ANALYST COVERAGE AND TAX REPORTING AGGRESSIVENESS

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ABSTRACT

The role of analysts in corporate governance has been examined extensively in the accounting literature. Two conflicting representations of the influence of analysts have emerged. Analysts are either viewed as external monitors of corporate behavior, thereby reducing agency costs; or they are viewed as exerting additional pressure on management to meet earnings forecasts, which may contribute to aggressive corporate behavior. Studies exist that examine the impact of analyst coverage in a financial reporting context. The purpose of this study is to examine the role of analysts in the corporate tax reporting context.

This dissertation examines the impact of analyst coverage on corporate tax aggressiveness using a cross-section of publicly traded firms between 1992 and 2006. Permanent discretionary book-tax differences are used to proxy for tax aggressiveness. The relation is examined using ordinary least squares regression as well as two-stage least squares regression using expected coverage and inclusion in the S&P 500 index as instrumented variables to account for the endogeneity of analyst coverage selections. Additional analyses investigate the impact of analyst characteristics: experience as an analyst, experience covering a specific firm and identification as a top analyst.

Results indicate that analyst coverage is associated with lower levels of tax aggressiveness. This finding suggests that analysts serve as external monitors of corporate tax behavior. In addition, more experienced analysts are associated with lower levels of tax

aggressiveness indicating an improvement in monitoring ability with experience. Analysts identified as All-American analysts by *Institutional Investor* magazine are associated with higher levels of tax aggressiveness. This result suggests that top analysts may view aggressive tax behavior as a wealth creation tool for firms.

DEDICATION

This dissertation is dedicated to my wonderful family and friends. Thank you for your love and support. Without it, this accomplishment would not have been possible.

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No one who achieves success does so without the help of others. The wise and confident acknowledge this help with gratitude.

-- Alfred North Whitehead

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CHAPTER ONE

INTRODUCTION

Many firms engage in both earnings management and aggressive tax behavior to achieve certain desired financial results, as evidenced by the incidence of corporate fraud and known tax shelter participation. Managers are frequently viewed as striving to meet consensus analyst forecasts (Degeorge et al. 1999) which is a strong argument for analysts exerting undue pressure on management. However, research by Yu (2008) finds that analysts can serve as external monitors of financial reporting based on the association between analyst coverage and lower levels of financial earnings management. Even if analyst coverage moderates financial earnings management, management continues to have an incentive to meet consensus analyst forecasts. Tax aggressiveness remains a viable option for managers to achieve this goal.[1]

The existence of these two conflicting representations of analyst influence leaves unanswered the question of what role analysts serve in the realm of corporate tax behavior. In the extant literature, analysts are either viewed as external monitors of corporate behavior, thereby reducing agency costs (Healy and Palepu 2001; Jensen and Meckling 1976); or they are viewed as exerting additional pressure on management to meet earnings forecasts (Degeorge et al. 1999). Analysts can be uniquely qualified to serve as external monitors because they have extensive training in finance and experience in analyzing and interpreting financial information. Analysts can also be instrumental in detecting corporate fraud (Dyck et al. 2006). However, managers often perceive analysts as a primary factor in the determination of their share price

[1] As in Frank et al. (2009), tax aggressiveness is defined as utilizing tax planning to lower taxable income. These planning activities may or may not be considered tax evasion and may not be opposed by the IRS, but are still considered aggressive. These activities may include the use of tax shelters, transfer pricing, the use of flow-through entities in structured transactions, etc.

(Graham et al. 2005) and firms pay a stiff penalty in the market for failing to meet consensus analyst forecasts (Skinner and Sloan 2002).

Given these different roles ascribed to analysts by the existing literature, analysts can be viewed as either serving as external monitors of aggressive tax behavior or as exerting undue pressure on management to meet earnings targets through aggressive tax reporting. It is conceivable that the skill set of financial analysts extends into the realm of tax reporting, which would allow them to monitor the tax behavior of management. Alternatively, it is possible that financial analysts have little training and experience in analyzing tax reporting, and thus, are not well qualified to handle complicated tax issues. Indeed, Plumlee (2003) finds that analysts were able to incorporate less complex tax law changes into forecasts of effective tax rates but were not able to incorporate more complex tax law changes. Moreover, research by Shane and Stock (2006) finds that analysts are unable to detect tax motivated income shifting, indicating that analysts may not be as skilled at monitoring aggressive tax behavior as they are at monitoring financial reporting aggressiveness. This can present management with an opportunity to engage in more aggressive tax reporting to meet analysts' forecasts. Thus, the role of financial analysts with respect to corporate tax behavior remains uncertain.

It is possible that firms are less tax aggressive because analysts serve as external monitors. However, an alternative explanation is that analysts opt to cover firms that are less tax aggressive which presents endogeneity issues. Research demonstrates that analysts cover firms with a better information environment (Bhushan 1989; Francis et al. 1998; Lang and Lundholm 1996). Thus, when examining the impact of analyst coverage on financial earnings management and tax aggressiveness, it is important to develop a research design that accounts for

endogeneity. Yu (2008) provides a relevant solution to this situation by demonstrating an instrumental variables approach to capture exogenous variation in analyst coverage.

Although Yu (2008) addresses the endogeneity associated with levels of analyst coverage, the typical measurements of tax aggressiveness (effective tax rates, cash effective tax rates, total book-tax differences) are based on variables that could be indicative of either tax aggressiveness or financial earnings management. This makes it problematic to determine which behavior is driving the results and could produce spurious results in a test of the impact of analyst coverage on tax aggressiveness. Research by Frank et al. (2009) provides a measure of tax aggressiveness that directly addresses this issue. This measure is based on discretionary permanent book-tax differences, and thus excludes pre-tax earnings adjustments, thereby isolating tax aggressiveness from financial earnings management. Moreover, Frank et al. (2009) surmise that the cost of aggressive tax behavior is not sufficiently high to prevent managers from engaging in both financial and tax aggressive behavior. It is conceivable that financial analysts fill this gap.

To provide insight into this issue, this study examines the ability of analysts to serve as external monitors of corporate tax behavior using a sample of publicly traded firms during the period 1992-2006. The primary approach is to examine the relation between analyst coverage and tax aggressiveness using discretionary permanent book-tax differences as measured by Frank et al. (2009), which should reduce the likelihood of spurious results. An instrumental variables approach similar to Yu (2008) is utilized to account for the endogeneity of analyst coverage selections. Specifically, (1) expected coverage of a firm with a contraction in the size of the covering brokerage house and (2) inclusion in the Standard & Poor's 500 index are utilized as

exogenous variations in analyst coverage. Additionally, the impact of analyst experience and brokerage house prestige on the ability to monitor tax reporting behavior is examined.

This study contributes to the extant literature by examining the role of analysts in corporate tax reporting. This sheds light on whether analysts are associated with lower levels of tax aggressiveness or if the presence of analysts exerts enough pressure to cause management to be more aggressive in their tax reporting behavior to achieve their desired financial results. The results of this study indicate that analyst coverage is associated with lower levels of tax aggressiveness. The results hold using ordinary least squares regression and two-stage least squares regression using expected coverage and S&P 500 inclusion as instrumented variables as well as institutional ownership control variables. This indicates that analysts serve as external monitors of corporate tax behavior. In addition, experienced analysts are associated with lower levels of tax aggressiveness, indicating that monitoring ability improves with experience as an analyst and experience covering a specific firm. In contrast, top analysts are associated with higher levels of discretionary permanent book-tax differences. This may be due to the fact that top analysts view aggressive tax behavior as a means to lower the overall tax burden of a corporation and thus serves as a wealth creating tool. This result builds on the findings in Wilson (2009) indicating tax sheltering in the presence of strong corporate governance results in wealth creation through positive abnormal returns. These results highlight the ability of analysts to serve in a corporate governance role in corporate tax behavior.

The remainder of this paper is organized as follows. In Section 2, I review the relevant literature and develop hypotheses. Section 3 describes the sample selection process and measurement of tax aggressiveness. Section 4 describes the research design implemented to test

the hypotheses. In Section 5, I explore specific characteristics of analysts. Finally, Section 6 discusses contributions, limitations and future research.

CHAPTER TWO

LITERATURE REVIEW AND DEVELOPMENT OF HYPOTHESES

2.1 Literature Review

2.1.1 Tax Aggressiveness

Aggressive tax behavior is problematic and on the rise. The difference between financial and taxable income continues to grow (Manzon and Plesko 2002; Mills et al. 2002; Plesko 2004). Effective tax rates have declined over time (Yin 2003) and firms have lowered their projected effective tax rates in the fourth quarter to meet analysts' forecasts (Dhaliwal et al. 2004). Firms find ways to report higher financial earnings without affecting taxable income or decreasing taxable income without affecting financial reporting income, causing an increase in book-tax differences (Hanlon et al. 2005; Phillips et al. 2003; Shackelford and Shevlin 2001). As a specific example of reporting higher financial income than taxable income, Hanlon and Shevlin (2002) discuss the treatment of employee stock options as a method for reporting lower taxable income without impacting financial reporting income. For tax purposes, nonqualified stock options allow the granting firm a deduction for the amount of income recognized as ordinary income by the employee in the year of exercise. For financial reporting purposes, no deduction exists and the tax benefits are accounted for through the Additional Paid-In Capital account. This differential treatment allows for a decrease in taxable income without a corresponding decrease in financial income (Hanlon and Shevlin 2002). For periods starting after June 15, 2005, companies are required to expense employee stock options at the time of issue, reducing the book-tax difference related to option issuance. This reporting change is in effect for the last years of the current study. Additionally, management utilizes the tax accounts to avoid earnings declines or meet analysts' forecasts (Frank and Rego 2006; Phillips et al.

2004). A significant number of firms engage in tax sheltering behavior, a severe form of tax aggressiveness (Frank et al. 2009; Graham and Tucker 2006; Wilson 2009).

It is difficult to identify tax sheltering firms from an examination of their financial statements (McGill and Outslay 2004) and it is difficult to draw inferences about sheltering from the book-tax difference (Hanlon 2003). Metrics exist to detect tax aggressiveness (Desai and Dharmapala 2006; Dyreng et al. 2008; Gupta and Newberry 1992; Wilson 2009). However, the measures are usually based on similar factors as financial earnings management variables. The results of the tests using these metrics may indicate tax aggressiveness, when financial aggressiveness is driving the results.

Effective tax rates are used in a multitude of studies (Callihan 1994; Gupta and Newberry 1992, 1997; Mills 1998; Stickney and McGee 1982; Yin 2003). However, the effective tax rate is driven by pre-tax accrual earnings, which is an indication of earnings management and not representative of tax aggressiveness. Cash effective tax rates (Dyreng et al. 2008) are also related to pre-tax earnings management. A low cash effective tax rate could be based on an increase in net income from financial planning or tax planning activities. A more recent metric (Desai and Dharmapala 2006) is problematic because it is based on inferring the reported taxable income without access to corporate tax returns. There are several limitations of this metric, noted by the authors, including consolidation rules and net operating loss carryovers. Additionally, based on validation tests conducted by Frank et al (2009), this measure is less accurate at detecting tax sheltering.

Firms engage in aggressive financial reporting as well as aggressive tax planning in the same period, leading to a growing gap between taxable income and financial income. Frank et al. (2009) examine the relation between aggressive financial reporting and aggressive tax

reporting. Most existing measures of tax aggressiveness are based on the same underlying variables as the financial aggressiveness metrics. To overcome this, Frank et al. (2009) develop a metric of tax aggressiveness that is not based on the financial earnings management variables that accounts for nondiscretionary items.

An additional improvement of the Frank et al. (2009) measure is their examination of permanent book-tax differences instead of both permanent and temporary book-tax differences. Permanent book-tax differences provide the largest benefits for companies. Unlike temporary differences, that provide only limited timing differences, permanent differences do not reverse in future periods. Additionally, the majority of tax shelters examined by Wilson (2009) produce permanent book-tax differences (McGill and Outslay 2004; Weisbach 2002; Wilson 2009). A larger concern with the inclusion of temporary book-tax differences in tax aggressiveness models is that they may reflect pre-tax earnings management (Hanlon 2005; Phillips et al. 2003). The inclusion of temporary book-tax differences in a tax aggressiveness measure may create spurious results based on financial earnings management.

The Frank et al. (2009) measure is developed using the modified Jones approach to determine the discretionary portion of permanent book-tax differences by regressing total permanent differences on nondiscretionary items, by two-digit SIC codes and fiscal year. Permanent book-tax differences are calculated as total book-tax differences less temporary book-tax differences. Nondiscretionary items include intangibles, income (loss) reported under the equity method, income (loss) attributable to minority interests, current state income tax expense, the change in net operating loss carryforwards, and one-year lagged permanent book-tax differences to account for recurring firm specific nondiscretionary items. The residuals from this model are a firm's discretionary permanent differences for a given year.

The model is then validated against a sample of known aggressive tax reporters – firms known to have engaged in tax shelter activity (Graham and Tucker 2006). The Frank et al. (2009) measure is at least as good as or better than the existing measures of tax planning (total book-tax differences, cash ETRs and discretionary total book-tax differences) at predicting tax shelter activity. The authors indicate a negative relation between the number of analysts covering a firm and the discretionary permanent book-tax difference. However, it is unclear if analysts are opting to cover less tax aggressive firms or if they are serving as monitors of aggressive tax behavior. Frank et al. (2009) utilize a metric that is not calculated using the same variables as those used to calculate financial earnings management, so results based on the tax aggressiveness metric should not produce spurious results. However, the authors indicate there is a positive relation between financial aggressiveness and tax aggressiveness, indicating that firms are willing to engage in both financial and tax aggressiveness. While they find a correlation between the incidence of tax aggressiveness and financial earnings management, the discretionary permanent book-tax difference (DTAX) metric is not based on the same variables as financial aggressiveness and, therefore, should be better able to detect tax aggressiveness than previous measures.

2.1.2 Analyst Coverage

Analysts can either serve as external monitors of a firm's behavior (Jensen and Meckling 1976) or exert undue pressure on management; but it is unclear which role they serve. To address this question, Yu (2008) uses an instrumental variables approach to examine the relation between analyst coverage and earnings management and finds that analyst coverage is related to lower levels of earnings management. Furthermore, analysts associated with better brokerage houses and those with more experience are also associated with lower levels of earnings

management than their counterparts. Yu (2008) examines the relation between analyst coverage and earnings management using the modified Jones approach to calculate discretionary accruals. To control for the endogeneity in analyst coverage selection, Yu includes the change in broker size and inclusion in the S&P 500 index as instrumental variables. These factors are not generally associated with earnings management behavior but are associated with levels of analyst coverage. Yu finds that analyst coverage is associated with lower levels of earnings management, consistent with analysts serving as external monitors of aggressive financial reporting. Additionally, Yu examines the prestige and experience of the analysts. The author argues that analysts associated with the top brokerage firms have access to better resources (for example, databases and research support), that top brokerage firms are able to hire better talent, and that they are able to make more accurate forecasts. Based on these advantages, analysts from the top brokerage houses should be better able to detect earnings management than analysts from less prestigious brokerage firms. Yu also examines the ability of more experienced analysts to serve as external monitors of earnings management. He argues that weaker analysts are weeded out of the field or that longer tenured analysts gain experience and improve their skill set through time. Again, these analysts should better serve as external monitors. Yu finds that analysts associated with top research teams and more experienced analysts are associated with less financial earnings management.

2.2 Hypothesis Development

2.2.1 Hypotheses 1 and 2: The Effect of Analyst Coverage on Tax Aggressiveness

While Yu (2008) finds that analyst coverage is associated with less financial earnings management, management will continue to feel pressure to meet consensus analysts' forecasts. This has led many to view the tax accounts as a last resort earnings management tool (Dhaliwal

et al. 2004). This can lead to increased tax aggressiveness. While there is incentive to use the tax accounts to make up the difference to meet the analysts' forecast, a reduction in financial earnings management and an increase in tax aggressiveness would create a large book-tax difference. Research has shown that firms with large book-tax differences face additional scrutiny from regulators and auditors (Badertscher et al. 2009; Cloyd 1995; Hanlon and Krishnan 2006; Mills 1998). This could cause managers to think twice before they engage in aggressive tax behavior when the opportunity to engage in financial earnings management has been reduced by analyst coverage. Additionally, Frank et al. (2009) find a negative relation between the number of analysts covering a firm and discretionary tax accruals as well as a positive relation between discretionary tax and discretionary financial accruals (the measure used in Yu 2008). It is possible that analysts serve as external monitors of tax aggressiveness and are associated with lower levels of DTAX. While prior research indicates that analysts may serve as external monitors of tax behavior, the pressure to meet consensus analyst forecasts may force management to engage in aggressive tax behavior. Specifically, the less management is able to engage in financial reporting aggressiveness to achieve their desired financial results, the more they may rely on aggressive tax reporting. This leads to my first hypothesis:

H1: Levels of discretionary permanent book-tax differences will differ significantly between firms with analyst coverage and those without analyst coverage.

Hypothesis 1 is tested using a sample that includes all firms for which the discretionary tax variable can be calculated – with or without analyst coverage. If analysts serve as external monitors, there should be a lower level of tax aggressiveness for firms with coverage than firms without coverage. However, if the pressure from analysts is greater than their monitoring ability, there should be a higher level of tax aggressiveness for firms with coverage than firms without

coverage. If coverage by one analyst is associated with a change in tax aggressiveness, the level of tax aggressiveness should differ between firms with different levels of analyst coverage. Hypothesis 2 is based on a sample of firms with at least one analyst covering the firm. This is an examination of the difference in tax aggressiveness based on the relative level of analyst coverage, measured by the number of analysts covering the firm.

H2: Levels of discretionary permanent book-tax differences will differ significantly between firms with greater analyst coverage than firms with less analyst coverage.

2.2.2 Hypotheses 3 and 4: Analyst Characteristics

Yu (2008) finds that firms covered by analysts associated with top brokerage houses exhibit lower levels of discretionary accruals, indicating a stronger monitoring effect from these analysts. Top analysts are determined by inclusion in the *Institutional Investors All-American* research team rankings. Analysts from more prestigious brokerage firms are shown to make more accurate forecasts (Clement 1999; Jacob et al. 1999; Mikhail et al. 1997, 2003; Stickel 1992) and the top brokerage houses are able to hire better talent (Hong and Kubik 2003). The top brokerage houses are also able to supply better research staff and more extensive databases for analysts to conduct their research. Tax disclosures are highly complex and require a great deal of knowledge, experience and resources to interpret accurately. Due to the complexity of tax information, analysts who have access to better resources and provide more accurate financial forecasts may be better at analyzing tax disclosures than analysts associated with less prestigious brokerage firms. Yu (2008) shows that top analysts are associated with lower levels of financial reporting aggressiveness. This may leave management with few options, other than tax aggressiveness, to achieve their desired financial results. In addition, top analysts may not be skilled in analyzing tax disclosures. This leads to the following hypothesis:

H3: Levels of discretionary permanent book-tax differences will differ significantly between firms covered by analysts identified as top analysts and firms without coverage from analysts identified as top analysts.

Research demonstrates that analysts with more experience make more accurate forecasts and are better able to incorporate earlier information into their forecasts (Clement 1999; Mikhail et al. 1997, 2003). Analysts with longer tenure may make better forecasts because the less accurate analysts are not able to stay in the industry or because the analysts increase their analytical skills, background information and communication skills over time. Yu (2008) finds that analysts with more experience are associated with lower levels of discretionary accruals. If analysts are able to transfer their financial analysis expertise to the domain of tax analysis, analysts with more experience will be better able to analyze tax information and to detect aggressive tax behavior. However, as analysts typically do not have extensive background knowledge of tax analysis; their skills may not transfer to the tax domain. Additional experience may not provide additional exposure to tax analysis, which would not improve an analyst's ability to monitor tax reporting aggressiveness over time. In addition, experienced analysts are associated with lower levels of financial reporting aggressiveness. Again, this reduces the avenues for management to achieve desired financial results, which may lead managers to engage in more aggressive tax behavior as the opportunity to engage in accruals earnings management is reduced. This leads to my final hypothesis:

H4: Levels of discretionary permanent book-tax differences will differ significantly between firms that are covered by analysts with more experience and those firms covered by less experienced analysts.

The results of examining these hypotheses will provide insight into the ability of analysts to serve as external monitors of corporate tax reporting behavior or highlight the impact of the pressure management feels to satisfy analysts.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Sample Selection

The sample includes the accounting information for all firm-year observations from Compustat's Annual Industrial File and analyst information from the Institutional Brokers' Estimate System (I/B/E/S) beginning in 1992 and extending through 2006. The sample period starts in 1992 as the book-tax gap began growing during the early 1990's (Desai 2002; Frank et al. 2009; Hanlon 2005; Manzon and Plesko 2002; Mills et al. 2002). Additionally, there is a concern over the quality and quantity of information provided by I/B/E/S in the early 1980's. Further, the cash flow from operations variable only became available in the Compustat database beginning in 1988 (Yu 2008). Additionally, for consistency, the entire period of 1992 – 2006 is covered by Statement of Financial Accounting Standards No. 109, "Accounting for Income Taxes" (SFAS 109). SFAS 109 became effective in 1992. The next major change to the reporting of tax information was effective in 2007, FASB Interpretation No. 48, "Accounting for Uncertainty in Income Tax." The reporting requirements for income tax are now covered by FASB ASC 740.

I eliminate observations associated with foreign firms and subsidiaries due to the differences in financial and tax consolidation rules. Additionally, I delete firms with an unclassified SIC code, as the code is necessary for calculating the discretionary tax variable. I also delete firms from regulated industries (utilities [code 49] and financial services [codes 60-69]) since they face a different regulatory environment than the majority of firms. Firms with missing values for sales, total assets, net income before extraordinary items or cash flows from operations are also removed from the sample as these are key control variables in the OLS

regressions. Finally, I eliminate firm-observations with a market value of less than $10 million, book value of equity less than or equal to zero or total assets of less than $1 million to avoid small denominator problems. The full sample contains 69,901 firm-year observations.

To control for the impact of institutional ownership, institutional ownership information is collected from the Thomson-Reuters Institutional (13f) Holdings database (formerly CDA/Spectrum). Investment managers with more than $100 million in securities under management are required to report, on a quarterly basis, all common stock positions of more than 10,000 shares or $200,000. As in Yu (2008), I calculate annual holdings as the average of the four quarterly reports. If a 13(f) filing is not available, I assume an institution's holding of a firm to be zero.

External financing is related to earnings management and analyst coverage (Bhushan 1989; Dechow and Dichev 2002; Kasznik 1999) and is controlled for in this study. External financing is measured as in previous studies (Bradshaw et al. 2006; Yu 2008) as the sum of net proceeds from equity financing and debt financing scaled by total assets. Equity financing is measured as net cash from the sale of common and preferred stock less cash dividends paid. Debt financing is measured as net cash from the issuance or reduction of short and long-term debt.

Analysts are identified as being associated with a top research team if they are affiliated with an *All-American* research team, as ranked by *Institutional Investors*. As in Yu (2008), analyst experience is the number of years an analyst has been working and experience with a firm is defined as the number of years an analyst has covered a specific firm. The I/B/E/S translation file (converting analyst code to analyst name) is no longer available. Therefore, the name data is available starting in 1993.

3.2 Estimation of Tax Aggressiveness

I use the discretionary tax (DTAX) measure introduced in Frank et al. (2009) as a proxy for tax aggressiveness. This metric is an estimate of the discretionary permanent book-tax differences based on the modified Jones methodology (Dechow et al. 1995; Jones 1991). This innovative measure accounts for nondiscretionary items (intangible assets) and statutory adjustments (state taxes) that lead to permanent book-tax differences but that should not be related to aggressive reporting. The following equation is run by two-digit SIC codes and fiscal year. All variables, including the intercept, are scaled by beginning-of-year total assets (Compustat AT). The residuals from Equation (1) derived in Frank et al. (2009) are used as the estimate of discretionary permanent book-tax differences (DTAX):

$$PERMDIFF_{it} = \alpha_0 + \alpha_1 INTANG_{it} + \alpha_2 UNCON_{it} + \alpha_3 MI_{it} + \alpha_4 CSTE_{it} + \alpha_5 \Delta NOL_{it} + \alpha_6 LAGPERM_{it} + \varepsilon_{it} \quad (1)$$

where:

$PERMDIFF_{it}$ = total book-tax differences less temporary book-tax differences for firm *i* in year *t*
$= \{ BI_{it} - [(CFTE_{it} + CFOR_{it})/STR_t] \} - (DTE_{it}/STR_t)$;

BI_{it} = pre-tax book income (Compustat PI) for firm *i* in year *t*;

$CFTE_{it}$ = current federal tax expense (Compustat TXFED) for firm *i* in year *t*;

$CFOR_{it}$ = current foreign tax expense (Compustat TXFO) for firm *i* in year *t*;

DTE_{it} = deferred tax expense (Compustat TXDI) for firm *i* in year *t*;

STR_t = statutory tax rate in year *t*;

$INTANG_{it}$ = goodwill and other intangibles (Compustat INTAN) for firm *i* in year *t*;

$UNCON_{it}$ = income (loss) reported under the equity method (Compustat ESUB) for firm *i* in year *t*;

MI_{it} = income (loss) attributable to minority interest (Compustat MII) for firm *i* in year *t*;

$CSTE_{it}$ = current state income tax expense (Compustat TXS) for firm *i* in year *t*;

ΔNOL_{it} = change in net operating loss carryforwards (Compustat TLCF) for firm *i* in year *t*;

$LAGPERM_{it}$ = one-year lagged PERMDIFF for firm *i* in year *t*; and

ε_{it} = discretionary permanent book-tax difference ($DTAX_{it}$) for firm *i* in year *t*.

Based on Frank et al. (2009), if values for minority interest, current foreign tax expense, income from unconsolidated entities or current state tax expense are missing, *MI, CFOR, UCON*, or *CSTE*, respectively, are set to zero. If current federal tax expense is missing on Compustat, then *CFTE* is equal to total tax expense (Compustat TXT) less current foreign tax expense (Compustat TXFO) less current state tax expense (Compustat TXS) less deferred tax expense (Compustat TXDI). If goodwill and other intangibles (Compustat INTANG) is missing in Compustat, then *INTANG* is set to 0. If it has a code of C (indicating the items have been combined) in Compustat, then goodwill (Compustat GDWL) is used as the value for *INTANG*.

This model accounts for nondiscretionary permanent differences that are not created through aggressive tax planning. The differences in the tax and financial reporting rules for intangible assets, the equity method and minority interests lead to permanent book-tax differences but are not considered to be elements of aggressive tax planning. Additionally, current state tax expense is controlled for because it does not reduce book income, but is a reduction for taxable income – creating a nondiscretionary book-tax difference. Changes in net operating losses are included in the model because they are associated with changes in the

valuation allowance account but are usually unrelated to tax aggressiveness and may be related to financial aggressiveness (Frank and Rego 2006; Miller and Skinner 1998; Schrand and Wong 2003). The lagged value of permanent differences is included to account for persistent nondiscretionary permanent book-tax differences such as tax-exempt interest.

The DTAX metric is most appropriate for this study as previous measures of aggressive tax reporting are correlated with financial reporting aggressiveness. Yu (2008) finds a significant relation between analyst coverage and financial reporting aggressiveness. Utilizing any of the metrics other than DTAX could produce spurious results of the test of the relation between analyst coverage and tax aggressiveness. As noted in Frank et al. (2009), the effective tax rate (ETR) measures (the ratio of total income tax expense to pre-tax book income) used in various studies (Callihan 1994; Gupta and Newberry 1992, 1997; Mills et al. 1998; Stickney and McGee 1982; Yin 2003) reflect permanent book-tax differences and are stated in percentage terms. These metrics frequently suffer from a small denominator problem. The use of cash effective tax rates (Dyreng et al. 2008) is also ill-advised in the current study. Any upward manipulation in pretax income (financial aggressiveness) will mechanically lead to a lower ETR. A firm engaging in aggressive financial reporting would have a relatively high pre-tax earnings figure leading to a lower cash ETR. This would create spurious results of the test of the relation between the aggressive tax measure (cash ETR) and financial aggressiveness measures. Additionally, tax sheltering is a serious form of aggressive tax reporting and the best tax shelters create permanent book-tax differences (Shevlin 2002; Weisbach 2002; Wilson 2009). Earnings management through pre-tax accruals leads to temporary book-tax differences (Hanlon 2005; Phillips et al. 2003). Therefore, a reasonable proxy for tax aggressiveness should evaluate permanent book-tax differences instead of the combination of temporary and permanent book-

tax differences. This rules out the use of total book-tax differences (Wilson 2009) as a reasonable proxy as it includes temporary book-tax differences as well as discretionary accruals using the modified Jones methodology which can create an artificial relation to financial aggressiveness. Specifically, the Wilson (2009) metric includes discretionary accruals, size and return on assets to identify tax shelter participants. These variables are included in the financial earnings management metric employed by Yu (2008). Thus, the use of the Wilson (2009) metric in this specific study would not be appropriate because it could lead to spurious results. Additionally, none of the aforementioned measures account for nondiscretionary items that create book-tax differences. In summary, after examining all of the logical metrics, the measure of nondiscretionary permanent book-tax differences developed by Frank et al. (2009) appears to be the most appropriate and is utilized in this study.

3.3 Ordinary Least Squares Regression

Prior research finds that analyst coverage is related to firm size, past performance, growth, external financing activities and volatility (Bhushan 1989; Dechow and Dichev 2002; Kasznik 1999). Based on Yu (2008), I run the following regression to provide the variable *ResidualCoverage* which is unrelated to the size, performance, growth, external financial or volatility of a specific firm:

$$Analyst\ Coverage_{it} = firm\ size_{it} + past\ performance_{it} + growth_{it} + external\ financing\ activities_{it} + cash\ flow\ volatility_{i} + year\ dummies + e, \quad (2)$$

where:

Analyst Coverage = the number of analysts who made annual or quarterly forecasts about firm *i*'s earnings in year *t*;

Firm Size = the market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding for firm *i* in year *t*;

Past Performance = one-year lagged return on assets defined as net income divided by total assets for firm *i* in year *t*;

Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t-1* divided by total assets in year *t-1* for firm *i* in year *t*;

External Financing = the net cash proceeds from equity and debt financing scaled by total assets for firm *i* in year *t*; and

Cash Flow Volatility = the standard deviation of cash flows for firm *i* during the sample period scaled by lagged assets.

The residuals from the above regression proxy for analyst coverage and are labeled *Residual Coverage*. This model is run for all firms and separately for covered firms. This variable represents the analyst coverage unrelated to the size, performance, growth, external financing or volatility of a specific firm. The results of the regressions are presented in Table 3.

3.4 Negative Binomial Regression

The previous models utilize OLS regression to determine residual coverage. However, analyst coverage is a count variable that is bounded at 0. Using OLS, predicted analyst coverage could potentially be a negative value. The stochastic generating mechanism for analyst coverage does not follow the normal distribution, but rather follows the negative binomial distribution (Rock et al. 2001). As a robustness check, I examine the following models utilizing the residuals from Equation (2) assuming the data follow the negative binomial distribution instead of the normal distribution.. Based on Rock et al. (2001), institutional ownership variables are included in the model.

$$\textit{Analyst Coverage}_{it} = \textit{ln(firm size)}_{it} + \textit{past performance}_{it} + \textit{growth}_{it} + \textit{external financing activities}_{it} + \textit{cash flow volatility}_{i} + \textit{ln(number of institutional owners)}_{it} + \textit{percentage of shares held by institutions}_{it} + \textit{year dummies} + e, \quad (3)$$

where:

Analyst Coverage = the number of analysts who made annual or quarterly forecasts about firm *i*'s earnings in year *t*;

ln Firm Size = the natural log of the market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding for firm *i* in year *t*;

Past Performance = one-year lagged return on assets defined as net income divided by total assets for firm *i* in year *t*;

Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t-1* divided by total assets in year *t-1* for firm *i* in year *t*;

External Financing = the net cash proceeds from equity and debt financing scaled by total assets for firm *i* in year *t*; and

Cash Flow Volatility = the standard deviation of cash flows for firm *i* during the sample period scaled by lagged assets.

ln Number of Institutional Owners = the natural log of the number of institutional investors owning shares in firm *i* in year *t;*

Percentage of Shares = the percentage of outstanding shares in firm *i* held by institutional investors.

The negative binomial regression model is run for all firms and, then again, separately for covered firms. When examining covered firms, analyst coverage will always be greater than zero. Therefore, the zero truncated negative binomial model is employed. The results of these regressions are presented in Table 4.

3.5 Covered Versus Uncovered Firms

To test hypothesis 1, I run the following test utilizing the entire sample of firms – including firms with and without coverage. The sample is not limited to firms listed in the I/B/E/S database. This test determines if coverage by at least one analyst is associated with a different level of aggressive tax reporting than no coverage at all. I use the following OLS regression:

$$DTAX_{it} = \alpha_t + \gamma_k + \beta CoverageDummy_{it} + \lambda Controls_{it} + \varepsilon_{it} \qquad (4)$$

where:

$DTAX_{it}$ = the residual from Equation (1) for firm *i* in year *t*;

α_t = year fixed effects;

γ_k = industry fixed effects based on 2-digit SIC codes;

$CoverageDummy_{it}$ = 1 if firm *i* is covered by at least one analyst in year *t*;

$Controls_{it}$ = a vector of controls described previously for Equation 2 that includes size, market-to-book ratio, profitability, growth rate of assets, cash flow volatility, external financing activities and institutional ownership for firm *i* in year *t*; and

ε_{it} = error term for firm *i* in year *t*.

I expect to find a significant relation between CoverageDummy and DTAX consistent with the conjecture that firms with analyst coverage have a different level of tax aggressiveness than firms without coverage. Institutional investors are shown to serve as external monitors (Clay 2000). Therefore, the models are run with and without controlling for institutional ownership, both the percentage of shares held by institutions and the number of institutions holding shares, to observe the monitoring effect of institutional investors. Additionally, the institutional ownership variable may serve as a weak proxy for the missing buy-side analyst information, a group that provides additional analyst coverage of firms but is not publicly available[2].

3.6 Level of Analyst Coverage

Using the following OLS regression, I estimate the effect of analyst coverage on tax aggressiveness to test hypothesis 2 without controlling for the endogeneity of analyst coverage selections:

[2] Institutional ownership may serve as a weak proxy for buy-side analysts as most buy-side analysts work directly for institutional investors.

$$DTAX_{it} = \alpha_t + \gamma_k + \beta_1 ResidualCoverage_{it} + \lambda Controls_{it} + \varepsilon_{it} \quad (5)$$

where:

$DTAX_{it}$ = the residual from Equation (1) for firm *i* in year *t*;

α_t = year fixed effects;

γ_k = industry fixed effects based on 2-digit SIC codes;

$ResidualCoverage_{it}$ = the residual from Equation (2) for firm *i* in year *t*; and

$Controls_{it}$ = a vector of controls described previously for Equation 2 that includes size, market-to-book ratio, profitability, growth rate of assets, cash flow volatility, external financing activities and institutional ownership for firm *i* in year *t*.

ε_{it} = error term for firm *i* in year *t*.

Equation 5 is estimated using the entire sample of firms, as well as separately for covered firms. As stated in hypothesis 2, I expect to find a significant relation between residual coverage and DTAX which would be consistent with analysts impacting corporate tax behavior.

3.7 Expected Coverage as Instrument

As in Yu (2008), endogeneity of analyst coverage is a concern for the previous OLS regression model. If analysts are able to detect tax aggressiveness, they may opt to cover firms that do not engage in aggressive tax reporting. Extant research has illustrated that analysts cover firms with better information environments (Bhushan 1989; Bushman et al. 2005), more voluntary disclosure (Healy et al. 1999; Lang and Lundholm 1996), fewer segments (Bhushan 1989) and more corporate presentations (Francis et al. 1998). Additionally, Frank et al. (2009) show a significant negative relation between the number of analysts and tax aggressiveness. However, this result may be due to analysts opting to cover less tax aggressive firms. To help

alleviate this endogeneity problem, I use a 2SLS instrumental variables approach similar to Yu (2008) to capture the variation in analyst coverage that is exogenous to aggressive tax behavior.

I use the change in brokerage house size metric developed by Yu (2008) as my first instrumental variable. Brokerage houses change size over time, which should not be related to aggressive tax reporting by covered firms. As brokerage houses contract, they will discontinue coverage of certain firms. The decrease in coverage should be exogenous to analyst coverage. Expected coverage is measured as follows:

$$ExpectedCoverage_{itj} = (Brokersize_{jt}/Brokersize_{j0})*Coverage_{i0} \text{ and}$$

$$ExpectedCoverage_{it} = \sum_{j=1}^{n} ExpectedCoverage_{itj}\ , \qquad (6)$$

where:

$ExpectedCoverage_{itj}$ = the expected coverage of firm *i* from broker *j* in year *t* (constrained to 1 analyst per brokerage house);

$BrokerSize_{jt}$ = the number of analysts employed by broker *j* in year *t*;

$BrokerSize_{j0}$ = the number of analysts employed by broker *j* in the benchmark year 0;

$Coverage_{i0}$ = the size of the coverage of firm *i* in the benchmark year 0, and

$ExpectedCoverage_{it}$ = the expected coverage of firm *i* in year *t* (constrained to 1 analyst per brokerage house).

Expected coverage is calculated before the broker determines which firms to cover after contraction. This metric is limited to capturing only the variation related to a decrease in coverage and not the initiation of coverage. To capture additional coverage, I would have to measure the change in the size of all brokerage houses and firms in the market, which reduces to a fixed year effect. A firm must be covered by at least one broker in the benchmark year to have a value for expected coverage. I use 1992 (the first year of the sample) as the benchmark year. As a sensitivity test, I also use 1999 (the middle year of the sample period) as a benchmark year.

I then estimate the following 2SLS regressions:

$$Residualcoverage_{it} = c_t + c_k + \phi_1 ExpectedCoverage_{it} + \phi_2 Controls_{it} + \eta_{it} \text{ and}$$

$$DTAX_{it} = \alpha_t + \gamma_k + \beta_1 ResidualCoverage_{it} + \lambda Controls_{it} + \varepsilon_{it} \quad (7)$$

where:

$ResidualCoverage_{it}$ = the residual from Equation (2) for firm *i* in year *t*;

c_t *and* α_t = year fixed effects;

c_k and γ_k = industry fixed effects based on 2-digit SIC codes;

$ExpectedCoverage_{it}$ = the result of Equation (5) for firm *i* in year *t*;

$Controls_{it}$ = a vector of controls previously described in Equation (2) that includes size, market-to-book ratio, profitability, growth rate of assets, cash flow volatility, external financing activities and institutional ownership for firm *i* in year *t*.

$DTAX_{it}$ = the residual from Equation (1) for firm *i* in year *t*; and

ε_{it} and η_{it} = error terms for firm *i* in year *t*.

My expectation is to find a significant relation between the instrumented residual coverage variable and DTAX consistent with firm behavior being impacted by analyst coverage.

3.8 S&P Index Dummy as Instrument

The previous instrumental variable is only able to capture brokerage house contractions in analyst coverage. To capture both increases and decreases in analyst coverage, I use an additional instrumental variable – inclusion in the S&P 500. S&P 500 firms typically have a larger analyst following than similar firms that are not included in the index. Inclusion in the index is not likely based on aggressive tax behavior but rather industry conditions and a firm's representativeness of its industry (S&P 500 Fact Sheet, 2004). While the metric accounts for the weakness in the previous measure, it comes with a cost. When a firm is included in the S&P

500, other factors change as well, including institutional ownership (Yu 2008). Correspondingly, institutional ownership is included in the model to help control for these changes.

I estimate the following 2SLS regressions as an additional test of hypothesis 2:

$$ResidualCoverage_{it} = c_t + c_k + \phi_1 DummySP500_{it} + \phi_2 Controls_{it} + \eta_{it} \text{ and}$$

$$DTAX_{it} = \alpha_t + \gamma_k + \beta_1 ResidualCoverage_{it} + \lambda Controls_{it} + \varepsilon_{it} \quad (8)$$

where:

$ResidualCoverage_{it}$ = the residual from Equation (2) for firm *i* in year *t*;

c_t *and* α_t = year fixed effects;

c_k and γ_k = industry fixed effects based on 2-digit SIC codes;

$DummySP500_{it}$ = 1 if firm *i* is included in the S&P 500 index in year *t*;

$Controls_{it}$ = a vector of controls previously described in Equation (2) that includes size, market-to-book ratio, profitability, growth rate of assets, cash flow volatility, external financing activities and institutional ownership for firm *i* in year *t*.

$DTAX_{it}$ = the residual from Equation (1) for firm *i* in year *t*; and

ε_{it} and η_{it} = error terms for firm *i* in year *t*.

I expect to find a significant relation between the instrumented residual coverage variable and DTAX which would be consistent with analysts impacting corporate tax reporting behavior.

3.9 The Effect of Change in Analyst Coverage – Robustness Test

If analysts play a role in tax aggressiveness, there should be a change in tax aggressiveness when there is a change in analyst coverage. Thus, as a robustness check, I examine the effect of the change in analyst coverage on the change in discretionary tax. Due to the limited change in analyst coverage, I examine the change over three year periods. If there is a significant relation between residual coverage and discretionary tax, then one should find a

significant relation between residual coverage and discretionary tax. As the level of coverage increases, I expect discretionary tax to change consistent with the conjecture that analysts serve a role in corporate tax aggressiveness. I run the following OLS regression:

$$\Delta DTAX_{it} = \alpha_t + \gamma_k + \beta_1 \Delta ResidualCoverage_{it} + \lambda Controls_{it} + \varepsilon_{it} \quad (9)$$

where:

$\Delta DTAX_{it}$ = the three-year change in the residual of Equation (1);

α_t = year fixed effects;

γ_k = industry fixed effects based on 2-digit SIC codes;

$\Delta ResidualCoverage_{it}$ = the three-year change in the residual of Equation (2);

$Controls_{it}$ = a vector of controls described in Equation (2) that includes size, market-to-book ratio, profitability, growth rate of assets, cash flow volatility, external financing activities and institutional ownership for firm *i* in year *t*; and

ε_{it} = error term for firm *i* in year *t*.

Additionally, I use the change in expected analyst coverage and S&P 500 index dummy instrumental variables to evaluate the change in DTAX. I again expect to find a significant relation between the instrumented change in coverage variable and DTAX. This finding would be consistent with analysts serving a role in tax aggressiveness.

3.10 Characteristics of Analysts and Tax Aggressiveness

Extant research shows that analysts associated with higher quality brokerage firms serve as better monitors of earnings management (Yu 2008). Additional research shows that analysts from the higher quality brokerage firms and those with more experience are better at forecasting firm earnings (Clement 1999; Jacob et al. 1999; Mikhail et al. 1997, 2003; Stickel 1992). The top brokerage firms are able to hire the best talent (Hong and Kubik 2003) and these firms

provide the most accurate forecasts and their revisions have the largest market impact (Clement 1999; Jacob et al. 1999; Stickel 1992).

Yu (2008) shows that analysts from top brokerage firms are better able to serve as external monitors of earnings management. Analysts receive significant training in financial analysis. Often, they receive little to no training in tax analysis. Management will continue to feel pressure to meet analyst forecasts. This combination may create an opportunity for management to engage in aggressive tax behavior. As in Yu (2008), an analyst is identified as associated with a top brokerage house if the house is listed on the *Institutional Investors All-American* research teams. As the broker translation file is no longer available through I/B/E/S, analyst names are only available starting in 1993 through the I/B/E/S database. Therefore, top analyst data is not collected for 1992.

More experienced analysts prove to be better external monitors of earnings management than less experienced analysts (Yu 2008). Over time, analysts should improve in their ability to analyze firm data through experience and familiarity with the process and the information provided. Like financial reporting, tax rules are complex and experience evaluating tax reporting should make it easier for analysts over time. Additionally, inefficient and ineffective analysts should be weeded out by the market. Analysts may improve their tax analysis skills over time. If this is the case, more senior analysts should serve as better external monitors of tax aggressiveness. However, more experienced analysts may serve as more effective external monitors of financial reporting aggressiveness, leading management to engage in more tax aggressive behavior in the presence of experienced analysts. Experience is measured as number of years as an analyst and also the number of years following a specific firm.

I estimate the following OLS regression to test hypotheses 3 and 4 by including a variable for analysts from top brokerage firms and experience variables:

$$DTAX_{it} = \alpha_t + \gamma_k + \beta_1 AnalystCoverage_{it} + \beta_2 AnalystCharacteristics_{it} + \lambda Controls_{it} + \varepsilon_{it} \quad (10)$$

where:

$DTAX_{it}$ = the residual from Equation (1) for firm *i* in year *t*;

α_t = year fixed effects;

γ_k = industry fixed effects based on 2-digit SIC codes;

$AnalystCoverage_{it}$ = number of analysts covering firm *i* in year *t*;

$AnalystCharacteristics_{it}$ = number of analysts from a top brokerage firm covering firm *i* in year *t*, the average experience of analysts covering firm *i* in year *t* and the average experience of the analysts with firm *i* in year *t*;

$Controls_{it}$ = a vector of controls described in Equation (2) that includes size, market-to-book ratio, profitability, growth rate of assets, cash flow volatility, external financing activities and institutional ownership for firm *i* in year *t*; and

ε_{it} = error term for firm *i* in year *t*.

I expect to find a significant relation between discretionary permanent book-tax differences and broker prestige as well as analyst experience.

CHAPTER FOUR

ANALYSIS OF RESULTS

4.1 Descriptive Statistics

Table 1 presents the descriptive statistics. Panel A of Table 1 presents the descriptive statistics for the full sample and separately for covered and uncovered firms. The average firm in the sample has a market value of 2.01 billion and a market-to-book ratio of 5.31. For covered firms, the average market value is 2.88 billion and a market-to-book ratio of 4.41. Covered firms have a lower level of DTAX than uncovered firms. Additionally, covered firms are typically larger than uncovered firms, have higher levels of institutional ownership, both in number of institutions (mean of 105 versus 13) and percentage of shares outstanding (50% versus 6%) and are more likely to belong to the S&P 500 index. Approximately 21% (14,905 out of 69,901 firm-year observations) of the sample has no institutional ownership. Of those firms covered by at least one analyst, less than 1% have no institutional owners (151 out of 35,790 firm-year observations).

Panel B of Table 1 presents the analyst level descriptive statistics. For covered firms, the average firm is covered by 7.60 analysts with 4.13 analysts identified as a top analyst by *Institutional Investor*. The average experience of the analysts is 6.99 years with 2.83 years covering a specific firm. Panel C of Table 1 provides the annual summaries of the analyst information and the trends in coverage. Table 2 presents the correlation coefficients between discretionary permanent book-tax differences and select key variables. Analyst coverage has a negative correlation with the discretionary tax variable consistent with Frank et al. (2009).

4.2 Residual Coverage

Table 3 presents the results from the regression in Equation 2, which is used to determine analyst coverage which is unrelated to the size, performance, growth, external financing or cash flow volatility of a specific firm using ordinary least squares regression. The residuals from the model are labeled *Residual Coverage* for use in later models. The model is run using the full sample and separately for covered firms as covered firms likely have a different relation to the control variables. In the full sample, analyst coverage is negatively related to external financing and cash flow volatility and positively related to all other variables. In the covered firm sample, analyst coverage is positively related to all variables other than external financing.

In addition, analyst coverage is a count variable that is bounded at zero. Therefore, residual coverage is also calculated using the assumption of the negative binomial distribution, as stated in Equation (3). Again, the model is run separately for the full sample and for covered firms. When modeling covered firms using the negative binomial distribution, I use a zero-truncated negative binomial model to capture the positive, integer data. The results from Equation (3) are presented in Table 4. Analyst coverage is negatively related to firm size, past performance and the growth rate of assets and positively related to all other variables in the model examining all firms. In the model examining covered firms, analyst coverage is negatively related to past performance and growth and positively related to all other variables. All remaining models are run using the ordinary least squares residuals as well as the negative binomial residuals, as indicated. These results indicate that bigger firms have a larger analyst following as do firms with a higher growth rate, higher return on assets and institutional ownership.

4.3 Covered Versus Uncovered Firms

Table 5 presents the results of Equation 4, a regression of discretionary permanent book-tax differences on a dummy variable for analyst coverage to determine if there is a significant difference in tax aggressiveness between covered and uncovered firms. The results indicate a significant negative relation between analyst coverage and discretionary permanent book-tax differences. The beta coefficient is -0.0843, indicating a one standard deviation change in the coverage indicator variable leads to a -0.0843 standard deviation change in DTAX. Beta coefficients are calculated based on regressions run on variables that have been standardized to have a variance of one. These results confirm hypothesis 1 – there is a significant relation between analyst coverage and tax aggressiveness. This may be evidence of analysts serving as external monitors of corporate tax behavior. However, this model does not account for endogeneity. Analysts may choose to cover less tax aggressive firms rather than serving as external monitors.

In addition, institutional ownership is negatively related to discretionary permanent book-tax differences. This is indicative of institutional owners serving in a corporate governance capacity. The growth rate of assets is negatively related to DTAX in all models. Firms with growth opportunities are performing well and may not need to resort to accruals management and tax aggressiveness in order to achieve desired financial results.

4.4 Effect of Analyst Coverage on Tax Aggressiveness

The results from Equation 5, regressing discretionary permanent book-tax differences on *Residual Coverage* from Equation (2) to examine the relation between the level of analyst coverage and tax aggressiveness, are presented in Table 6 using *Residual Coverage* from the ordinary least squares regression. Columns 1-3 reports the results of the model for all firms and columns 4-6 report the results for the firms that are covered by at least one analyst. For columns

1-3, I use *Residual Coverage* from the full sample of Equation (2) and for columns 4-6 I use *Residual Coverage* from the covered firm only regression. Columns 1 and 4 include a control variable for the percentage of shares held by institutions, columns 2 and 5 include a control variable for the number of institutions holding shares and columns 3 and 6 do not include a variable for institutional ownership. In all cases, the coefficient on *Residual Coverage* is negative and significant, indicating that analyst coverage is negatively related to tax reporting aggressiveness. When controlling for the percentage of institutional ownership, a one standard deviation change in *Residual Coverage* leads to a -0.0409 standard deviation change in *DTAX*. The magnitude is similar when controlling for the number of institutional investors and without an institutional ownership control variable. This may indicate that analysts are serving as external monitors of corporate tax behavior, supporting hypothesis 2. The Yu (2008) paper reports a lower level of discretionary accruals in the presence of analysts, indicating that analysts serve as external monitors of financial earnings management. The results in this regression suggest that analysts are able to transfer their skills to the tax domain. Again, this model does not account for endogeneity.

When the percentage of institutional ownership is considered, the coefficient on *Residual Coverage* is still significantly positive, but the magnitude is smaller. Prior research indicates that institutions serve as external monitors (Clay 2000) and Yu (2008) reports a negative relation between institutional ownership and discretionary accruals. This study provides support for the conjecture that institutional owners also serve as external monitors of tax behavior.

Table 7 presents the results of Equation 5 utilizing the *Residual Coverage* variable from the negative binomial model (Equation 3) utilizing the zero-truncated model for the covered firm sample. Again, the model is run using the full sample and covered firms separately. The models

examining the full sample and covered firms only show a negative relation between *Residual Coverage* and tax aggressiveness. A one standard deviation change in *Residual Coverage* will result in a -0.0424 standard deviation change in *DTAX*. These results provide support for hypothesis 2. Additionally, institutional ownership is negatively related to the proxy for tax aggressiveness, indicating an external monitoring role.

4.5 Expected Coverage as Instrument

The results of the 2SLS modeled in Equation 7 are presented in Tables 8 and 9. This model uses expected coverage as the instrumental variable to determine the relation between analyst coverage and tax aggressiveness while accounting for endogeneity. I report the results using 1992 (the first year of the sample) as the benchmark year in Table 8 and the results using 1999 (the middle year of the sample) as the benchmark year in Table 9. Again, separate models are run to control for the percentage of shares held by institutions, the number of institutions holding shares and without a control variable for institutional ownership. The coefficients on the instrumented *Residual Coverage* variable are significant and negative, indicating decreased levels of tax aggressiveness in the presence of analyst coverage. Using 1992 [1999] as the benchmark year, a one standard deviation change in *Residual Coverage* results in a -0.0235 [-0.04188] standard deviation change in *DTAX*. The inclusion of a control variable for the percentage of institutional ownership causes the magnitude of the coefficient on *Residual Coverage* to decrease indicating institutions play a monitoring role in tax aggressive behavior. Tables 10 and 11 report the results of Equation (7) using *Residual Coverage* from the negative binomial model. Again, the results indicate a negative relation between analyst coverage and tax aggressiveness. Using 1992 [1999] as the benchmark year, a one standard deviation change in *Residual Coverage* results in a -0.0819 [-0.1027] standard deviation change in *DTAX*. In

addition, the chi-squares from the Hausman specification tests for all models are highly significant indicating that the OLS model in Equation (5) is an inconsistent estimator due to the endogeneity of analyst coverage.

4.6 S&P Index Dummy as Instrument

The results from the 2SLS regression indicated in Equation 8 using inclusion in the S&P 500 index as the instrumental variable to evaluate the relation between analyst coverage and tax aggressiveness while accounting for endogeneity using the OLS *Residual Coverage* variable are reported in Table 12. The model including a control variable for the percentage of shares held by institutions and the model that does not include a control variable for institutional ownership indicate a significant negative relation between analyst coverage and tax aggressiveness. When using the number of institutions holding shares, the coefficient on *Residual Coverage* is positive, but not significant. A one standard deviation change in the S&P 500 indicator variable results in a -0.0311 standard deviation change in *DTAX*. Table 13 presents the results using the negative binomial *Residual Coverage* variable. The coefficient on *Residual Coverage* is positive and significant in two models. However, the models have a negligible adjusted R-squared. In contrast to the expected coverage model, the Hausman specification test is not highly significant indicating the OLS model is not inconsistent.

Overall, the results of the OLS system of equations supports hypothesis 2 when considering the model controlling for percentage of shares held by institutions and the model without an institutional ownership control variable. Analysts serve as external monitors of corporate tax aggressiveness.

4.7 The Effect of Change in Analyst Coverage – Robustness Test

The results for Equation 9, examining the effect of the three-year change in DTAX and *Residual Coverage,* are presented in Table 14 using *Residual Coverage* from the OLS model and from the negative binomial model in Table 15. Columns 1-3 report the results for the change in residual coverage from Equation 2, Columns 4-6 report the results for the change in expected coverage as calculated in Equation 6 and Columns 7-9 present the results from the change in the S&P 500 dummy variable. The models examine the three-year change in the variables. For the change in residual coverage and the change in expected coverage, the variable *Residual Coverage* is negative and significant with little change with the inclusion of institutional ownership control variables using the OLS and negative binomial *Residual Coverage* variables. A one standard deviation change in the change in residual coverage leads to a -0.0201 standard deviation adjustment in the change in *DTAX* using the OLS residuals and a -0.0698 standard deviation adjustment when using the negative binomial residuals. These results are consistent with Hypothesis 2 – a significant relation exists between analyst coverage and tax aggressiveness.

Examining the three-year change in S&P 500 inclusion using the residuals from the OLS model of Equation (2), *Residual Coverage* is positively related to the change in tax aggressiveness. When using the negative binomial residuals from Equation (3), the change in *Residual Coverage* is negatively related to the change in *DTAX* in the model controlling for the percentage of institutional ownership and without controlling for institutional ownership. The relation is positive when controlling for the number of institutional owners. However, the coefficients are not significant at the 10% level. The Hausman specification test is not significant for these models, indicating that an instrumented variables approach is not an improvement over the OLS model.

4.8 Characteristics of Analysts and Tax Aggressiveness

The results of Equation 10 which examines the relation between analyst characteristics and tax aggressiveness are reported in Table 16. The model is run using total experience as an analyst and experience with a specific firm separately. Again, the model controls for the percentage of shares held by institutions as well as the number of institutions owning shares. The coefficient on analysts identified as top analysts is positive and significant in all models. This result supports hypothesis 3. These results indicate that top analysts are associated with higher levels of the proxy for tax aggressiveness. This may indicate that the top analysts view tax aggressiveness as a positive as the reduction in the overall tax burden of a firm should create additional wealth. In fact, Wilson (2009) finds that participating in tax shelters in the presence of strong governance leads to wealth creation for firms.

The coefficients on experience, both overall and with a specific firm, are significant and negative in all models, supporting Hypothesis 4. More experienced analysts are associated with lower levels of tax aggressiveness. This supports the conjecture that analysts serve as external monitors of tax reporting behavior and that their ability to monitor this behavior improves with experience.

4.9 Summary

The results of these tests indicate that analyst coverage is associated with lower levels of tax aggressiveness. These results hold using OLS regression as well as 2SLS using expected coverage as the instrumented variable to account for the endogeneity of analyst selection. In addition, institutional ownership does not change the direction of the relation. The results indicate that analysts serve as external monitors of corporate tax behavior. It is not likely that they are selecting to cover firms that are less tax aggressive.

Surprisingly, top analysts are associated with higher levels of tax aggressiveness. This may be due to top analysts viewing tax aggressiveness as a wealth creation tool. Firms that are tax aggressive, without violating the law, reduce their overall tax burden and their cash outflow for tax expenses, thus improving the financial position of the firm. This result builds on the findings in Wilson (2009), which indicate that tax sheltering in a strong governance environment leads to wealth creation in the form of positive abnormal returns.

CHAPTER FIVE

CONTRIBUTIONS, IMPLICATIONS AND LIMITATIONS

5.1 Contributions and Implications

This study examines the ability of analysts to serve as external monitors of aggressive tax behavior using a recently published metric of tax aggressiveness that is not based on the same variables as the extant financial earnings management measurements. In addition, an instrumental variables approach is utilized to account for the endogeneity of analyst coverage. I find that firms that are covered by at least one analyst have lower levels of discretionary permanent book-tax differences. I also find that additional analyst coverage is associated with less aggressive tax behavior. In addition, more experienced analysts are associated with lower levels of tax aggressiveness. Prior research (Yu 2008) finds that analysts serve as external monitors of financial reporting aggressiveness. The results of the current study indicate that analysts are able to transfer their unique skill set to the tax realm. Surprisingly, the results indicate that top analysts are associated with higher levels of tax aggressiveness. This may be the result of top analysts believing that tax aggressive behavior leads to wealth creation for corporations.

The tax gap has continued to grow since the early 1990's (Desai and Dharmapala 2006; Manzon and Plesko 2002; Mills et al. 2002). While studies show that firms with large book-tax differences face increased scrutiny from regulators and auditors (Badertscher et al. 2009; Cloyd 1995; Erickson and Wang 1999; Hanlon and Krishnan 2006; Mills 1998), some surmise that the costs of engaging in aggressive tax behavior are not steep enough to curb the activity. This is evidenced by the number of firms that engage in tax sheltering activities (Frank et al. 2009; Graham and Tucker 2006; Wilson 2009). Additionally, it appears as though the market is

unaware of the aggressive tax behavior based on the negative stock price reaction after discovery of sheltering behavior (Hanlon and Slemrod 2009). However, it appears as though analysts are serving as an extra layer of corporate governance and monitoring the tax behavior of firms. While analysts appear to monitor corporate tax decisions, it appears that there is still room for improvement in tax disclosures.

Recent research by Yu (2008) demonstrates that coverage by analysts is related to lower levels of earnings management. While analysts are able to serve as external monitors of financial aggressiveness, it is unclear if they are able to serve this function for tax aggressiveness. Shane and Stock (2006) find that analysts are not able to detect income shifting from the fourth quarter of a high tax year into the first quarter of the following low tax year, consistent with analysts possessing limited tax knowledge. However, the tax accounts are viewed as a last chance earnings management tool. If analyst coverage reduces other earnings management outlets, the tax accounts could be the only avenue left for management. While earlier research indicates that analysts may not be skilled in the tax realm, the results of the current study indicate that analysts are able to serve in an external monitoring role of aggressive tax decisions.

This study contributes to the existing literature by providing evidence of the ability of financial analysts to serve in a corporate governance role in the tax realm. Additionally, this study provides support for the conjecture that analysts associated with top research teams are associated with higher levels of tax aggressiveness indicating that not all tax aggressiveness should be viewed as a negative. This paper also examines tax aggressiveness using a measure that is less correlated with financial earnings management accounts, reducing the risk of spurious results.

5.2 Limitations

I acknowledge some potential limitations of the current study. One limitation of this study is the lack of data availability on buy-side analysts. This information is not publicly available as it is proprietary in nature and is not included in the I/B/E/S database. Thus, my research is limited to focusing on sell-side analyst information. However, as buy-side analysts provide a wealth of information to institutional investors, including institutional ownership as a control variable in the models should serve as a noisy proxy for this missing information. A second limitation relates to utilizing the expected coverage metric as an instrumental variable which is limited in its ability to capture only contractions in analyst coverage. To help compensate for this limitation, a variable representing a firm's inclusion in the S&P 500 index is added to the models, which should help account for increases and decreases in coverage. The drawback of this measure is that it is not as clean as the expected coverage method. By examining both instrumental variables, the impact of these limitations should be reduced. There is always the possibility of a correlated omitted variable driving the results. However, this study controls for known affecting factors identified in prior research.

5.3 Future Research

This study is an initial examination into the ability of analysts to serve as external monitors of tax aggressiveness or the impact of their pressure on management. Future research can continue to examine the role of financial analysts in corporate governance, specifically in tax aggressiveness and tax sheltering behavior. This paper illustrates a weakness in the ability of analysts to decipher tax disclosures. Future research could examine which forms of tax aggressiveness should be viewed as positive and which should be viewed as negatives based on the positive relation between top analysts and tax aggressiveness. Additionally, future studies

could examine the change in the relation between analyst coverage and tax aggressiveness over time to determine if market and environmental conditions contribute to the relation.

TABLES

Table 1: Descriptive Statistics

This table presents the summary statistics for the sample. The sample consists of firm-year observations From 1992-2006 with information available from Compustat, excluding firms from regulated industries.

Panel A

	All Firms (n=69,901)		Covered Firms (n=35,790)		Uncovered Firms (n=34,111)	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Firm Characteristics						
Discretionary Tax (DTAX)	0.03	0.74	-0.06	0.45	0.16	0.99
Firm Size (in billions)	2.01	14.01	2.88	15.01	0.86	12.45
Market-to-book Ratio	5.31	58.71	4.41	52.46	6.42	66.08
Past Performance	-0.03	0.35	0.00	0.23	-0.08	0.46
S&P 500 dummy	0.08	0.27	0.13	0.33	0.03	0.17
Growth	0.33	1.63	0.28	1.42	0.39	1.87
Cash Flow Volatility	0.21	1.24	0.16	0.72	0.29	1.71
Number of Institutional Owners	82.12	130.23	105.17	142.94	13.42	17.55
Percent of Shares Held by Institutions	0.28	0.31	0.50	0.27	0.06	0.14
External Financing Activities	0.10	0.31	0.06	0.22	0.13	0.37

Panel B

	Covered Firms	
	Mean	Standard Deviation
Analyst Characteristics		
Analysts Covering	7.60	7.41
Analysts from Top Brokerage Firms	4.13	8.29
Experience with Firm	2.83	1.75
Experience as an Analyst	6.99	2.87

Panel C

(Table 1, cont)

Year	Number of Analysts	Analysts from Top Research Teams	If Covered by at least 1 analyst: Tenure with Firm	Tenure as Analyst	Average Coverage	Covered Firms	Uncovered Firms
1992	2,254		2.92	6.24	7.62	1,695	2,433
1993	2,480	304	2.99	6.76	7.51	1,903	2,801
1994	2,877	337	2.88	6.92	7.00	2,148	2,751
1995	3,173	235	2.82	7.05	6.75	2,314	2,992
1996	3,540	232	2.67	7.00	6.54	2,676	2,972
1997	3,991	246	2.68	7.04	6.66	2,814	2,638
1998	4,379	327	2.78	7.17	7.00	2,727	2,406
1999	4,502	340	2.83	7.25	7.38	2,644	2,563
2000	4,648	328	2.84	7.30	7.68	2,540	2,227
2001	4,628	362	2.96	7.39	8.07	2,282	1,985
2002	4,838	375	2.81	6.87	8.03	2,242	1,725
2003	4,771	314	2.85	6.78	8.16	2,250	1,908
2004	4,564	289	2.79	6.75	8.35	2,447	1,732
2005	4,592	302	2.87	6.91	8.69	2,525	1,561
2006	4,711	276	2.92	7.09	8.81	2,583	1,417
					Total	35,790	34,111
					%	0.5120	0.4880

Variable Definitions (all variables are at year *t*):
Discretionary Tax = discretionary permanent book-tax differences (residuals from Equation (1))
Firm Size = market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding
Market-to-Book ratio = ratio of the current share price to the book value per share
Past Performance = one-year lagged return on assets defined as net income divided by total assets
S&P 500 dummy = indicator variable to indicate inclusion in the S&P 500 index in a particular year
Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1
Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets
Number of Institutions = the number of institutional investors holding shares in a given firm as reported in (13f) filings
Percent of Shares Held by Institutions = the percentage of shares held by institutional investors as reported in (13f) filings
External Financing = the net cash proceeds from equity and debt financing scaled by total assets
Analysts Covering = the number of analysts covering a firm in a given year
Analysts from Top Brokerage Firms = the number of analysts identified as belonging to an *All-American* research team as reported by *Institutional Investors* covering a given firm
Experience with a firm = the number of years an analyst has covered a particular firm
Experience as an analyst = the number of years the analyst has worked as an analyst.

Table 2: Correlation Matrix of Key Variables

This table presents the correlations between key variables.

	DTAX	Cover.	Firm Size	M-to-B	Past Perf.	SP	Growth	CFV	#	%	EFA
Discretionary Tax (DTAX)		**-0.3390**	**-0.4063**	**-0.1289**	**-0.1085**	**-0.1036**	**-0.0639**	**0.0567**	**-0.3963**	**-0.3182**	**-0.0190**
Analyst Coverage (Cov)	**-0.1104**		**0.7494**	**0.2385**	**0.1986**	**0.4524**	**0.1151**	**-0.1165**	**0.8229**	**0.6612**	**-0.0461**
Firm Size (in billions)	**-0.0236**	**0.3080**		**0.4032**	**0.2530**	**0.4982**	**0.1860**	**-0.1687**	**0.8912**	**0.6463**	**-0.0857**
Market-to-book Ratio (M-to-B)	-0.0013	-0.0044	**0.0238**		**0.1215**	**0.1611**	**0.2667**	**0.3208**	**0.2349**	**0.0844**	**0.1386**
Past Performance	**0.0185**	**0.1175**	**0.0446**	**-0.0484**		**0.1381**	**0.2790**	**0.0084**	**0.2242**	**0.1919**	**-0.2029**
S&P 500 dummy (SP)	**-0.0472**	**0.5523**	**0.3302**	**-0.0034**	**0.0795**		**-0.0451**	**-0.1623**	**0.4985**	**0.2770**	**-0.1688**
Growth	**-0.2837**	**-0.0294**	0.0003	**0.2659**	**-0.0923**	**-0.0391**		**0.3023**	**0.0646**	**0.0587**	**0.4608**
Cash Flow Volatility (CFV)	**-0.0193**	**-0.0378**	**-0.0111**	**0.3214**	**-0.1195**	**-0.0323**	**0.2565**		**-0.2275**	**-0.2149**	**0.2654**
Number of Institutional Owners (#)	**-0.0882**	**0.7650**	**0.6936**	**0.2336**	**0.1174**	**0.7194**	**-0.0269**	**-0.0529**		**0.8070**	**-0.1365**
Percent of Shares Held by Institutions (%)	**-0.1373**	**0.6339**	**0.0855**	**0.0833**	**0.1553**	**0.2601**	**-0.0491**	**-0.0640**	**0.4774**		**-0.1105**
External Financing Activities(EFA)	**0.0141**	**-0.1308**	**-0.0494**	**0.1390**	**-0.3769**	**-0.1188**	**0.2749**	**0.1307**	**-0.1497**	**-0.1694**	

Correlations presented on the upper (lower) diagonal are the Spearman (Pearson) correlations.
Reported correlations that are significant at $p<0.05$, two-tailed, are bolded.
Variable Definitions:
Discretionary Tax = discretionary permanent book-tax differences (residuals from Equation (1))
Analyst Coverage = the number of analysts covering a firm in a given year
Firm Size = market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding
Market-to-Book ratio = ratio of the current share price to the book value per share
Past Performance = one-year lagged return on assets defined as net income divided by total assets
S&P 500 dummy = indicator variable to indicate inclusion in the S&P 500 index in a particular year
Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1
Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets
Number of Institutions = the number of institutional investors holding shares in a given firm as reported in (13f) filings
Percent of Shares Held by Institutions = the percentage of shares held by institutional investors as reported in (13f) filings
External Financing = the net cash proceeds from equity and debt financing scaled by total assets

Table 3: Residual Coverage – OLS Model

This table presents the regression of analyst coverage on control variables during 1992-2006 using OLS. (Equation 2) The residuals from this model are labeled *Residual Coverage*.

$$Analyst\ Coverage_{it} = Firm\ Size_{it} + Past\ Performance_{it} + Growth_{it} + External\ Financing_{it} + Cash\ Flow\ Volatility_{it} + Year\ Dummies + e$$

	Ordinary Least Squares Regression			
Dependent Variable: Number of Covering Analysts	All Firms		Covered Firms	
Firm Size	0.14	***	0.18	***
	(72.88)		(77.03)	
Past Performance	1.87	***	2.64	***
	(20.76)		(15.13)	
Growth	0.02		0.07	**
	(1.10)		(2.51)	
External Financing Activities	-1.93	***	-2.61	***
	(-14.60)		(-12.35)	
Cash Flow Volatility	-0.05	**	0.04	
	(-2.07)		(0.72)	
Constant	5.29	***	7.44	***
	(46.67)		(46.88)	
Year Fixed Effects	Yes		Yes	
Number of Observations	53,479		32,689	
Adjusted R-squared	0.12		0.18	

t-statistics for OLS in parentheses

*, **, *** Statistically significant at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

Variable Definitions:

Analyst Coverage = the number of analysts covering a firm in a given year

Firm Size = market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding

Past Performance = one-year lagged return on assets defined as net income divided by total assets

Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1

External Financing = the net cash proceeds from equity and debt financing scaled by total assets

Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets

Table 4: Residual Coverage - Negative Binomial Model

This table presents the regression of analyst coverage on control variables during 1992-2006 using the negative binomial model. (Equation 3) The residuals from this model are labeled *Residual Coverage*.

$$Analyst\ Coverage_{it} = Firm\ Size_{it} + Past\ Performance_{it} + Growth_{it} + External\ Financing_{it} + Cash\ Flow\ Volatility_{it} + Number\ of\ Inst_{it} + Percent\ Inst\ Owner_{it} + Year\ Dummies + e$$

	Negative Binomial			
Dependent Variable: Number of Covering Analysts	All Firms		Covered Firms	
Firm Size	-0.0232	***	0.0625	***
	(-4.70)		(11.85)	
Past Performance	-0.0297	*	-0.0928	***
	(-1.92)		(-5.38)	
Growth	-0.0113	***	-0.0107	***
	(-3.90)		(-3.61)	
External Financing Activities	0.3254	***	0.2132	***
	(15.55)		(10.05)	
Cash Flow Volatility	0.0210	***	0.0144	***
	(3.84)		(3.01)	
Number of Institutional Owners	0.8754	***	0.6266	***
	(93.31)		(60.69)	
Percent of Shares Held by Institutions	0.2055	***	0.1659	***
	(10.67)		(8.97)	
Constant	-2.3135	***	-1.0325	***
	(-57.72)		(-22.94)	
Year Fixed Effects	Yes		Yes	
Number of Observations	41,929		32.553	
Psuedo R-squared	0.20		0.17	
Log-likelihood	-95,901.43		-80,990.90	

z-statistics for the negative binomial model in parentheses

*, **, *** Statistically significant at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

The model using covered firms only uses the zero-truncated negative binomial model as observations in this sample do not have zero analyst coverage.

Variable Definitions:

Analyst Coverage = the number of analysts covering a firm in a given year

Firm Size = the natural log of the market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding

Past Performance = one-year lagged return on assets defined as net income divided by total assets

Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1

External Financing = the net cash proceeds from equity and debt financing scaled by total assets

Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets

Number of Institutions = the natural log of the number of institutional investors holding shares in a given firm as reported in (13f) filings

Percent of Shares Held by Institutions = the percentage of shares held by institutional investors as reported in (13f) filings

Table 5: Covered vs. Uncovered

This table presents the regression of DTAX on a coverage indicator and control variables during 1992-2006 using OLS (Equation 4).

$$DTAX_{it} = \alpha_t + \gamma_k + \beta Coverage\ Dummy_{it} + \lambda Controls_{it} + \varepsilon_{it}$$

	All Firms					
Dependent Variable: Discretionary Tax	% of Inst. Ownership		# of Inst. Owners		Without Institutions	
Coverage Dummy	-0.1135	***	-0.1629	***	-0.1720	***
	(-14.64)		(-25.60)		(-29.62)	
Firm Size	0.0000		0.0004	*	0.0000	
	(0.09)		(1.81)		(-0.24)	
Market-to-Book Ratio	-0.0001		-0.0001		-0.0001	
	(-1.14)		(-1.15)		(-1.11)	
Past Performance	0.0521	***	0.0448	***	0.0431	***
	(5.85)		(5.03)		(4.85)	
Growth	-0.1320	***	-0.1322	***	-0.1323	***
	(-72.04)		(-72.05)		(-72.08)	
Cash Flow Volatility	0.0234	***	0.0235	***	0.0235	***
	(9.96)		(10.03)		(10.03)	
External Financing	0.2456	***	0.2515	***	0.2551	***
	(18.76)		(19.18)		(19.51)	
Institutional Ownership %	-0.1447	***				
	(-11.36)					
# of Institutional Owners			-0.0001	***		
			(-3.51)			
Constant	0.1904	***	0.07266		0.0697	
	(3.73)		(1.42)		(1.36)	
Year Fixed Effects	Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes	
Number of Observations	50,989		50,989		50,989	
Adjusted R-squared	0.13		0.12		0.12	

t-statistics for OLS are in parentheses

*, **, *** Statistically significant at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

Variable Definitions:

DTAX = discretionary permanent book-tax differences (the residuals from Equation 1)

Coverage Dummy = 1 if a firm is covered by at least 1 analyst; 0 otherwise

Firm Size = market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding

Market-to-Book ratio = ratio of the current share price to the book value per share

Past Performance = one-year lagged return on assets defined as net income divided by total assets

Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1

Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets

External Financing = the net cash proceeds from equity and debt financing scaled by total assets

Percent of Shares Held by Institutions = the percentage of shares held by institutional investors as reported in (13f) filings
Number of Institutions = the number of institutional investors holding shares in a given firm as reported in (13f) filings
Industry Fixed Effects = control variable by 2-digit SIC code

Table 6: Effect of Analyst Coverage on Tax Aggressiveness – OLS Residuals

This table presents the regression of DTAX on Residual Coverage and control variables during 1992-2006 using OLS (Equation 5). Residual Coverage is from the OLS model of Equation 2.

$$DTAX_{it} = \alpha_t + \gamma_k + \beta \text{Residual Coverage}_{it} + \lambda \text{Controls}_{it} + \varepsilon_{it}$$

	All Firms						Covered Firms					
Dependent Variable: Discretionary Tax	% of Inst. Own		# of Inst. Owners		Without Inst.		% of Inst. Own		# of Inst. Owners		Without Inst.	
Residual Coverage	-0.0041	***	-0.0117	***	-0.0098	***	-0.0038	***	-0.0062	***	-0.0057	***
	(-7.66)		(-17.49)		(-22.92)		(-10.72)		(-13.35)		(-17.59)	
Firm Size	-0.0001		-0.0011	***	-0.0004	**	0.0003	**	-0.0003		0.0002	*
	(-0.67)		(-4.15)		(-2.12)		(2.28)		(-0.13)		(1.70)	
Market-to-Book Ratio	-0.0001		-0.0001		-0.0001		-0.0001	***	-0.0001	***	-0.0001	***
	(-1.16)		(-1.04)		(-1.11)		(-2.85)		(-2.81)		(-2.81)	
Past Performance	0.0426	***	0.0105		0.0153	*	0.1079	***	0.0829	***	0.0852	***
	(4.75)		(1.17)		(1.72)		(10.36)		(7.95)		(8.29)	
Growth	-0.1321	***	-0.1326	***	-0.1325	***	-0.1833	***	-0.1838	***	-0.1837	***
	(-71.95)		(-72.04)		(-71.98)		(-113.19)		(-113.19)		(-113.21)	
Cash Flow Volatility	0.0239	***	0.0249	***	0.0248	***	0.0397	***	0.0401	***	0.0401	***
	(10.19)		(10.57)		(10.54)		(12.55)		(12.63)		(12.63)	
External Financing	0.2485	***	0.2763	***	0.2699	***	0.2355	***	0.2501	***	0.2474	***
	(18.94)		(20.90)		(20.59)		(19.08)		(20.01)		(20.06)	
Institutional Ownership %	-0.2139	***					-0.1243	***				
	(-17.95)						(-12.60)					
# of Institutional Owners			0.0002	***					0.0000			
			(3.72)						(1.33)			
Constant	0.1584	***	0.0927	*	-0.0331		0.0219		-0.0347		-0.0311	
	(3.09)		(1.81)		(-0.65)		(0.46)		(-0.73)		(-0.65)	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	50,989		50,989		50,989		31,413		31,413		31,413	
Adjusted R-squared	0.12		0.12		0.12		0.32		0.32		0.32	

t-statistics for OLS are in parentheses
*, **, *** Statistically significant at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).
Variable Definitions:
DTAX = discretionary permanent book-tax differences (the residuals from Equation 1)
Residual Coverage = the residuals from Equation (2) using the OLS model
Firm Size = market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding
Market-to-Book ratio = ratio of the current share price to the book value per share
Past Performance = one-year lagged return on assets defined as net income divided by total assets
Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1
Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets
External Financing = the net cash proceeds from equity and debt financing scaled by total assets
Percent of Shares Held by Institutions = the percentage of shares held by institutional investors as reported in (13f) filings
Number of Institutions = the number of institutional investors holding shares in a given firm as reported in (13f) filings
Industry Fixed Effects = control variable by 2-digit SIC code

Table 7: Effect of Analyst Coverage on Tax Aggressiveness - Negative Binomial Residuals

This table presents the regression of DTAX on Residual Coverage and control variables during 1992-2006 using OLS (Equation 5). Residual Coverage is from the negative binomial model of Equation 3.

$$DTAX_{it} = \alpha_t + \gamma_k + \beta Residual\ Coverage_{it} + \lambda Controls_{it} + \varepsilon_{it}$$

	All Firms						Covered Firms					
Dependent Variable: Discretionary Tax	% of Inst. Owner.		# of Inst. Owners		Without Institut.		% of Inst. Owner.		# of Inst. Owners		Without Institut.	
Residual Coverage	-0.0049	***	-0.0067	***	-0.0046	***	-0.00353	***	-0.0037	***	-0.00340	***
	(-8.50)		(-11.22)		(-7.79)		(-7.02)		(-7.37)		(-6.73)	
Firm Size	-0.0003	*	0.0028	***	-0.0008	***	0.0000		0.0016	***	0.0000	
	(-1.90)		(11.35)		(-4.15)		(0.33)		(7.96)		(-0.27)	
Market-to-Book Ratio	-0.0001	*	-0.0001		-0.0001	*	-0.0001	***	-0.0001	***	-0.0001	***
	(-1.80)		(-1.63)		(-1.82)		(-2.94)		(-2.88)		(-2.96)	
Past Performance	0.0510	***	0.0298	***	0.0122		0.1306	***	0.1151	***	0.0999	***
	(5.99)		(3.49)		(1.43)		(12.34)		(10.90)		(9.51)	
Growth	-0.1559	***	-0.1565	***	-0.1575	***	-0.1858	***	-0.1859	***	-0.1864	***
	(-86.28)		(-85.90)		(-85.95)		(-115.24)		(-114.97)		(-115.04)	
Cash Flow Volatility	0.0566	***	0.0584	***	0.0598	***	0.0402	***	0.0405	***	0.0406	***
	(15.18)		(15.52)		(15.80)		(12.74)		(12.80)		(12.80)	
External Financing	0.2048	***	0.2060	***	0.2341	***	0.2299	***	0.2278	***	0.2451	***
	(16.28)		(16.19)		(18.38)		(18.65)		(18.34)		(19.83)	
Institutional Ownership %	-0.3071	***					-0.1620	***				
	(-34.51)						(-18.20)					
# of Institutional Owners			-0.0006	***					-0.0003	***		
			(-22.03)						(-11.77)			
Constant	0.1474	***	0.0684		0.0488		0.0359		-0.0174		-0.0357	
	(3.31)		(1.53)		(1.08)		(0.76)		(-0.37)		(-0.75)	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	40,112		40,112		40,112		31,287		31,287		31,287	
Adjusted R-squared	0.20		0.18		0.17		0.33		0.32		0.32	

t-statistics for OLS are in parentheses
*, **, *** Statistically significant at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).
The model using covered firms only uses the zero-truncated negative binomial residual.
Variable Definitions:
DTAX = discretionary permanent book-tax differences (the residuals from Equation 1)
Residual Coverage = the residuals from Equation (3) using the negative binomial model
Firm Size = market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding
Market-to-Book ratio = ratio of the current share price to the book value per share
Past Performance = one-year lagged return on assets defined as net income divided by total assets
Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1
Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets
External Financing = the net cash proceeds from equity and debt financing scaled by total assets
Percent of Shares Held by Institutions = the percentage of shares held by institutional investors as reported in (13f) filings
Number of Institutions = the number of institutional investors holding shares in a given firm as reported in (13f) filings
Industry Fixed Effects = control variable by 2-digit SIC code

Table 8: Expected Coverage as Instrument - 1992 Benchmark using OLS Residuals

This table presents the regression of DTAX on Residual Coverage and control variables during 1992-2006 using 2SLS (Equation 7) and 1992 as the benchmark year. Residual Coverage is from the OLS model of Equation 2.

$$\text{Residual Coverage}_{it} = c_t + c_k + \Phi_1 \text{ExpectedCoverage}_{it} + \Phi_2 \text{Controls}_{it} + \eta_{it}$$

$$\text{DTAX}_{it} = \alpha_t + \gamma_k + \beta \text{Residual Coverage}_{it} + \lambda \text{Controls}_{it} + \varepsilon_{it}$$

	1992 Benchmark											
Second Stage Dependent Variable: Discretionary Tax	First Stage		% of Inst. Owner		First Stage		# of Inst. Owners		First Stage		Without Institutions	
Expected Coverage	0.9223	***			0.7184	***			0.9568	***		
	(117.67)				(85.42)				(125.06)			
Residual Coverage (instrumented)			-0.0006	*			-0.0021	***			-0.0018	***
			(-1.78)				(-4.20)				(-5.87)	
Firm Size	-0.0817	***	0.0002	**	-0.1881	***	0.0001		-0.0876	***	0.0003	***
	(-36.37)		(2.05)		(-65.29)		(0.62)		(-39.00)		(3.18)	
Market-to-Book Ratio	0.0209	***	-0.0015	***	0.0137	***	-0.0016	***	0.0227	***	-0.0016	***
	(4.24)		(-8.10)		(3.06)		(-8.23)		(4.55)		(-8.20)	
Past Performance	2.7551	***	-0.2130	***	0.7139		-0.2353	***	3.4762	***	-0.2330	***
	(5.28)		(-10.63)		(1.51)		(-11.63)		(6.60)		(-11.53)	
Growth	0.7347	***	-0.0073		0.7156	***	-0.0143	*	0.9775	***	-0.0142	*
	(3.79)		(-0.98)		(4.08)		(-1.91)		(4.98)		(-1.90)	
Cash Flow Volatility	0.9345	***	-0.0551	***	1.0722	***	-0.0514	***	0.8717	***	-0.0519	***
	(5.09)		(-7.83)		(6.45)		(-7.22)		(4.69)		(-7.32)	
External Financing	2.4957	***	-0.0278		3.6353	***	-0.0196		2.4062	***	-0.0219	
	(4.99)		(-1.46)		(8.01)		(-1.01)		(4.75)		(-1.14)	
Institutional Ownership %	4.3808	***	-0.1468	***								
	(16.27)		(-13.61)									
# of Institutional Owners					0.0224	***	0.0000					
					(48.62)		(1.00)					
Constant	1.0045		0.0629	*	-1.6127	*	-0.0425		4.2466	***	-0.0370	
	(1.08)		(1.78)		(-1.94)		(-1.20)		(4.62)		(-1.06)	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	9,427				9,427				9,427			
Adjusted R-squared	0.68		0.13		0.74		0.11		0.67		0.11	

The model is run as a two stage least squares regression using 1992 as the benchmark year. The predicted value of Residual Coverage from stage 1 is used in

stage 2.

t-statistics for OLS are in parentheses

*, **, *** Statistically significant at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

Variable Definitions:

DTAX = discretionary permanent book-tax differences (the residuals from Equation 1)

Residual Coverage = the residuals from Equation (2) using the OLS model

Expected Coverage = the expected coverage of a firm based on the change in brokerage house size (Equation 7)

Residual Coverage (Instrumented) = the predicted value of Residual Coverage from stage 1 of the regression.

Firm Size = market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding

Market-to-Book ratio = ratio of the current share price to the book value per share

Past Performance = one-year lagged return on assets defined as net income divided by total assets

Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1

Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets

External Financing = the net cash proceeds from equity and debt financing scaled by total assets

Percent of Shares Held by Institutions = the percentage of shares held by institutional investors as reported in (13f) filings

Number of Institutions = the number of institutional investors holding shares in a given firm as reported in (13f) filings

Industry Fixed Effects = control variable by 2-digit SIC code

Table 9: Expected Coverage as Instrument - 1999 Benchmark using OLS Residuals

This table presents the regression of DTAX on Residual Coverage and control variables during 1992-2006 using 2SLS (Equation 7) and 1999 as the benchmark year. Residual Coverage is from the OLS model of Equation 2.

$$\text{Residual Coverage}_{it} = c_t + c_k + \Phi_1 \text{ExpectedCoverage}_{it} + \Phi_2 \text{Controls}_{it} + \eta_{it}$$

$$\text{DTAX}_{it} = \alpha_t + \gamma_k + \beta \text{Residual Coverage}_{it} + \lambda \text{Controls}_{it} + \varepsilon_{it}$$

	1999 Benchmark											
Second Stage Dependent Variable: Discretionary Tax	First Stage		% of Inst. Owner		First Stage		# of Inst. Owners		First Stage		Without Institutions	
Expected Coverage	1.0153	***			0.8158	***			1.0529	***		
	(124.24)				(91.91)				(133.95)			
Residual Coverage (instrumented)			-0.0027	***			-0.0041	***			-0.0031	***
			(-3.85)				(-4.08)				(-4.83)	
Firm Size	-0.1016	***	0.0003	*	-0.1849	***	-0.0002		-0.1063	***	0.0003	*
	(-50.73)		(1.67)		(-73.56)		(-0.66)		(-53.13)		(1.73)	
Market-to-Book Ratio	-0.0006		-0.0001		-0.0003		-0.0001		-0.0005		-0.0001	
	(-0.86)		(-1.18)		(-0.51)		(-1.19)		(-0.73)		(-1.20)	
Past Performance	-1.3477	***	0.1782	***	-0.1897	***	0.1644	***	-0.7061	***	0.1707	***
	(-5.41)		(8.37)		(-8.30)		(7.76)		(-2.85)		(8.15)	
Growth	0.0309		-0.2133	***	0.0009		-0.2135	***	0.0391		-0.2134	***
	(1.17)		(-94.19)		(0.04)		(-94.28)		(1.46)		(-94.23)	
Cash Flow Volatility	-0.0198		0.2872	***	0.0530		0.2895	***	-0.1605		0.2887	***
	(-0.10)		(16.31)		(0.28)		(16.45)		(-0.77)		(16.41)	
External Financing	2.7111	***	0.1526	***	3.3854	***	0.1583	***	2.8075	***	0.1526	***
	(9.42)		(6.21)		(12.71)		(6.38)		(9.66)		(6.21)	
Institutional Ownership %	2.9944	***	-0.0337	*								
	(15.03)		(-1.90)									
# of Institutional Owners					0.0186	***	0.0001	*				
					(45.67)		(1.71)					
Constant	-0.6632		0.0224		-1.8679	*	-0.0188		1.7290		-0.0038	
	(-0.61)		(0.24)		(-1.87)		(-0.20)		(1.59)		(-0.04)	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	10,886				10,886				10,886			
Adjusted R-squared	0.67		0.48		0.72		0.48		0.67		0.48	

The model is run as a two stage least squares regression using 1999 as the benchmark year. The predicted value of Residual Coverage from stage 1 is used in stage 2.
t-statistics for OLS are in parentheses
*, **, *** Statistically significant at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).
Variable Definitions:
DTAX = discretionary permanent book-tax differences (the residuals from Equation 1)
Residual Coverage = the residuals from Equation (2) using the OLS model
Expected Coverage = the expected coverage of a firm based on the change in brokerage house size (Equation 7)
Residual Coverage (Instrumented) = the predicted value of Residual Coverage from stage 1 of the regression.
Firm Size = market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding
Market-to-Book ratio = ratio of the current share price to the book value per share
Past Performance = one-year lagged return on assets defined as net income divided by total assets
Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1
Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets
External Financing = the net cash proceeds from equity and debt financing scaled by total assets
Percent of Shares Held by Institutions = the percentage of shares held by institutional investors as reported in (13f) filings
Number of Institutions = the number of institutional investors holding shares in a given firm as reported in (13f) filings
Industry Fixed Effects = control variable by 2-digit SIC code

Table 10: Expected Coverage as Instrument - 1992 Benchmark using Negative Binomial Residuals

This table presents the regression of DTAX on Residual Coverage and control variables during 1992-2006 using 2SLS (Equation 7) and 1992 as the benchmark year. Residual Coverage is from the negative binomial model of Equation 2.

$$\text{Residual Coverage}_{it} = c_t + c_k + \Phi_1 \text{ExpectedCoverage}_{it} + \Phi_2 \text{Controls}_{it} + \eta_{it}$$

$$\text{DTAX}_{it} = \alpha_t + \gamma_k + \beta \text{Residual Coverage}_{it} + \lambda \text{Controls}_{it} + \varepsilon_{it}$$

	1992 Benchmark											
Second Stage Dependent Variable: Discretionary Tax	First Stage		% of Inst. Owner		First Stage		# of Inst. Owners		First Stage		Without Institutions	
Expected Coverage	0.2118	***			0.5040	***			0.1724	***		
	(24.19)				(57.78)				(20.16)			
Residual Coverage (instrumented)			-0.0025	*			-0.0030	***			-0.0099	***
			(-1.78)				(-4.18)				(-5.64)	
Firm Size	-0.1330	***	-0.0001		0.0136	***	0.0005	***	-0.1263	***	-0.0008	***
	(-53.06)		(-0.69)		(4.56)		(4.46)		(-50.30)		(-3.97)	
Market-to-Book Ratio	-0.0045		-0.0016	***	0.0060		-0.0016	***	-0.0066		-0.0017	***
	(-0.83)		(-8.23)		(1.29)		(-8.26)		(-1.18)		(-8.43)	
Past Performance	-2.3441	***	-0.2203	***	0.6809		-0.2345	***	-3.1629	***	-0.2703	***
	(-4.02)		(-10.96)		(1.38)		(-11.53)		(-5.36)		(-12.74)	
Growth	0.5393	**	-0.0064		0.6278	***	-0.0140	*	0.2625		-0.0135	*
	(2.49)		(-0.86)		(3.45)		(-1.86)		(1.20)		(-1.73)	
Cash Flow Volatility	1.1500	***	-0.0527	***	0.9424	***	-0.0509	***	1.2213	***	-0.0414	***
	(5.61)		(-7.29)		(5.47)		(-7.10)		(5.87)		(-5.38)	
External Financing	0.6786		-0.0273		-0.9311	*	-0.0297		0.7829		-0.0181	
	(1.21)		(-1.43)		(-1.98)		(-1.53)		(1.38)		(-0.90)	
Institutional Ownership %	-5.0070	***	-0.1623	***								
	(-16.63)		(-14.97)									
# of Institutional Owners					-0.0312	***	-0.0001	***				
					(-65.23)		(-5.82)					
Constant	2.4403	**	0.0729	**	6.6063	***	-0.0186		-1.1721	*	-0.0609	*
	(2.36)		(2.05)		(7.71)		(-0.52)		(-1.14)		(-1.66)	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	9,423				9,423				9,423			
Adjusted R-squared	0.38		0.13		0.56		0.11		0.37		0.04	

The model is run as a two stage least squares regression using 1992 as the benchmark year. The predicted value of Residual Coverage from stage 1 is used in

stage 2.

t-statistics for OLS are in parentheses

*, **, *** Statistically significant at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

Variable Definitions:

DTAX = discretionary permanent book-tax differences (the residuals from Equation 1)

Residual Coverage = the residuals from Equation (3) using the negative binomial model

Expected Coverage = the expected coverage of a firm based on the change in brokerage house size (Equation 7)

Residual Coverage (Instrumented) = the predicted value of Residual Coverage from stage 1 of the regression.

Firm Size = market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding

Market-to-Book ratio = ratio of the current share price to the book value per share

Past Performance = one-year lagged return on assets defined as net income divided by total assets

Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1

Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets

External Financing = the net cash proceeds from equity and debt financing scaled by total assets

Percent of Shares Held by Institutions = the percentage of shares held by institutional investors as reported in (13f) filings

Number of Institutions = the number of institutional investors holding shares in a given firm as reported in (13f) filings

Industry Fixed Effects = control variable by 2-digit SIC code

Table 11: Expected Coverage as Instrument - 1999 Benchmark using Negative Binomial Residuals

This table presents the regression of DTAX on Residual Coverage and control variables during 1992-2006 using 2SLS (Equation 7) and 1999 as the benchmark year. Residual Coverage is from the OLS model of Equation 2.

$$\text{Residual Coverage}_{it} = c_t + c_k + \Phi_1 \text{ExpectedCoverage}_{it} + \Phi_2 \text{Controls}_{it} + \eta_{it}$$

$$\text{DTAX}_{it} = \alpha_t + \gamma_k + \beta \text{Residual Coverage}_{it} + \lambda \text{Controls}_{it} + \varepsilon_{it}$$

	1999 Benchmark											
Second Stage Dependent Variable: Discretionary Tax	First Stage		% of Inst. Owner		First Stage		# of Inst. Owners		First Stage		Without Institutions	
Expected Coverage	0.3354	***			0.6292	***			0.2809	***		
	(36.29)				(66.70)				(31.39)			
Residual Coverage (instrumented)			-0.0080	***			-0.0053	***			-0.0114	***
			(-3.84)				(-4.07)				(-4.79)	
Firm Size	-0.1329	***	-0.0005	**	-0.0108	***	0.0005	**	-0.1262	***	-0.0008	***
	(-58.66)		(-2.08)		(-4.03)		(2.09)		(-55.43)		(-3.01)	
Market-to-Book Ratio	-0.0003		-0.0001		-0.0007		-0.0001		-0.0004		-0.0001	
	(-0.32)		(-1.18)		(-0.95)		(-1.23)		(-0.48)		(-1.24)	
Past Performance	-1.8492	***	0.1669	***	-1.0300	***	0.1667	***	-2.7784	***	0.1411	***
	(-6.57)		(7.74)		(-4.24)		(7.87)		(-9.85)		(6.54)	
Growth	0.0033		-0.2134	***	0.0473	*	-0.2133	***	-0.0087		-0.2136	***
	(0.11)		(-93.99)		(1.82)		(-94.06)		(-0.29)		(-93.63)	
Cash Flow Volatility	0.3292		0.2898	***	0.2205		0.2904	***	0.5337	**	0.2952	***
	(1.41)		(16.39)		(1.09)		(16.48)		(2.26)		(16.61)	
External Financing	0.0703		0.1460	***	-0.9158	***	0.1395	***	-0.0676		0.1433	***
	(0.22)		(5.92)		(-3.24)		(5.65)		(-0.20)		(5.78)	
Institutional Ownership %	-4.3429	***	-0.0764	***								
	(-19.27)		(-4.57)									
# of Institutional Owners					-0.0273	***	-0.0001	***				
					(-63.09)		(-4.02)					
Constant	1.0468		0.0313		2.5446	**	0.0033		-2.3007	*	-0.0385	
	(0.85)		(0.34)		(2.41)		(0.04)		(-1.86)		(-0.41)	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	10,884				10,884				10,884			
Adjusted R-squared	0.37		0.48		0.52		0.48		0.35		0.47	

The model is run as a two stage least squares regression using 1999 as the benchmark year. The predicted value of Residual Coverage from stage 1 is used in

stage 2.

t-statistics for OLS are in parentheses

*, **, *** Statistically significant at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

Variable Definitions:

DTAX = discretionary permanent book-tax differences (the residuals from Equation 1)

Residual Coverage = the residuals from Equation (3) using the negative binomial model

Expected Coverage = the expected coverage of a firm based on the change in brokerage house size (Equation 7)

Residual Coverage (Instrumented) = the predicted value of Residual Coverage from stage 1 of the regression.

Firm Size = market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding

Market-to-Book ratio = ratio of the current share price to the book value per share

Past Performance = one-year lagged return on assets defined as net income divided by total assets

Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1

Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets

External Financing = the net cash proceeds from equity and debt financing scaled by total assets

Percent of Shares Held by Institutions = the percentage of shares held by institutional investors as reported in (13f) filings

Number of Institutions = the number of institutional investors holding shares in a given firm as reported in (13f) filings

Industry Fixed Effects = control variable by 2-digit SIC code

Table 12: S&P 500 Index Dummy as Instrument – using OLS Residuals

This table presents the regression of DTAX on an S&P 500 index indicator variable and control variables during 1992-2006 using 2SLS (Equation 8). Residual Coverage is from the OLS model of Equation 2.

$$\text{Residual Coverage}_{it} = c_t + c_k + \Phi_1 \text{Dummy S\&P500}_{it} + \Phi_2 \text{Controls}_{it} + \eta_{it}$$
$$\text{DTAX}_{it} = \alpha_t + \gamma_k + \beta \text{Residual Coverage}_{it} + \lambda \text{Controls}_{it} + \varepsilon_{it}$$

	First Stage		% of Inst. Owner		First Stage		# of Inst. Owners		First Stage		Without Institutions	
S&P 500 Dummy	9.0342	***			1.2582	***			11.5528	***		
	(119.30)				(15.22)				(126.49)			
Residual Coverage (instrumented)			-0.0031	***			0.0075				-0.0073	***
			(-2.72)				(0.75)				(-8.40)	
Firm Size	-0.0709	***	-0.0001		-0.2177	***	0.0031		-0.0727	***	-0.0004	**
	(-50.37)		(-0.57)		(-151.03)		(1.42)		(-41.88)		(-2.08)	
Market-to-Book Ratio	0.0007	*	-0.0001		0.0014	***	-0.0001		0.0008		-0.0001	
	(1.66)		(-1.16)		(3.61)		(-1.45)		(1.47)		(-1.12)	
Past Performance	-1.6876	***	0.0442	***	-1.4367	***	0.0386	**	-0.2413	***	0.0151	*
	(-25.58)		(4.84)		(-24.31)		(2.25)		(-3.00)		(1.71)	
Growth	-0.0129		-0.1320	***	-0.0280	**	-0.1321	***	-0.0169		-0.1325	***
	(-0.95)		(-71.93)		(-2.30)		(-70.23)		(1.01)		(-71.97)	
Cash Flow Volatility	0.0605	***	0.0239	***	0.0215		0.0245	***	0.0130		0.0248	***
	(3.49)		(10.16)		(1.38)		(10.29)		(0.61)		(10.55)	
External Financing	2.0551	***	0.2473	***	1.9575	***	0.2399	***	1.1070	***	0.2704	***
	(21.17)		(18.77)		(22.42)		(10.36)		(9.27)		(20.62)	
Institutional Ownership %	11.7035	***	-0.2270	***								
	(162.44)		(-12.60)									
# of Institutional Owners					0.0477	***	-0.0008					
					(211.03)		(-1.59)					
Constant	-5.2990	***	0.1012	*	-3.3800	***	0.1566	**	-2.9432	***	-0.0015	
	(-14.03)		(1.95)		(-9.95)		(2.55)		(-6.32)		(-0.03)	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	

Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	50,989		50,989		50,989	
Adjusted R-squared	0.51	0.12	0.61	0.10	0.26	0.12

The model is run as a two stage least squares regression using inclusion in the S&P 500 index. The predicted value of Residual Coverage from stage 1 is used in stage 2.

t-statistics for OLS are in parentheses

*, **, *** Statistically significant at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

Variable Definitions:

DTAX = discretionary permanent book-tax differences (the residuals from Equation 1)

Residual Coverage = the residuals from Equation (2) using the OLS model

S&P 500 Dummy = 1 if a firm is included in the S&P 500 index in a given year; 0 otherwise

Residual Coverage (Instrumented) = the predicted value of Residual Coverage from stage 1 of the regression

Firm Size = market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding

Market-to-Book ratio = ratio of the current share price to the book value per share

Past Performance = one-year lagged return on assets defined as net income divided by total assets

Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1

Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets

External Financing = the net cash proceeds from equity and debt financing scaled by total assets

Percent of Shares Held by Institutions = the percentage of shares held by institutional investors as reported in (13f) filings

Number of Institutions = the number of institutional investors holding shares in a given firm as reported in (13f) filings

Industry Fixed Effects = control variable by 2-digit SIC code

Table 13: S&P 500 Index Dummy as Instrument - using Negative Binomial Residuals

This table presents the regression of DTAX on an S&P 500 index indicator variable and control variables during 1992-2006 using 2SLS (Equation 8). Residual Coverage is from the negative binomial model of Equation 3.

$$\text{Residual Coverage}_{it} = c_t + c_k + \Phi_1 \text{Dummy S\&P500}_{it} + \Phi_2 \text{Controls}_{it} + \eta_{it}$$
$$\text{DTAX}_{it} = \alpha_t + \gamma_k + \beta \text{Residual Coverage}_{it} + \lambda \text{Controls}_{it} + \varepsilon_{it}$$

	First Stage		% of Inst. Owner		First Stage		# of Inst. Owners		First Stage		Without Institutions	
S&P 500 Dummy	-1.4470	***			0.3605	***			-1.4204	***		
	(-19.09)				(3.58)				(-19.35)			
Residual Coverage (instrumented)			0.0003				0.2585	***			0.0518	***
			(0.05)				(3.19)				(7.63)	
Firm Size	-0.0967	***	0.0002		-0.0608	***	0.0194	***	-0.0968	***	0.0053	***
	(-61.24)		(0.32)		(-28.93)		(3.79)		(-61.29)		(7.02)	
Market-to-Book Ratio	0.0005		-0.0001	*	0.0005		-0.0002	*	0.0005		-0.0001	**
	(1.13)		(-1.84)		(1.32)		(-1.75)		(1.13)		(-2.09)	
Past Performance	-0.1067		0.0515	***	0.0947		0.0081		-0.0934		0.0198	**
	(-1.46)		(6.03)		(1.31)		(0.37)		(-1.29)		(2.07)	
Growth	-0.0028		-0.1559	***	0.0100		-0.1589	***	-0.0022		-0.1573	***
	(-0.18)		(-86.19)		(0.65)		(-35.16)		(-0.14)		(-77.45)	
Cash Flow Volatility	-0.0481		0.0568	***	-0.0570		0.0736	***	-0.0491		0.0621	***
	(-1.51)		(15.19)		(-1.80)		(7.13)		(-1.54)		(14.78)	
External Financing	-0.3625	***	0.2059	***	-0.5146	***	0.3451	***	-0.3698	***	0.2448	***
	(-3.35)		(16.26)		(-4.80)		(6.54)		(-3.43)		(17.27)	
Institutional Ownership %	0.1112		-0.3057	***								
	(1.41)		(-33.78)									
# of Institutional Owners					-0.0077	***	0.0013	**				
					(-25.65)		(2.24)					
Constant	-1.2155	***	0.1444	***	-1.0546	***	0.3788	***	-1.1822	***	0.1213	**
	(-3.19)		(3.19)		(-2.79)		(2.57)		(-3.11)		(2.39)	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	40,112				40,112				40,112			

Adjusted R-squared	0.20	0.21	0.20

The model is run as a two stage least squares regression using inclusion in the S&P 500 index. The predicted value of Residual Coverage from stage 1 is used in stage 2.
t-statistics for OLS are in parentheses
*, **, *** Statistically significant at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).
Variable Definitions:
DTAX = discretionary permanent book-tax differences (the residuals from Equation 1)
Residual Coverage = the residuals from Equation (3) using the negative binomial model
S&P 500 Dummy = 1 if a firm is included in the S&P 500 index in a given year; 0 otherwise
Residual Coverage (Instrumented) = the predicted value of Residual Coverage from stage 1 of the regression
Firm Size = market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding
Market-to-Book ratio = ratio of the current share price to the book value per share
Past Performance = one-year lagged return on assets defined as net income divided by total assets
Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1
Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets
External Financing = the net cash proceeds from equity and debt financing scaled by total assets
Percent of Shares Held by Institutions = the percentage of shares held by institutional investors as reported in (13f) filings
Number of Institutions = the number of institutional investors holding shares in a given firm as reported in (13f) filings
Industry Fixed Effects = control variable by 2-digit SIC code

Table 14: The Effect of Change in Analyst Coverage – OLS Residuals

This table presents the regression of the three-year change in DTAX on the three-year change in Residual Coverage (OLS and 2SLS) and control variables during 1992-2006 (Equation 9). Residual Coverage is from the OLS model of Equation 2.

$$\Delta DTAX_{it} = \alpha_t + \gamma_k + \beta \Delta \text{Residual Coverage}_{it} + \lambda \text{Controls}_{it} + \varepsilon_{it}$$

	Change in Residual Coverage						Change in Expected Coverage (1992 benchmark)						Change in S&P 500					
Dependent Variable: ΔDTAX	% of Inst. Owner		# of Inst. Owners		Without Inst.		% of Inst. Owner		# of Inst. Owners		Without Inst.		% of Inst. Owner		# of Inst. Owners		Without Institutions	
Δ Residual Coverage	-0.0020	**	-0.0037	***	-0.0026	***	-0.0053	**	-0.0053	**	-0.0054	**	0.0019		0.0056		0.0017	
	(-2.54)		(-4.41)		(-3.59)		(-2.12)		(-2.27)		(-2.28)		(0.33)		(0.23)		(0.31)	
Δ Firm Size	-0.0001		-0.0005	**	-0.0002		-0.0002		-0.0006		-0.0002		0.0004		0.0010		0.0003	
	(-0.60)		(-1.96)		(-0.94)		(-0.42)		(-1.07)		(-0.46)		(0.47)		(0.25)		(0.45)	
Δ M-to-B Ratio	-0.0002	**	-0.0002	**	-0.0002	**	-0.0001		-0.0001		-0.0001		-0.0002	**	-0.0002	**	-0.0002	**
	(-2.34)		(-2.35)		(-2.36)		(-1.31)		(-1.31)		(-1.33)		(-2.22)		(-2.07)		(-2.24)	
Δ Past Performance	-0.1492	***	-0.1549	***	-0.1515	***	-0.1299	***	-0.1363	***	-0.1309	***	-0.1434	***	-0.1403	***	-0.1470	***
	(-12.95)		(-13.43)		(-13.22)		(-9.46)		(-9.84)		(-9.68)		(-10.05)		(-3.45)		(-11.45)	
Δ Growth	-0.0579	***	-0.0583	***	-0.0581	***	-0.1427	***	-0.1435	***	-0.1428	***	-0.0575	***	-0.0574	***	-0.0578	***
	(-25.54)		(-25.74)		(-25.65)		(-44.41)		(-44.58)		(-44.68)		(-24.56)		(-16.46)		(25.22)	
Δ Cash Flow Volatility	0.0386	***	0.0387	***	0.0386	***	0.0492	***	0.0505	***	0.0493	***	0.0390	***	0.0395	***	0.0392	***
	(16.04)		(16.10)		(16.06)		(13.13)		(13.91)		(13.01)		(15.80)		(12.72)		(15.60)	
Δ External Financing	0.0307	**	0.0323	**	0.0308	**	0.1821	***	0.1801	***	0.1818	***	0.0242		0.0154		0.0223	
	(2.24)		(2.36)		(2.25)		(11.41)		(11.34)		(11.32)		(1.45)		(0.33)		(1.28)	
Δ Inst. Ownership %	-0.0341	*					-0.0100						-0.0697					
	(-1.87)						(-0.48)						(-1.28)					
Δ # of Inst. Owners			0.0002	***					0.0002	**					-0.0002			
			(2.60)						(2.20)						(-0.20)			
Constant	0.0154		0.0065		0.0123		-0.0006		-0.0107		-0.0013		0.0226		-0.0411		0.0175	
	(0.27)		(0.11)		(0.22)		(-0.01)		(-0.18)		(-0.02)		(0.39)		(-0.72)		(0.31)	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Industry F.E.	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
# of Observations	27,591		27,591		27,591		16,022		16,022		16,022		27,591		27,591		27,591	
Adjusted R-squared	0.05		0.05		0.05		0.13		0.13		0.13		0.04		0.04		0.04	

t-statistics for OLS are in parentheses

*, **, *** Statistically significant at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

Variable Definitions:
ΔDTAX = the three-year change discretionary permanent book-tax differences (the residuals from Equation 1)
ΔResidual Coverage = the three-year change in the residuals from Equation (3) using the negative binomial model
ΔExpected Coverage = the three-year change in expected coverage (based on the change in brokerage house size) using 1999 as the benchmark year.
ΔS&P 500 Dummy = the three-year change in the S&P 500 dummy variable - 1 if a firm is included in the S&P 500 index in a given year; 0 otherwise
Firm Size = market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding
Market-to-Book ratio = ratio of the current share price to the book value per share
Past Performance = one-year lagged return on assets defined as net income divided by total assets
Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1
Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets
External Financing = the net cash proceeds from equity and debt financing scaled by total assets
Percent of Shares Held by Institutions = the percentage of shares held by institutional investors as reported in (13f) filings
Number of Institutions = the number of institutional investors holding shares in a given firm as reported in (13f) filings
Industry Fixed Effects = control variable by 2-digit SIC code

Table 15: Effect of Change in Analyst Coverage - Negative Binomial Residuals

This table presents the regression of the three-year change in DTAX on the three-year change in Residual Coverage (OLS and 2SLS) and control variables during 1992-2006 (Equation 9). Residual Coverage is from the negative binomial model of Equation 3.

$$\Delta DTAX_{it} = \alpha t + \gamma k + \beta \Delta \text{Residual Coverage}_{it} + \lambda \text{Controls}_{it} + \varepsilon_{it}$$

	Change in Residual Coverage						Change in Expected Coverage (1992 benchmark)						Change in S&P 500					
Dependent Variable: ΔDTAX	% of Inst. Owner		# of Inst. Owners		Without Inst.		% of Inst. Owner		# of Inst. Owners		Without Inst.		% of Inst. Owner		# of Inst. Owners		Without Institutions	
Residual Coverage	-0.0017	**	-0.0016	**	-0.0017	**	-0.0083	**	-0.0093	**	-0.0092	**	-0.0847		0.0326		-0.0850	
	(-2.26)		(-2.13)		(-2.19)		(-2.11)		(-2.24)		(-2.25)		(-1.25)		(1.40)		(-1.24)	
Firm Size	0.0006	**	0.0006	*	0.0006	**	-0.0002		0.0000		-0.0002		-0.0066		0.0026	*	-0.0067	
	(1.99)		(1.82)		(2.01)		(-0.42)		(0.05)		(-0.57)		(-1.12)		(1.84)		(-1.12)	
M-to-B Ratio	-0.0002	***	-0.0002	***	-0.0002	***	-0.0001		-0.0001		-0.0001		-0.0004	**	-0.0001		-0.0004	**
	(-2.74)		(-2.76)		(-2.76)		(-1.42)		(-1.49)		(-1.48)		(-2.26)		(-1.50)		(-2.26)	
Past Performance	-0.1469	***	-0.1498	***	-0.1496	***	-0.1340	***	-0.1352	***	-0.1387	***	-0.1369	***	-0.1618	***	-0.1450	***
	(-10.52)		(-10.74)		(-10.77)		(-9.75)		(-9.78)		(-10.12)		(-7.11)		(-9.68)		(-8.14)	
Growth	-0.1042	***	-0.1046	***	-0.1046	***	-0.1448	***	-0.1451	***	-0.1455	***	-0.1202	***	-0.0989	***	-0.1213	***
	(-32.05)		(-32.18)		(-32.20)		(-44.62)		(-44.92)		(-44.62)		(-8.76)		(-19.15)		(-8.46)	
Cash Flow Volatility	0.0776	***	0.0784	***	0.0783	***	0.0492	***	0.0488	***	0.0496	***	0.0439		0.0945	***	0.0457	*
	(19.11)		(19.26)		(19.34)		(12.92)		(12.22)		(13.15)		(1.56)		(8.01)		(1.68)	
External Financing	0.0786	***	0.0772	***	0.0772	***	0.1495	***	0.1455	***	0.1449	***	-0.0528		0.1303	***	-0.0580	
	(5.37)		(5.28)		(5.28)		(8.42)		(8.11)		(7.99)		(-0.48)		(3.32)		(-0.52)	
Inst. Ownership %	-0.0323	*					-0.0489	***					-0.0972	*				
	(-1.93)						(-2.77)						(-1.70)					
# of Inst. Owners			0.0000						-0.0001						0.0005			
			(0.20)						(-1.36)						(1.48)			
Constant	-0.0072		0.0095		-0.0083		-0.0414		-0.0137		-0.0440		-0.1779		0.0125		-0.1809	
	(-0.13)		(0.18)		(-0.16)		(-0.68)		(-0.23)		(-0.72)		(-1.33)		(0.19)		(-1.34)	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Industry F.E.	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
# of Observations	21,300		21,300		21,300		15,957		15,957		15,957		21,300		21,300		21,300	
Adjusted R-squared	0.07		0.07		0.07		0.13		0.13		0.13							

t-statistics for OLS are in parentheses

*, **, *** Statistically significant at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

Variable Definitions:

ΔDTAX = the three-year change discretionary permanent book-tax differences (the residuals from Equation 1)

ΔResidual Coverage = the three-year change in the residuals from Equation (3) using the negative binomial model
ΔExpected Coverage = the three-year change in expected coverage (based on the change in brokerage house size) using 1999 as the benchmark year.
ΔS&P 500 Dummy = the three-year change in the S&P 500 dummy variable - 1 if a firm is included in the S&P 500 index in a given year; 0 otherwise
Firm Size = market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding
Market-to-Book ratio = ratio of the current share price to the book value per share
Past Performance = one-year lagged return on assets defined as net income divided by total assets
Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1
Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets
External Financing = the net cash proceeds from equity and debt financing scaled by total assets
Percent of Shares Held by Institutions = the percentage of shares held by institutional investors as reported in (13f) filings
Number of Institutions = the number of institutional investors holding shares in a given firm as reported in (13f) filings
Industry Fixed Effects = control variable by 2-digit SIC code

Table 16: Effect of Analyst Characteristics on Tax Aggressiveness

This table presents the regression of DTAX on analyst characteristics and control variables during 1992-2006 (Equation 10).

$$DTAX_{it} = \alpha_t + \gamma_k + \beta Analyst\ Coverage_{it} + \beta Analyst\ Characteristics_{it} + \lambda Controls_{it} + \varepsilon_{it}$$

	Experience as Analyst						Experience with Firm					
Dependent Variable: DTAX	% of Inst. Ownership		# of Inst. Owners		Without Institutions		% of Inst. Ownership		# of Inst. Owners		Without Institutions	
Analysts from Top Brokers	0.0018	***	0.0019	***	0.0019	***	0.0018	***	0.0020	***	0.0020	***
	(4.91)		(5.05)		(5.25)		(4.95)		(5.21)		(5.49)	
Experience as Analyst	-0.0067	**	-0.0120	***	-0.0119	***						
	(-2.45)		(-4.45)		(-4.42)							
(Experience as Analyst)^2	0.0004	***	0.0007	***	0.0007	***						
	(2.68)		(4.33)		(4.30)							
Experience with Firm							-0.0109	***	-0.0194	***	-0.0189	***
							(-2.91)		(-5.19)		(-5.10)	
(Experience with Firm)^2							0.0012	***	0.0018	***	0.0018	***
							(3.17)		(4.72)		(4.67)	
Number of Analysts	-0.0050	***	-0.0070	***	-0.0068	***	-0.0051	***	-0.0070	***	-0.0068	***
	(-10.85)		(-13.34)		(-15.40)		(-11.05)		(-13.66)		(-15.51)	
Firm Size	0.0010	***	0.0012	***	0.0012	***	0.0010	***	0.0011	***	0.0013	***
	(6.44)		(5.49)		(8.16)		(6.46)		(5.21)		(8.22)	
Market-to-Book Ratio	-0.0001	***	-0.0001	***	-0.0001	***	-0.0001	***	-0.0001	***	-0.0001	***
	(-2.84)		(-2.79)		(-2.79)		(-2.85)		(-2.82)		(-2.82)	
Past Performance	0.1179	***	0.1015	***	0.1020	***	0.1166	***	0.0982	***	0.0993	***
	(11.37)		(9.80)		(9.90)		(11.23)		(9.49)		(9.64)	
Growth	-0.1833	***	-0.1837	***	-0.1837	***	-0.1835	***	-0.1841	***	-0.1840	***
	(-113.29)		(-113.29)		(-113.31)		(-113.24)		(-113.33)		(-113.36)	
Cash Flow Volatility	0.0401	***	0.0404	***	0.0404	***	0.0399	***	0.0400	***	0.0400	***
	(12.67)		(12.75)		(12.75)		(12.62)		(12.63)		(12.64)	
External Financing	0.2263	***	0.2322	***	0.2316	***	0.2223	***	0.2232	***	0.2226	***
	(18.28)		(18.67)		(18.68)		(17.67)		(17.68)		(17.65)	
Institutional Ownership %	-0.1197	***					-0.1190	***				
	(-11.96)						(-11.80)					
# of Institutional Owners			0.0000						0.0000			
			(0.64)						(1.05)			
Constant	0.0711		0.0266		0.0540593		0.0700		0.0198		0.0447	
	(1.46)		(0.54)		(1.11)		(1.45)		(0.41)		(0.93)	
Year Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes		Yes		Yes		Yes	
Number of Observations	31,352		31,352		31,352		31,352		31,352		31,352	
Adjusted R-squared	0.32		0.32		0.32		0.32		0.32		0.32	

t-statistics for OLS are in parentheses

*, **, *** Statistically significant at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed).

Variable Definitions:

DTAX = discretionary permanent book-tax differences (the residuals from Equation 1)

Analysts from Top Brokerage Firms = the number of analysts listed as an *All-American* research team as identified by *Institutional Investor* covering a given firm

Experience as an Analyst = the number of years the analyst has worked as an analyst

Experience with a Firm = the number of years an analyst has followed a specific firm

Number of Analysts = the number of analysts covering a firm in a given year

Firm Size = market value defined as the stock price at fiscal year end multiplied by the number of shares outstanding

Market-to-Book ratio = ratio of the current share price to the book value per share

Past Performance = one-year lagged return on assets defined as net income divided by total assets

Growth = the growth rate of assets defined as total assets in year *t* less total assets in year *t*-1 divided by total assets in year *t*-1

Cash Flow Volatility = the standard deviation of cash flows for a firm during the sample period scaled by lagged assets

External Financing = the net cash proceeds from equity and debt financing scaled by total assets

Percent of Shares Held by Institutions = the percentage of shares held by institutional investors as reported in (13f) filings

Number of Institutions = the number of institutional investors holding shares in a given firm as reported in (13f) filings

Industry Fixed Effects = control variable by 2-digit SIC code

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