

Early Evidence on the Determinants of Unrecognized Tax Benefits

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ABSTRACT:

This study examines the association between disclosures of unrecognized tax benefits made under FASB Interpretation No. 48 and existing measures of tax avoidance. Prior research suggests managers use discretion in accounting for income tax contingencies to meet key earnings targets. It is not clear however, whether such opportunism mitigates the signal about tax avoidance activity provided by these contingencies or whether the opportunistic use of these reserves continued following the adoption of FIN 48. We find that both the level of unrecognized tax benefits at fiscal year-end and changes in the liability linked to current year tax positions are related to firm characteristics that prior research has found to be associated with tax avoidance activity. Further, we document a significant and negative association between firms' cash effective tax rates and the ending balance of unrecognized tax benefits. We believe this analysis will be useful to researchers and financial statement users that rely on financial statement-based measures of tax avoidance to evaluate corporate tax planning.

Keywords: *Unrecognized tax benefits; FIN 48; tax contingency; tax cushion; tax avoidance.*

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I. INTRODUCTION

The Financial Accounting Standards Board (FASB) issued Interpretation No. 48 (FIN 48), “Accounting for Uncertainty in Income Taxes” in June 2006 amidst extensive criticism from public accounting firms and their corporate clients. The stated purpose of FIN 48 is to clarify the accounting for uncertainty in income taxes by providing greater consistency in the criteria used to recognize and measure uncertain tax benefits. Under the new accounting rule firms are required to disclose a liability for unrecognized tax benefits.¹ Prior to FIN 48, financial statement users had only limited information about the uncertainty associated with firms’ tax positions.² Thus, many regulators, public accounting firms, and their clients expected FIN 48 disclosures to reveal proprietary information about the tax planning practices of companies subject to the new accounting rules. Moreover, critics claimed that the Internal Revenue Service (IRS) could use the disclosures required by FIN 48 as a “roadmap” in future income tax audits.³

Despite these concerns, it is not clear the new FIN 48 disclosures provide useful information to investors or tax authorities about the extent of firms’ tax avoidance. Frischmann et al. (2008) examine the market response to key FIN 48 pronouncements and find little evidence investors anticipated incremental costs associated with the new accounting rule. There are several reasons that the unrecognized tax benefits disclosed by firms might be of limited

¹ Tax planning strategies that reduce tax liabilities on tax returns generate “tax benefits,” which may or may not be recognized in financial statements. When a firm recognizes a tax benefit on a tax return and records an offsetting liability in the financial statements to account for the contingent liability associated with that tax position, we refer to the tax benefit as being “unrecognized.” The liability for unrecognized tax benefits is also commonly referred to by tax practitioners as the tax contingency or the tax cushion.

² Prior to the implementation of FIN 48, firms primarily followed the loss-contingency method prescribed by FAS 5 to account for uncertain tax positions. This method required firms to accrue an income tax contingency (aka tax cushion) if the likelihood of losing the tax benefit associated with an uncertain tax position was “probable” to occur.

³ Consistent with this concern, Congress was so alarmed by the magnitudes of unrecognized tax benefits initially disclosed by the large U.S. corporations that it demanded at least 30 companies provide more details about the tax periods and jurisdictions generating their uncertain tax benefits (Drucker 2007).

usefulness as a signal of tax avoidance activity. First, the costs associated with accurate disclosures could be so high that firms disclose incomplete and/or inaccurate information about their uncertain tax benefits. Potential costs include an increased tax burden if the disclosures provide information that is useful to the IRS in identifying and challenging tax positions that previously would have gone unchallenged. A second reason the new disclosures might not reflect corporate tax avoidance is the previously documented use of tax contingencies to manage earnings. Prior research suggests that firms use tax contingencies to manage earnings upward to meet or beat analysts' forecasts and as "cookie jar reserves" to generate a smooth earnings stream (e.g., Dhaliwal, Gleason, and Mills 2004; Blouin, Gleason, Mills, and Sikes 2008; Gupta and Laux 2008). If firms use unrecognized tax benefits to opportunistically manage earnings upward or to smooth earnings, then the association between unrecognized tax benefits and corporate tax avoidance should be attenuated, if not reduced to zero.⁴

For the above reasons, it is not clear the new disclosures required by FIN 48 provide financial statement users with useful information about firms' tax avoidance activities. In this study we investigate the association between FIN 48 disclosures and firm characteristics that prior studies have shown are significantly associated with actual cases of tax sheltering (e.g. Graham and Tucker 2006; Wilson 2008; Lisowsky 2009). Specifically, we study the associations between unrecognized tax benefits and firm size, profitability, the extent of foreign operations, research and development expenditures, leverage, growth opportunities, and aggressive financial reporting. Evidence of an association between these firm characteristics and

⁴ The limited detail provided in the FIN 48 disclosures is an additional reason they may not be useful for tax authorities. While firms must apply the recognition and measurement criteria as prescribed by FIN 48 to *each* tax position, they disclose the liability for unrecognized tax benefits as a single *aggregate* amount. While this disclosure might provide financial statement users with a signal about the extent of a firm's uncertain tax positions, the aggregation likely limits the usefulness of the new disclosures to tax authorities in identifying specific transactions for additional scrutiny during the audit process (Mills, Robinson, and Sansing 2009).

FIN 48 disclosures would provide indirect support for the usefulness of these disclosures as measures of aggressive tax planning. Currently, International Financial Reporting Standards (IFRS) do not require disclosures similar to those required by FIN 48. Consequently, evidence of an association between FIN 48 disclosures and firm characteristics that prior studies have found to be associated with tax avoidance would be useful to international accounting standard setters in determining whether to require similar disclosures under IFRS.

We also provide descriptive evidence on the association between FIN 48 disclosures and existing measures of tax avoidance (e.g., book-tax differences, effective tax rates, cash effective tax rates, and discretionary book-tax differences). Because existing measures of tax avoidance all suffer from measurement error, and were designed to capture different aspects of tax avoidance, it would be difficult to conclude that a lack of association (if any) between these measures and FIN 48 disclosures is solely the result of the new disclosures not providing useful information about tax avoidance activities.⁵ Nonetheless, we believe these tests provide useful information to researchers and financial statement users as they develop methods for measuring tax avoidance. To the extent we observe associations between FIN 48 disclosures and measures of tax avoidance, researchers and financial statement users can use the new disclosures in conjunction with measures of tax avoidance to triangulate results and overcome the limitations of individual tax avoidance measures.

We are interested in the extent to which FIN 48 disclosures reflect *both* tax avoidance and tax aggressiveness. Following Dyreng et al. (2008), we define tax avoidance activity as the ability to reduce explicit tax liabilities relative to pre-tax accounting income. This definition encompasses all transactions that affect a firm's tax liability and does not distinguish between real activities that are tax-favored and activities whose primary purpose is tax avoidance.

⁵ We discuss the measurement error associated with each measure of tax avoidance in Section 2.

Similar to Hanlon and Heitzman (2009), we view tax aggressiveness as a subset of tax avoidance activity, where transactions are entered into specifically for the purpose of avoiding taxes and are characterized by a relatively weak set of supporting facts. We test the associations between FIN 48 disclosures and different measures of tax avoidance that capture different points on the tax avoidance continuum – from more general measures of overall tax avoidance (e.g., cash effective tax rates) to measures that are intended to capture more aggressive tax planning (e.g., discretionary book-tax differences).

We examine different components of the liability for unrecognized tax benefits in our empirical tests. We first analyze the determinants of unrecognized tax benefits as reported at fiscal year-end. This balance reflects unrecognized tax benefits accrued in prior years, as well as changes during in the current tax year. Next, we analyze the portion of unrecognized tax benefits (as reported at fiscal year-end) that management indicates would impact a firm’s effective tax rate, if recognized. These uncertain tax benefits should only reflect tax planning strategies that cause effective tax rates to diverge from the U.S. statutory tax rate (i.e., excludes tax strategies that generate temporary book-tax differences). Lastly, we examine changes in unrecognized tax benefits that are related to current year tax returns.

Our results indicate that firms with greater profitability, more extensive foreign operations, greater research and development activity, higher leverage, and lower sales growth report larger liabilities for uncertain tax benefits at fiscal year-end. These firms also report larger changes in their liability for uncertain tax benefits related to current year tax positions. These results are consistent with prior research that finds significant associations between these firm characteristics and tax avoidance activity (e.g. Rego 2003; Dyreng, Hanlon, and Maydew 2008; Wilson 2009). We also find that of the tax avoidance measures we examine, only the cash

effective tax rate has incremental explanatory power beyond other firm characteristics in predicting the level of unrecognized tax benefits. When we replace the level of unrecognized tax benefits with the portion that would impact a firm's effective tax rate, only the cash effective tax rate and permanent book-tax differences have incremental explanatory power. In contrast, none of our measures of current year tax avoidance are associated with changes in unrecognized tax benefits related to current year tax returns.

It is notable that the only measure of tax avoidance associated with the level of unrecognized tax benefits is the five-year cash effective tax rate. Of the five measures of tax avoidance we examine in this study, the cash effective tax rate is the only measure not affected by reported income tax expense. If a firm engages in extensive tax avoidance activity, but does not recognize the tax benefit associated with such activity for financial reporting purposes due to uncertainty surrounding the transaction, then the firm's reported income tax expense will not reflect the tax avoidance activity. Hence, measures of tax avoidance based on reported tax expense, such as the effective tax rate or book-tax differences, do not reflect tax planning activity when firms simultaneously increase their liability for unrecognized tax benefits. In contrast, tax avoidance reduces cash taxes paid, resulting in lower cash effective tax rates.⁶

The purpose of this study is not to evaluate the effectiveness of measures of tax avoidance. However, the results of our analyses illustrate a significant limitation of the existing measures. When tax avoidance involves significant uncertainty regarding the sustainability of a tax position upon audit (e.g., tax shelter transactions that have no valid business purpose), then measures of tax avoidance that are based on reported income tax expense will not reflect the tax avoidance, provided companies comply with the FIN 48 disclosure requirements.

⁶ We discuss the relation between the contingency for unrecognized tax benefits and measures of tax avoidance in greater detail in the next section.

This study makes several contributions to the accounting literature. Using detailed FIN 48 data for fiscal year 2007, our study provides an early look at the financial reporting practices of S&P 500 and S&P 400 firms immediately following the implementation of this controversial new accounting rule. We find that both the level of unrecognized tax benefits and changes in that liability related to current period tax returns are significantly associated with firm characteristics that prior studies have linked to tax avoidance activity. Further, we find firms with lower five-year cash effective tax rates have larger liabilities for unrecognized tax benefits. However, it is not clear from these tests whether these disclosures provide financial statement users with new information about tax avoidance activity or whether they will be helpful to tax authorities in the audit process.

II. BACKGROUND AND EMPIRICAL PREDICTIONS

Accounting for Uncertainty in Income Taxes

In this section we summarize the generally accepted accounting principles for uncertainty in income taxes in the pre- and post-FIN 48 time periods. We discuss prior research that examines financial reporting practices associated with uncertain tax benefits and introduce the measures of tax avoidance that we use in our empirical tests. We close this section by demonstrating how changes in unrecognized tax benefits affect certain measures of corporate tax avoidance.

Prior to the issuance of FIN 48, firms generally followed the “liability model” of accounting for uncertainty in income taxes, consistent with SFAS No. 5, “Accounting for Contingencies”. Under this model, firms accrued a contingent tax liability when the liability was probable to occur and the amount could be reasonably estimated. In this financial reporting

regime, recognition and measurement practices varied greatly across firms and few firms disclosed any tax contingency information (Gleason and Mills 2002).

Issued in June 2006, FIN 48 applies a “benefit recognition model” that requires a two-step process to determine the amount of tax benefits recognized in financial statements. Step one determines whether the firm can recognize *any tax benefit* associated with a specific tax position,⁷ while step two measures *the amount of tax benefit* that can be recognized. FIN 48 imposes two stringent requirements in the “benefit recognition model”: 1) Firms must assume that all positions taken on a tax return will be audited by relevant tax authorities, and 2) Firms cannot incorporate the potential for tax audit settlements with tax authorities in step one. These requirements are significant departures from SFAS No. 5 and caused many to predict that the prevalence and size of uncertain tax benefits would increase under FIN 48.⁸

Under both reporting regimes, increases in uncertain tax benefits increase total tax expense and also generate contingent liabilities (i.e., reserves) that are reversed in the future when the uncertain tax position is resolved. Upon the resolution of a particular uncertain tax position, the firm may be under-reserved or over-reserved relative to the actual outcome. If the firm is *under-reserved*, it will reverse the accrued tax liability, report additional tax expense (which reduces current period net income), and pay the relevant tax authority. If the firm is *over-reserved*, it will reverse the accrued tax liability, report a tax benefit (which increases current period net income), and pay the relevant tax authority, if applicable. In the latter case,

⁷ There must be a greater than 50 percent likelihood that a “tax position” will be sustained upon audit based on its technical merits, in order for any tax benefit to be recognized in the financial statements. According to FIN 48, “The term *tax position* ... refers to a position in a previously filed tax return or a position expected to be taken in a future tax return that is reflected in measuring current or deferred income tax assets and liabilities for interim or annual periods.”

⁸ See Dunbar, Kolbasovsky, and Phillips (2007) for examples of the journal entries necessary to record contingencies for unrecognized tax benefits.

firms with ample uncertain tax benefits can potentially reduce those liabilities to manage earnings upward.

Evidence on the Opportunistic Use of Income Tax Contingencies

The potential for tax contingencies to serve as an earnings management tool has been the focus of recent accounting studies. Dhaliwal, Gleason, and Mills (2004) provide evidence firms use discretion in accounting for income tax expense to manage earnings upward to meet or beat analysts' forecasts. Managers have substantial discretion with respect to multiple components of the tax provision. These components include discretion over the valuation allowance account, the designation of earnings as permanently reinvested abroad, and the focus of our analysis, the liability for unrecognized tax benefits. In addition, income tax expense is one of the last accounts closed prior to earnings announcements. Thus, the tax provision has been characterized as "ripe" for earnings management, which likely prompted the FASB to issue FIN 48 and clarify the accounting for uncertainty in income taxes.

While Dhaliwal et al. (2004) rely on third- to fourth-quarter effective tax rate changes, Gupta and Laux (2008) utilize pre-FIN 48 tax footnote disclosures to specifically examine whether firms use tax contingency reversals to opportunistically manage earnings. Their results are consistent with firms reducing their tax contingencies to meet or beat analysts' forecasts. Blouin, Gleason, Mills, and Sikes (2008) investigate whether firms with excess tax reserves (at the time FIN 48 was enacted) were more likely to reduce those reserves in the quarters leading up to the adoption of FIN 48. While reversals prior to FIN 48 adoption increased *net income*, reversals after FIN 48 adoption increase *retained earnings*. Thus, firms with excess tax reserves at the FIN 48 enactment date had incentives to reduce those reserves prior to FIN 48 adoption, and consequently report higher net income. Blouin et al.'s results indicate that firms with excess

tax reserves were more likely to decrease those reserves in the two quarters prior to FIN 48 adoption than firms without excess reserves.

Measures of Corporate Tax Avoidance

While the studies discussed above provide evidence managers use discretion in accounting for tax contingencies to meet key earnings targets, it is not clear this activity has persisted following the implementation of FIN 48. This new accounting rule was intended to provide greater consistency in the criteria used to recognize and measure uncertain tax benefits. It is possible the new criteria for recording tax liabilities under FIN 48, in conjunction with the additional footnote disclosure requirements, have increased auditor scrutiny of this account and reduced the opportunity for managerial discretion in this area. If firms follow the recognition and measurement procedures as prescribed by FIN 48, then unrecognized tax benefits should reflect aggressive tax strategies in which a firm engages.⁹ To test this assertion empirically, we need measures of corporate tax avoidance. We utilize several different measures of avoidance that have been used in recent accounting studies, including traditional and cash effective tax rates, total book-tax differences, permanent book-tax differences, and discretionary permanent book-tax differences.

While the traditional effective tax rate (*ETR*) compares total tax expense to pretax income, the cash effective tax rate (*CASH_ETR*) compares cash taxes paid to pretax income adjusted for special items (see Appendix A for complete definitions for each measure of tax avoidance). We utilize *ETR* because firms report this measure in their annual financial statements, and thus, it is the most accessible measure of corporate tax burden. *ETR* is also subject to considerable scrutiny by managers, shareholders, and competitors, because it directly

⁹ This statement is based on the assumption that tax aggressiveness is defined as engaging in tax positions that are supported by a relatively weak set of facts.

impacts a firm's 'bottom-line' net income (Robinson, Sikes, and Weaver 2008). The *CASH_ETR* has several advantages over *ETR*, including the fact that it reflects the tax benefits of non-qualified stock options and it excludes the impact of changes in the liability for unrecognized tax benefits. However, refunds, estimated tax payments, and settlements with tax authorities over prior year tax returns increase the measurement error in *CASH_ETR* when measured over short time periods. In addition, a low *CASH_ETR* could be the result of entering into aggressive tax shelter transactions, or it could arise from tax-favored transactions, such as investing in municipal bonds, which would not be considered aggressive tax planning. Thus, the relation between *CASH_ETR* and tax aggressiveness is ambiguous in the cross-section of firms.

We also utilize three measures of tax avoidance that are based on differences between a firm's financial and taxable incomes. In particular, we calculate total book-tax differences (*BTD*), permanent book-tax differences (*PERM_BTD*), and discretionary permanent differences (*DTAX*). Although each measure has strengths and weaknesses, all three contain measurement error due to certain factors that complicate the estimation of a firm's tax liability (see Hanlon 2003). These factors, which also affect *ETR*, include liabilities for uncertain tax positions, intra-period tax allocation, rules for consolidation for book vs. tax purposes, employee stock option exercises, tax credits, foreign operations, and negative taxable income.

Wilson (2009) and Frank, Lynch, and Rego (2009) demonstrate that total book-tax differences are associated with tax shelter activity. However, Hanlon (2003) and Manzon and Plesko (2002) identify firm characteristics that are determinants of book-tax differences but are not necessarily reflective of tax avoidance activity.¹⁰ In addition, book-tax differences contain measurement error to the extent that temporary differences reflect earnings management rather

¹⁰ For example, firms with large capital expenditures would have sizable book-tax differences caused by depreciation expense, which would not be reflective of aggressive tax avoidance.

than tax planning activity (Phillips, Pincus, and Rego 2003). Both *PERM_BT*D and *DTAX* exclude temporary differences and thus exclude the measurement error caused by earnings management; however, they also exclude tax planning activities that generate temporary differences. Frank, Lynch, and Rego (2009) show that discretionary permanent differences (*DTAX*) predict tax shelter activity; however, to the extent the nondiscretionary items included in the *DTAX* model are associated with tax planning strategies, then *DTAX* also reflects tax avoidance with error. Given the strengths and weaknesses of each measure of tax avoidance, we utilize all five in our empirical tests.

Determinants of Unrecognized Tax Benefits

In addition to examining whether unrecognized tax benefits are associated with various measures of corporate tax avoidance, we also investigate which firm characteristics are associated with unrecognized tax benefits and its components. Numerous accounting studies have analyzed the determinants of corporate tax burden and tax shelter activity. The results of those studies suggest that measures of corporate tax burden (e.g., effective tax rates) and tax shelter activity are systematically related to firm size (e.g., Zimmerman 1983; Gupta and Newberry 1997), profitability (Gupta and Newberry 1997; Frank, Lynch, and Rego 2009), extent of foreign operations (e.g., Rego 2003; Lisowsky 2009), research and development activity (e.g., Dyreng, Hanlon, and Maydew 2008; Wilson 2009), leverage (e.g., Stickney and McGee 1982; Graham and Tucker 2006), growth opportunities (e.g., Dyreng et al. 2008), and aggressive financial reporting (e.g., Frank et al. 2009; Wilson 2009).

If firms follow the recognition and measurement procedures for uncertainty in income taxes as prescribed by FIN 48, then the balance of unrecognized tax benefits at fiscal year-end should also reflect the firm characteristics found to be associated with tax avoidance in prior

accounting research. Thus, we include proxies for firm size, profitability, extent of foreign operations, research and development activity, leverage, selling, general, and administrative expense, growth opportunities, and aggressive financial reporting in our empirical tests.

Based on a sample of 273 industrial firms in the S&P 500, Song and Tucker (2008) also examine the determinants of the liability for unrecognized tax benefits as disclosed by firms in their first 10-Qs filed with the SEC in 2007. Song and Tucker find that the unrecognized tax benefits are positively related to profitability, leverage, research and development, and selling, general, and administrative expenses, and negatively related to sales growth. We extend their analyses by utilizing the liability for unrecognized tax benefits at fiscal year-end 2007 for S&P 500 and S&P 400 firms. Importantly, we examine the determinants of the ending balance *and* various components of unrecognized tax benefits for fiscal year 2007. We also analyze the correlations between unrecognized tax benefits and measures of corporate tax avoidance.

Impact of Changes in Unrecognized Tax Benefits on Measures of Corporate Tax Avoidance

Of the five measures of tax avoidance that we use in our empirical tests, only the cash effective tax rate is unaffected by changes in the contingency for unrecognized tax benefits. Specifically, increases in unrecognized tax benefits increase current and/or deferred tax expense, which produces higher traditional effective tax rates and lower book-tax differences, permanent differences, and discretionary permanent differences. In contrast, changes in the liability for unrecognized tax benefits affect neither the numerator (i.e., cash taxes paid) nor the denominator (i.e., pre-tax income plus special items) of the cash effective tax rate.

Figure 1 illustrates the impact of increases in unrecognized tax benefits on the traditional effective tax rate (*ETR*) and the correlation between changes in unrecognized tax benefits and

ETR.¹¹ In this simple example, we compute the effective tax rates for nine different companies and assume that all firms engage in some amount of tax planning, which for ease of exposition consists of the research and development tax credit. In each case, the firm has \$1,000 of pre-tax book income, which generates \$350 of income tax liability before any tax planning.¹² We first note that if firms follow the recognition and measurement procedures prescribed by FIN 48, the amount of tax benefits recognized in the financial statements is a function of two factors: 1) how conservative the firm is in its *financial* reporting, and 2) how aggressive the firm is in its *tax* planning.¹³ Thus, in Figure 1, firms can engage in conservative, moderate, or aggressive tax planning, where conservative (aggressive) tax planning generates smaller (larger) tax credits. Our example also allows firms to have conservative, moderate, or aggressive financial reporting practices, where conservative (aggressive) financial reporting accrues larger (smaller) unrecognized tax benefits related to current year tax returns (*CURR_UTB*).

At first glance, the data in Panel A seems to suggest that increases in unrecognized tax benefits should be associated with higher effective tax rates. For example, within the conservative tax planning row, as *CURR_UTB* increases from \$0 to \$100, *ETR* increases from 25 percent to 35 percent. A similar pattern emerges within the moderate and aggressive tax planning rows. In fact, the correlation between *CURR_UTB* and *ETR* amongst all nine firms in Panel A is 65 percent.

However, Panel B portrays a different story. While the relation between *CURR_UTB* and *ETR* is positive *within* each tax planning row, the correlation *amongst all nine firms* in Panel B is

¹¹ Increases in unrecognized tax benefits impact book-tax differences in a manner similar to their impact on *ETR*, although in the opposite direction. Thus, inferences from Figure 1 also apply to book-tax based measures of tax avoidance.

¹² For simplicity, we assume no book-tax differences in this simulation.

¹³ Stated another way, the decision to increase the contingency for unrecognized tax benefits is a function of: 1) how conservative management is in its assessment of whether or not the tax position has a greater than 50 percent likelihood of being sustained upon examination, and 2) the strength of the facts that support the tax position.

-12 percent. This negative correlation is caused by firms with aggressive tax planning having systematically different financial reporting practices than firms with conservative or moderate tax planning. Thus, Figure 1 demonstrates that the relation between changes in unrecognized tax benefits related to current year tax positions and effective tax rates is impossible to predict, given the variation in conservatism for financial and tax reporting purposes in a broad sample of firms. As a result, we may not observe an association between *ETR* and *CURR_UTB* in our cross-sectional analyses.

III. RESEARCH DESIGN AND RESULTS

Table 1 summarizes our sample selection procedure. We begin with all firms listed on either the S&P 500 or the S&P 400 index. We then eliminate 166 firms that had not made their initial FIN 48 disclosures at the time this data was collected. Firms were required to adopt FIN 48 for fiscal years beginning after December 15, 2006. Thus, at the time the data for the initial draft of this study was collected, most of the firms making initial FIN 48 disclosures in their annual reports were calendar year-end firms. We further eliminate 87 firms without sufficient financial data available on *Compustat* to calculate the measures included in our empirical tests. This requirement includes having five-years of financial data necessary to calculate cumulative measures of tax avoidance ending in fiscal year 2007. Our final sample consists of 578 firm-year observations.

Determinants of Unrecognized Tax Benefits at Fiscal Year-End

We first examine the firm characteristics associated with the balance of unrecognized tax benefits (*UTB*) at fiscal year-end. We include variables known to be associated with corporate tax avoidance that would give rise to uncertain tax positions. Specifically, we include the

following variables in equation (1): pre-tax return on assets (*ROA*) as a measure of firm profitability; natural log of total sales (*SIZE*) as a proxy for firm size; the ratio of foreign sales to total sales (*FOR_SALE*); research and development expenditures (*R&D*); leverage (*LEV*); the market-to-book ratio (*MTB*) as a proxy for a firm's growth opportunities; discretionary accruals (*DA*) as a proxy for financial reporting aggressiveness; selling, general, and administrative expenditures (*SG&A*); and a measure of sales growth (*SALES_GR*) (see Appendix A for complete variable definitions). We also include the number of analysts following a firm (*COVERAGE*) as a proxy for external monitoring, and fixed-effects for two-digit SIC codes:

$$\begin{aligned}
 END_UTB_{it} = & \alpha_0 + \alpha_1 PT_ROA_t + \alpha_2 SIZE_t + \alpha_3 FOR_SALE_t + \alpha_4 R\&D_t + \alpha_5 LEV_t + \alpha_6 MTB_t + \\
 & \alpha_7 DA_t + \alpha_8 COVERAGE_t + \alpha_9 SG\&A_t + \alpha_{10} SALES_GR_t + \alpha_{11} TAX + \varepsilon_{it}
 \end{aligned} \tag{1}$$

We examine five alternative measures of tax avoidance (*TAX*) in our empirical tests, where two measures are effective tax rate measures and three measures are based on book-tax differences. We include five-year measures of corporate tax avoidance in equation (1) because the dependent variable, *END_UTB*, is the balance of unrecognized tax benefits at fiscal year-end, which should reflect uncertain tax positions taken over a multi-year time period. The two effective tax rate measures are: 1) the traditional effective tax rate (*ETR5*), computed as the five-year sum of total tax expense divided by the five-year sum of pre-tax book income, and 2) the cash effective tax rate (*CASH_ETR5*), computed as the five-year sum of cash taxes paid divided by the five-year sum of pre-tax book income less special items.

The three measures of tax avoidance that are based on book-tax differences are: 1) total book-tax differences (*BTD5*), 2) permanent book-tax differences (*PERM_BTD5*), and 3) discretionary permanent book-tax differences (*DTAX5*). We calculate *BTD5* as the sum of total book-tax differences over the five year period ending in year *t*, where total book-tax differences are pre-tax book income less an estimate of taxable income. We calculate *PERM_BTD5* as the

sum of permanent book-tax differences over the five year period ending in year t , where permanent differences are total book-tax differences less deferred tax expense divided by the applicable federal statutory tax rate. We calculate discretionary permanent differences ($DTAX5$) following Frank, Lynch, and Rego (2009). In particular, for each of the five years leading to and including year t , we regress permanent book-tax differences on nondiscretionary items unrelated to tax planning (e.g., state income taxes and minority interest) that are known to cause permanent differences. The residuals from these regressions should reflect permanent differences associated with corporate tax avoidance. $DTAX5$ is the sum of the residuals from these five separate regressions. See Appendix A for details on the regression estimated to calculate $DTAX5$.

Table 2 presents descriptive statistics for the variables predicted to be associated with unrecognized tax benefits. The median sample firm reports positive pre-tax income (PT_ROA) that is almost 9 percent of lagged total assets, has foreign sales that are 21 percent of total sales (FOR_SALE), reports no research and development expense ($R\&D$), and is followed by 16 analysts ($COVERAGE$). The median for each book-tax difference measure (BTD , $PERM_BTD$, and $DTAX$) is positive, the median ETR is 28.9 percent, and the median $CASH_ETR$ is 24.7 percent. Interestingly, the median book-tax difference measures increase when they are summed over a five-year period ($BTD5$, $PERM_BTD5$, and $DTAX5$), and both the median $ETR5$ and median $CASH_ETR5$ decrease to 24.4 percent and 23.4 percent, respectively, when calculated over a five-year period. We calculate the discretionary accrual (DA) and discretionary book-tax difference ($DTAX$) measures based on all *Compustat* firm-years from 1992 through 2007 that have the requisite data to calculate these measures. As a result, the mean DA and $DTAX$ are not

equal to zero for our sample firms despite using residuals from annual cross-sectional regressions.

Panel A of Table 3 presents unscaled descriptive statistics for the FIN 48 data we collected from tax footnotes in the 2007 annual reports of our sample firms. The mean (median) effect of adopting FIN 48 on retained earnings (*CUM_EFF*) was \$3.27 million (\$0.00 million). The mean (median) beginning balance of the contingency for unrecognized tax benefits (*BEG_UTB*) is \$188 million (\$4.3 million). We also collected data for each component of the current year change in unrecognized tax benefits. These change components include increases and decreases related to settlements with tax authorities (*SETTLE*), increases for tax positions related to current year tax positions (*CURR_UTB*), increases and decreases for tax positions related to prior years (*PRIOR_UTB*), and reductions due to lapsed statutes of limitations (*STAT_LIM*). The largest change component is the increase for current year tax positions (*CURR_UTB*), with a mean (median) value of \$24.22 million (\$4.55 million). The second largest change component is changes related to settlements with tax authorities (*SETTLE*), with mean (median) values of -\$13.77 million and (-\$0.70 million). We also note that the mean balance in the liability for unrecognized tax benefits decreased by (\$0.01 million) during the initial disclosure year for the sample firms, while the median balance increased by \$0.30 million. These results are consistent with the average sample firm not experiencing significant changes in unrecognized tax benefits during the first year of FIN 48 disclosures.

Panels B – D of Table 3 present the FIN 48 data scaled by beginning-of-year total assets and partitioned based on quartiles of firm size. We partition the descriptive statistics for the FIN 48 data by size quartile because Blouin et al. (2007) provide evidence of systematic differences in the adoption of FIN 48 by large and small firms. Specifically, they find larger firms were

more likely to release tax contingencies prior to the adoption of FIN 48. Interestingly, we do *not* observe systematic differences in the liability for unrecognized tax benefits as a percentage of total assets across size quartiles. Across all four size quartiles, the median beginning and ending balances in unrecognized tax benefits is approximately 1 percent of total assets. We also observe little variation in the components of the change in unrecognized tax benefits across size quartiles. We note, however, that while the smallest quartile of firms reports a mean increase in unrecognized tax benefits of 1.5 percent of total assets, the mean increase in unrecognized tax benefits is much smaller for larger firms. The largest quartile of firms reports a mean increase in unrecognized tax benefits of just 0.04 percent of total assets.

Panel A of Table 4 presents correlations between each of our 5-year measures of tax avoidance and some of the key FIN 48 data examined in this study. The focus of this bivariate analysis is on the association between the level of unrecognized tax benefits (*END_UTB*) and measures of tax avoidance. Consistent with expectations, we observe a significant (at 5 percent level or better) and negative Pearson (but not Spearman) correlation between the 5-year cash effective tax rate (*CASH_ETR5*) and *END_UTB*. We also observe a significant and positive Pearson and Spearman correlation between the 5-year measure of discretionary book-tax differences (*DTAX5*) and *END_UTB*, and a significant and positive Spearman (but not Pearson) correlation between permanent book-tax differences (*PERM_BTD5*) and *END_UTB*. We do not observe significant Pearson or Spearman correlations between *END_UTB* and the traditional effective tax rate (*ETR5*) or total book-tax differences (*BTD5*). In sum, we observe mixed results when examining the association between the ending balance of unrecognized tax benefits and the 5-year measures of tax avoidance.

Next, we examine the portion of unrecognized tax benefits that management indicates relates to tax positions that, if recognized, would affect the firm's effective tax rate (*UTB_ETR*). We document a significant Pearson (Spearman) correlation between *UTB_ETR* and four (three) of the five-year measures of tax avoidance. These results are consistent with Frischmann et al. (2008) who also document a significant association between this portion of unrecognized tax benefits and both total book-tax differences and the cash effective tax rate.

Panel B of Table 4 examines the associations between *changes* in unrecognized tax benefits and measures of tax avoidance. The focus of this bivariate analysis is on the association between changes in unrecognized tax benefits related to current year tax positions (*CURR_UTB*) and measures of current year tax avoidance. We first examine the relation between increases and decreases in unrecognized tax benefits related to prior year tax positions (*PRIOR_UTB*) and each measure of tax avoidance. We have no clear predictions for how these changes in unrecognized tax benefits would be associated with current year measures of tax avoidance, and we do not observe significant associations between *PRIOR_UTB* and any of the five measures of tax avoidance. However, we do observe a significant and negative Pearson correlation between *PRIOR_UTB* and changes in unrecognized tax benefits related to settlements with tax authorities (*SETTLE*). This negative correlation is consistent with firms that reduce unrecognized tax benefits due to settlements simultaneously rebuilding their tax reserves to facilitate future earnings management. Alternatively, this negative correlation could simply reflect the fact that settlements with tax authorities inform firms how certain tax issues may be resolved in the future. As a consequence, firms revise their unrecognized tax benefits for other tax return years.

We now discuss the correlations between increases and decreases in unrecognized tax benefits related to current year tax positions (*CURR_UTB*) and each measure of tax avoidance.

We find a significant and positive Pearson correlation between our single-year measure of total book-tax differences (*BTD*) and *CURR_UTB*, and a significant and positive Spearman correlation between our single-year measure of permanent book-tax differences (*PERM_BTD*) and *CURR_UTB*. However, neither the Pearson nor Spearman correlations between *CURR_UTB* and *ETR*, *CASH_ETR*, and *DTAX* are significant. Thus, we find mixed results in examining the correlations between changes in unrecognized tax benefits related to current year tax positions and single-year measures of tax avoidance. Interestingly, we do observe significant and negative Pearson and Spearman correlations (-0.136 and -0.249, respectively) between *CURR_UTB* and changes in the tax contingency related to settlements with tax authorities (*SETTLE*). This result suggests that firms increase their unrecognized tax benefits related to current year tax positions to offset reductions in liabilities caused by settlements with tax authorities, consistent with firms maintaining their tax cushions, on average.

Multivariate Analysis of *END_UTB*

We first estimate equation (1) without measures of tax avoidance and instead focus on the firm characteristics hypothesized to be associated with unrecognized tax benefits. The results of this estimation reported in column (1) of Table 5 indicate a significant and positive association between *PT_ROA* and the ending balance of unrecognized tax benefits (*END_UTB*). This result is consistent with our expectation that profitable firms would have the greatest incentive to engage in the type of tax planning that would result in uncertain tax benefits. We also observe a significant and positive association between *FOREIGN_SALE* and *END_UTB*. This result suggests that firms with more extensive foreign operations have more opportunities to engage in tax planning that involves significant uncertainty. Similarly, consistent with the argument that larger firms have more opportunity to engage in complex tax planning transactions, we observe a

positive association between *END_UTB* and *SIZE*. We also observe a significant and positive association between *R&D* and *END_UTB*. This result suggests that firms with greater research and development expenditures engage in more tax planning with a weaker set of underlying facts. The results also indicate a significant and negative association between our measure of discretionary accruals (*DA*) and *END_UTB*. This result is not consistent with a positive association between aggressive financial and tax reporting, and is contrary to results in prior research.¹⁴ Consistent with Song and Tucker (2008), we observe a significant and positive association between leverage (*LEV*) and *END_UTB* and a significant and negative association between sales growth (*SALES_GR*) and *END_UTB*. We do not observe significant relations between the market-to-book ratio (*MTB*), selling, general, and administrative expenditures (*SG&A*), or analyst coverage (*COVERAGE*) and the level of unrecognized tax benefits (*END_UTB*).

Columns (2) – (6) of Table 5 report the results of estimating equation (1) including the 5-year measures of tax avoidance. Consistent with expectations, we find a significant and negative association between *END_UTB* and the 5-year cash effective tax rate. This finding suggests that, on average, firms with a lower cash tax burden also engage in more tax planning with uncertain tax benefits. We do not observe a significant association between *END_UTB* and any of the remaining four cumulative measures of tax avoidance. As discussed previously, this result could reflect managerial opportunism in the accounting for unrecognized tax benefits, which mitigates their usefulness as signals of tax avoidance. Alternatively, this lack of association could be indicative of measurement error in *ETR*, *BTD*, *PERM_BTD*, and *DTAX*, since these measures are

¹⁴ One possible explanation for the observed negative association between discretionary accruals and the level of unrecognized tax benefits is that larger contingencies for unrecognized tax benefits are reflective of more conservative financial reporting and that is why firms with higher levels of unrecognized tax benefits exhibit lower levels of discretionary accruals. However, we leave further investigation of this explanation to future research.

based on reported tax expense, which is directly affected by changes in uncertain tax benefits. As shown in Figure 1, variation in tax aggressiveness *and* financial reporting conservatism across firms interact and cause unrecognized tax benefits to affect measures of tax avoidance in unpredictable ways.

Table 6 presents the results of our estimation of equation (1) substituting the portion of unrecognized tax benefits that, if recognized, would affect the effective tax rate (*ETR_UTB*) as the dependent variable. The results are very similar to those reported in Table 5 for *END_UTB*. Specifically, we find that *ETR_UTB* is positively associated with profitability, the extent of foreign operations, leverage, and the magnitude of research and development expenditures. Also consistent with our *END_UTB* results, we observe a significant and negative association between *CASH_ETR* and *ETR_UTB*. We also observe a significant and positive association between 5-year cumulative permanent book-tax differences (*PERM_BTD*) and *ETR_UTB*. However, none of the coefficients on the other three measures of tax avoidance are significant.

Determinants of *CURR_UTB*

We now shift our focus to examine the association between firm characteristics and the change in unrecognized tax benefits related to current year tax positions (*CURR_UTB*). This amount represents the increase in the liability for unrecognized tax benefits related to tax positions the firm plans to take on current year tax returns. As such, *CURR_UTB* represents current year tax benefits for which management does not believe it is more-likely-than-not the tax position would be sustained upon examination by the relevant tax authority. Thus, we speculate that *CURR_UTB* could serve as a reasonable proxy for current period tax avoidance. Following our analysis of unrecognized tax benefits above, we examine the association between

CURR_UTB and firm characteristics that we predict should be associated with the incentive and ability of the firm to engage in tax avoidance. Specifically, we estimate equation (2) below:

$$\begin{aligned}
 CURR_UTB_t = & \alpha_0 + \alpha_1 PT_ROA_t + \alpha_2 FOR_SALE_t + \alpha_3 SIZE_t + \alpha_4 R\&D_t + \alpha_5 DA_t + \\
 & \alpha_6 LEV_t + \alpha_7 MTB_t + \alpha_8 COVERAGE_t + \alpha_9 SG\&A_t + \alpha_{10} SALES_GR_t + \\
 & \alpha_{11} SETTLE + \alpha_{12} TAX + \varepsilon_{it}
 \end{aligned} \tag{2}$$

We calculate all independent variables in equation (2) consistent with those in equation (1), with the exception of our measures of tax avoidance. Because *CURR_UTB* represents the change in unrecognized tax benefits related to current year tax positions, we calculate single-year measures of tax avoidance (i.e., *ETR*, *CASH_ETR*, *BTD*, *PERM_BTD*, and *DTAX*). We also include current year settlements with tax authorities (*SETTLE*) in equation (2). The descriptive statistics in Tables 3 and 4 suggest that reductions in unrecognized tax benefits related to settlements (*SETTLE*) are accompanied by increases in unrecognized tax benefits related to current year tax returns (*CURR_UTB*). This negative relation between *SETTLE* and *CURR_UTB* is consistent with firms maintaining their tax contingencies as “cookie jar reserves” to facilitate future opportunistic earnings management.¹⁵ In this case, we should find a significant and negative relation between *CURR_UTB* and *SETTLE* in our estimation of equation (2).

The results reported in Table 7 for the *CURR_UTB* regressions are generally consistent with those for the ending balance of unrecognized tax benefits (*END_UTB*). We observe a significant and positive relation between *CURR_UTB* and pre-tax profitability (*PT_ROA*), the extent of foreign operations (*FOR_SALE*), the magnitude of research and development expenditures (*R&D*), and leverage (*LEV*). We also observe a significant and positive association

¹⁵ Alternatively, the negative correlation is also consistent with: 1) firms accruing uncertain tax benefits related to older tax return years in year *t-2*, 2) settling those issues with tax authorities in year *t* (which would appear as a reduction in uncertain tax benefits related tax settlements), and 3) simultaneously increasing uncertain tax benefits related to more recent tax return years, based on information gained in the settlement with tax authorities (which would appear as an increase in uncertain tax benefits related to prior and/or current year tax returns).

between *CURR_UTB* and the magnitude of selling, general, and administrative expenses (*SG&A*). However, *CURR_UTB* is not significantly related to firm size (*SIZE*), discretionary accruals (*DA*), the market-to-book ratio (*MTB*), analyst coverage (*COVERAGE*), sales growth (*SALES_GR*), or settlements (*SETTLE*). Although the coefficients on *SETTLE* are negative as predicted, the t-statistics range from just -1.19 to -1.26.

Notably, none of the coefficients on our measures of tax avoidance are significant in Table 7. Similar to the *END_UTB* analysis, the lack of association between *CURR_UTB* and our measures of tax avoidance could be caused by differing degrees of conservatism in financial and tax reporting across firms (e.g., see Figure 1), or due to the preservation of unrecognized tax benefits as “cookie jar reserves” for future earnings management. We leave it to future research to distinguish between these competing explanations.

V. CONCLUSION

Prior to the adoption of FIN 48, commentators expressed substantial concern that the required tax footnote disclosures would provide a “roadmap” for tax authorities during the audit process. In fact, the magnitudes of the contingencies for unrecognized tax benefits were so large that Congress investigated the FIN 48 disclosures of 30 U.S. companies. Despite these initial concerns, little evidence exists on whether these disclosures provide relevant and/or accurate information about tax avoidance activity. Frischmann et al. (2008) find limited evidence that investors anticipated incremental costs associated with FIN 48 disclosures. Moreover, existing studies provide evidence that managers use their discretion in accounting for tax contingencies to meet key earnings targets. As a consequence, it is not clear whether these contingencies reflect tax avoidance activity.

We find that both the level of unrecognized tax benefits and changes in the liability linked to current year tax positions are related to firm characteristics that prior research has found to be associated with tax avoidance activity. Specifically, we document a positive association between unrecognized tax benefits and pre-tax profitability, firm size, leverage, research and development, and selling, general, and administrative expenditures. Further, we document a significant and negative association between cash effective tax rates and the balance of unrecognized tax benefits at fiscal year-end. Taken together, these results suggest initial FIN 48 disclosures provide some information about the magnitude of firms' tax avoidance activity.

This study is subject to several limitations and we view this paper as an initial step in the process of developing a comprehensive understanding of the new FIN 48 disclosures. Despite the documented association between unrecognized tax benefits and firm characteristics associated with tax avoidance, it is not possible from our current analyses to determine whether these disclosures provide investors with *new* information about firms' tax avoidance activities. Further, we believe a study documenting a direct link between identified cases of tax avoidance and the contingency for unrecognized tax benefits would provide additional evidence these contingencies reflect firms' tax avoidance activities and would make an important contribution to the accounting literature.

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FIGURE 1

Demonstration of the Impact of an Increase in Unrecognized Tax Benefits Related to the Current Year Tax Return (*CURR_UTB*) on Effective Tax Rates (*ETR*) and the Correlation between *CURR_UTB* and *ETR* for Firms with Differing Levels of Conservatism for Both Financial and Tax Reporting Purposes

Panel A: Positive Correlation between *CURR_UTB* and *ETR*

Tax Planning:	Financial Reporting:	<i>Conservative</i>	<i>Moderate</i>	<i>Aggressive</i>
		1	2	3
<i>Conservative:</i>	Pretax Income	\$1,000	\$1,000	\$1,000
	Tax Rate	35%	35%	35%
	Tax Credits	\$100	\$100	\$100
	Tax on Return	\$250	\$250	\$250
	<i>CURR_UTB</i>	100	50	0
	<i>ETR</i>	35%	30%	25%
		4	5	6
<i>Moderate:</i>	Pretax Income	\$1,000	\$1,000	\$1,000
	Tax Rate	35%	35%	35%
	Tax Credits	\$200	\$200	\$200
	Tax on Return	\$150	\$150	\$150
	<i>CURR_UTB</i>	200	100	0
	<i>ETR</i>	35%	25%	15%
		7	8	9
<i>Aggressive:</i>	Pretax Income	\$1,000	\$1,000	\$1,000
	Tax Rate	35%	35%	35%
	Tax Credits	\$300	\$300	\$300
	Tax on Return	\$50	\$50	\$50
	<i>CURR_UTB</i>	300	150	0
	<i>ETR</i>	35%	20%	5%

Firm	<i>CURR_UTB</i>	<i>ETR</i>
1	100	35%
2	50	30%
3	0	25%
4	200	35%
5	100	25%
6	0	15%
7	300	35%
8	150	20%
9	0	5%

Correlation between *CURR_UTB* and *ETR*
= + 65%

Panel B: Negative Correlation between *CURR_UTB* and *ETR*

Tax Planning:	Financial Reporting:	<i>Conservative</i>	<i>Moderate</i>	<i>Aggressive</i>
		1	2	3
<i>Conservative:</i>	Pretax Income	\$1,000	\$1,000	\$1,000
	Tax Rate	35%	35%	35%
	Tax Credits	\$100	\$100	\$100
	Tax on Return	\$250	\$250	\$250
	<i>CURR_UTB</i>	50	25	0
	<i>ETR</i>	30%	28%	25%
		4	5	6
<i>Moderate:</i>	Pretax Income	\$1,000	\$1,000	\$1,000
	Tax Rate	35%	35%	35%
	Tax Credits	\$200	\$200	\$200
	Tax on Return	\$150	\$150	\$150
	<i>CURR_UTB</i>	50	25	0
	<i>ETR</i>	20%	18%	15%
		7	8	9
<i>Aggressive:</i>	Pretax Income	\$1,000	\$1,000	\$1,000
	Tax Rate	35%	35%	35%
	Tax Credits	\$300	\$300	\$300
	Tax on Return	\$50	\$50	\$50
	<i>CURR_UTB</i>	100	50	25
	<i>ETR</i>	15%	10%	8%

Firm	<i>CURR_UTB</i>	<i>ETR</i>
1	50	30%
2	25	28%
3	0	25%
4	50	20%
5	25	18%
6	0	15%
7	100	15%
8	50	10%
9	25	8%

Correlation between *CURR_UTB* and *ETR*
 $\equiv -12\%$

Appendix A: Variable measurement

Measures of tax avoidance activity (capitalized, non-italic variables are *Compustat* acronyms):

BTD = Book income less taxable income scaled by lagged total assets. Book income is pretax income (PI) in year t. Taxable income is calculated by grossing-up the sum of current federal tax expense (TXFED) and current foreign tax expense (TXFO) and subtracting the change in NOL carry forwards (TLCF) in year t. If current federal tax expense is missing, total current tax expense is calculated by subtracting deferred taxes (TXDI), state income taxes (TXS) and other income taxes (TXO) from total income taxes (TXT) in year t.

CASH_ETR = Cash taxes paid (TXPD) divided by pretax net income (PI) minus special items (SPI) in year t.

CASH_ETR5 = *CASH_ETR* calculated over five-year period ending in year t.

ETR = (TXT)/(PI)
Where:
TXT is total income taxes, PI is pre-tax income.

ETR5 = ETR calculated over five-year period ending in year t.

PERM_BTD = Total book-tax differences minus temporary book-tax differences = [{PI – [(TXFED + TXFO) / STR]} – (TXDI / STR)], scaled by beginning of year assets (AT).

DTAX = Residual from the following regression estimated by year and 2-digit SIC code:
$$PERMDIFF_{it} = \alpha_0 + \alpha_1 INTANG_{it} + \alpha_2 UNCON_{it} + \alpha_3 MI_{it} + \alpha_4 CSTE_{it} + \alpha_5 NOL_{it} + \alpha_6 LAGPERM_{it} + \varepsilon_{it}$$

Where:

PERMDIFF = Total book-tax differences– temporary book-tax differences = [{PI – [(TXFED + TXFO) / STR]} – (TXDI / STR)], scaled by beginning of year assets (AT);

STR = Statutory tax rate;

INTANG = Goodwill and other intangibles (INTAN) divided by total assets at year t-1;

UNCON = Income (loss) reported under the equity method (ESUB) divided by total assets at year t- 1;

MI = Income (loss) attributable to minority interest(MII), scaled by beginning of year assets (AT);

CSTE = Current state tax expense(TXS), scaled by beginning of year assets;

ANOL = Change in net operating loss carry forwards (TLCF), scaled by beginning of year assets (AT);

LAGPERM = *PERMDIFF* in year t-1.

BTD5 = Cumulative *BTD* for the past five years ending in year t.

PERM_BTD5 = Cumulative *PERMDIFF* for the past five years ending in year t.

DTAX5 = Cumulative *DTAX* for the past five years ending in year t.

Other firm characteristics (capitalized, non-italic variables are *Compustat* acronyms):

PT_ROA = Pretax income (PI), scaled by beginning of year total assets (AT)

<i>SIZE</i>	= Natural log of total assets (AT)
<i>FOR_SALE</i>	= Sum of foreign sales scaled by total sales. Missing values are coded zero.
<i>DA</i>	= Discretionary accrual calculated using performance adjusted modified Jone's model. We first run the following cross-sectional regression by sic 2-digit industry and year. $TACCR_{it} = \alpha_0 + \alpha_1 1/AT_{it} + \alpha_2 SSA_{it} + \alpha_3 SPPENT_{it} + \alpha_4 ROA_{it} + \varepsilon_{it}$ Where: <i>TACCR</i> = Total accrual using cash flow approach =(IBC-(OANCF-XIDOC)) scaled by lagged assets; <i>SSA</i> = Change in sales minus change in accounts receivable = SALE – lagged sale + RECCH scaled by lagged assets; <i>SPPENT</i> =Net value of property plan and equipment= PPENT scaled by lagged assets; <i>ROA</i> = Return on asset; Then, we use the estimated coefficients from the above regression to calculate expected accrual. Discretionary accrual is actual accrual minus expected accrual.
<i>LEV</i>	= (DLTT+DLC) scaled by lagged assets.
<i>R&D</i>	= Research and development expense (XRD).
<i>MTB</i>	= Market to book ratio calculated as (CSHO*PRCC_F)/CEQ.
<i>COVERAGE</i>	= number of analysts following the firm.
<i>INDUS</i>	= Indicator variable for two-digit SIC industry code.
<i>SG&A</i>	= XSGA scaled by lagged assets.
<i>SALES GR</i>	= Three-year average change in sales.

FIN 48 data:

<i>CUM_EFF</i>	= Cumulative effect of FIN 48 adoption on retained earnings scaled by lagged assets.
<i>BEG_UTB</i>	= Beginning gross unrecognized tax benefits scaled by lagged assets.
<i>PRIOR_UTB</i>	= Change in unrecognized tax benefits related to prior year tax positions scaled by lagged assets.
<i>CURR_UTB</i>	= Change in unrecognized tax benefits related to current year tax positions scaled by lagged assets.
<i>SETT</i>	= Change in unrecognized tax benefits related to settlements with tax authorities scaled by lagged assets.
<i>STAT_LIM</i>	= Change in unrecognized tax benefits related to the expiration of statute of limitations scaled by lagged assets.
<i>OTHER</i>	= Other changes in unrecognized tax benefits scaled by lagged assets.
<i>END_UTB</i>	= Ending gross unrecognized tax benefits scaled by lagged assets.
<i>ETR_UTB</i>	= Portion that would affect the effective tax rate if recognized, scaled by lagged assets.
<i>TOT_ACC</i>	= Contingency for tax related interest and penalties, scaled by lagged assets.
<i>SIG_CHG</i>	= Anticipated significant changes in unrecognized tax benefits during the next 12 months, scaled by lagged assets.

Table 1: Sample Selection Procedure

	Firm Observations
All firms listed on either the S&P 500 or S&P 400 Index	900
<u>Less:</u>	
Firms that had not yet made initial FIN 48 disclosures*	(235)
Firms with insufficient financial data**	(87)
Sample firms for UTB analysis	578

* Firms were required to adopt FIN 48 for fiscal years beginning after December 15, 2006. As a result, at the time this data was collected most of the firms making initial FIN 48 disclosures in their annual reports were calendar year-end firms.

** This includes firms in industry-years with less than the 15 observations required to run regressions for estimating the DTAX variable.

Table 2: Descriptive statistics for variables predicted to be associated with unrecognized tax benefits

Variable	N	Mean	Median	Std Dev	Q1	Q3
<i>PT_ROA</i>	597	0.100	0.087	0.111	0.042	0.151
<i>SIZE</i>	597	8.368	8.279	1.291	7.456	9.219
<i>FOR_SALE</i>	597	0.290	0.214	0.297	0.000	0.501
<i>R&D</i>	597	0.026	0.000	0.051	0.000	0.028
<i>DA</i>	581	-0.019	-0.014	0.076	-0.058	0.019
<i>LEV</i>	597	0.232	0.197	0.200	0.074	0.325
<i>MTB</i>	597	3.685	2.429	4.669	1.585	3.918
<i>COVERAGE</i>	597	16.241	16.000	8.584	10.000	22.000
<i>SG&A</i>	581	0.193	0.146	0.193	0.023	0.294
<i>SALES_GR</i>	579	0.119	0.090	0.143	0.042	0.172
<i>ETR</i>	597	0.258	0.289	0.252	0.185	0.350
<i>CASH_ETR</i>	597	0.238	0.247	0.235	0.119	0.329
<i>BTD</i>	597	0.024	0.023	0.060	0.003	0.049
<i>PERM_BTD</i>	597	0.017	0.016	0.071	0.001	0.041
<i>DTAX</i>	597	0.033	0.006	0.311	-0.032	0.064
<i>ETR5</i>	590	0.246	0.244	0.221	0.152	0.324
<i>CASH_ETR5</i>	597	0.219	0.234	0.225	0.150	0.307
<i>BTD5</i>	582	0.129	0.106	0.201	0.025	0.209
<i>PERM_BTD5</i>	582	0.041	0.046	0.217	-0.009	0.127
<i>DTAX5</i>	577	0.250	0.062	0.896	-0.086	0.645

All variables are as defined in Appendix A.

Table 3: Descriptive for FIN 48 footnote data

Panel A: Full sample – in millions

Variable	N	Mean	Median	Std Dev	Q1	Q3
<i>CUM_EFF</i>	336	3.276	0.000	22.227	-1.850	0.000
<i>BEG_UTB</i> (in billions)	597	0.188	0.043	0.442	0.013	0.137
<i>PRIOR_UTB</i>	597	-1.240	0.045	37.977	-2.200	5.700
<i>CURR_UTB</i>	597	24.219	4.552	63.395	0.853	16.920
<i>SETTLE</i>	596	-13.769	-0.700	42.482	-6.001	0.000
<i>STAT_LIM</i>	597	-3.226	-0.242	8.319	-2.100	0.000
<i>OTHER</i>	597	2.043	0.000	13.214	0.000	0.000
<i>END_UTB</i> (in billions)	597	0.187	0.046	0.430	0.014	0.138
<i>ETR_UTB</i> (in billions)	565	0.109	0.025	0.256	0.007	0.086
<i>TOT_ACC</i>	566	30.966	6.282	78.243	1.700	20.000
<i>SIG_CHG</i>	506	-1.467	0.000	30.132	0.000	0.000

Panel B: Descriptive statistics – scaled by beginning total assets and split into quartiles based on firm size: Quartile 1 (smallest firms)

Variable	N	Mean	Median	Std Dev	Q1	Q3
<i>CUM_EFF</i>	131	-0.0010	-0.0001	0.0030	-0.0015	0.0000
<i>BEG_UTB</i>	145	0.0167	0.0098	0.0200	0.0048	0.0198
<i>PRIOR_UTB</i>	145	0.0009	0.0001	0.0036	-0.0001	0.0010
<i>CURR_UTB</i>	145	0.0025	0.0012	0.0034	0.0003	0.0031
<i>SETTLE</i>	144	-0.0011	0.0000	0.0030	-0.0011	0.0000
<i>STAT_LIM</i>	145	-0.0007	-0.0001	0.0016	-0.0007	0.0000
<i>OTHER</i>	145	0.0002	0.0000	0.0014	0.0000	0.0000
<i>END_UTB</i>	145	0.0182	0.0093	0.0217	0.0057	0.0213
<i>ETR_UTB</i>	145	0.0124	0.0067	0.0170	0.0035	0.0131
<i>TOT_ACC</i>	140	0.0028	0.0017	0.0042	0.0005	0.0036
<i>SIG_CHG</i>	118	-0.0013	0.0000	0.0032	-0.0015	0.0000

Panel B: Quartile 2

Variable	N	Mean	Median	Std Dev	Q1	Q3
<i>CUM_EFF</i>	108	0.0001	0.0000	0.0041	-0.0009	0.0000
<i>BEG_UTB</i>	149	0.0143	0.0109	0.0149	0.0050	0.0179
<i>PRIOR_UTB</i>	149	0.0004	0.0000	0.0034	-0.0006	0.0009
<i>CURR_UTB</i>	149	0.0021	0.0011	0.0030	0.0002	0.0025
<i>SETTLE</i>	149	-0.0009	-0.0001	0.0024	-0.0007	0.0000
<i>STAT_LIM</i>	149	-0.0007	-0.0001	0.0015	-0.0006	0.0000
<i>OTHER</i>	149	0.0001	0.0000	0.0011	0.0000	0.0000

<i>END_UTB</i>	149	0.0151	0.0116	0.0157	0.0051	0.0187
<i>ETR_UTB</i>	142	0.0111	0.0062	0.0143	0.0023	0.0141
<i>TOT_ACC</i>	143	0.0028	0.0017	0.0041	0.0007	0.0031
<i>SIG_CHG</i>	118	-0.0013	0.0000	0.0040	-0.0013	0.0000

Panel C: Quartile 3

Variable	N	Mean	Median	Std Dev	Q1	Q3
<i>CUM_EFF</i>	61	0.0004	0.0000	0.0030	-0.0001	0.0006
<i>BEG_UTB</i>	145	0.0125	0.0089	0.0132	0.0030	0.0173
<i>PRIOR_UTB</i>	145	-0.0001	0.0000	0.0030	-0.0003	0.0010
<i>CURR_UTB</i>	145	0.0019	0.0009	0.0028	0.0001	0.0025
<i>SETTLE</i>	145	-0.0011	-0.0002	0.0029	-0.0009	0.0000
<i>STAT_LIM</i>	145	-0.0005	0.0000	0.0012	-0.0004	0.0000
<i>OTHER</i>	145	0.0002	0.0000	0.0014	0.0000	0.0000
<i>END_UTB</i>	145	0.0128	0.0097	0.0136	0.0030	0.0163
<i>ETR_UTB</i>	136	0.0085	0.0055	0.0102	0.0016	0.0113
<i>TOT_ACC</i>	135	0.0024	0.0015	0.0030	0.0005	0.0035
<i>SIG_CHG</i>	127	-0.0001	0.0000	0.0027	0.0000	0.0000

Panel D: Quartile 4 (largest firms)

Variable	N	Mean	Median	Std Dev	Q1	Q3
<i>CUM_EFF</i>	30	0.0017	0.0001	0.0037	0.0000	0.0011
<i>BEG_UTB</i>	146	0.0153	0.0095	0.0171	0.0034	0.0222
<i>PRIOR_UTB</i>	146	-0.0002	0.0000	0.0027	-0.0006	0.0006
<i>CURR_UTB</i>	146	0.0020	0.0009	0.0029	0.0002	0.0024
<i>SETTLE</i>	146	-0.0014	-0.0003	0.0032	-0.0013	0.0000
<i>STAT_LIM</i>	146	-0.0002	0.0000	0.0003	-0.0002	0.0000
<i>OTHER</i>	146	0.0001	0.0000	0.0014	0.0000	0.0000
<i>END_UTB</i>	146	0.0157	0.0093	0.0172	0.0035	0.0221
<i>ETR_UTB</i>	133	0.0091	0.0050	0.0117	0.0013	0.0130
<i>TOT_ACC</i>	137	0.0025	0.0012	0.0041	0.0002	0.0033
<i>SIG_CHG</i>	132	0.0000	0.0000	0.0032	0.0000	0.0000

All variables are as defined in Appendix A.

Table 4: Panel A - Pearson (upper diagonal) and Spearman (lower diagonal) correlation coefficients between five-year measures of tax aggressiveness and FIN 48 data.

Variable	<i>CUM_EFF</i>	<i>END_UTB</i>	<i>ETR_UTB</i>	<i>BTD5</i>	<i>CASH_ETR5</i>	<i>ETR5</i>	<i>PERM_BTD5</i>	<i>DTAX5</i>
<i>CUM_EFF</i>	1.000	0.097 (0.080)	0.139 (0.013)	-0.079 (0.158)	-0.086 (0.121)	0.084 (0.131)	0.017 (0.767)	0.025 (0.657)
<i>END_UTB</i>	-0.048 (0.385)	1.000	0.844 (0.000)	0.047 (0.264)	-0.131 (0.002)	-0.074 (0.077)	0.076 (0.072)	0.117 (0.006)
<i>ETR_UTB</i>	-0.044 (0.431)	0.864 (0.000)	1.000	0.090 (0.037)	-0.120 (0.005)	0.0105 (0.796)	0.169 (0.000)	0.146 (0.001)
<i>BTD5</i>	-0.069 (0.221)	0.043 (0.311)	0.066 (0.127)	1.000	-0.240 (0.000)	-0.064 (0.126)	0.169 (0.000)	0.273 (0.000)
<i>CASH_ETR5</i>	-0.060 (0.281)	-0.023 (0.586)	0.020 (0.647)	-0.385 (0.000)	1.000	0.085 (0.041)	-0.002 (0.970)	-0.123 (0.004)
<i>ETR5</i>	0.006 (0.912)	-0.071 (0.088)	-0.122 (0.003)	-0.220 (0.000)	0.349 (0.000)	1.000	0.139 (0.001)	-0.145 (0.001)
<i>PERM_BTD5</i>	-0.013 (0.819)	0.124 (0.003)	0.218 (0.000)	0.241 (0.000)	-0.102 (0.016)	-0.351 (0.000)	1.000	-0.214 (0.000)
<i>DTAX5</i>	0.032 (0.571)	0.166 (0.000)	0.132 (0.002)	0.234 (0.000)	-0.207 (0.000)	-0.176 (0.000)	-0.207 (0.000)	1.000

P-values are given in parenthesis and values that are significant at 5% level are bolded. All variables are as defined in Appendix A and FIN 48 variables are scaled by lagged assets.

Table 4: Panel B - Pearson (upper diagonal) and Spearman (lower diagonal) correlation coefficients between five-year measures of tax aggressiveness and FIN 48 data.

Variable	<i>PRIOR_UTB</i>	<i>CURR_UTB</i>	<i>SETTLE</i>	<i>BTD</i>	<i>CASH_ETR</i>	<i>ETR</i>	<i>PERM_BTD</i>	<i>DTAX</i>
<i>PRIOR_UTB</i>	1.000	0.062	-0.148	-0.025	-0.016	-0.001	0.021	-0.007
		(0.137)	(0.000)	(0.542)	(0.706)	(0.988)	(0.616)	(0.864)
<i>CURR_UTB</i>	0.073	1.000	-0.136	0.084	0.063	0.011	0.070	-0.027
	(0.079)		(0.001)	(0.044)	(0.128)	(0.794)	(0.090)	(0.508)
<i>SETTLE</i>	-0.042	-0.249	1.000	-0.092	-0.066	0.014	0.014	-0.040
	(0.318)	(0.000)		(0.027)	(0.110)	(0.732)	(0.736)	(0.337)
<i>BTD</i>	-0.009	0.056	-0.056	1.000	-0.071	0.043	0.055	0.389
	(0.827)	(0.181)	(0.181)		(0.089)	(0.301)	(0.189)	(0.000)
<i>CASH_ETR</i>	-0.022	0.066	-0.158	-0.244	1.000	0.084	0.001	-0.018
	(0.595)	(0.111)	(0.000)	(0.000)		(0.043)	(0.989)	(0.663)
<i>ETR</i>	-0.044	-0.080	0.023	-0.163	0.323	1.000	0.100	0.004
	(0.286)	(0.054)	(0.586)	(0.000)	(0.000)		(0.016)	(0.924)
<i>PERM_BTD</i>	0.026	0.190	0.042	0.199	-0.085	-0.273	1.000	-0.345
	(0.528)	(0.000)	(0.313)	(0.000)	(0.041)	(0.000)		(0.000)
<i>DTAX</i>	-0.008	0.053	-0.080	0.264	0.000	-0.090	-0.200	1.000
	(0.843)	(0.204)	(0.053)	(0.000)	(0.997)	(0.030)	(0.000)	

P-values are given in parenthesis and values that are significant at 5% level are bolded. All variables are as defined in Appendix A and FIN 48 variables are scaled by lagged assets.

Table 5: Firm characteristics and the ending balance of unrecognized tax benefits

	<i>END_UTB</i>			<i>END_UTB</i>			<i>END_UTB</i>		
	(1)			(2)			(3)		
		Coeff	t-stat		Coeff	t-stat		Coeff	t-stat
INTERCEPT	?	-4.749	-2.89***	?	-4.974	-2.84***	?	-4.337	-2.66***
<i>PT_ROA</i>	+	0.025	2.73***	+	0.027	3.00***	+	0.025	2.70***
<i>SIZE</i>	+	0.001	1.85*	+	0.001	1.46	+	0.001	2.03**
<i>FOR_SALE</i>	+	0.012	4.10***	+	0.011	3.96***	+	0.012	4.09***
<i>R&D</i>	+	0.090	3.53***	+	0.093	3.64***	+	0.086	3.44***
<i>DA</i>	+	-0.030	-2.72***	+	-0.032	-2.79**	+	-0.031	-2.75***
<i>LEV</i>	-	0.007	1.73*	-	0.007	1.69*	-	0.007	1.72*
<i>MTB</i>	-	0.000	0.49	-	0.000	-0.42	-	0.000	-0.04
<i>COVERAGE</i>	-	0.000	-0.46	-	0.000	-0.47	-	0.000	-0.50
<i>SG&A</i>	+	0.009	1.58	+	0.010	1.72*	+	0.009	1.69*
<i>SALES_GR</i>	-	-0.011	-1.95*	-	-0.011	-1.83*	-	-0.011	-2.00**
<i>ETR5</i>	-			-	-0.004	-1.25	-		
<i>CASH_ETR5</i>	-			-			-	-0.007	-1.67*
Observations		579			574			579	
R-square		58.24%			58.30%			58.50%	
	<i>END_UTB</i>			<i>END_UTB</i>			<i>END_UTB</i>		
	(4)			(5)			(6)		
		Coeff	t-stat		Coeff	t-stat		Coeff	t-stat
INTERCEPT	?	-4.965	-2.85***	?	-4.902	-2.84***	?	-4.876	-2.77***
<i>PT_ROA</i>	+	0.027	2.86***	+	0.021	2.09**	+	0.025	2.80***
<i>SIZE</i>	+	0.001	1.43	+	0.001	1.39	+	0.001	1.38
<i>FOR_SALE</i>	+	0.012	4.00***	+	0.011	3.83***	+	0.013	4.26***
<i>R&D</i>	+	0.091	3.57***	+	0.091	3.62***	+	0.085	3.24***
<i>DA</i>	+	-0.033	-2.85***	+	-0.034	-2.96***	+	-0.036	-3.08***
<i>LEV</i>	-	0.007	1.72*	-	0.008	1.83*	-	0.007	1.66*
<i>MTB</i>	-	0.000	-0.43	-	0.000	-0.42	-	0.000	-0.26
<i>COVERAGE</i>	-	0.000	-0.48	-	0.000	-0.51	-	0.000	-0.44
<i>SG&A</i>	+	0.009	1.60	+	0.008	1.50	+	0.009	1.53
<i>SALES_GR</i>	-	-0.011	-1.87*	-	-0.010	-1.71*	-	-0.009	-1.55
<i>BTD5</i>	+	-0.002	-0.39	+			+		
<i>PERM_BTD5</i>	-			-	0.006	1.14	-		
<i>DTAX5</i>	-			-			-	0.000	-0.28
Observations		566			566			560	
R-square		58.14%			58.35%			57.71%	

This table presents results of cross-sectional OLS regressions for the tax aggressiveness and ending gross unrecognized tax benefits. Fixed effects for 2-digit SIC codes are included in the regressions, but not tabulated. All other variables are calculated as defined in appendix 1 and scaled by lagged assets except *DTAX* and *DA*. T-statistics with White's heteroskedasticity-corrected standard error are presented. Asterisks *, **, and *** denote one-tailed statistical significance at 10%, 5%, and 1% respectively.

Table 6: Firm characteristics and the portion of unrecognized tax benefits that would affect the effective tax rate, if recognized.

	<i>ETR_UTB</i> (1)			<i>ETR_UTB</i> (2)			<i>ETR_UTB</i> (3)		
		Coeff	t-stat		Coeff	t-stat		Coeff	t-stat
INTERCEPT	?	-3.126	-2.22**	?	-3.480	-2.37**	?	-2.749	-1.96*
<i>PT_ROA</i>	+	0.026	3.02***	+	0.027	3.13***	+	0.026	3.00***
<i>SIZE</i>	+	0.001	1.51	+	0.001	1.13	+	0.001	1.70*
<i>FOR_SALE</i>	+	0.009	4.12***	+	0.009	3.90***	+	0.009	4.12***
<i>R&D</i>	+	0.106	4.46***	+	0.109	4.56***	+	0.102	4.35***
<i>DA</i>	+	-0.014	-1.33	+	-0.011	-1.03	+	-0.014	-1.36
<i>LEV</i>	-	0.009	2.25**	-	0.008	2.10**	-	0.009	2.21**
<i>MTB</i>	-	0.000	0.12	-	0.000	-0.33	-	0.000	-0.47
<i>COVERAGE</i>	-	0.000	-0.76	-	0.000	-0.87	-	0.000	-0.80
<i>SG&A</i>	+	0.008	1.52	+	0.009	1.63	+	0.009	1.60
<i>SALES_GR</i>	-	-0.007	-1.30	-	-0.007	-1.25	-	-0.008	-1.34
<i>ETR5</i>	-			-	-0.002	-0.77	-		
<i>CASH_ETR5</i>	-			-			-	-0.006	-1.69*
Observations		550			545			550	
R-square		54.20%			53.96%			54.54%	
	<i>ETR_UTB</i> (4)			<i>ETR_UTB</i> (5)			<i>ETR_UTB</i> (6)		
		Coeff	t-stat		Coeff	t-stat		Coeff	t-stat
INTERCEPT	?	-3.311	-2.25**	?	-3.275	-2.29**	?	-3.243	-2.18**
<i>PT_ROA</i>	+	0.025	2.78***	+	0.015	1.69*	+	0.026	3.03***
<i>SIZE</i>	+	0.000	0.98	+	0.000	1.20	+	0.000	0.93
<i>FOR_SALE</i>	+	0.009	3.91***	+	0.009	3.70***	+	0.010	4.12***
<i>R&D</i>	+	0.108	4.57***	+	0.111	4.90***	+	0.101	4.20***
<i>DA</i>	+	-0.012	-1.07	+	-0.016	-1.51	+	-0.014	-1.17
<i>LEV</i>	-	0.009	2.12**	-	0.010	2.57**	-	0.008	2.00**
<i>MTB</i>	-	0.000	-0.27	-	0.000	-0.40	-	0.000	-0.21
<i>COVERAGE</i>	-	0.000	-0.80	-	0.000	-1.02	-	0.000	-0.81
<i>SG&A</i>	+	0.008	1.55	+	0.006	1.29	+	0.008	1.50
<i>SALES_GR</i>	-	-0.007	-1.24	-	-0.005	-0.87	-	-0.006	-0.98
<i>BTD5</i>	+	0.002	0.61	+			+		
<i>PERM_BTD5</i>	-			-	0.012	2.76***	-		
<i>DTAX5</i>	-			-			-	0.000	0.39
Observations		537			537			531	
R-square		54.09%			55.83%			53.82%	

This table presents results of cross-sectional OLS regressions for the tax aggressiveness and the portion of unrecognized tax benefits that would affect the effective tax rate if recognized. Fixed effects for 2-digit SIC codes are included in the regressions, but not tabulated. All other variables are calculated as defined in appendix 1 and scaled by lagged assets except *DTAX* and *DA*. T-statistics with White's heteroskedasticity-corrected standard error are presented. Asterisks *, **, and *** denote one-tailed statistical significance at 10%, 5%, and 1% respectively.

Table 7: Firm characteristics and the change in unrecognized tax benefits related to current year tax positions

	<i>CURR_UTB</i>			<i>CURR_UTB</i>			<i>CURR_UTB</i>		
	(1)			(2)			(3)		
		Coeff	t-stat		Coeff	t-stat		Coeff	t-stat
INTERCEPT	?	-0.634	-1.79*	?	-0.628	-1.78*	?	-0.681	-2.00**
<i>PT_ROA</i>	+	0.008	4.40***	+	0.008	4.30***	+	0.007	4.20***
<i>SIZE</i>	+	0.000	1.02	+	0.000	1.01	+	0.000	0.70
<i>FOR_SALE</i>	+	0.001	2.47**	+	0.001	2.46**	+	0.001	2.51**
<i>R&D</i>	+	0.016	3.90***	+	0.016	3.89***	+	0.016	3.88***
<i>DA</i>	+	-0.001	-0.56	+	-0.001	-0.55	+	-0.001	-0.68
<i>LEV</i>	-	0.002	1.83*	-	0.002	1.82*	-	0.002	1.87*
<i>MTB</i>	-	0.000	0.20	-	0.000	0.19	-	0.000	0.31
<i>COVERAGE</i>	-	0.000	0.52	-	0.000	0.51	-	0.000	0.59
<i>SG&A</i>	+	0.002	1.65*	+	0.002	1.65*	+	0.002	1.71*
<i>SALES_GR</i>	-	0.000	-0.31	-	0.000	-0.32	-	0.000	-0.24
<i>SETTLE</i>	-	-0.078	-1.24	-	-0.078	-1.23	-	-0.075	-1.19
<i>ETR</i>	-			-	0.000	-0.19	-		
<i>CASH_ETR</i>	-			-			-	0.001	1.27
Observations		578			578			578	
R-square		48.53%			48.73%			48.70%	
	<i>CURR_UTB</i>			<i>CURR_UTB</i>			<i>CURR_UTB</i>		
	(4)			(5)			(6)		
		Coeff	t-stat		Coeff	t-stat		Coeff	t-stat
INTERCEPT	?	-0.656	-1.84*	?	-0.646	-1.83*	?	-0.647	-1.83*
<i>PT_ROA</i>	+	0.008	3.97***	+	0.008	4.13***	+	0.008	4.45***
<i>SIZE</i>	+	0.000	1.05	+	0.000	1.05	+	0.000	1.15
<i>FOR_SALE</i>	+	0.001	2.50**	+	0.001	2.53**	+	0.001	2.61***
<i>R&D</i>	+	0.017	3.91***	+	0.016	3.87***	+	0.016	3.9***
<i>DA</i>	+	-0.001	-0.51	+	-0.001	-0.53	+	-0.001	-0.56
<i>LEV</i>	-	0.002	1.89*	-	0.001	1.73*	-	0.002	2.12**
<i>MTB</i>	-	0.000	0.16	-	0.000	0.26	-	0.000	0.15
<i>COVERAGE</i>	-	0.000	0.48	-	0.000	0.45	-	0.000	0.40
<i>SG&A</i>	+	0.002	1.62	+	0.002	1.62	+	0.002	1.64
<i>SALES_GR</i>	-	0.000	-0.32	-	0.000	-0.36	-	0.000	-0.37
<i>SETTLE</i>	-	-0.079	-1.26	-	-0.077	-1.25	-	-0.079	-1.22
<i>BTD</i>	-	-0.001	-0.49	-			-		
<i>PERM_BTD</i>	-			-	-0.002	-0.68	-		
<i>DTAX</i>	+			+			+	-0.001	-1.58
Observations		578			578			578	
R-square		48.47%			48.51%			48.82%	

This table presents results of cross-sectional OLS regressions for the tax aggressiveness and the change in unrecognized tax benefits related to current year tax positions. Fixed effects for 2-digit SIC codes are included in the regressions, but not tabulated. All other variables are calculated as defined in appendix 1 and scaled by lagged assets except *DTAX* and *DA*. T-statistics with White's heteroskedasticity-corrected standard error are presented. Asterisks *, **, and *** denote one-tailed statistical significance at 10%, 5%, and 1% respectively.