. This search was conducted for the periods between January 1, 1990 and May 31, 2006 using the key words “tax shelter” and “corporat.\*” Consistent with Hanlon and Slemrod (2006), I recognize that there is no generally accepted definition of tax sheltering and that some of the firms in this sample may not have received a Notice of Deficiency from the IRS. The Factiva search yielded an additional 12 observations for a total of 55 tax sheltering observations in the combined sample. Many of the sheltering cases extend to multiple years resulting in a total of 202 firm-year observations during which firms were accused of sheltering.

As shown in Panel A of Table 1, there were 53 tax shelter observations with the necessary Compustat data available to calculate my estimate of book-tax differences.

Panel B of Table 1 indicates that the highest number of firm-year tax sheltering

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<sup>17</sup> I would like to thank John Graham and Alan Tucker for making information on their tax shelter sample available with their paper.

observations occurring during any five-year period is 64 between 1990 and 1994, and the second highest is 46 between 1995 and 1999. Panel C of Table 1 shows that the highest industry concentration of tax shelter observations is 15 in manufacturing, and the second highest concentration is 14 in construction.

The tax shelter cases examined in this study involve a variety of different types of tax shelters. There are fifteen cases involving transfer pricing, twelve COLI transactions, five contingent payment installment sales, five contested liability accelerations, three lease-in, lease-out (LILO) deals, two cross border dividend capture cases, two intellectual property havens, two 401(k) Accel shelters, and nine shelters categorized as other. A summary of each type of tax shelter and the potential financial reporting implications is presented in Appendix A.<sup>18</sup>

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<sup>18</sup> Graham and Tucker (2005) also provide an excellent summary of each type of shelter along with a summary of key judicial doctrines related to tax sheltering.

Table 1: Panel A  
Summary of sample selection criteria

Total sample of tax shelter firm observations from Graham and Tucker (2006)	43
Additional tax shelter firm observations obtained from Factiva database search	12
Less firm observations without the necessary data to calculate book-tax differences	<u>(2)</u>
Firms with an active tax shelter and complete data	<u><u>53</u></u>

Table 1: Panel B  
Fiscal Year Firms Engaged in Tax Sheltering

Fiscal Years	Number of Firm-years
1975-1979	21
1980-1984	32
1985-1989	23
1990-1994	64
1995-1999	46
2000-2002	16
<b>Total</b>	202

Table 1: Panel C  
Industry Distribution of Sample Firms

SIC Code	Industry Type	Number of Firms
1-999	Agriculture, Forestry, Fishing	0
1000-1999	Mining, Building	0
2000-2999	Construction	14
3000-3999	Manufacturing	15
4000-4999	Transportation, Communication, Electric, Gas	8
5000-5999	Wholesale, Retail	6
6000-6999	Financial Services	5
7000-7999	Hotels, Services	3
8000-8999	Services	1
9000-9999	International, Non-Operating	1
<b>Total</b>		53

*b. Control Sample*

The primary control sample is composed of a set of firms matched to the tax shelter sample based on size, industry, and year. Specifically, I select the control sample using the following three criteria: (1) fiscal year, (2) two-digit SIC code, and (3) nearest total assets (data 6) in the current year. I choose to match on size because size is a key condition for engaging in most of the tax shelters examined in this sample because of the scale and complexity of the shelters. Table 2 indicates that the control group consists of 53 matched-control firms. For the primary analysis of tax shelter firm characteristics, I collapse the years a firm was alleged to have been engaged in tax sheltering into a single “event year.” This is accomplished by averaging the corporate data for a given firm over all the years a shelter occurred. Graham and Tucker (2006) note this approach helps to address concerns about the lack of independence between multiple observations from the same firm. The control firms are matched to the tax shelter firms in the initial year of tax sheltering and, consistent with the shelter firms, the corporate data for each control firm is averaged over the same years its matched shelter firm was actively sheltering.

The results in Table 2 show that the control firms are significantly less profitable, hold more debt, have greater intangible assets, and have lower BTDs, than the sample of tax shelter firms. The tax shelter firms also have a significantly larger change in tax cushion than the control firms. There is however no significant difference between the tax shelter firms and control firms in terms of the level of foreign income, the cash effective tax rate, or the absolute value of discretionary accruals.

Panel B of Table 2 reports the Pearson and Spearman correlation coefficients for key test variables. Most interestingly, the results indicate a significant positive correlation

between the measure of change in tax cushion and book-tax differences. This result is consistent with expectations if large positive BTDs and large positive changes in tax cushion are both proxies for the same underlying construct of aggressive tax reporting. I do not find a significant correlation however, between the cash effective tax rate and either changes in tax cushion or BTDs.

Table 2  
Panel A: Summary Statistics

	Tax Shelter Sample						Matched Control Sample						Pr(Median Control: Median Test)
	N	Mean	Std D	Median	Min	Max	N	Mean	Std D	Median	Min	Max	
ASSETS (millions)	53	23,657	55,362	5,338	23	288,575	53	16,331	42,055	4,070	9	288,320	0.56
LEV	53	0.16	0.12	0.14	0.00	0.60	53	0.23	0.19	0.17	0.01	1.02	0.02
ROA	53	0.14	0.11	0.09	-0.11	0.55	53	0.09	0.09	0.08	-0.08	0.36	0.03
FOREIGN PRE-TAX INCOME (millions)	53	117	345	0	-41	2,170	53	80	290	0	-8	1,964	0.23
INTANGIBLES	53	2,604	8,616	37	0	46,594	53	554	2,059	0	0	14,091	0.06
BTD	53	0.03	0.06	0.02	-0.16	0.23	53	0.00	0.04	0.00	-0.16	0.09	0.00
CASH ETR	32	0.32	0.16	0.31	0.03	0.81	32	0.30	0.11	0.33	0.01	0.49	0.45
ΔCUSHION	24	-0.01	0.02	0.00	-0.09	0.01	24	0.00	0.01	0.00	-0.01	0.03	0.05
ABS(DAP)	46	0.05	0.05	0.03	0.03	0.00	46	0.04	0.04	0.04	0.00	0.28	0.25

Table 2 Panel A - Continued

\*Wilcoxon test (two-tailed). TOTAL ASSETS is total liabilities and stockholder's equity (data 6); LEV is total long term debt (data 9) divided by total assets; ROA is pre-tax earnings (data 170) in the event year divided by lagged total assets. FOREIGN PRE-TAX is (data 273); INTANGIBLES is (data 33) divided by lagged total assets. BTD is book income less taxable income divided by lagged total assets. CASH ETR is the five-year sum of taxes paid (data 317) divided by the corresponding five-year sum of pre-tax book income (data 170) minus special items (data 17).  $\Delta$ CUSHION is the current portion of the tax expense (data 16 – data 50) less cash paid for taxes (data 317) less the change in income taxes payable (data 71 + data 161) divided by lagged total assets. ABS(DAP) is the average absolute value of discretionary accruals from the performance-adjusted modified cross-sectional Jones Model. All variables are calculated as the average value of the variable reported by the firm during the active tax shelter years. All variables have been winsorized and the 1 and 99<sup>th</sup> percentile.

Table 2 (Continued)  
 Panel B: Pearson and Spearman Correlation Coefficients

	SIZE	LEV	ROA	FOREIGN INCOME	INTANGIBLES	BTD	CASH ETR	ΔCUSHION	ABS(DAP)
SIZE		0.14	-0.12	-0.01	<b>0.18</b>	<b>-0.19</b>	-0.01	<b>-0.23</b>	<b>-0.29</b>
LEV	0.16		<b>-0.31</b>	<b>-0.17</b>	<b>0.23</b>	-0.06	0.03	<b>-0.32</b>	<b>0.19</b>
ROA	-0.11	-0.34		<b>0.48</b>	0.00	<b>0.53</b>	-0.06	<b>0.56</b>	0.09
FOREIGN INCOME	0.01	-0.12	<b>0.20</b>		0.15	0.08	<b>-0.26</b>	0.13	0.05
INTANGIBLES	<b>0.20</b>	0.07	0.02	0.24		0.08	0.16	-0.12	-0.09
BTD	<b>-0.20</b>	-0.14	<b>0.57</b>	-0.08	0.06		-0.03	<b>0.19</b>	<b>0.23</b>
CASH ETR	-0.05	0.10	0.03	<b>-0.32</b>	-0.17	-0.09		0.12	-0.16
ΔCUSHION	-0.16	<b>-0.30</b>	<b>0.55</b>	<b>0.20</b>	-0.07	<b>0.25</b>	0.07		0.15
ABS(DAP)	<b>-0.36</b>	<b>-0.20</b>	<b>0.26</b>	0.15	0.02	<b>0.23</b>	-0.15	<b>0.30</b>	

In Panel B, upper (lower) diagonal reports Pearson (Spearman) correlations and all reported correlations that are significant at  $p < 0.05$ , two tailed, are bolded. SIZE is the log of total assets (data 6). All other variables are as defined above.



## Chapter IV: Research Design

### *a. Calculating book-tax differences*

In order to calculate an estimate of BTDs, I first calculate an estimate of taxable income based on financial statement information. Consistent with Heltzer (2006), I calculate book income as pre-tax book income (data 170) less minority interest (data 49). Taxable income is calculated by grossing up the sum of the current federal tax expense (data 63) and the current foreign tax expense (data 64) and subtracting the change in NOL Carryforward (data 52).<sup>19</sup> If the current federal tax expense is missing, total current tax expense is calculated by subtracting deferred taxes (data 50), state income taxes (data 173) and other income taxes (data 211) from total income taxes (data 16). The BTD is then calculated as the difference between book and tax income. This measure of BTDs is designed to reflect both permanent and temporary differences.<sup>20</sup>

Hanlon (2003) and Hanlon et al. (2005) identify a number of problems associated with estimating taxable income from the financial statements. First, the current tax expense under GAAP is not reduced by the tax benefit the firm receives from employee stock options.<sup>21</sup> As a result, for firms with tax benefits related to stock options my estimation of the firm's taxable income would be overstated by the amount of the tax deduction associated with stock options. Second, firms often book contingencies for tax positions that may be reversed upon examination. These contingencies often referred to as tax cushion, increase the tax expense reported on a firm's

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<sup>19</sup> Taxable income is grossed up by the top U.S. statutory tax rate (STR) equal to 48% for tax years 1975 through 1978, 46% for tax years 1979 through 1986, 40% for 1987, 34% for tax years 1988 through 1993, and 35% thereafter.

<sup>20</sup> Hanlon (2005) excludes the effect of permanent differences when examining book-tax differences because of the difficulty associated with measuring permanent items. For purposes of this study, however, I include the effect of permanent differences because I am investigating the association between book-tax differences and tax shelters, some of which give rise to permanent book-tax differences (McGill and Outslay 2004).

<sup>21</sup> See Hanlon and Shevlin (2002) for a detailed discussion of the accounting for the tax benefit associated with employee stock options.

financial statements relative to the actual expense reported on the firm's return. Similar to the benefit from stock options, failure to account for these contingencies would lead to an overstatement in my estimation of taxable income. Third, tax expense is reported after credits, such as the R&D and foreign tax credits. Because I gross up the entire current tax expense I will be understating taxable income for firms with tax credits. Fourth, it is difficult to identify the appropriate rate to use for grossing up the foreign current tax expense. To the extent foreign rates differ from the U.S. rate, this will add measurement error to my BTD measure. Finally, for firms with negative taxable income, the current tax expense is truncated at zero or is reported as a negative in the case of a refund. I attempt to address this issue by subtracting the change in the NOL carryforward.

Each of the above items could introduce measurement error into my estimate of taxable income. Plesko (2000 and 2003) examines how well financial statement numbers correlate with actual tax return numbers. As a part of his analyses, he reports a regression coefficient of 0.986 when actual tax liability before tax credits is regressed on the reported current federal tax expense.<sup>22</sup> This provides some support for using financial statement information to calculate a firm's taxable income.

*b. Modeling tax shelter participation*

I test hypotheses (1) through (4) and (6) by estimating variations of the following logistic regression:

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<sup>22</sup> I should note that Plesko (2000) conducts this analysis on a set of carefully selected U.S. based firms with 1992 financial statement data that was then matched to 1992 tax return data potentially biasing upward the correlation.

$$SHELTER_{it} = \beta_0 + \beta_1 BTD_{it} + \beta_2 CASH ETR_{it} + \beta_3 \Delta CUSHION_{it} + \beta_4 ABS(DAP)_{it} + \beta_5 AGE_{it} + \beta_6 MBA_{it} + \beta_7 LEV_{it} + \beta_8 SIZE_{it} + \beta_9 ROA_{it} + \beta_{10} FOREIGN INCOME_{it} + \beta_{11} INTANGIBLES_{it} + \varepsilon_{it}$$

(1)

where:

*SHELTER<sub>it</sub>* = an indicator variable set equal to one for firm-year observations identified as participating in a tax shelter, and set to zero for all other firm-year observations,

*BTD<sub>it</sub>* = is calculated as the difference between book income and taxable income, scaled by total assets,

*CASH ETR<sub>it</sub>* = is the five-year sum of taxes paid (data 317) divided by the corresponding five-year sum of pre-tax book income (data 170) minus special items (data 17),

*ΔCUSHION<sub>it</sub>* = is the current portion of the tax expense (data 16 – data 50) less cash paid for taxes (data 317) less the change in income taxes payable (data 71 + data 161) divided by lagged total assets,

*ABS(DAP)<sub>it</sub>* = is the average absolute value of discretionary accruals from the modified performance adjusted cross-sectional Jones Model developed by Kothari et al. (2005), calculated over the five-year period ending in year t,

*AGE<sub>it</sub>* = is an indicator variable set equal to one if the firm's CEO is under the age of 55, and set to zero for all other observations,

*MBA<sub>it</sub>* = is an indicator variable set equal to one if the firm's CEO received an MBA degree, and set to zero for all other observations,

*LEV<sub>it</sub>* = long-term debt (data 9) divided by total assets,

*SIZE<sub>it</sub>* = the log of total assets (data 6),

*ROA<sub>it</sub>* = pre-tax earnings (data 170) divided by total assets,

*FOREIGN INCOME<sub>it</sub>* = an indicator variable set equal to one for firm observations reporting foreign income, and set to zero for all other observations.

*INTANGIBLES<sub>it</sub>* = is an indicator variable set equal to one for firm observations reporting intangible assets, and set to zero for all other observations.

The above model of tax shelter participation is a non-standard model because it does not attempt to predict which firms will enter into tax shelters in the future. Rather, all of the variables are measured during the period of actual tax shelter participation because the purpose of the model is to identify characteristics that can be used to identify firms that are actively engaged in tax sheltering. The first three variables examined are proxies for aggressive tax reporting that could be useful signals of tax sheltering. I run separate regressions testing the association between incidence of tax sheltering and each of these tax aggressiveness proxies. If large positive BTDs are a signal of aggressive tax reporting, then I expect a positive and significant relation between BTDs and

incidence of tax sheltering.<sup>23</sup> Similarly, if the cash effective tax rate is a useful measure of tax aggressiveness, then I expect a significant negative association between incidence of tax sheltering and  $CASH\ ETR_{it}$ . This result would be consistent with tax shelter firms, *ceteris paribus*, having a lower tax burden relative to the matched control firms.

If managers book contingent tax liabilities associated with their firm's tax shelter participation, then I expect a positive and significant association between changes in the tax cushion and incidence of tax sheltering. Blouin and Tuna (2006) calculate several measures of the change in tax cushion. I use the measure consistent with the  $\Delta\textit{Cushion}$  measure from their paper, however rather than using an estimate of the tax benefit associated with stock options based on ExecuComp data, I hand collect the actual tax benefit from stock options reported in the firm's financial statements. I limit this analysis to tax shelter firms involved in tax shelter vehicles that give rise to permanent book-tax differences. Managers are likely to only record tax cushion to offset potential contingencies associated with permanent book-tax differences which, if not reserved for, could lead to an increased tax expense in future periods if the position is not sustained. In contrast, tax shelter vehicles which lead to temporary book-tax differences are unlikely to lead to an increased tax expense in future periods with the exception of possible penalties and interest associated with the shelter.<sup>24</sup>

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<sup>23</sup> An alternative explanation for a positive association between BTDs and taxes payable and actual incidence of tax sheltering is that I am simply modeling the process used by the IRS to detect tax sheltering. Mills (1998) documents a positive association between IRS proposed audit adjustments and the level of a firm's book-tax differences. She also notes that the IRS includes firms in their coordinated examination program on the basis of a point system that measures the size and complexity of their tax return and that firms in this program are usually audited every year by the IRS. Given that my sample of tax shelter firms and matched firms from Control Group (1) are large firms, it is reasonable to assume many of these firms are likely subject to annual audits by the IRS. As a result, the IRS likely uses much more detailed information to audit these firms than aggregate measures such as BTDs and taxes payable that can be calculated from a firm's financial statement disclosures. Nonetheless, it is difficult to completely rule out this alternative explanation.

<sup>24</sup> The tax cushion analysis was replicated using the complete sample of tax shelter and control firms and the results were unchanged.

To examine the association between aggressive tax and financial reporting, I first calculate my proxy for aggressive financial reporting as the absolute value of discretionary accruals.

Discretionary accruals are calculated using a cross-sectional modified Jones Model with lagged return-on-assets (Kothari et al. 2005).<sup>25</sup> To test the association between aggressive financial and tax reporting I add the absolute value of discretionary accruals,  $ABS(DAP)$ , to regression (1) above. If aggressive tax reporting is associated with aggressive financial reporting, then I expect the coefficient on  $ABS(DAP)$  to be positive and significant. Hribar and Nichols (2007) provide evidence of a significant correlation between unsigned measures of discretionary accruals and the standard deviations of operating cash flows, cash sales, and earnings. Their research is consistent with operating volatility being an important determinant of unsigned discretionary accruals. In an effort to control for operating volatility as possible correlated omitted variable, I follow the suggestion of Hribar and Nichols (2007), and include the standard deviations of cash flows, sales, and earnings in my regression examining the association between tax sheltering and discretionary accruals.

In order to examine the characteristics of CEOs who engage their firms in corporate tax sheltering I restrict my analysis to tax shelter firm and matched control firm observations occurring after 1990, and only to the first year the firm engaged in tax sheltering. I limit my analysis to the first year of tax sheltering because the CEO characteristics examined are likely to be relatively stationary and as a result multiple observations from one firm would not be independent. In order to determine whether the CEO had received an MBA degree and the age of the CEO I consulted the *Dun and Bradstreet reference book of corporate management*. The reference book data is

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<sup>25</sup> For details on the calculation of discretionary accruals see Appendix C.

limited to periods after 1990. Consistent with hypothesis (6), I expect the coefficients on both the AGE and MBA variables to be positive and significant.

*c. Aggressive tax reporting and future earnings restatements*

I test hypothesis (5) by estimating the following logistic regression:

$$RESTATE_{i,t+n} = \alpha_0 + \alpha_1 SHELTER_{it} + \alpha_2 MB_{it} + \alpha_3 LEVERAGE_{it} + \alpha_4 \ln MKTCAP_{it} + \varepsilon_{it} \quad (2)$$

where:

$RESTATE_{i,t+n}$  = is an indicator variable set to 1 if the firm announced a restatement in the event year or in the n subsequent years after the event year.

$SHELTER_{it}$  = an indicator variable set equal to one for firm-year observations identified as participating in a tax shelter, and set to zero for all other firm-year observations,

$\ln MKTCAP_{it}$  = the natural log of the firm's market capitalization, as of the end of the year of the event year, where market capitalization is defined as stock price times the number of shares outstanding (data 199  $\times$  data 25).

$MB_{it}$  = the market-to-book ratio of the firm at the end of the event year, (data 199  $\times$  data 25) / (data 60).

$LEVERAGE_{it}$  = long-term debt (data 9) divided by total assets in the event year.

In order to test the association between future restatements and tax sheltering I rely on a list of earnings restatement compiled by the General Accounting Office (GAO) consisting of 919 restatement announcements for 845 firms between January 1, 1997 and June 30, 2002. According to the GAO (2002) report these restatements were due to accounting irregularities resulting in a material misstatement of financial statements. This list of restatements excludes routine restatements due to items such as changes in business segment definitions or changes made for presentation purposes.

If engaging in tax sheltering is associated with future earnings restatements then I would expect the coefficient on  $SHELTER_{it}$  to be positive and significant. Following Bowen, Call, and Rajgopal (2006) I include controls for the firm's operating characteristics including size  $\ln MKTCAP_{it}$ ,

market-to-book ratio  $MB_{it}$ , leverage  $LEVERAGE_{it}$ . The purpose of this test is to examine whether tax sheltering is a signal of the type of corporate aggressiveness that could lead to a future earnings restatement. I restrict my analysis to five years following the event year (tax sheltering year) to avoid the potential for a fundamental shift in a firm's operating environment between the time the firm engaged in the tax shelter and the announcement of the earnings restatement. The control firms for this analysis include all firms with the same fiscal year and two-digit SIC code as the tax shelter firms.

*d. Stock return performance of tax shelter firms*

I examine the stock return performance of the tax shelter firms for three separate periods. The 24 months prior to the initial year of tax shelter participation, the months during which the firm was actively engaged in sheltering, and the 24 months following the final year of tax shelter participation. I test for abnormal returns using a four factor Fama-French (1993) model. I use the Gompers et al. (2003) index of shareholder rights as a measure of corporate governance characteristics. This measure is constructed based on 24 different provisions which can be classified into five categories – tactics for delaying hostile bidders, voting rights, director and officer protection, other takeover defenses, and state laws. Each of these categories represents potential determinants of a firm's takeover vulnerability. The Gompers et al. (2003) index ranges from 0-24, where low scores indicate a lower degree of insulation for managers from hostile takeovers and therefore a lower quality of corporate governance. I expect that more insulated managers from poorly governed firms will be better able to use tax shelters in an opportunistic

manner.<sup>26</sup> Gompers et al. (2003) construct values of G for a large sample of firms for various years beginning in 1990. As a result, I limit my analysis to tax shelter and control firm observations with fiscal years beginning in 1990. I include a matched set of control firms in these regressions in order to help alleviate the concern that differences in performance between the well governed and poorly governed tax shelter firms are simply the result of differences in governance quality. Control firms are matched to the tax shelter firms on the basis of fiscal year and two-digit SIC code. Within the same industry, the matched firms are those with assets (return on assets) within +/- 25 percent (+/- 50 percent) of the tax shelter firm's assets (return on assets).<sup>27</sup>

The indicator variable *POOR GOVERNANCE – CONTROL* is set equal to one for control firms with a corporate governance score above the sample median and set to zero for all other observations. The indicator variable *GOOD GOVERNANCE – CONTROL* is set equal to one for control firms with corporate governance scores equal to or below the sample median and to zero for all other observations. I do not expect either the well governed or the poorly governed control firms to exhibit any significant abnormal returns. In other words, I do not expect governance quality alone to drive abnormal returns, but rather the combination of poor governance and active tax shelter participation.

The indicator variable *POOR GOVERNANCE - SHELTER* is set to one for tax shelter firms with governance scores above the median score in my sample, and all other observations are set to zero. The regressions are conducted using monthly stock return data for the tax shelter firms. The

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<sup>26</sup> Gompers et al (2003) provide results consistent with their G variable being correlated with factors such as firm size, institutional ownership, and past sales growth. Differing effects for well-governed and poorly-governed control firms could be a result of these factors and not their governance characteristics. However, to the extent I observe no difference in the performance of the well-governed versus poorly-governed control firms this helps to mitigate this concern.

<sup>27</sup> In untabulated regressions I find the results are generally unchanged when a single size and industry matched set of control firms is used rather than the broader set of control firms described above.



monthly data for each of the Fama-French factors was drawn from Ken French's website. It is important to note that not all of the tax shelter firms have complete monthly stock return data for the periods examined. The abnormal return for the tax shelter firms with strong governance is reflected in the intercept of the Fama-French regressions. Including the dummy variables in the Fama-French regressions allows me to interpret the coefficient on those variables as the abnormal monthly return attributable to those sets of firms incremental to the abnormal return for the well governed tax shelter firms. If the tax shelter firms with poor governance are experiencing rent extraction by management then I would expect the coefficient on the *POOR GOVERNANCE - SHELTER* indicator variable to be negative and significant. This would indicate that the returns for the poor governance firms are significantly lower than those for the strong governance tax shelter firms. In addition, I would also expect the combined coefficient on the intercept plus the *POOR GOVERNANCE - SHELTER* variable to also be negative and significant indicating that the poor governance firms were experiencing significant negative abnormal returns in the period surrounding their tax shelter participation. I also interact the factor loadings with each of the indicator variables to allow the risk loadings to vary by group membership. The coefficients for these interaction variables are not tabulated.

## Chapter V: Results

### *a. Tests examining the characteristics of tax shelter firms*

Table 3 reports the results of logistic regressions examining the determinants and characteristics of incidence of tax sheltering using the matched pair control group. Table 3 presents both the estimated coefficients from the logistic regressions and the marginal changes ( $\Delta\text{Prob}$ ) in the probability of using a tax shelter vehicle, implied by the estimated logit coefficients, which result from a unit change in the explanatory variables. The results of the full-sample analysis in Table 3 indicate that a one percent increase in BTDs leads to a statistically significant 2.78% increase in the probability the firm engages in tax sheltering. The results also indicate that, consistent with the findings of Graham and Tucker (2005), tax sheltering is negatively associated with the level of a firm's debt holdings. Further, the results show that consistent with expectations, incidences of tax sheltering are positively associated with the existence of foreign income. However, I do not find a significant association between incidences of tax sheltering and ROA, or the magnitude of a firm's intangible assets. Not surprisingly, the coefficient on the SIZE variable is also not significant, which is consistent with the control firms being effectively matched to the tax shelter firms on the basis of size. Goodness-of-fit statistics are consistent with a good fit for this empirical model of tax sheltering with correct prediction rates for the full sample model of 63.50%.

Column (2) of Table 3 replaces the BTD variable with an alternative proxy for tax aggressiveness, the CASH ETR. The results indicate the coefficient on the CASH ETR variable is not significantly associated with incidence of tax sheltering. This result is not consistent with CASH ETR being a useful proxy for tax aggressiveness. However, the data requirements necessary to calculate CASH ETR reduce the sample size to 32 tax shelter and 32 matched control firms. The reduced power of this test resulting from the small sample is a possible explanation for the

insignificant results associated with CASH ETR. Column (3) of Table 3 replaces the CASH ETR proxy for tax aggressiveness with  $\Delta$ CUSHION. The coefficient on the  $\Delta$ CUSHION variable is not significant. The sample for this set of tests was further reduced to include only 24 tax shelter observations which result in permanent book-tax differences and are therefore more likely to result in managers recording tax cushion.

Column (4) of Table 3 adds a measure of earnings management, ABS(DAP), as an additional explanatory variable. The results indicate that a one percent increase in discretionary accruals leads to a statistically significant 2.93% increase in the probability the firm engages in tax sheltering. This result suggests that aggressive accrual-based earnings management is positively associated with tax aggressiveness. This result is consistent with the argument that tax sheltering is one signal of an aggressive corporate environment. The coefficient on the BTD variable remains positive and significant with the addition of the ABS(DAP) variable to the regression in Column (4). This result suggests the association between tax sheltering and BTDs is not driven by their common association with accrual based earnings management. Rather, this finding suggests BTDs contain information about aggressive tax reporting. Column (5) adds indicator variables for both the age of the CEO and whether or not the CEO possesses an MBA degree. Consistent with expectations, firms with CEOs under the age of 55 and CEOs with an MBA degree are significantly more likely to engage their firm in tax sheltering.

Table 4 presents the results of a robustness check on the results reported in Table 3 using an expanded sample of control firms. Rather than limiting the control sample to one matched firm per tax shelter firm, I match firms on the basis of two-digit SIC code, year, and assets (return on assets) within +/- 25 percent (+/- 50 percent) of the sheltering firm's assets (return on assets). This procedure results in numerous matched control firms for each tax shelter firm observation. Not

surprisingly, the most dramatic difference between Tables 3 and 4 relates to the SIZE variable.

Because the control firms in Table 4 are not matched as closely to the shelter firms on the basis of size, the SIZE variable is positive and significant in each estimated regression in Table 4. This is consistent with the tax shelter firms being very large firms relative to the other firms in their industries. The results for the other variables are generally consistent with those reported in Table 3 with a few notable exceptions. Discretionary accruals remain significantly positively associated with tax sheltering in Table 4, however unlike the results in Table 3, each of the measures of firm operating volatility are also significantly associated with incidence of tax sheltering. I cannot think of an explanation for the association between tax sheltering and firm operating volatility.

*b. Tests of the association between tax sheltering and future earnings restatements.*

The evidence in Table 5 shows that the probability of an earnings restatement is higher over the next year and over the next three years if a firm is currently engaged in tax sheltering. However, there is not a significant association between tax sheltering and the probability of receiving an earnings restatement over the next five years. In general, these results suggest a positive association between future earnings restatements and tax sheltering that is consistent with tax sheltering being associated with aggressive financial reporting. In summary these tests provide additional support for the findings in Tables 3 and 4 that tax sheltering is associated with aggressive financial reporting.

*c. Stock return performance of tax shelter firms*

Table 6 reports the stock return performance of the tax shelter firms and a set of matched control firms during the period when the firms were actively engaged in tax sheltering as well as

the 24 month period prior to the first year of tax sheltering and the 24 month period after the final year of tax sheltering. The intercept term representing the abnormal stock return of the well governed tax shelter firms is positive and significant in each of the three periods examined. This result is consistent with tax sheltering creating wealth in firms with strong corporate governance. In contrast, the *POOR GOVERNANCE - SHELTER* variable is negative and significant during the period of active tax shelter participation and the 24 months following the period of active sheltering. This result indicates that the tax shelter firms with poor governance provided significantly lower abnormal returns than the strong governance tax shelter firms. The coefficients on both the *POOR GOVERNANCE – CONTROL* and *GOOD GOVERNANCE – CONTROL* variables are also negative and significant during the period of active tax shelter participation and the 24 months following the period of active sheltering indicating that each of the sets of control firms significantly underperformed the well governed tax shelter firms. This is consistent with my conjecture that corporate governance alone does not cause abnormal returns, but rather the combination of tax sheltering and corporate governance.

Note that only the well governed tax shelter firms exhibit significant abnormal returns during any of the periods examined. The combined coefficient for the intercept term and each of the respective indicator variables is not significantly different than zero for any of the variables during any of the periods examined. While the tax shelter firms with poor governance underperformed the tax shelter firms with strong governance, they did not exhibit negative abnormal returns. In general, the results are consistent with the assertion that tax sheltering is a wealth creating activity for shareholders, but that this benefit is mitigated for firms with poor corporate governance.<sup>28</sup> There

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<sup>28</sup> While these results are consistent with tax sheltering being associated with wealth creation in well governed firms, it is impossible to determine whether the actual act of tax sheltering is the cause of those

was not a significant difference in performance between the well-governed and poorly-governed control firms in any of the periods examined.

*e. Operating performance of tax shelter firms*

Table 7 provides an analysis of the after-tax earnings of the tax shelter firms and the matched set of control firms as well as sub-samples of the well-governed and poorly-governed tax shelter firms during the period of active tax sheltering, the two years prior to engaging in sheltering, and the two years following the conclusion of sheltering. Table 7 reports tests of the differences in the mean and median after-tax earnings between each of the four samples of firms. My discussion below focuses on the difference in means between the groups. The results in Table 7 indicate that the mean after-tax earnings of the tax shelter firms are significantly greater during each of the periods examined than those of the matched control firms. This result is consistent with the univariate test of the difference in before-tax return on assets presented in Table 2.

The results in Table 7 also indicate that the sub-sample of well-governed tax shelter firms significantly outperform the sub-sample of poorly-governed tax shelter firms in the two years leading up to tax sheltering activity, the years of active tax sheltering, and the year following the sheltering activity. Further, the results in Table 7 also show that the well-governed tax shelter firms report significantly higher after-tax earnings than the matched control firms in each of the periods examined. In contrast, the poorly-governed tax shelter firms only outperform the matched control firms in the two years leading up to the sheltering activity, but there is not a significant difference in after-tax earnings once the firms engage in sheltering or in the two years following the sheltering activity.

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positive abnormal returns. It is entirely possible that tax sheltering is simply associated with other actions by management that produce positive abnormal returns.

Consistent with the stock return performance tests, the well-governed tax shelter firms report the strongest operating results of any of the samples examined. Also consistent with the stock return tests, the poorly-governed tax shelter firms significantly under-perform the well-governed tax shelter firms, but not the matched control firms. These results are consistent with the conjecture that tax sheltering is a wealth creating activity for shareholders, but that the benefits are mitigated by poor corporate governance.

Table 3  
 Regression examining determinants and characteristics of tax shelter firms - matched control sample

	Pred. Sign	Full Sample			Cash_ETR Sample			ΔCushion Sample			ABS(DAP) Sample			CEO - Sample		
		Coeff	ΔProb	t-stat	Coeff	ΔProb	t-stat	Coeff	ΔProb	t-stat	Coeff	ΔProb	t-stat	Coeff	ΔProb	t-stat
INTERCEPT	?	-1.49	-0.37	-1.20	-0.32	-0.08	-0.17	0.31	0.08	0.13	-3.02	-0.75	-1.65*	-1.31	-0.33	-0.57
BTD	+	11.13	2.78	2.07**							9.83	2.46	1.83**	10.78	2.69	1.02
CASH ETR	-				-0.58	-0.14	-0.74									
ΔCUSHION	+							8.14	2.04	0.20						
ABS(DAP)	+										11.73	2.93	1.48*			
LEV	-	-2.55	-0.64	-1.66**	-0.97	-0.24	-0.46	-3.02	-0.76	-1.33*	-1.22	-0.31	-0.70	-2.36	-0.59	-1.38*
SIZE	?	0.35	0.09	1.25	-0.06	-0.02	-0.13	-0.31	-0.08	-0.52	0.60	0.15	1.36*	0.13	0.03	0.24
ROA	+	1.90	0.47	0.71	1.95	0.49	0.60	6.47	1.62	1.27*	0.93	0.23	0.33	-1.36	-0.34	-0.27
FOREIGN INCOME	+	0.62	0.16	1.38*	0.32	0.08	0.56	1.14	0.28	1.46*	0.38	0.09	0.78	0.44	0.11	0.73
INTANGIBLES	+	0.30	0.08	0.69	1.29	0.32	2.12**	0.56	0.14	0.71	0.37	0.09	0.74	0.66	0.16	1.00
σ <sub>REV</sub>	?										0.00	0.00	0.79			
σ <sub>EARN</sub>	?										0.00	0.00	0.62			
σ <sub>CFO</sub>	?										0.01	0.00	0.01			
AGE	+													1.52	0.38	2.23**
MBA	+													1.36	0.34	1.89**
N - Shelter Firms			53			32			24			46			33	
N - Control Firms			53			32			24			46			33	
<b>Goodness of Fit Statistics</b>																
Pseudo R-squared			0.16			0.14			0.22			0.15			0.19	
Chi-Square Test			17.95			9.42			10.93			14.15			13.78	
% Correct			63.50			63.50			57.80			58.90			51.50	



Table 3 – (Continued)

Logit regression estimates of the relation between the likelihood that a firm engages in tax sheltering and proxies for firm characteristics hypothesized to be associated with tax sheltering. The dependent variable, SHELTER, is an indicator variable set equal to one for firm-year observations where the firm is identified as having an active tax shelter, and set to zero for all other firm-year observations. FOREIGN INCOME is an indicator variable set equal to one for firm observations reporting foreign income, and set to zero for all other observations. INTANGIBLES is an indicator variable set equal to one for firm observations reporting intangibles, and set to zero for all other observations. SIZE is the log of total assets.  $\sigma_{SALES}$ ,  $\sigma_{EARN}$ ,  $\sigma_{CFO}$  are the standard deviation of sales, net income, and CFO deflated by total assets over the prior five years. AGE is an indicator variable set equal to one if the firm's CEO is under the age of 55, and set to zero for all other observations. MBA is an indicator variable set equal to one if the firm's CEO received an MBA degree, and set to zero for all other observations. All other variables are calculated as reported in Table 2.  $\Delta Prob.$  Measures the marginal change in the probability of using a tax shelter resulting from a change in the independent variable. The t-statistics are for the logit coefficients with \*, \*\*, \*\*\* indicating statistical significance at the 0.10, 0.05, and 0.01 levels (one-tailed tests).

**Table 4**  
**Regression examining determinants and characteristics of tax shelter firms - Expanded Control Sample**

	Pred. Sign	Full Sample			Cash_ETR Sample			ΔCushion Sample			ABS(DAP) Sample		
		Coeff	ΔProb	t-stat	Coeff	ΔProb	t-stat	Coeff	ΔProb	t-stat	Coeff	ΔProb	t-stat
INTERCEPT	?	-4.35	-0.61	-3.81***	-4.56	-0.74	-2.34**	-4.00	-0.63	-2.21**	-4.95	-0.76	-2.91***
BTD	+	5.43	0.77	1.44*							4.73	0.72	1.20
CASH ETR	-				0.54	0.09	0.67						
ΔCUSHION	+							6.22	0.99	0.30			
ABS(DAP)	+										5.38	0.82	1.33*
LEV	-	-2.27	-0.32	-1.69**	-2.92	-0.47	-1.35*	-3.21	-0.51	-1.45*	-2.75	-0.42	-1.52*
SIZE	?	0.63	0.09	2.49***	0.79	0.13	1.65**	0.74	0.12	1.59*	0.79	0.12	1.83**
ROA	+	3.33	0.47	1.56*	-0.52	-0.08	-0.17	-2.20	-0.35	-0.63	3.37	0.52	1.21
FOREIGN INCOME	+	1.50	0.21	3.97***	1.76	0.29	2.88***	1.57	0.25	2.68***	1.60	0.25	3.34***
INTANGIBLES	+	0.13	0.02	0.37	0.73	0.12	1.34*	0.67	0.11	1.26	0.00	0.00	0.00
σ <sub>REV</sub>	?										0.00	0.00	3.05***
σ <sub>EARN</sub>	?										0.00	0.00	2.60***
σ <sub>CFO</sub>	?										-0.01	0.00	2.12**
N - Shelter Firms			53			32			32			46	
N - Control Firms			259			125			130			198	
<b>Goodness of Fit Statistics</b>													
Pseudo R-squared			0.13			0.23			0.20			0.22	
Chi-Square Test			42.83			41.01			36.02			58.02	
% Correct			81.70			78.30			77.20			78.20	

Table 4 – (Continued)

Logit regression estimates of the relation between the likelihood that a firm engages in tax sheltering and proxies for firm characteristics hypothesized to be associated with tax sheltering. The dependent variable, SHELTER, is an indicator variable set equal to one for firm-year observations where the firm is identified as having an active tax shelter, and set to zero for all other firm-year observations. FOREIGN INCOME is an indicator variable set equal to one for firm observations reporting foreign income, and set to zero for all other observations. INTANGIBLES is an indicator variable set equal to one for firm observations reporting intangibles, and set to zero for all other observations. SIZE is the log of total assets.  $\sigma_{SALES}$ ,  $\sigma_{EARN}$ ,  $\sigma_{CFO}$  are the standard deviation of sales, net income, and CFO deflated by total assets over the prior five years. AGE is an indicator variable set equal to one if the firm's CEO is under the age of 55, and set to zero for all other observations. MBA is an indicator variable set equal to one if the firm's CEO received an MBA degree, and set to zero for all other observations. All other variables are calculated as reported in Table 2.  $\Delta Prob.$  Measures the marginal change in the probability of using a tax shelter resulting from a change in the independent variable. The t-statistics are for the logit coefficients with \*, \*\*, \*\*\* indicating statistical significance at the 0.10, 0.05, and 0.01 levels (one-tailed tests).

Table 5  
Relationship between restatements and tax sheltering

	Pred. Sign	Year + 1	Year + 3	Year + 5
INTERCEPT	?	-0.050 (-15.87)***	-0.080 (-16.12)***	-0.062 (-15.41)***
SHELTER	+	-0.130 (-0.01)	0.013 (1.25)*	0.022 (2.90)**
MB	+	0.000 (0.74)	0.000 (0.12)	0.000 (0.21)
LEVERAGE	+	0.001 (0.10)	0.006 (0.59)	0.015 (1.90)*
lnMKTCAP	+	0.001 (2.80)***	0.002 (2.30)**	0.000 (0.04)
Likelihood Ratio Statistic		9.24	8.52	9.43
Total Sample Size		5,429	4,425	4,154

Logistic regression estimates of the likelihood that a firm restates earnings in the current or future periods and proxies for firm characteristics hypothesized to be associated with restatements. The dependent variable, RESTATE, is an indicator variable set equal to 1 if the firm announced a restatement in the event year (e.g. tax sheltering year) or in the n subsequent years after the event year, 0 otherwise. SHELTER is an indicator variable set to 1 if the firm engaged in tax sheltering, 0 otherwise. lnMKTCAP is the natural log of the firm's market capitalization, as of the end of the year of the event year, where market capitalization is defined as stock price times the number of shares outstanding (Compustat # 199\* Compustat #25). MB is the market-to-book ratio of the firm at the end of the event year (Compustat # 199\* Compustat #25) / (Compustat #60). LEVERAGE is long-term debt (Compustat data item #9) divided by total assets. SIZE is the log of total assets (Compustat #6). This table provides the estimated marginal effects from the logit model of the relation between the likelihood of restatement and the explanatory variables. Values in parenthesis represent t-statistics with \*, \*\*, \*\*\* indicating statistical significance at the 0.10, 0.05, and 0.01 levels (one-tailed tests).

Table 6  
 Fama French (1993) abnormal return regressions for the periods both before, during, and after tax shelter participation

	24 MONTHS PRIOR TO FIRST SHELTER YEAR	ACTIVE SHELTER YEARS	24 MONTHS AFTER FINAL SHELTER YEAR
INTERCEPT	1.381 (5.95) ***	1.429 (4.47) ***	1.176 (4.71) ***
POOR GOVERNANCE - SHELTER	-1.010 (-2.60) ***	-1.066 (-1.98) **	-0.908 (-2.22) ***
POOR GOVERNANCE - CONTROL	-0.523 (-2.01) **	-1.173 (-3.25) ***	-0.977 (-3.47) **
GOOD GOVERNANCE - CONTROL	-0.320 (-1.20)	-0.873 (-2.38) ***	-1.055 (-3.69)
MKTRF	0.920 (14.80) ***	1.004 (12.63) ***	0.848 (12.97) ***
SMB	-0.200 (-2.29) **	-0.192 (-1.54) **	-0.154 (-1.76) **
HML	-0.375 (-3.95) ***	-0.241 (-1.73) **	-0.119 (-1.15) ***
UMD	-0.097 (-1.41) *	-0.152 (-1.53) **	-0.162 (-1.97) *
Adjusted R-squared	21.98%	28.60%	21.93%
Total Sample Size	9,016	4,577	9,026

Abnormal return regressions for sample of tax shelter firms. POOR GOVERNANCE - SHELTER is an indicator variable set equal to 1 for tax shelter firms with governance scores above the sample median. POOR GOVERNANCE - CONTROL is an indicator variable set equal to 1 for matched control firms with governance scores above the sample median. GOOD GOVERNANCE - CONTROL is an indicator variable set equal to 1 for matched control firms with governance scores equal to or below the sample median. The governance score is a continuous governance variable from Gompers et al. (2003). All other variables are as defined in Fama and French (1993). Values in parenthesis represent t-statistics with \*, \*\*, \*\*\* indicating statistical significance at the 0.10, 0.05, and 0.01 levels (one-tailed tests). F-tests (not tabulated) indicate that there is not a significant difference in the abnormal returns reported by the POOR GOVERNANCE - SHELTER firms, the POOR GOVERNANCE - CONTROL firms, or the GOOD GOVERNANCE - CONTROL firms in any of the periods examined.

Table 7: Operating performance of tax shelter and control firms

	Full Tax Shelter Sample				Control Sample				Well Governed - Shelter Firms				Poorly Governed -Shelter Firms			
	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.	N
<b>B: After-Tax Earnings</b>																
<i>Year -2</i>	0.10	0.07	0.10	53	0.05	0.05	0.06	53	0.13	0.10	0.11	22	0.08	0.05	0.09	23
<i>Year -1</i>	0.09	0.07	0.08	53	0.05	0.05	0.06	53	0.11	0.10	0.09	22	0.08	0.07	0.06	23
<i>Shelter Year</i>	0.08	0.06	0.08	53	0.05	0.05	0.05	53	0.10	0.09	0.09	22	0.07	0.05	0.07	23
<i>Year +1</i>	0.08	0.08	0.07	52	0.05	0.05	0.05	46	0.10	0.09	0.09	22	0.07	0.05	0.06	21
<i>Year +2</i>	0.08	0.06	0.07	52	0.05	0.05	0.05	46	0.10	0.08	0.09	22	0.06	0.04	0.06	21

Tax Shelter Firms vs. Control Firms		Well Governed Shelter Firms vs. Poorly Governed Shelter firms		Well Governed Shelter Firms vs. Control Firms		Poorly Governed Shelter firms vs. Control Firms	
t-stat	Wilcoxon Z	t-stat	Wilcoxon Z	t-stat	Wilcoxon Z	t-stat	Wilcoxon Z
-3.08 ***	-1.37	-1.59 *	-1.83 *	-2.87 ***	-1.91 *	-1.98 *	-1.11
-3.11 ***	-1.76 **	-1.68 **	-1.51	-3.39 ***	-2.66 ***	-1.74 *	-1.24
-2.43 **	-2.15 **	-1.42 *	-1.24	-2.87 ***	-2.29 **	-1.05	-1.12
-1.79 **	-1.42	-1.68 **	-0.75	-2.73 ***	-2.47 ***	-0.56	-1.01
-2.23 **	-1.97 **	-1.20	-1.34	-2.72 ***	-2.41 **	-1.06	0.43

Table 7 reports data for the operating performance of the tax shelter and control firms. Shelter year data is an average of operating performance data for each year a firm was engaged in tax sheltering. Year -1 and Year -2 present operating performance data for one and two years prior to the firm engaging in tax sheltering respectively. Year +1 and Year +2 present operating performance data for one and two years following the final year of active tax sheltering respectively. The control firms represent the closest matches to the tax shelter firms based on calendar year, two-digit SIC industry classification, and total assets as of fiscal year-end. AFTER-TAX EARNINGS is net income before extraordinary items (data 18) scaled by lagged total assets (data 6). Reported t-statistics (Wilcoxon Z-statistics) test for differences in the mean (median) with \*, \*\*, \*\*\* indicating statistical significance at the 0.10, 0.05, and 0.01 levels (one-tailed tests).

## **Chapter VI: Conclusion**

The purpose of this study is to develop a profile of the type of firm likely to be actively engaged in tax sheltering. This study also examines the circumstances in which tax sheltering is associated with wealth creation for shareholders and those in which tax sheltering might be used as a vehicle for rent extraction by management. I conduct this analysis by examining a set of firms identified in Tax Court records and press articles as having participated in corporate tax shelters. The results of my first analysis indicate that BTDs are positively associated with tax sheltering. This finding is consistent with BTDs being a useful measure of tax aggressiveness. This result also provides support for previous research that attributes the growth in BTDs during the 1990's to increased tax sheltering. In addition, I find that tax sheltering is positively associated with firm size and the existence of foreign income. Further, consistent with Graham and Tucker (2005), I find that firms engaged in tax sheltering tend to hold less debt.

As a part of my examination of tax shelter firm characteristics, I investigate whether there is a connection between aggressive book and tax reporting. The results of this analysis indicate that firms accused by the government of engaging in tax sheltering also appear to report aggressively for financial statement purposes. This finding provides support for the theory that aggressive corporate behavior can lead to aggressive reporting for both book and tax purposes. In addition to examining the firm level characteristics of tax shelter participants, I also examine the characteristics of their CEOs. This set of tests builds on previous research that documents that younger CEOs and CEOs with MBAs tend to make more aggressive financing and operating decisions. I extend this analysis by examining whether these characteristics also affect tax reporting decisions. I find that my sample of tax sheltering firms have significantly more CEOs who are age 55 and under,

and significantly more CEOs with an MBA as compared with a matched set of control firms. These findings are consistent with these characteristics also being associated with more aggressive tax reporting. Developing a model that effectively identifies aggressive corporate taxpayers is an important research contribution because it allows researchers to examine research questions such as changes in the tax aggressiveness of firms around the introduction of new financial reporting or tax regulations. It also allows researchers to identify tax aggressive firms in order to investigate investor perceptions of tax aggressiveness.

My second set of tests examine whether tax sheltering is associated with effective tax planning that creates wealth for shareholders or whether tax shelters are a tool used by managers to extract rents from the firm. The results indicate that tax shelter firms with strong corporate governance exhibit significant positive abnormal returns during the period when the firm is actively engaged in sheltering and the 24 month periods before and after tax sheltering. In contrast, the tax shelter firms with poor governance significantly underperform the strong governance tax shelter firms during the period of active tax shelter participation and the 24 months following the period of active sheltering. These results are consistent with tax sheltering being associated with wealth creation for shareholders, while the benefit of tax sheltering is mitigated for firms with poor corporate governance. While it is possible that tax sheltering itself is the source of the wealth creation, it is also possible that the combination of good-governance and active tax sheltering are simply a signal of strong incentive alignment between managers and shareholders that leads to superior performance.

There are several limitations to this study. I examine a set of tax shelter firms that were successfully identified and investigated by the IRS. While the use of tax shelters may be



pervasive, this set of firms could represent a unique subset of tax shelter participants. As a result, it is possible the findings from this study will not generalize to a broader set of tax shelter participants. This limitation is especially true of the tests examining CEO characteristics, which are limited to a smaller subset of tax shelter observations with available data. In addition, many of the specific types of tax shelters in which these firms participated have been curtailed by subsequent legislation and IRS investigation. Consequently, these findings may not generalize to newer forms of tax sheltering being employed by firms currently or in the future.

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## **Appendix A: Tax Shelter Descriptions**

### **1. Lease-in, lease-out (LILO)**

In a LILO transaction a U.S. corporation leases long-lived property, such as a building, from a tax-indifferent party (such as a municipality) and then immediately subleases the property back to the same party. The lease calls for the U.S. corporation to prepay its rental obligation. This prepayment generates a significant deduction in the early years of the lease for tax purposes. For financial reporting purposes, the U.S. corporation is able to amortize the costs over the life of the lease. The early tax deduction is offset by income recognized by the U.S. corporation in the final year of the lease. However, the early net deduction can be used by the U.S. corporation to offset other unrelated income and provides a significant time-value benefit.

There were a total of three LILO transactions examined in this study, Graham and Tucker (2005) note that these shelters were popular from 1995 to 1999. Because the cost of the lease is amortized over a much longer period for financial reporting purposes than for tax purposes LILO shelters should generate a significant temporary book-tax difference. This difference would result in a deferred tax liability in the early years of the lease, but would not reduce the firm's effective tax rate.

### **2. Corporate-owned life insurance (COLI)**

In a basic COLI transaction, the corporation purchases numerous cash value life insurance policies on the lives of its employees. The corporation will then borrow funds to pay the premiums on the policies. The anticipated build-up inside the policy is substantially offset by the interest expense from the borrowing so there is little net non-tax benefit associated with the policy. However, for tax purposes, the inside-buildup on the

cash-value life insurance is not included in income, but the interest on the debt used to fund the policy is deductible. This mismatch creates a significant tax benefit for the corporation.

The investment return inside a COLI policy would result in a permanent book-tax difference that would lead to a reduced effective tax rate. This would occur regardless of whether the firm borrowed to pay the premiums on the policy. There are a total of 12 COLI tax shelters examined in this study.

### 3. Contested liability acceleration strategy (CLAS)

The CLAS tax shelter was developed by KPMG and according to *The Wall Street Journal* (2004), the IRS reported the shelter generated \$1.7 billion in tax savings for several dozen companies. KPMG devised the CLAS shelter to help clients accelerate the timing of tax deductions for settlements of lawsuits and other claims against the corporation. Typically, deductions for these claims are not allowable until the claim is paid. However, one exception to this rule involves transferring money or other property to a contested liability trust before the claims are resolved. A firm would establish a trust with itself as the beneficiary, and then transfer noncash assets such as company stock or some type of intercompany note to the trust. The transferred items were intended to correspond to amounts owed related to a particular claim, and the firm would then take a deduction when the items were transferred to the trust. The CLAS shelter likely results in a timing difference between book and tax reporting, but the nature of this difference is dependent on when the deduction is taken for financial reporting purposes. There are five CLAS shelters, all from the year 2000, included in the sample of tax shelter firms.

### 4. Contingent-payment installment sales (CPIS)

The purpose of the CPIS shelter is to generate a paper capital loss to offset a real capital gain generated by the corporation. A typical CPIS transaction would involve a U.S.

corporation forming a partnership with a tax-exempt foreign entity. In the beginning the foreign partner would have the overwhelming majority partnership interest. The partnership would then purchase short-term private placement notes eligible for the installment method of accounting. The partnership would then sell the notes for a large cash down payment with the balance made up of a comparatively small amount of debt instruments. The gain from the sale would be allocated according to partnership interests with the foreign entity receiving the majority of the gain. The partnership would then claim a large basis in the remaining debt instruments. At the end of the tax-year the partnership interests would be reversed and the partnership would distribute the cash to the foreign entity and the notes to the U.S. company in redemption of their partnership interests. The U.S. company would then sell the notes to a third party and because the basis in the notes greatly exceeds their value, the sale would create a large paper loss that could be used to offset existing capital gains. There are five CPIS shelters in the tax shelter sample.

#### 5. Cross-border dividend capture (CBDC)

Under this tax shelter a corporation purchases foreign stock after a dividend has been declared immediately prior to the record date, and then it sells the stock ex dividend immediately after the record date capturing the dividend and the foreign withholding tax credit. The corporation realizes a short-term capital loss on the sale because of the price decline associated with the payment of the dividend, which offsets the dividend received by the corporation. This transaction allows the U.S. firm to capture the foreign tax credit to offset U.S. income tax liability from foreign shareholders who could not have used the credits because they have no U.S. income tax to offset. This type of shelter would lead to a permanent reduction in a firm's effective tax rate through the use of increased foreign tax credits. There were two CBDC shelters in the Graham and Tucker (2005) sample.



## 6. Transfer Pricing

This type of shelter occurs when a U.S. corporation with a foreign subsidiary in a low-tax jurisdiction produces an asset at the foreign subsidiary and then has the subsidiary sell the asset back to the U.S. corporation at an above market price. Selling the asset to the U.S. parent at an above market price enables the company to subject most of the profit on the asset to the low foreign tax rate. To the extent that the company chooses to designate profits earned in the foreign subsidiary as permanently reinvested, a transfer pricing shelter will result in a reduction in its effective tax rate. There are 15 transfer pricing shelters in the Graham and Tucker (2005) sample.

## 7. Offshore intellectual property havens (OIPH)

In this type of shelter a U.S. multinational corporation establishes a subsidiary in a low-tax foreign jurisdiction such as Bermuda. The subsidiary then buys a portion of valuable intellectual property from the U.S. parent, such as trademarks and patents. The offshore subsidiary will then collect the royalties from sales of the parent company's products overseas. The IRS requires that royalties collected be reported, but payments made back to the U.S. are subject to discretion and are often set artificially low, limiting the extent to which royalties are subject to U.S. taxation. The firm can then use the remaining untaxed profits to expand operations overseas. Similar to the transfer pricing shelter, the OIPH shelter will result in a reduction in the participating firm's effective tax rate. There are two OIPH shelters included in the sample.

## 8. 401(k) Deduction Acceleration Strategy

Similar to CLAS, 401(k) Accel was developed by KPMG during the late 1990s. On October 14, 2005 *The Wall Street Journal* reported that KPMG sold the 401(k) Accel to at least 143 companies, which together "claimed undisclosed millions in accelerated tax

deductions.” The 401(k) Accel strategy requires a company's tax year to end on a different day than its 401(k) plan's fiscal year, which would be changed if necessary. The firm's board would then pass a resolution on or before the last day of the tax year -- but at the start of the 401(k) plan's new fiscal year -- fixing the company's minimum 401(k) contribution for the coming year. The firm would then record a tax deduction composed of both the prior year's contribution and a large portion of the next year's contribution. The 401(k) Accel strategy would likely result in a timing difference between book and taxable income. There were a total of two 401(k) Accel tax shelters examined in this study.

#### 9. Other

There were eight tax shelters that only appeared in the sample one time. All of these observations were categorized as other tax shelters. This set of shelter observations includes interest rate swaps, money market principal strips, and sham transactions. There were a total of nine tax shelters included in the other category.

## Appendix B: Detecting Tax Shelters

Below are two examples of the difficulty of identifying corporate tax shelters through financial statement analysis. The first example involves a tax shelter that results in a temporary book-tax difference and the second examines a tax shelter that results in a permanent book-tax difference. McGill and Outslay (2004) also provide an excellent detailed analysis of the financial reporting consequences of some other prominent tax shelters.

On June 16, 2004 the *Wall Street Journal* published an article discussing the CLAS tax shelter developed by KPMG. The article noted that WorldCom purchased this shelter from KPMG in 1999 and used it to accelerate several hundred million dollars in deductions over a three-year period. The article further noted that a person “familiar with the transaction” said the company unwound the shelter and reversed the deductions in 2002. As discussed above, the CLAS tax shelter results in a timing difference between book and taxable income that results from the accelerated deduction of the contingent liability for tax purposes. This timing difference would result in the creation of a deferred tax liability in the year the CLAS shelter was implemented.

Below is an excerpt from the 1999 10-K of WorldCom, Inc. detailing the company’s deferred tax assets and liabilities in 1998 and 1999. It is difficult to discern the impact of the CLAS shelter from an examination of this footnote. In hindsight, it is likely the deferred liability from the CLAS shelter was recorded in the other deferred tax liability account, which increased from \$27 million in 1998 to \$135 million in 1999. The other deferred tax liability account further increased to \$366 million in 2000 and the account was no longer present in the company’s 2002 tax footnote, which is consistent with the liability being reversed as reported above. While this explanation seems reasonable, the other deferred tax liability account is likely to be composed of a number of different deferred tax liabilities and the general nature of the account title makes it unlikely to have been identified as a red flag for aggressive tax reporting at the time of the tax sheltering. This short example demonstrates the difficulty of identifying aggressive tax sheltering through financial statement analysis even when the timing of the sheltering is known ex post.

WorldCom, Inc. 1999 – 10-K

The following is a summary of the significant components of the Company's deferred tax assets and liabilities as of December 31, 1998 and 1999 (in millions):

	1999		1998	
	<u>Assets</u>	<u>Liabilities</u>	<u>Assets</u>	<u>Liabilities</u>
Allowance for bad debts	\$ -	\$ -	98	\$ -
Fixed assets	-	(3,167)	-	(2,585)
Goodwill and other intangibles	-	(68)	-	(103)
Investments	90	-	91	-
Line installation costs	-	(400)	-	(277)
Accrued liabilities	273	-	924	-
NOL carryforwards	926	-	1,499	-
Tax credits	220	-	142	-
Other	-	(135)	74	(27)
	<u>1,509</u>	<u>(3,770)</u>	<u>2,828</u>	<u>(2,992)</u>
Valuation allowance	(51)-		(160)-	
	<u>1,458</u>	<u>(3,770)</u>	<u>2,668</u>	<u>(2,992)</u>

Winn-Dixie purchased life insurance for approximately 36,000 of its employees and borrowed against the value of these policies to fund the premium payments. This tax shelter was designed to generate significant interest deductions for income tax purposes. On its fiscal-year 1993 return, the company claimed a \$3.7 million deduction for accrued interest on loans from COLI policies purchased in 1993. The IRS subsequently determined a deficiency of \$1.6 million for Winn-Dixie's 1993 tax year, finding that the COLI program was entirely tax motivated and therefore lacked any economic substance (Morrissey 2000).

The interest deduction on the loans from the COLI policy would not result in a book-tax difference, however the investment return inside the company's COLI policy should have resulted in a permanent book-tax difference because the inside build-up on the cash value life insurance is not includable in income for tax purposes. This would result in a permanent book-tax difference that would have reduced Winn Dixie's effective tax rate. Below is an excerpt from the company's effective tax rate reconciliation from its 1994 fiscal year 10-K. There is no clear indication in the rate reconciliation that the life insurance policies reduced the company's effective tax rate in 1993. Any book-tax difference resulting from the COLI shelter is likely reflected in the -1.3% other, net adjustment in the rate reconciliation.<sup>29</sup> In the company's 1996 10-K the company began separately disclosing the impact of the COLI shelter on its effective tax rate despite the adjustments being below 5%. In 2000 the company recorded a contingency of \$42.5

<sup>29</sup> SEC Regulation S-X Rule 4-08(h)(2) states that reconciling items in the effective tax rate computation should be stated separately if they are greater than or equal to 5% of income before taxes times 35%. If such items are below 5% then no reconciliation is required unless such items are deemed "significant in appraising the trend of earnings." As a result, Winn-Dixie would not be required to separately reconcile the impact of the COLI shelter if it did not reduce the effective tax rate by at least 5%.

million associated with the IRS disallowance of the interest associated with the COLI loans.

Winn Dixie Stores, Inc. 1994 – 10-K

The following reconciles the above provision to the Federal statutory income tax rate:

	1994	1993	1992
Federal statutory income tax rate	35%	34%	34%
State and local income taxes, net of federal income tax benefits	3.8	2.9	2.4
Other tax credits	-1.1	-0.6	-1.8
Other, net	0.3	-1.3	-0.6
	<u>38.0%</u>	<u>35.0%</u>	<u>34.0%</u>

	1996	1995	1994
Federal statutory income tax rate	35%	35%	35%
State and local income taxes, net of federal income tax benefits	3.5	4.3	3.8
Other tax credits	(0.2)	(1.1)	(1.1)
Life Insurance	(3.1)	(2.1)	(1.1)
Other, net	(1.2)	(1.7)	1.4
	<u>34.0%</u>	<u>34.4%</u>	<u>38.0%</u>

### Appendix C: Calculation of Discretionary Accruals

Consistent with Kothari et al. (2005), I use a cross-sectional modified-Jones model with lagged return-on-assets (ROA) to estimate discretionary accruals. Lagged ROA is included to control for the effects of performance on discretionary accruals. Collins and Hribar (1999) argue that the balance sheet approach to calculating total accruals is inferior in certain instances to a cash-flow statement based approach. However, because many of the incidences of tax sheltering used in my analysis occur prior to the availability of cash flow statement information, I use a balance sheet approach to calculating total accruals in this study. My variable definitions are as follows:

$$TA_{i,t} = (\Delta CA_{i,t} - \Delta CL_{i,t} - \Delta Cash_{i,t} + \Delta STDEBT_{i,t} - DEPN_{i,t})$$

where

$TA_{i,t}$  = firm  $i$ 's total accruals in year  $t$ ,  
 $\Delta CA_{i,t}$  = firm  $i$ 's change in current assets (data 4) between year  $t-1$  and year  $t$ ,  
 $\Delta CL_{i,t}$  = firm  $i$ 's change in current liabilities (data 5) between year  $t-1$  and year  $t$ ,  
 $\Delta Cash_{i,t}$  = firm  $i$ 's change in cash (data 1) between year  $t-1$  and year  $t$ ,  
 $\Delta STDEBT_{i,t}$  = firm  $i$ 's change in debt in current liabilities (data 34) between year  $t-1$  and year  $t$ ,  
 $DEPN_{i,t}$  = firm  $i$ 's depreciation and amortization expense (data 14) in year  $t$ .

To calculate the modified cross-sectional Jones Model I estimate the following regression for each two-digit SIC industry group with at least 20 firms in year  $t$  (all variables are scaled by beginning of the year total assets)<sup>30</sup>:

$$TA_{i,t} = \beta_0 + \beta_1[1/A_{i,t-1}] + \beta_2[\Delta REV_{i,t} - \Delta REC_{i,t}] + \beta_3 PPE_{i,t} + \beta_4 ROA_{i,t-1} + \varepsilon_{j,t} \quad (1)$$

where

$A_{i,t-1}$  = firm  $i$ 's total assets (data 6) at the beginning of year  $t$ ,  
 $\Delta Rev_{i,t}$  = firm  $i$ 's change in revenues (data 12) between year  $t-1$  and year  $t$ ,

<sup>30</sup> Following Kothari et al. (2005), I include the change in accounts receivable in the estimation stage of the modified Jones model. Kothari et al. (2005) argue that failure to include the change in receivables in the estimation stage is likely to generate large estimated unexplained accruals whenever a firm experiences extreme growth during the "test" stage compared to the "estimation" stage.

$\Delta REC_{i,t}$  = firm  $i$ 's net receivables in year  $t$  (data 2) less net receivables in year  $t-1$ ,  
 $PPE_{i,t}$  = firm  $i$ 's gross value of property, plant and equipment (data 7) in year  $t$ ,  
 $ROA_{i,t-1}$  = firm  $i$ 's net income before extraordinary items (data 18) in year  $t-1$ , divided by lagged total assets.

The industry- and year-specific parameters estimated in equation (1) are used to calculate firm-specific non-discretionary accruals:

$$NDA_{i,t} = \beta_0 + \beta_1[1/A_{i,t-1}] + \beta_2[\Delta REV_{i,t} - \Delta REC_{i,t}] + \beta_3 PPE_{i,t} + \beta_4 ROA_{i,t-1} \quad (2)$$

where

$NDA_{i,t}$  = non-discretionary accruals in year  $t$  scaled by lagged total assets,

Discretionary accruals in year  $t$  are calculated as follows:

$$DAP_{i,t} = TA_t/A_{t-1} - NDA_{i,t} \quad (3)$$

**Vita**

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