Did FIN 48 Arrest the Trend in Multistate Tax Avoidance?

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Abstract
This study considers whether the falling state effective tax rates (ETRs) beginning in the 1990s rose in response to FASB Interpretation No. 48 (FIN 48), Accounting for Uncertainty in Income Taxes. Starting in 2007, FIN 48 requires firms to record and disclose liabilities for unrecognized tax benefits based on the merits of each position, ignoring audit probabilities. We predict that both state ETRs and cash payments for state taxes will generally increase as a result. Obtaining evidence on this prediction is important as a test of theoretical predictions that FIN 48 will reduce taxpayers’ claims of weak tax positions.

Aggregate trends in reported state tax expense and tax collections from 1995 through 2007 provide overall evidence that state ETRs and collections, which declined for a decade, increase in the years surrounding FIN 48. Reserves for unrecognized tax benefits are positively associated with our proxy for state tax avoidance, suggesting that state taxes are a substantial source of uncertain tax benefits.

We develop a model of state tax avoidance that contributes new evidence that firm-level intangibility provides opportunities to decrease state ETRs. Controlling for planning opportunities, we find that state ETRs increase most between 2005 and 2007 for those firms that had the greatest decreases in state ETRs in the prior decade, suggesting that the most aggressive firms recorded more expense following FIN 48. Further, firm-level and state-level cash tax payments increased in 2006 and 2007, consistent with FIN 48 having broad effects on state tax collections. Together, all of these results triangulate to suggest that FIN 48 helped arrest the trend in multistate tax avoidance.

Keywords: state taxation, uncertain tax benefits, tax reserves, tax avoidance  
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We also appreciate the use of FIN 48 public disclosure data collected by analysts with the Internal Revenue Service’s Large and MidSized Business Research Division.
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Our recent experience clearly demonstrates that entities with nexus considerations are responding to the responsibilities mandated by the provisions of FIN 48.

Mike Mason, Director of Tax Policy, Alabama Department of Revenue

1 Ely and Long (2007, page 655) credit the substantial increase in Alabama tax revenue in 2007 to the strong U.S. and Alabama economy, and increased enforcement efforts and increased taxpayer compliance. “The latter reason involves a surge … resulting from the implementation of FIN 48” (page 653).

1. Introduction

Tax reserve disclosures mandated by FASB Interpretation No. 48 (FIN 48), Accounting for Uncertainty in Income Taxes, provide a new link between financial reporting and tax aggressiveness. We investigate potential implications of this link in the setting of multistate taxation. Based on game-theoretic predictions about the value of FIN 48 disclosures to tax authorities, predictions about internal monitoring in response to new information, and anecdotal evidence, we expect that FIN 48 arrests the trend in multistate tax avoidance. To test our predictions, we first examine whether multistate tax avoidance contributes to the liabilities for unrecognized tax benefits reported pursuant to FIN 48. Second, in a direct test of FIN 48’s impact on multistate tax avoidance, we investigate 1) whether firms’ state effective tax rates increase following the enactment of FIN 48, and 2) whether firms’ cash effective tax rates and states’ tax collections increase following the enactment of FIN 48. Our study contributes evidence to recent theory about the unintended effects of new financial reporting disclosures on tax compliance.

Under FIN 48, firms do not have to record uncertain tax benefits that are “more likely than not” to be sustained under examination assuming the tax authority has full information. For other uncertain tax positions, FIN 48 requires firms to record and disclose a liability. Therefore, positions subject to low detection risk prior to FIN 48 will frequently result in higher liabilities after FIN 48. Two areas of multistate taxation likely create weak positions for corporate taxpayers. First, states have recently begun

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2 There is no widely-accepted definition of tax aggressiveness so, consistent with Mills, Robinson and Sansing (2009), we view tax aggressiveness as claiming a tax benefit with relatively weak facts to sustain the benefit if the company were audited. Examples of tax benefits with weak positions include tax evasion, some tax avoidance, and unintentional errors such as corporations being unaware of filing requirements.

3 Mills et al. (2009) point out that when firms faced substantial detection risk pre-FIN48 and/or highly skewed benefit distributions, the reserve could still decrease after FIN 48.
to fight taxpayer attempts to shift income from high tax jurisdictions to lower tax jurisdictions via related party transactions, especially through the formation of passive investment companies or “intangible holding companies” as they are more popularly labeled.\(^4\) Second, firms that expand their operations may not consider state and local tax filing requirements. As a result, growing firms likely have nonfiling exposure in states where taxing authorities can assert “nexus.”

We expect that firms with weak state tax positions will report increased state effective tax rates (ETRs) in response to FIN 48. There are two possible scenarios where we may not see this predicted increase. First, managers may simply interpret their support of uncertain tax positions more liberally to justify those positions as meeting the new standard (Cuccia, Hackenbrack and Nelson, 1995).\(^5\) Second, FIN 48 appears to create a financial reporting incentive to record excess reserves at adoption because any adjustments are recorded in stockholders’ equity rather than in the statement of earnings. Reversal of this reserve allows firms to manage earnings per share upwards. If reserve releases offset increases in state tax expense associated with weak tax positions, we would fail to detect our predicted increase in state ETRs.

There is speculation in some states that the implementation of FIN 48 will positively impact revenue collections (e.g., Ely and Long, 2007). We are unsure, however, whether FIN 48 will change overall state tax payments. Mills et al. (2009) model the strategic interaction between the taxpayer and the government pre- and post-FIN 48. The disclosure of high tax reserves informs the government about the strength of the uncertain position, so the government succeeds in collecting slightly more tax on audit and some weak firms are less likely to claim the uncertain tax benefit. However, Mills et al. (2009) assume the taxpayer has only one uncertain tax position and one filing jurisdiction, so that the authors can determine the maximum constraints FIN 48 places on taxpayers. The actual disclosure is less informative because the reported aggregate reserve includes multiple jurisdictions, years and issues. Thus, it is unclear

\(^4\) Rulings in a number of high-profile nexus battles in several states, notably New Jersey and West Virginia, all revolving around states’ efforts to undermine tax-planning techniques involving intangible holding companies, have been decided in favor of the states (Grissom and Lohman, 2007).

\(^5\) Similarly, Kachelmeier and Messier (1990) find that auditors who have a desired sample size assign parameters in a statistical decision aid that yield the desired sample, implying that they “back into” the desired answer even with apparently stricter numerical guidance.
whether disclosed FIN 48 reserves will increase detection by state governments. If not, disclosure may
not motivate greater compliance or lead to higher state tax collections.

On the other hand, FIN 48 raises awareness about the merits of uncertain tax positions to those
governing the company. Prior to FIN 48, executives and boards might only have been aware of the net
amounts the tax director expected to lose under audit, taking into account detection risk. However,
because the statute of limitations on a state tax examination does not generally start until a taxpayer files
its return, the exposure for nonfiling is unlimited. The potential exposure becomes new information to
boards. Firms can reduce their recorded FIN 48 liability by negotiating with state tax authorities to settle
outstanding disputes. Further, we expect some taxpayers will sometimes pay undetected back taxes to
reduce uncertainty and decrease liabilities (Dubin and Davis 2009). Finally, knowledge of the merits of
the uncertain tax benefit introduces an additional element of tax ethics into the tax filing positions. Failing
to file required tax returns or claiming other uncertain tax benefits that would not be sustained on their
merits requires company management to actively endorse the position. Clear knowledge of unmeritorious
tax positions constrains managers’ motivated reasoning (Kunda, 1990). Thus, we expect that merely the
increased awareness of the merits of uncertain tax positions could increase voluntary compliance.

Higher state tax payments could represent an unintended consequence of FIN 48. In its comment
letter to the FASB, the Council on State Taxation cites anecdotal evidence that one public accounting firm
advised clients to file and pay taxes in jurisdictions where they might not have nexus because the FIN 48
liability would otherwise be too large. Thus, “the regrettable result of FIN 48 … will make shareholders
of companies with nexus questions financially worse off because the company will be compelled to pay a

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6 Other standards issued by the FASB requiring firms to change accounting measurement for liabilities have also had
unintended consequences. FASB Statement of Financial Accounting Standards No. 106 (SFAS 106), Employers’
Accounting for Postretirement Benefits Other Than Pensions requires firms to accrue other post-retirement
employee benefit expenses when earned. Prior to SFAS 106, employers usually recorded expenses when benefits
were actually paid. Brown (1993) notes that SFAS 106 made companies sit up and say, ‘My God, look at what this
is going to cost!’”
tax that it never actually owes.” FASB Concepts Statement No. 2 *Qualitative Characteristics of Accounting Information* indicates that the primary desirable quality of accounting information is decision usefulness, but FASB Concepts Statement No. 1 *Objectives of Financial Reporting by Business Enterprises* (paragraph 26) makes it clear that taxing authorities have statutory authority to require the specific information they need. Thus, any higher tax payments as a result of FIN 48 represent a cost to some firms. Whether FIN 48’s measurement and disclosure rules provide useful information to investors and creditors is beyond the scope of this paper due to data constraints.\(^8\)

To set the stage for our main analysis, we first describe aggregate trends in corporate state ETRs and state tax collections from 1995 through 2007 reported in financial statements. The trend through 2005 captures the extent to which state and local tax (“SALT”) consulting practices succeeded in multistate tax minimization. We expect that state ETRs in 2006 and 2007 will reflect effects from FIN 48, although 2004 and 2005 state ETRs may reflect anticipatory effects of FIN 48 adoption. Next we estimate a benchmark regression model of firm-level state ETRs to determine whether intangibility and growth, our proxies for multistate tax avoidance, suggest the presence of uncertain tax positions. Finally, we establish that state tax planning is a source of uncertain tax benefits by fitting the liability for unrecognized tax benefits to federal, foreign and state components of tax savings.

Our main analysis of the effects of FIN 48 on arresting multistate tax avoidance consists of analyzing firm-level book and cash effective tax rates and state-level collections. We first examine whether mean firm-level state tax expense and aggregate state corporate income tax collections increase subsequent to the enactment of FIN 48. As expected, state ETRs and aggregate state tax collections generally decreased from 1995 through 2004. This evidence is consistent with prior research that examined this trend and its causes in greater detail (e.g., Gupta, Moore, Gramlich and Hofmann, 2009). In


\(^8\) Additional tax payments made by taxpayers with weak uncertain tax positions may create a welfare benefit to already-compliant taxpayers if corporate tax rates fall or grow more slowly in the long-run. Frischmann et al. (2008) find that although the market does not react to events increasing the probability of FIN 48 taking effect, investors respond favorably to firms reporting unrecognized tax benefits that would impact the firm’s ETR if recognized.
the subsequent years surrounding FIN 48, we find dramatic increases in state ETRs and aggregate cash collections suggesting increased tax compliance.

In benchmark firm-level tests, we find that intangibility is systematically associated with state ETRs but growth is not. We also find that firms with aggressive state tax positions have larger liabilities for uncertain tax positions.

Next, we investigate whether state tax aggressiveness explains increases in firm-level state tax expense from 2005 to 2007. In our analysis of two-year changes in state ETRs, we observe that firms with the largest decreases in state ETR over 1995-2005 are more likely to increase state ETRs from 2005 to 2007. This suggests that while tax aggressive firms generally decreased state ETRs over our sample period leading up to 2005, those firms increased state ETRs surrounding FIN 48. We then investigate whether state tax collections increase following FIN 48 by examining whether two-year changes in cash effective tax rates, controlling for changes in federal and foreign ETRs, increase in the period following FIN 48. We find that state taxes paid generally increased in 2006 and 2007, but not more so for the tax aggressive firms. We speculate that there may be some lag in payments as aggressive firms negotiate settlements. Finally, tests of state-level collections confirm that, holding constant state tax computational and enforcement regimes, collections increased in 2006 and 2007.

Triangulating evidence from tax collections and state ETRs, balance sheet tests of FIN 48 unrecognized tax benefits, firm-level tests of changes in state ETRs and state cash taxes paid, and state-level tests of changes in collections points to increased state ETRs and state tax payments surrounding FIN 48. These results are consistent with the standard arresting the trend in state tax avoidance.

2. **FIN 48 and Multistate Taxation**

2.1 **FIN 48 overview**

the effects of income taxes on U.S. GAAP-based financial statements. However, SFAS 109 provided limited guidance on the recognition and measurement of uncertain tax positions.⁹

In June 2006, the FASB released FIN 48, an interpretation of SFAS 109, effective for public companies for fiscal periods beginning after December 15, 2006.¹⁰ FIN 48 specifically addresses the recognition and measurement of benefits of uncertain tax positions and, for the first time, requires explicit disclosure of unrecognized tax benefits.¹¹ With the issuance of FIN 48, the FASB sought among other things, to provide users of U.S. GAAP financial statements a clearer picture of a company’s tax aggressiveness, thus enabling stakeholders an opportunity to make more informed investment decisions. Accordingly, FIN 48 sets forth a two-step process for evaluating tax positions:

1) The company determines whether it is “more likely than not” that a tax position will be sustained upon examination based on the technical merits of the position – in doing so, the filer should presume that the position will be examined by the appropriate taxing authority that has full knowledge of all relevant information; and
2) A tax position that meets the more-likely-than-not test is then measured to determine the amount of benefit to recognize in the financial statements – the position is measured at the largest amount of benefit that is greater than 50 percent likely of being realized upon ultimate settlement.¹²

The amount of the uncertain tax benefit that is not recognized becomes a liability.¹³ Consistent with the FASB’s objective in issuing FIN 48, the standard also requires companies to disclose a detailed reconciliation of beginning to ending balance of unrecognized tax benefits; the amounts of interest and penalties recognized in the income statement and balance sheet; a description of tax years that remain

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⁹ Examples of these positions include: 1) An entity’s decision to not file a tax return in a jurisdiction in which it may have nexus; 2) The decision to exclude potentially taxable income from a tax return; 3) The choice to take a position that has had mixed results/acceptance from the taxing authority; and 4) The decision to consider a transaction as tax-free.
¹⁰ The FASB initially proposed that the standard would be effective for fiscal periods beginning on or after December 15, 2005 in the Exposure Draft issued in July of 2005. Thus, it is possible companies began to respond prior to 2007.
¹¹ Numerous professional (Dunbar, 2008) and academic articles (Blouin et al. 2007; Blouin et al., forthcoming, ; Frischmann et al., 2008; Mills et al., 2009) describe these rules in detail and so we are somewhat brief here.
¹² FASB Staff Position (FSP) No. FIN 48-1, Definition of Settlement in FASB Interpretation No. 48, modified this standard from “ultimate” to “effective” settlement.
¹³ These accruals are subject to materiality provisions. In addition to the tax, the company must accrue any potential interest and/or penalties related to unrecognized tax benefits. Sollie, Gutowski and Levine (2007) note that interest can quickly add up. For example, in Praxair Technology, Inc. v. Director, Division of Taxation (New Jersey Tax Court, Docket No. 074445-05 (June 18, 2007)), the interest at issue for 1994-1996 exceeded the disputed tax. Thus most aggressive tax positions usually meet the materiality standard.
subject to examination by major tax jurisdictions; and significant changes expected in the next twelve months.

When firms adopt FIN 48 for their first year beginning after December 15, 2006, they must record any change of accounting method adjustments as increases or decreases to retained earnings.\textsuperscript{14} It is possible that the stockholders’ equity adjustment provides an incentive to over-reserve at adoption so that any future change in reserves will increase income. Thus, over-reserving firms that settle cases shortly after adopting FIN 48, may have lower effective tax rates after adoption.

2.2 \textit{Multistate tax issues}

Multistate taxation generates sub-national issues similar to international taxation. State tax jurisdictions differ in the type of tax(es) they administer (income, franchise or no tax at all). States also differ in their allocation and apportionment schemes— including the sourcing of sales and allocation of non-business income (e.g., capital gains).\textsuperscript{15} These differences and others result in various states becoming “tax havens” for certain types of corporate income, which in turn enables corporations to pay state tax on less than 100\% of their income or have more of their income sourced (and taxed) in states with favorable tax regimes. Thus, multistate taxation is not a zero-sum game and assessments by one state do not automatically result in a correlative adjustment to reduce tax in another state.

\cite{attermeier2007} identify several specific challenges to the application of FIN 48 to state tax positions, including nexus, characterization of taxes (e.g. income taxes, excise taxes, franchise taxes, etc.), offsetting positions, and statutes of limitations. In addition, intangible holding companies present unique state tax issues with FIN 48 implications (Kwiatek, 2007; Solie et al., 2007).

\textsuperscript{14} Blouin et al. (forthcoming) find that firms are more likely to partially decrease reserves and increase earnings prior to adopting FIN 48. In contrast, firms that need additional reserves show no pattern of increasing reserves and decreasing earnings prior to adoption.

\textsuperscript{15} Some states use only the location of sales to determine their share of business income, whereas other states use a combination of sales, property and payroll. In addition, some states employ a “throwback rule” that taxes income attributable to sales made to states that impose no corporate income tax.
2.2.1 Nexus

Nexus is a term describing a jurisdiction’s right to tax an enterprise. FIN 48 (paragraph 4) explicitly identifies “a decision not to file a tax return” as a tax position that the firm must evaluate. Among the many diverse practices of identifying and measuring unrecognized tax benefits prior to FIN 48, many firms considered the probability of detection when determining tax liabilities. To illustrate, if a company chose not to file a tax return in a particular jurisdiction, but the facts and applicable law indicated that it was more likely than not that nexus existed, it would probably not record a liability if it faced a small probability of detection. Because FIN 48 requires that recognition and measurement be based on the technical merits of the transaction, assuming “that the tax position will be examined by the relevant taxing authority that has full knowledge of all relevant information,” many companies must record liabilities under FIN 48 that they previously ignored (including failure to file penalties and interest, which can be substantial). Failure to file is rarely an issue at the federal tax level, and the largest U.S. corporations already file in most states (Gupta and Mills, 2002). Thus, state nexus issues related to nonfiling are likely a greater issue for small- to medium-sized companies.

Federal Public Law 86-272 provides protection to taxpayers from a state asserting nexus. The statute bars states from imposing income tax on firms whose activity is limited to the sale and solicitation of sales of tangible personal property. However, this law does not protect service providers and has been narrowly interpreted by many state taxing authorities. Recent judicial cases involving nexus issues have tended to favor state governments (Grissom and Lohman, 2007; Wells and McFadden-Wade, 2007). In 2007, the U.S. Supreme Court declined to grant certiorari to taxpayers in two nexus cases originating in West Virginia (MBNA) and New Jersey (Lanco).\(^{16,17}\) Refusing to hear the appeals essentially upheld the decisions favoring the state governments, which potentially increased companies’ FIN 48 exposure.

\(^{16}\) FIA Card Services, N.A., fka MBNA Am. Bank, N.A. v. Tax Comm’r of the State of W.Va., U.S. No. 06-1228, cert. denied (6/18/07). The MBNA case was a pure economic nexus issue in which the West Virginia court upheld the state’s imposition of income taxes on an out-of-state credit card company for income generated from the use of its credit cards by its West Virginia customers.
Concern over economic or affiliate nexus recently caused several taxpayer associations to join in filing a Brief *Amica Curiae* with the U.S. Supreme Court asking for affirmation of a physical presence nexus rule. Citing Gupta and Mills’ (2002) finding that the costs of complying with disparate state rules falls disproportionately on smaller firms, they argue that states’ new interpretations in enforcing nexus have more impact on small- and medium-sized corporations. Related to FIN 48, the Brief argues that FIN 48 mandates a ‘reserve’ for 100% of tax items unless it is more likely than not that the company will prevail in litigation on those items. This reserve is of indefinite duration, with interest and penalties accruing annually… The ambiguous and evolving nature of the concept of ‘nexus’ makes it extremely difficult to decide … will therefore frustrate the goal of providing investors with a realistic picture of a corporations’ financial position (*State Tax Notes* June 4, 2007, p. 764).

2.2.2 *Statutes of limitations*

A taxing jurisdiction has the right to examine a company’s filings as long as the statute of limitations remains open. Typically state statutes of limitation range from three to five years from the time the tax return is filed, and can remain open if a year is under examination or appeal. Nexus presents a significant risk because an unpaid tax liability remains open to challenge indefinitely if the corporation does not file a return.

FIN 48 (paragraph 7) permits companies to consider “past administrative practices and precedents of the taxing authority in its dealings with the enterprise or similar enterprises” when these practices are widely understood. Administrative practices related to nonfiling include limiting the look-back period for nonfilers that voluntarily come forward (Kwiatek, 2007). Certain states offer amnesty programs that similarly limit exposure, especially for interest and penalties, but might not be as reliable as administrative precedents. As a result, companies evaluating FIN 48 liabilities related to nonfiling positions face substantial uncertainty.

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17 Lanco Inc. v. Dir., N.J. Div. of Taxation, U.S. No. 061236, cert. denied (6/18/07). In the *Lanco* case, the New Jersey Supreme Court in 2006 enforced the concept of “affiliate nexus” to require an out-of-state seller using a trademark holding company to pay New Jersey taxes when it had affiliated companies operating in the state. In the *Praxair* case discussed previously, the New Jersey Tax Court recently extended *Lanco* to broader facts, a longer look-back period, and imposed 25 percent failure-to-file penalties.
2.2.3 Income Shifting Activities

The variety of state tax rates and rules provides firms with an opportunity to shift income to favorable taxing jurisdictions via passive investment companies (PICs), also known as intangible holding companies. Many companies place their intangible assets (e.g., brand names, trademarks, or intellectual property) into a separate subsidiary strategically located in a tax-favored jurisdiction such as Delaware or Nevada. The subsidiary then charges royalties to the other entity(ies) in the consolidated group to generate deductions in high-tax jurisdictions and create income in low-tax jurisdictions. Other income shifting techniques include the use of real estate investment trusts (REITs) and other rental entities to move income to low tax jurisdictions.

In recent years, several states have attacked these related-party arrangements arguing that the entities lack business purpose. States have also enacted add-back rules and unitary (combined) reporting requirements that unwind these income-shifting transactions. Companies using these tax avoidance techniques must evaluate the gross exposure in each jurisdiction (including interest/penalties) for current and open prior years.

2.2.4 Offsetting positions

Multistate companies must assign their income among the multiple jurisdictions in which they do business using a system of allocation for non-business income and apportionment for business income (Gupta and Hofmann, 2003). FIN 48 (paragraph 7c) requires that each tax position “be evaluated without consideration of the possibility of offset or aggregation with other positions.” Hence, exposures created by allocating or apportioning too little income to a particular jurisdiction, cannot be offset with probable refunds from other jurisdictions for paying excess tax.

2.2.5 Characterization of taxes as “income” or “non-income”

SFAS 109 applies only to income taxes, so companies must already consider whether the taxes they pay and/or accrue are classified as “income” or “non-income”. However, exposure related to unfiled

18 Delaware does not impose its corporate income tax on income from intangibles, whereas Nevada does not levy a state corporate income tax.
returns under FIN 48 requires firms to analyze the character of new tax regimes. Small- and medium-sized companies likely had to grapple with new taxes and new jurisdictions when implementing FIN 48. Similarly, changes in state tax regimes, such as Michigan’s transition from a value-added tax (which most corporations treated as not being subject to SFAS 109) to a combination of an income tax and a gross receipts tax, may also trigger analysis of the character of the tax.19

3. **Prior Literature and Hypothesis Development**

3.1 **Prior Literature**

Mills et al. (2009) analyze taxpayer and government behavior pre- and post-FIN 48 in a game-theoretic model. Taxpayers do not disclose liabilities for unrecognized tax benefits prior to FIN 48. Hence, the government cannot distinguish taxpayers with weak positions from taxpayers with strong positions. FIN 48’s mandatory disclosure of the liability for unrecognized tax benefits makes the government better off regarding taxpayers with relatively weak positions because taxpayers are either deterred from claiming weaker positions or the governments’ audits are relatively more successful.20 On the other hand, the government should audit taxpayers in strong positions less frequently, making both the government and the taxpayer better off.

Frischmann et al. (2008) use an event study to examine the market’s reaction to key FIN 48 pronouncements prior to issuance. They find that the market did not react to the pronouncements, implying that investors were not concerned about increased tax costs due to FIN 48 prior to adoption. They also examine the market’s response to initial disclosures required by FIN 48 in 2007. They find a positive association between abnormal returns on the days surrounding the first quarter filing date and the reserves for uncertain tax benefits. These results suggest that market participants used the new FIN 48

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19 In July 2007, the Michigan legislature enacted the Michigan Business Tax (“MBT”) as a substitute for the Single Business Tax (“SBT”). The Michigan Treasury views the SBT as a value added tax, whereas the MBT imposes a 4.95% tax on business income and a 0.80% tax on modified gross receipts. While the business income portion clearly meets the definition of an income tax for purposes of SFAS 109, most public accounting firms have taken the position that the modified gross receipts tax is also subject to SFAS 109.

20 See Beck and Jung (1989a, b) for earlier work on the strategic interaction between the taxpayer and the government when the outcome of the audit is uncertain. See also Beck et al. (2000) for a model of voluntary disclosure of the existence of an uncertain tax position to avoid penalty.
disclosures to revise their assessments of firm value. While this paper does not specifically test the propositions of Mills et al. (2009), it provides a glimpse into how the market anticipates the government and taxpayers will behave in a pre- and post-FIN 48 environment.

Blouin et al. (forthcoming) examine corporate reporting behavior in 2006 between the enactment and adoption of FIN 48 for the largest 100 calendar-year non-financial firms. These firms released approximately half of their excess reserves between enactment and adoption.\(^2\) They predict this behavior because releasing reserves before adoption increases earnings and also prevents the government from inferring that companies are in a weak tax position. We extend tests of behavior to post-FIN 48 periods.

3.2 Hypothesis Development

Multistate taxation provides a setting that permits strong tests of the theory that FIN 48 would restrain tax aggressiveness, which we define as claiming uncertain tax benefits with relatively weak positions on their merits. Multistate tax planning gained popularity in the 1990s primarily because the diversity of state tax regimes and the existence of state tax loopholes provided a means to shift income from high-tax to low-tax jurisdictions (e.g., Mazerov, 2003; Multistate Tax Commission, 2003), and lax enforcement regimes led to low probability of detection. However, recent legislative changes enacted to counteract popular state tax planning strategies, judicial support for states’ asserting jurisdiction over taxpayers, and heightened enforcement by state revenue authorities suggest that many companies face numerous situations where the merits of a transaction create FIN 48 exposure. This is especially because companies must now assume that the tax authority has full knowledge of the uncertain tax position.

For these reasons we expect that multistate taxation will be a powerful setting to observe the effects of FIN 48. We assert that low state effective tax rates on domestic income before FIN 48 can serve as a proxy for the existence of uncertain state tax benefits. Evidence of higher state ETRs after a decade

\(^2\) Lee and Swenson (2008) find that 87% of the firms in their sample of 2,584 calendar-year firms adjusted their 2007 beginning retained earnings as a result of FIN 48. They also provide evidence that cash effective tax rates increased in 2006 and 2007.
of average declines would provide evidence that FIN 48 affects reporting for state taxes. We predict that state effective tax rates increase after adoption of FIN 48.

We realize that time-series trends can arise from economic and regulatory conditions unrelated to FIN 48. The mid-2000s represent an economy that recovered from the post-9/11/2001 downturn. In addition, closer examination of tax internal controls in Section 404 audits may have spurred firms to resolve outstanding tax cases.\(^{22}\) To refine our predictions, we consider what types of firms are most likely to exhibit lower ETRs prior to FIN 48 and respond the most as a result of FIN 48. We attempt to identify whether factors related to state tax planning influence state ETRs at the individual firm-level. We expect that firms with higher intangibility and growth are most likely to have lower state ETRs.

Even after controlling for these factors, FIN 48 theoretically can only be associated with increased state ETRs if some portion of firms’ uncertain tax positions are state-related. We predict that state tax planning is associated with increased unrecognized tax benefits. Further, we expect that the change in state effective tax rates surrounding FIN 48 can also be explained by growth and intangibility, which suggests the presence of uncertain tax benefits that are both difficult to detect and sustain if detected. Essentially, we predict a difference-in-differences relation. Firms with weak state tax positions are more likely to increase state tax expense than are other firms.

_Hypothesis 1: Firms with weaker state tax positions increase state ETRs in response to FIN 48, ceteris paribus._

As explained previously, we might not obtain evidence consistent with this prediction if releases of adoption reserves could offset increases in tax compliance.

\(^{22}\) The Sarbanes-Oxley Act of 2002, Section 404, requires auditors to attest to the effectiveness of internal controls. Gleason, Pincus and Rego (2007) report that, between 2004 and 2006, about one-third of the 1,000 reports of material weaknesses include weaknesses in tax controls. In addition, a Big 4 tax partner commented that for one sizeable client, the Board of Directors was surprised that the corporation had about 1,500 open disputes related to state and local income, excise or sales and use taxes. In evaluating the systems and personnel needed to manage that many outstanding disputes, the Board urged the corporate tax department to settle tax cases more quickly.
Next we consider the effects of FIN 48 on firms’ state tax payments and on aggregate state tax collections. If FIN 48 had the effect of arresting multistate tax avoidance as theory predicts and our anecdotal evidence suggests, we expect firms’ state tax payments will increase following the enactment of FIN 48. Because independent auditors are required to review the extent to which claimed benefits pass the “more likely than not” standard, we expect corporations face additional pressure from auditors and boards of directors to file returns where avoiding nexus fails that standard. We will also observe increased state tax collections if taxpayers seek amnesty or accelerated resolution of outstanding tax disputes. We predict any increase in state ETRs and payments will occur surrounding, rather than strictly after adoption of FIN 48, because FASB issued an exposure draft in 2005 that made it likely that the eventual standard would ignore detection risk. In addition, Blouin et al. (forthcoming) observe increased settlements leading up to adoption at January 1, 2007. Accordingly we propose and test the following hypothesis:

\[ \text{Hypothesis 2: Firms’ cash effective tax rates and state-level tax collections increase surrounding FIN 48.} \]

It is not obvious that we will detect an increase in state tax collections following FIN 48. The aggregated disclosure does not help a particular state examiner. Thus, a firm that recognizes a liability might not begin filing or increase payments merely because it records the liability. Finally, financial statements report cash payments for income taxes only on an aggregated basis, but we estimate state taxes paid by controlling for federal and foreign ETRs.

4. Research Design and Results

To determine whether the trend in state tax avoidance appears to reverse as a result of FIN 48, we triangulate evidence from multiple analyses described below. First, we discuss anecdotal evidence and descriptive trends that provide preliminary support for our hypotheses.

4.1 Preliminary Analysis and Results

4.1.1 Anecdotal evidence

Through discussions with tax advisors and tax administrators, we have gathered substantial anecdotal evidence consistent with our predictions. In one Mid-Atlantic state, tax examiners told an
economist colleague of ours during 2007 that firms were eager to settle outstanding cases and cited “FIN 48” as their reason for initiating the settlement. Likewise, the tax commissioner of a Midwestern agricultural state mentioned that some firms have sought settlement of uncertain tax positions in order to reduce the liabilities they booked upon adopting FIN 48. Many states, including his, will reward firms for voluntarily coming forward by requesting payment of back taxes for only the previous three to five years and frequently without penalties. The commissioner of a large municipality reports that audit managers believe FIN 48 will increase compliance, both because contingencies must be better documented and because taxpayers will be less aggressive. That municipality’s audit managers claim that FIN 48 has helped them identify potential audit cases. Finally, a former student who serves in a corporate tax department for a large multinational corporation comments that state tax planning initially decreased and the company booked higher reserves. Over time however, he believes more companies are using the tax authority administrative practices to substantiate a lower FIN 48 reserve.

We also discussed trends with representatives from the Multistate Tax Commission. They observed that applications for income tax amnesty significantly increased surrounding FIN 48, but applications for sales and use tax amnesty were unchanged. Because FIN 48 applies to income taxes only, this strongly suggests that FIN 48 caused firms to seek resolution for nexus issues.

4.1.2 Describing aggregate trends in state ETRs

As a broad test of Hypothesis 1, we describe state tax effects for firms that are listed in the Compustat database and have public filing data available for any of the years 1995 through 2007. We require observations to have all data items necessary to calculate effective tax rates and proxies for intangibility and size. To ensure that our tests focus on profitable firms that are likely subject to tax, we

However, firms that booked FIN 48 reserves upon adoption determined the amount of the reserves based on the merits of the case. The reserves therefore could and often did exceed the settlement amounts, resulting in a decreased tax expense and an earnings increase in 2007 because the initial FIN 48 reserve was an adjustment to retained earnings. Hence, although recurring state tax payments could increase as a result of improved compliance and enforcement, net tax expense could also decrease in 2007 relative to 2006.
included observations with 1) domestic pre-tax income greater than $0\textsuperscript{24} and 2) federal and state tax expense greater than $0. Application of these criteria results in 25,868 total observations. We winsorize observations in the top or bottom one percent of the distribution of state ETR, two-year changes in state ETR, or two-year changes in scaled taxes paid. Such winsorizing generates a sample with reasonable ETRs (between 0.0013 and 0.4865), two-year changes in state ETRs (between -0.3378 and 0.3073), and two-year changes in scaled cash taxes paid (between -1.66 and 3.06).

Table 1 and Figure 1 report the trend in mean federal and state ETRs for the period 1995 through 2007. For comparison, Panel A lists the average top statutory tax rate across 45 state taxing jurisdictions that have corporate income or business franchise taxes.\textsuperscript{25} Average state statutory rates have declined slightly over the past decade with an average decrease per year of 0.55%. The top federal corporate tax rate throughout this period remained 35%.

Panel B reports mean state and federal current ETRs for our full sample of 25,868 observations. State ETRs show an average decrease per year of 1.38%, which is more than twice the decline in statutory tax rates. Panel C examines a subsample of 171 firms in existence in all years from 1995 through 2007 (2,223 observations). This balanced panel confirms the overall trends in state ETRs in the full sample. We also aggregate current state tax expense each year for our panel firms in nominal and real dollars. Decreasing ETRs suggest that tax expense is not increasing at the same rate as the income base.

The evidence in Table 1 generally indicates a decreasing trend in state effective tax rates consistent with our prediction that state ETRs declined during the decade leading up to the adoption of FIN 48. Further, we see that state ETRs began to increase in the years surrounding FIN 48, providing broad evidence consistent with Hypothesis 1.

4.1.3 Describing trends in aggregate state tax collections

\textsuperscript{24} We used Compustat variable PIDOM for domestic pre-tax income, or Compustat variable PI if missing.

\textsuperscript{25} We excluded Texas and Michigan in the calculation of the annual average statutory tax rates for the tax years preceding their recent implementation of income taxes. We also exclude the District of Columbia.
To provide broad tests of Hypothesis 2, we consider trends in state tax collections from 1995-2007. We expect declining state tax collections for the first decade. If FIN 48 increases tax compliance, then state tax collections should increase in 2006 and 2007.

Table 2 shows aggregate corporate state income tax collections from 1995 through 2007. The first two rows show aggregate collections in nominal and real 1995 dollars. We then report collections as a percentage of Gross Domestic Product and aggregate corporate net income reported to the IRS. Finally, to ensure that our trend does not simply reflect a growth in all state tax revenues, we report state corporate income tax collections as a percentage of total state tax collections (including personal income, sales and property taxes). Across all our measures, state corporate income tax collections decrease from 1995 through 2004, consistent with Gupta et al. (2009), followed by dramatic increases in 2005, 2006 and 2007. Figure 2 charts these trends, which provide preliminary evidence consistent with Hypothesis 2 that FIN 48 triggered a recent change in voluntary or enforced compliance.

Likely contributing to this overall trend, Dubin and Davis (2009, Figures 3 and 4) quantify agreements and collections under the MTC’s National Nexus Program and show that income tax agreements peak in 2006. They note that on average it takes 270 days from opening a case to settlement, which only becomes effective after the MTC prepares the agreement, the company reviews it, and the state accepts it with a schedule of liabilities. Thus, we consider whether changes in state taxes paid might lag into 2007. We now turn to multivariate tests of financial and cash ETRs and state-level collections. Controlling for other factors is necessary to attribute univariate trends to the influence of FIN 48.

4.1.4 Modeling firm-level state effective tax rates

Before testing whether state ETRs increased surrounding FIN 48, we identify factors that systematically impact state ETRs so that we can hold them constant when we test for the effects of FIN 48 on changes in state ETRs. We estimate the following pooled, cross-sectional benchmark regression model to explain variation in firm-level state ETRs:
\[ \text{StateETR}_{it} = \alpha_0 + \alpha_1 \text{FederalETR}_{it} + \alpha_2 \text{R\&DIntensity}_{it} + \alpha_3 \text{AdvIntensity}_{it} \\
+ \alpha_4 \text{AdvIntensity} \times \text{RetailTransp}_{it} + \alpha_5 \text{MarketToBook}_{it} + \alpha_6 \text{ROA}_{it} \\
+ \alpha_7 \text{OneYearSalesGrowth}_{it} + \alpha_8 \text{Size}_{it} + \alpha_9 \text{ForeignPct}_{it} + \alpha_{10} \text{CapitalIntensity}_{it} \\
+ \alpha_{11} \text{RetailTransp} + \alpha_{12} \text{YearAfter1995}_{it} + \varepsilon_{it} \]  

(1)

We measure StateETR as the ratio of state current tax expense (Compustat TXS) to domestic pre-tax income (Compustat PIDOM, or PI if missing). We limit our sample to firms with nonmissing TXS and positive domestic pre-tax income.

*Intangible holding companies (IHCs).* Corporations decrease their state ETRs by contributing intangible assets to IHCs and charging deductible royalties to affiliates in high-tax states. To proxy for the opportunity to use IHC’s we include several variables to capture intangibility, specifically R&D expense (Compustat XRD) / sales (Compustat REVT), advertising expense (Compustat XAD) / sales, the market-to-book value of the firm (MarketToBook) and return on assets (ROA). We winsorize MarketToBook at 1% and 99%.

*Nexus issues (nonfiling risk).* We include size as an explanatory variable for nexus. We generally expect that smaller firms have lower ETRs because they are not filing in all required states, whereas the largest firms likely already file in all states (Gupta and Mills, 2002). On the other hand, Mills, Erickson and Maydew (1998) and Hanlon, Mills and Slemrod (2007) suggest that large firms generally have lower ETRs, likely because they have more sophisticated tax departments/advisors and the required legal structure to shift income via related party transactions. Specific to state tax planning, Gupta and Mills (2002) argue that opportunities to shift income favorably require more than one state, but that filing in all states restricts such opportunities. Consistent with this assertion, they estimate that filing in 22 states minimizes state ETRs on average. By measuring size as ln(Sales), we also capture any decreasing rate of return to size if size proxies for the number of states.

We also predict that firms experiencing high growth have nonfiling risk because their nexus expands faster than they file required returns. We consider both one-year (OneYearSalesGrowth) and five-year (FiveYearSalesGrowth) measures of percentage growth in sales (Compustat REVT).
**Other controls.** We control for foreign operations using the absolute value of foreign pre-tax income (Compustat PIFO) to total pre-tax income (Compustat PI). Because StateETR is scaled by U.S. pre-tax income, StateETR could be lower if firms shift income out of the U.S. for tax purposes, but higher if repatriations of foreign income increase state tax expenses.

We control for the ratio of gross property, plant and equipment (Compustat PPEGT) to total assets (Compustat AT) because, as Gupta and Newberry (1997) show, accelerated tax depreciation would generally reduce effective tax rates on pre-tax book income. Since this tax benefit continued during the 1990s and early 2000s, we expect a similar effect.

**Retail and Transportation.** Like Alexander et al. (2008), we control for whether the firm is in the retail (SIC 5000-5999) or transportation and warehousing (SIC 4000-4899) industries based on the argument that firms in those industries have more unresolved nexus issues. Issues unique to retail firms relate to recent splits between bricks and mortar activity versus internet activity. Transportation and warehousing firms potentially have nexus issues because they drive or fly through, or temporarily store goods in, states in which they do not own property.26 Because advertising is such an important element of retail operations, we interact AdvIntensity with RetailTransp.

**Time trend.** We control for the time trend because state ETRs appear to decrease over time. YearAfter1995 equals the number of years after 1995. A significantly negative coefficient would also provide a statistical test of the visible pattern in mean ETRs over time.

Our ETR regressions pool cross-sectional data over our full sample. To address potential serial dependence in the data, we report Huber-White robust standard errors (Rogers, 1993, generalizing White 1980). The maximum-likelihood estimation procedure assumes and estimates a common component of the variance and co-variance matrix for all observations from the same firm; the standard errors are robust

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26 CPA partners specializing in multistate taxation offered the following examples of efforts to impose nexus. In one case, a state auditor attempted to force nexus on an insurance company that floated a blimp over a sports game in his state. New Jersey auditors compel drivers at truck weighing stations to complete nexus questionnaires and impound the goods if the auditors believe the recipient should be filing in New Jersey.
to heteroskedasticity and serial correlation (StataCorp 1999, p. 257). Because we use this correction, we do not separately control for industry effects.

Table 3 reports descriptive statistics for our regression variables. The mean (median) state ETR of 4.6% (5.3%) is below the average statutory state tax rate of 7.61% reported in Table 1. This suggests that corporations generally do not pay tax on 100% of their income nationally. The federal ETR is similarly less than the U.S. statutory rate of 35%.

Table 4 reports results of estimating regressions of StateETR for the full sample and our sample of mostly-domestic firms. We focus the discussion below on the full sample because results are generally consistent across the two samples. The intercept represents the 1995 average tax rate of 6.21% for firms whose federal ETR is greater than zero. As expected, StateETR is positively related to FederalETR (coeff = 0.0634, t = 9.15). Firms with opportunities to shift intangible income have lower state ETRs. As predicted, StateETR is significantly negatively related to R&DIntensity. In untabulated tests, we find no effect for Intangible Assets / Total Assets, but purchased intangibles do not fully capture brand value. StateETR is lower as advertising intensity increases, but only for firms in the retail (or transportation) industries, consistent with marketing brands being used for interstate income shifting (Geoffrey, Inc. v. South Carolina Tax Commission, No. 23886 slip op. 11993). However, many states are successfully challenging this scheme as having no business purpose.

Market-to-Book and Growth are unrelated to StateETR, which is counter to our prediction about nexus exposure. When we substitute a five-year growth measure for the one-year growth measure, the five-year growth is also unrelated to StateETR. However, ROA is strongly, negatively related to StateETR. Because profitable firms with low assets have high ROA, MarketToBook and possibly OneYearSalesGrowth, we expect that ROA is capturing all of these effects, consistent with our predictions about nexus. Size is negatively related to StateETR, consistent with tax planning sophistication, but inconsistent with nexus arguments.

CapitalIntensity is negatively related to StateETR as expected. In our full sample, ForeignPct is unrelated to StateETR, but in the mostly-domestic sample, ForeignPct is negatively related to StateETR.
It appears that having some foreign income permits new opportunities for income-shifting. Perhaps in the full sample, Size captures much of the variation in foreign income. Finally, the strong negative relation between YearAfter1995 (coeff = -0.00097, t = -10.38) confirms that state effective tax rates declined throughout the decade after 1995 as shown in Table 1.

4.1.5 Measuring state tax avoidance included in unrecognized tax benefits (UTB)

Our final preliminary analysis is to test our assertion that state tax avoidance generates uncertain tax benefits subject to FIN 48. Providing evidence of this assertion is important as a precursor to our prediction that firms will take actions to reduce that uncertainty.

To determine whether state tax planning creates uncertain tax positions, we estimate the extent to which historical tax avoidance across federal, foreign and state jurisdictions explains the FIN 48 liability at adoption (UTB). We regress UTB on the amount of expense that falls below benchmark statutory rates by jurisdiction, controlling for foreign operations, as follows:

\[ UTB_i = \beta_0 + \beta_1 FedTxShort_i + \beta_2 ForeignTxShort_i + \beta_3 StateTxShort_i + \beta_4 ForeignPct_i + \varepsilon \]  

Where:

- \( UTB_i \) = the liability for unrecognized tax benefits at adoption (January 1, 2007 for calendar year firms), deflated by 2006 total assets
- \( FedTxShort_i \) = the greater of zero or 35% times the five-year (2002-2006) sum of domestic pre-tax income (Compustat PIDOM or PI if PIDOM missing) minus federal tax expense (Compustat TXFED), deflated by 2006 total assets
- \( ForeignTxShort_i \) = the greater of zero or 35% times the five-year sum of foreign pre-tax income (Compustat PIFO) minus foreign tax expense (Compustat TXFO), deflated by 2006 total assets; If either PIFO or TXFO are missing, ForTxShort is set to zero
- \( StateTxShort_i \) = the greater of zero or 7.61% times the five-year sum of imputed domestic taxable income less state tax expense (Compustat TXS), deflated by 2006 total assets; We impute domestic taxable income as domestic current tax expense (Compustat TXFED, or TXT if missing) divided by 35%

27 Seidman (2009) cautions that Compustat does not consistently record foreign pre-tax income, so we acknowledge that our measure cannot capture all foreign tax effects.

28 Our results are robust to a simpler measure of StateTaxShort in which we compute the benchmark tax as 7.61% times domestic pre-tax income rather than times an imputed domestic taxable income. We use the more complex estimate because using domestic pre-tax income to compute both FedTxShort and StateTxShort leads to a high
\[
ForeignPct_i = \text{the absolute value of the sum (2002-2006) of foreign pre-tax income (Compustat PIFO) divided by the sum of pre-tax income (Compustat PI); If PIFO is missing, ForeignPct is set to zero.}
\]

\(UTB\) is the reported reserve for unrecognized tax benefits for all open tax years in all jurisdictions. We scale \(UTB\) by assets to capture the relative size of this liability. Model (2) fits \(UTB\) across jurisdictions rather than across firm-level sources of tax uncertainty, tax avoidance or tax aggressiveness.\(^{29}\) Our rationale is that while an association between \(UTB\) and R&D expense might show that intangibility enhances tax avoidance, it would not show whether such shifting generated uncertainty in federal, foreign or state jurisdictions. We therefore develop variables to measure tax avoidance across jurisdictions.

Consistent with Dyreng et al. (2008), we use five-year aggregate tax expense by jurisdiction (scaled by 2006 total assets) to provide long-run stable estimates of taxes paid.\(^{30}\) We use the top U.S. statutory rate in 2006-2007 (35\%) as the benchmark for federal and foreign taxes. For example, if a corporation’s five-year sum of foreign pre-tax income is $10,000,000 and that corporation reported a five-year sum of foreign tax expense of $2,000,000, then unscaled \(ForTxShort\) would equal $1,500,000. On the other hand, if foreign tax expense were $4,000,000, \(ForTxShort\) would be zero because tax expense exceeded the $3,500,000 statutory benchmark. Because the \(Short\) variables are five-year aggregates proxying for the liability for avoided tax, we also scale these variables by assets.\(^{31}\)

correlation between those measures. Our regression variable effectively measures the state tax avoidance that is over and above any effect of federal book-tax differences.

\(^{29}\) Song and Tucker (2008) study whether firm-specific factors, such as profitability, leverage, and R&D, are correlated with the initial unrecognized tax benefit balance.

\(^{30}\) Current tax expense is a noisy measure of current taxes paid, in part because the tax benefit of stock options does not reduce current tax expense (for options issued prior to SFAS 123R). However, we cannot separately adjust the federal, foreign and state tax expense for stock option tax benefits.

\(^{31}\) Blouin et al. (2007) document that UTB for the largest 100 non-financial firms represented seven years’ open returns on average. By comparison, data provided by Tax Directors Roundtable for 641 firms showed an average of four years’ returns. Thus, we aggregate our tax shortfall variable over five years and scale by total assets. Our results are robust to including the inverse of total assets, with or without an intercept term, as a control for possible spurious correlation induced by using a common scalar. However, our results are not robust to scaling by aggregate pretax income. Pretax income already enters the computations of the tax shortfall variables, and we observe high correlations among the income-scaled variables.
Our main variable of interest is StateTxShort. To measure the state tax avoidance unrelated to federal tax avoidance, we first impute domestic taxable income equal to the five-year sum of federal current tax expense divided by 35%. We then compute a benchmark state tax rate of 7.61%, which is the mean statutory state tax rate from 1995 to 2007 (see Table 1). If state tax avoidance is a substantial source of tax uncertainty, then we expect StateTxShort to be positively associated with UTB. That is, the further state tax expense is below 7.61% of domestic taxable income, the more uncertainty the corporation might face from state tax avoidance schemes.

We require that the five-year sum of state tax expense exceed zero because we are specifically interested in the effect of state taxes. Further, to avoid difficulty interpreting tax measures for firms with negative or extreme ETRs, we keep only observations with ETRs exceeding 0 but less than 100%. We merge these 1,658 Compustat firm-observations by Employer Identification Number with a dataset of 6,408 public companies’ FIN 48 disclosures compiled by researchers at the Internal Revenue Service for taxpayers in the Large and Mid-Sized Business Division. Our final sample consists of 1,490 observations.

Table 5, Panel A describes unscaled UTB, total assets and our regression variables. The average UTB is slightly more than 1% of assets. On average, our sample firms report federal tax expense that is 3.29 percentage points less than the statutory rate of 35%. ForeignTxShort is right skewed because we set it to zero when data to compute this variable are missing or negative. Firms report more than half a percentage point less state tax expense (0.71%) than the mean state statutory rate of 7.61%. Our median firm reports no foreign pre-tax income, but the average foreign pre-tax income is 13.82% of the absolute value of pre-tax income.

Table 5, Panel B reports the results of estimating Model (2). In the first column we report results for our full sample. We see that shortfalls from statutory rates are significantly, positively associated with the UTB for all three jurisdiction components (FedTxShort, ForeignTxShort and StateTxShort). The coefficient on StateTxShort indicates that firms record a liability for unrecognized tax benefits about 23% of aggregate five-year state tax expense that is below 7.61% of aggregate five-year imputed domestic taxable income. The positive association of UTB with ForeignTxShort need not indicate that the
uncertainty relates to tax due to foreign jurisdictions. Because the U.S. is a relatively high-tax jurisdiction globally, the IRS could scrutinize and challenge many transactions that shift income to lower tax foreign jurisdictions.

The second and third columns report the OLS regression separately by a foreign indicator variable that equals one if either foreign tax expense or foreign pre-tax income (Compustat TXFO or PIFO) exceeds zero. StateTxShort affects UTB more than does FedTxShort, and especially within the 792 domestic firms, suggesting that state tax avoidance contributes more to tax uncertainty than federal tax avoidance. In the sample of 698 firms that report foreign tax information, federal and foreign shortfalls contribute substantially to UTB, as does having a higher percentage of foreign pre-tax income.32

4.2 Main Analysis and Results

In this section, we turn to Compustat data to conduct large-sample tests and aggregate state-level data to investigate whether state tax avoidance reversed surrounding FIN 48.

4.2.1 Analysis of firm-level changes in state effective tax rates surrounding FIN 48 (H1)

To test Hypothesis 1, we consider how firm-level state effective tax rates changed in the years surrounding FIN 48. Adapting model (1), we estimate the following regression to determine the extent to which increases in state ETRs relate to factors suggesting the presence of uncertain state tax positions:

\[
StateETRChange2Yr_{it} = \alpha_0 + \alpha_1 FedETRChangeTwoYr_{it} + \alpha_2 ForeignETRChangeTwoYr_{it} \\
+ \alpha_3 BmkDev_{it-2} + \alpha_4 LowestQuintStateETRDec9505 + \alpha_5 YearDummy_t \\
+ \alpha_6 YearDummy_t \ast LowestQuintStateETRDec9505 \\
+ \alpha_7 RDi{ntensity}_{it-2} + \alpha_8 AdvIntensity_{it-2} + \alpha_9 AdvIntensity \ast RetailTransp_{it-2} \\
+ \alpha_{10} MarketToBook_{it-2} + \alpha_{11} ROA_{it-2} + \alpha_{12} OneYearSalesGrowth_{it} + \alpha_{13} Size_{it-2} \\
+ \alpha_{14} ForeignPct_{it-2} + \alpha_{15} CapitalIntensity_{it-2} + \alpha_{16} RetailTransp_{it-2} + \varepsilon_{it}
\]  

(3)

Where:

\[
StateETRChange2Yr_{it} = \text{state effective tax rate in year } t \text{ minus state effective tax rate in year } t-2
\]

\[
FedETRChange2Yr_{it} = \text{federal effective tax rate in year } t \text{ minus federal effective tax rate in } t-2
\]

32 In untabulated results, we also estimate a Tobit regression because a sizeable proportion of the sample (349 out of 1,490 observations) reports zero UTB. Shortfalls from statutory rates also explain the total effect (the combined probability of recording a UTB and the amount of the tax reserve). Decomposing the Tobit coefficients (McDonald and Moffitt 1980) is not critical for our general observation.
\[ \text{ForeignETRChange2Yr}_{t,t} \]

foreign effective tax rate in year \( t \) minus federal effective tax rate in \( t-2 \)

\[ \text{LowestQuintStateETRDec9505}_i = \text{dummy variable equal to 1 if decrease in firm's state effective tax rate from 1995 to 2005 is greater than at least 80\% of other firms' decrease in firm's state effective tax rate from 1995 to 2005 and 0 otherwise} \]

\[ \text{YearDummy}_i = \text{dummy variable equal to 1 if financial reporting year begins after December 15, 2005 and before December 16, 2005 (2006 Dummy) or begins after December 15, 2006 (2007 Dummy), and 0 otherwise.} \]

\[ \text{LowestQuintStateETRDec9505}_i \times \text{YearDummy}_i \]

interaction between lowest quintile dummy variable and \( \text{YearDummy} \) variable

BnmkDevi_{t-2} = benchmark tax rate (see Table 5 Panel A) minus state effective tax rate in \( t-2 \)

and other variables are as previously defined.

We use two-year changes in \( \text{StateETR} \) because by comparing 2007 to 2005 state ETRs, we capture any effects surrounding FIN 48, ignoring any pre-adoption settlements (Blouin et al., forthcoming). We first control for changes unrelated to state tax avoidance or FIN 48 by including the two-year change in federal and foreign ETRs. We expect that any changes in federal taxable income relative to pre-tax book income will affect both federal and state ETRs. Further, changes in foreign taxable income could affect state ETRs due to unitary tax regimes. As expected, state ETR changes are significantly positively related to both federal ETR changes (coeff = 0.139, \( t = 32.36 \)) and foreign ETR changes (coeff = 0.147, \( t = 9.64 \)). Second, we control for mean reversion in state ETRs by considering how high or low the prior state ETR is relative to the national average of state corporate income tax rates reported in Table 1. Because firms that have unusually high or low state ETRs likely revert to the mean over time, we expect \( \text{BnmkDev} \) to be positively related to state ETR changes. We find that firms deviating from the statutory benchmark restore on average 0.9% of that deviation two years later.

We now attempt to better isolate the effects of FIN 48. As an overall test of the effect of FIN 48 on changes in firms’ state ETRs, we include \( \text{YearDummy} \), a dummy variable for 2006 or 2007 as defined
above. However, neither year dummy is significant alone, suggesting that after controlling for changes in federal and foreign ETRs and mean reversion, the average firm’s state ETRs did not increase in 2006 or 2007. To test whether state ETRs increased for state tax aggressive firms surrounding FIN 48, we introduce a dummy variable for firms in the lowest quintile of state ETR changes from 1995 through 2005. By construction, firms for whom \textit{LowestQuintStateETRDec9505} is equal to 1 have a significant decrease in state ETRs in the periods leading up to FIN 48 (in either model, coeff \approx -0.02, t \approx -14) on average. Consistent with Hypothesis 1, prior tax avoiders report a significant two-year increase in state ETRs in 2006 (coeff = 0.011, t = 2.87) and even more in 2007 (coeff = 0.026, t = 6.38). This substantial increase is consistent with our prediction that firms with weak tax positions increase their state ETRs in response to FIN 48.

Finally, we include our intangibility, growth and industry variables from the \textit{StateETR} levels regression. To the extent that proxies for tax avoidance opportunities generate an average trend across 1995-2007, we expect that state ETR changes are negatively related to such opportunities. Our results are generally consistent with that expectation.

\textbf{4.2.2 Analysis of firms’ cash effective tax rates and state tax collections surrounding FIN 48 (H2)}

Although our Table 2 results and the graphs in Figure 2 provide preliminary support for FIN 48 increasing state tax collections in the aggregate, consistent with anecdotal evidence, we also conduct firm-level tests. The only firm-level data available on cash taxes paid comes from the statement of cash flows and is aggregated across jurisdictions. Hence, we estimate a regression model similar to equation (3) using a cash effective tax rate. However, we can control for changes in cash tax payments unrelated to state taxes. Specifically, we control for changes in federal and foreign ETRs.

Table 7 reports the regression results. The dependent variable is the two-year change in cash ETR, calculated as cash tax payments (Compustat \textit{TXPD}) divided by pre-tax income (Compustat \textit{PI}). As

\[33 \text{ For example, the YearDummy2007 includes tax years ending December 31, 2007 through November 30, 2008, although because our completed analysis uses Compustat data only through 2007, the data end at May 31, 2008. We are incorporating 2008 Compustat data soon.} \]
in equation (3), we include two-year changes in federal and foreign cash ETRs in our model and control for mean reversion in state ETRs with $BnmkDev$. The main test variable is $YearDummy$, an indicator variable equal to 1 if the year equals 2006 (2007) and 0 otherwise in our first (second) specification. As in equation (3), we also include $LowestQuintileStateETRDec9505$, and its interaction with $YearDummy$. If FIN 48 results in arresting state tax aggressiveness, we would also expect state tax payments to increase in 2006 or 2007, especially for the most tax aggressive firms. Thus, we predict a positive coefficient on both the main effect and the interaction effect.

Consistent with Hypothesis 2, we find there is a significant increase in firms’ overall cash ETR in either 2006 or 2007. Because we control for changes in federal and foreign current ETRs, we interpret the changes in cash ETRs as representing increases in state taxes paid during the years surrounding FIN 48. These results reinforce the results for aggregate state tax revenue collections presented in Table 2 and Figure 2. However, the cash ETR increase in 2006 or 2007 is no higher for our firms in the $LowestQuintileStateETRDec9505$. We speculate that the cash payments for the most aggressive firms might be lagging the ETR changes. In untabulated tests, if we do not winsorize the cash ETR variable, we find that the coefficient on 2006 $YearDummy*LowestQuintileStateETRDec9505$ is significantly positive. Thus, some state tax avoiders appeared to pay material amounts prior to the adoption of FIN 48.

As a final empirical test of the effects of FIN 48 on state tax revenues, we estimate a regression model of state corporate income tax collections scaled by gross state product ($SCIT/GSP$). This model is a parsimonious version of Gupta et al.’s (2009) empirical analysis of the revenue effects of various state corporate income tax policies and incorporates only the main tax policies that vary across states and time. Thus, our regression model is:

$$SCIT/GSP_{i,t} = \alpha_0 + \alpha_1Sales_{i,t} + \alpha_2TaxRate_{i,t} + \alpha_3Throwback_{i,t} + \alpha_4PIC_{i,t} + \alpha_{5,29}YearDummy_{XXXX} + e_{i,t}$$

(4)

Where:

$SCIT/GSP_{i,t}$ = state corporate income tax collections (from U.S. Census Bureau) divided by gross state product (from Bureau of Economic Analysis)
\[
\begin{align*}
Sales_{i,t} &= \text{state sales apportionment factor (from CCH Research Services and state revenue department websites)} \\
TaxRate_{i,t} &= \text{maximum statutory marginal state corporate income tax rate (from CCH Research Services and state revenue department websites)} \\
Throwback_{i,t} &= \text{dummy variable equal to 1 if state has throwback rule in place and 0 otherwise (from state revenue department websites)} \\
AntiPIC_{i,t} &= \text{dummy variable equal to 1 if state disallows interest and royalty deductions related to Passive Investment Companies (PICs) and 0 otherwise} \\
YearDummy_{XXXX} &= \text{dummy variable equal to 1 if year of collections is current year and 0 otherwise (25 variables)}
\end{align*}
\]

The main test variables are \(YearDummy_{2006}\) and \(YearDummy_{2007}\), which should capture the effect of FIN 48 on state tax collections. This model controls for the three main state corporate income tax policies significant in Gupta et al. (2009), namely the state statutory tax rate, the sales apportionment factor weights and the throwback rule. In addition, we include a dummy variable for state-years during which there is an anti-PIC legislation in effect. As discussed before, this variable captures the potential revenue increase states might see from disallowing the benefits of related party transactions through shifting passive income. Table 8 reports the results of this model that includes year fixed effects.

Consistent with FIN 48 having a positive effect on state tax revenue collections, we find that the \(YearDummy_{2007}\) is significantly positive (coeff = 0.001; \(t = 3.24\)). Further, the \(YearDummy_{2006}\) is also significantly positive (coeff 0.001; \(t = 2.26\)), suggesting that some of the changes in state tax payments preceded the adoption of FIN 48, which is consistent with some of our anecdotal evidence.\(^34\) The results for the other tax policy variables such as the tax rate, sales factor and throwback rule are consistent with Gupta et al. (2009). Although the coefficient of the anti-PIC legislation variable is positive as expected, it is only marginally significant.

5. Conclusions

Effective in 2007, FASB Interpretation No. 48 (FIN 48), \textit{Accounting for Uncertainty in Income Taxes}, fundamentally changes how corporations record benefits for uncertain tax positions and requires

\(^{34}\) Our aggregate state tax collections tests are robust to controlling for state fixed effects, although doing so decreases the power of our tests.
them to disclose aggregate liabilities for unrecognized tax benefits. As corporations adopt the standard and independent auditors review the evidence supporting the recognized benefits, new processes could result in corporations reporting higher state tax expense and paying more state income tax.

Our study documents that the balance of unrecorded tax benefits is positively associated with a proxy for state tax avoidance, suggesting that state taxes are a substantial source of uncertain tax benefits. We also examine broad evidence that suggests state effective tax rates and collections fell over the decade from 1995 to 2005, but increased by 2007. The broad pattern is consistent with FIN 48 influencing ETRs and payments, but other factors such as the strong economy and efforts to reduce tax internal control weaknesses under the Sarbanes-Oxley Act could have contributed to this increase. Thus, we also consider firm-level tests that identify firms likely to have weak uncertain tax positions. We use disclosed FIN 48 tax reserve balances to confirm that prior state tax avoidance contributes substantially to the level of tax reserves, especially for domestic firms.

We find that two-year changes in state ETRs are generally related to how much the ETR deviates from average statutory tax rates, as well as changes in federal and foreign ETRs. Of interest, in both 2006 and 2007 we find that firms in the lowest quintile of state ETR changes from 1995-2005 increase their state ETRs, consistent with tax-aggressive firms increasing state ETRs in response to FIN 48. We find that the estimated state component of cash ETRs increased in 2006 and 2007, although similarly for aggressive and non-aggressive firms. Combined with our state-level regression evidence that collections increased in 2006 and 2007, holding constant state law and enforcement regimes, we conclude that FIN 48 affected both ETRs and collections.

Overall, we find evidence consistent with FIN 48 exerting influence over corporations’ state tax compliance. We caution that other factors could contribute to increasing tax rates and collections, but our evidence that firms with weaker state tax positions increased tax rates supports our prediction that FIN 48 is part of the story.
References


Financial Accounting Standards Board (FASB), 2007. Definition of Settlement in FASB Interpretation No. 48. Staff Position No. FIN 48-1. Norwalk, CT: FASB.


FIGURE 1
Mean State and Federal Effective Tax Rates (1995–2007) (a)

Mean State and Federal Effective Tax Rates, 1995-2007

(a) Source: Compustat
FIGURE 2
State Corporate Income Tax Collections (1995-2007) (a)

Panel A, State Corporate Income Tax Collections (Real $ Millions), 1995-2007

Panel B, State Corporate Income Tax Collections as a Percentage of GDP, 1995-2007

Panel C, State Corporate Income Tax Collections as a Percentage of Total Tax Collections, 1995-2007

(a) Sources: U.S. Census Bureau, Bureau of Economic Analysis, Internal Revenue Service (www.irs.gov)
### TABLE 1


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<tbody>
<tr>
<td>Mean State Statutory Tax Rate (MSSTR) (^{(a)})</td>
<td>7.7%</td>
<td>7.7%</td>
<td>7.7%</td>
<td>7.7%</td>
<td>7.7%</td>
<td>7.6%</td>
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<td>7.6%</td>
<td>7.5%</td>
<td>7.5%</td>
<td>7.2%</td>
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<tr>
<td>Annual % Change in MSSTR</td>
<td>-0.3%</td>
<td>0.3%</td>
<td>-0.7%</td>
<td>-0.3%</td>
<td>-0.5%</td>
<td>0.0%</td>
<td>0.1%</td>
<td>-1.1%</td>
<td>-0.4%</td>
<td>-0.7%</td>
<td>-3.2%</td>
<td>-0.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Federal Statutory Tax Rate</td>
<td>35%</td>
<td>35%</td>
<td>35%</td>
<td>35%</td>
<td>35%</td>
<td>35%</td>
<td>35%</td>
<td>35%</td>
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<td>35%</td>
<td>35%</td>
<td>35%</td>
<td>35%</td>
<td>35%</td>
</tr>
</tbody>
</table>

| Panel B, Mean State and Federal Effective Tax Rates (all observations) | Observations | 2,707 | 2,800 | 2,695 | 2,381 | 2,219 | 1,885 | 1,473 | 1,393 | 1,560 | 1,732 | 1,845 | 1,830 | 1,348 | 25,868 |
| Mean State ETR \(^{(b)}\) | 6.6% | 6.4% | 6.4% | 6.3% | 6.1% | 6.0% | 5.4% | 5.3% | 4.9% | 5.5% | 5.4% | 5.4% | 5.6% | 5.8% | 5.9% |
| Annual % Change in State ETR | -1.9% | -0.9% | -1.4% | -3.3% | 0.7% | -2.1% | -9.7% | -1.3% | -8.6% | 12.6% | -1.8% | 2.2% | 1.38% |
| Mean Federal ETR \(^{(c)}\) | 30.2% | 30.0% | 30.2% | 30.6% | 30.6% | 29.8% | 30.6% | 26.7% | 25.7% | 25.3% | 28.8% | 28.6% | 29.1% | 29.2% |
| Annual % Change in Federal ETR | -0.6% | 0.8% | 1.2% | -2.5% | 2.8% | -0.1% | 12.9% | -3.5% | -1.8% | 14.1% | -0.9% | 1.9% | N/A |
| Proportion State / Federal ETR | 21.7% | 21.4% | 21.1% | 20.5% | 20.4% | 20.0% | 19.6% | 20.3% | 20.7% | 19.3% | 19.1% | 18.9% | 19.0% | 20.3% |

| Mean State ETR | 6.5% | 6.2% | 5.9% | 5.9% | 5.4% | 5.3% | 5.2% | 4.3% | 4.5% | 4.7% | 4.8% | 4.9% | 4.9% | 5.3% |
| Mean Federal ETR | 31.2% | 31.8% | 32.0% | 32.1% | 31.1% | 30.9% | 31.4% | 26.3% | 25.4% | 27.3% | 30.3% | 32.2% | 35.8% | 30.6% |
| Proportion State / Federal ETR | 20.7% | 19.7% | 18.6% | 18.3% | 17.3% | 17.1% | 16.7% | 16.5% | 17.9% | 17.2% | 15.8% | 15.1% | 13.8% | 17.3% |
| Aggregate State Tax Exp Nominal SBB | $2.01 | $2.30 | $2.30 | $2.54 | $3.25 | $3.00 | $2.90 | $2.77 | $3.17 | $3.63 | $4.67 | $4.92 | $4.34 | $3.21 |
| Aggregate State Tax Exp Real 1995 SBB | $2.01 | $2.23 | $2.19 | $2.37 | $2.98 | $2.65 | $2.50 | $2.34 | $2.62 | $2.93 | $3.65 | $3.72 | $3.19 | $2.72 |


\(^{(b)}\) State effective tax rate = State Current Tax Expense (Compustat TXS) / Domestic Pre-tax income (Compustat PIDOM) or Pre-tax income if missing (Compustat PI).

\(^{(c)}\) Federal effective tax rate = Federal Current Tax Expense (Compustat TXFED) or Total Current Tax Expense (Compustat TXT) if missing / Domestic Pre-tax income (Compustat PIDOM) or Pre-tax income if missing (Compustat PI).
### TABLE 2
*State Corporate Income Tax Collections, 1995-2007*

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>State Corporate Income Tax (Nominal $ Billions)</strong>&lt;sup&gt;(a)&lt;/sup&gt;</td>
<td>29.08</td>
<td>29.32</td>
<td>30.72</td>
<td>31.09</td>
<td>30.77</td>
<td>32.52</td>
<td>31.69</td>
<td>25.12</td>
<td>28.38</td>
<td>30.23</td>
<td>38.69</td>
<td>47.47</td>
<td>53.38</td>
<td>33.73</td>
</tr>
<tr>
<td><strong>State Corporate Income Tax (Real $ Billions)</strong>&lt;sup&gt;(a)&lt;/sup&gt;</td>
<td>29.08</td>
<td>28.46</td>
<td>29.26</td>
<td>29.06</td>
<td>28.23</td>
<td>28.78</td>
<td>27.32</td>
<td>21.29</td>
<td>23.46</td>
<td>24.38</td>
<td>30.23</td>
<td>35.96</td>
<td>39.25</td>
<td>28.83</td>
</tr>
<tr>
<td><strong>GDP ($ Trillions)</strong>&lt;sup&gt;(b)&lt;/sup&gt;</td>
<td>7.40</td>
<td>7.82</td>
<td>8.30</td>
<td>8.75</td>
<td>9.27</td>
<td>9.82</td>
<td>10.13</td>
<td>10.47</td>
<td>10.96</td>
<td>11.69</td>
<td>12.43</td>
<td>13.19</td>
<td>13.84</td>
<td>10.31</td>
</tr>
<tr>
<td><strong>Net Income ($ Trillions)</strong>&lt;sup&gt;(c)&lt;/sup&gt;</td>
<td>0.88</td>
<td>0.99</td>
<td>1.12</td>
<td>1.09</td>
<td>1.23</td>
<td>1.34</td>
<td>1.11</td>
<td>1.05</td>
<td>1.18</td>
<td>1.46</td>
<td>1.20</td>
<td>1.54</td>
<td>1.62</td>
<td>1.22</td>
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<tr>
<td><strong>Total State Tax ($ Trillions)</strong></td>
<td>0.40</td>
<td>0.42</td>
<td>0.44</td>
<td>0.47</td>
<td>0.50</td>
<td>0.54</td>
<td>0.56</td>
<td>0.54</td>
<td>0.55</td>
<td>0.59</td>
<td>0.65</td>
<td>0.72</td>
<td>0.76</td>
<td>0.55</td>
</tr>
<tr>
<td><strong>State Corporate Income Tax / GDP</strong></td>
<td>0.4%</td>
<td>0.4%</td>
<td>0.4%</td>
<td>0.4%</td>
<td>0.3%</td>
<td>0.3%</td>
<td>0.3%</td>
<td>0.2%</td>
<td>0.3%</td>
<td>0.3%</td>
<td>0.3%</td>
<td>0.4%</td>
<td>0.4%</td>
<td>0.3%</td>
</tr>
<tr>
<td><strong>State Corporate Income Tax / Net Income</strong></td>
<td>3.3%</td>
<td>3.0%</td>
<td>2.8%</td>
<td>2.9%</td>
<td>2.5%</td>
<td>2.4%</td>
<td>2.9%</td>
<td>2.4%</td>
<td>2.4%</td>
<td>2.1%</td>
<td>3.2%</td>
<td>3.1%</td>
<td>3.3%</td>
<td>2.8%</td>
</tr>
<tr>
<td><strong>Total State Tax / GDP</strong>&lt;sup&gt;(d)&lt;/sup&gt;</td>
<td>7.3%</td>
<td>7.0%</td>
<td>6.9%</td>
<td>6.6%</td>
<td>6.2%</td>
<td>6.0%</td>
<td>5.7%</td>
<td>4.7%</td>
<td>5.2%</td>
<td>5.1%</td>
<td>5.9%</td>
<td>6.6%</td>
<td>7.0%</td>
<td>6.2%</td>
</tr>
<tr>
<td><strong>Net Income / GDP</strong>&lt;sup&gt;(d)&lt;/sup&gt;</td>
<td>11.9%</td>
<td>12.6%</td>
<td>13.5%</td>
<td>12.5%</td>
<td>13.3%</td>
<td>13.6%</td>
<td>11.0%</td>
<td>10.1%</td>
<td>10.7%</td>
<td>12.5%</td>
<td>9.7%</td>
<td>11.7%</td>
<td>N/A</td>
<td>11.9%</td>
</tr>
</tbody>
</table>

<sup>(a)</sup> Source: U.S. Census Bureau. Real 1995 $ based on Bureau of Labor Statistics Consumer Price Indices (also source for Total State Tax)

<sup>(b)</sup> Source: Bureau of Economic Analysis

<sup>(c)</sup> Source: Internal Revenue Service, www.irs.gov; 2006 and 2007 Net Income amounts are not yet available, so these amounts were extrapolated based on 1995-2005 Average Net income / GDP

<sup>(d)</sup> The 2006 "Ratio of Net Income to GDP" is calculated as an average of "Ratio of Net Income to GDP" for 1995-2005 due to the 2006 Net Income amounts not yet being available.
## Table 3

### Descriptive statistics, 1995-2007 (a)

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Q1</th>
<th>Median</th>
<th>Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>StateETR</td>
<td>25,868</td>
<td>0.059</td>
<td>0.064</td>
<td>0.026</td>
<td>0.046</td>
<td>0.071</td>
</tr>
<tr>
<td>FederalETR</td>
<td>25,868</td>
<td>0.292</td>
<td>0.191</td>
<td>0.187</td>
<td>0.290</td>
<td>0.352</td>
</tr>
<tr>
<td>R&amp;DIntensity</td>
<td>25,868</td>
<td>0.028</td>
<td>0.082</td>
<td>0.000</td>
<td>0.000</td>
<td>0.024</td>
</tr>
<tr>
<td>AdvIntensity</td>
<td>25,868</td>
<td>0.010</td>
<td>0.030</td>
<td>0.000</td>
<td>0.000</td>
<td>0.005</td>
</tr>
<tr>
<td>MarketToBook</td>
<td>25,868</td>
<td>3.034</td>
<td>3.922</td>
<td>1.411</td>
<td>2.181</td>
<td>3.592</td>
</tr>
<tr>
<td>ROA</td>
<td>25,868</td>
<td>0.117</td>
<td>0.098</td>
<td>0.057</td>
<td>0.097</td>
<td>0.153</td>
</tr>
<tr>
<td>OneYearSalesGrowth</td>
<td>25,868</td>
<td>0.277</td>
<td>2.556</td>
<td>0.041</td>
<td>0.128</td>
<td>0.279</td>
</tr>
<tr>
<td>Size</td>
<td>25,868</td>
<td>5.972</td>
<td>1.920</td>
<td>4.634</td>
<td>5.907</td>
<td>7.235</td>
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<td>ForeignPct</td>
<td>25,868</td>
<td>0.134</td>
<td>1.677</td>
<td>0.000</td>
<td>0.000</td>
<td>0.082</td>
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<tr>
<td>CapitalIntensity</td>
<td>25,868</td>
<td>0.480</td>
<td>0.370</td>
<td>0.181</td>
<td>0.391</td>
<td>0.702</td>
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<tr>
<td>RetailTransp</td>
<td>25,868</td>
<td>0.200</td>
<td>0.400</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>StateETRChangeTwoYr</td>
<td>20,139</td>
<td>-0.001</td>
<td>0.066</td>
<td>-0.018</td>
<td>-0.001</td>
<td>0.015</td>
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<tr>
<td>FedETRChangeTwoYr</td>
<td>25,868</td>
<td>0.093</td>
<td>0.291</td>
<td>-0.037</td>
<td>0.030</td>
<td>0.168</td>
</tr>
</tbody>
</table>

(a) Observations after winsorizing top and bottom one percent of StateETR (<0.0013 and >0.4865) and winsorizing top and bottom one percent of two-year change in StateETR (<-0.3378 and top >0.3073)

(b) Variable Definitions:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Formula</th>
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</thead>
<tbody>
<tr>
<td>StateETR</td>
<td>State current tax expense (Compustat TXS) divided by Domestic pre-tax income (Compustat PIDOM) or Pre-tax income if missing (Compustat PI)</td>
</tr>
<tr>
<td>FederalETR</td>
<td>Federal current tax expense (Compustat TXFED) or Total current tax expense (Compustat TXT) if missing divided by Domestic pre-tax income (Compustat PIDOM) or Pre-tax income if missing (Compustat PI)</td>
</tr>
<tr>
<td>R&amp;DIntensity</td>
<td>R&amp;D expense (Compustat XRD) divided by Sales (Compustat REVT)</td>
</tr>
<tr>
<td>AdvIntensity</td>
<td>Advertising expense (Compustat XAD) divided by Sales (Compustat REVT)</td>
</tr>
<tr>
<td>MarketToBook</td>
<td>Market value [Common shares outstanding (Compustat CSHO) multiplied by common share price at fiscal year end (Compustat PRCC_F)] divided by Book value [Total assets (Compustat AT) minus Total liabilities (Compustat LT)]</td>
</tr>
<tr>
<td>ROA</td>
<td>Pre-tax income (Compustat PI) divided by Total assets (Compustat AT)</td>
</tr>
<tr>
<td>OneYearSalesGrowth</td>
<td>Percentage change in Sales (Compustat REVT) from year t-1 to year t</td>
</tr>
<tr>
<td>Size</td>
<td>Natural logarithm of reported sales (Sales REVT)</td>
</tr>
<tr>
<td>ForeignPct</td>
<td>Absolute value of [Foreign pre-tax income (Compustat PIFO) divided by Worldwide pre-tax income (Compustat PI)]</td>
</tr>
<tr>
<td>CapitalIntensity</td>
<td>Gross property, plant and equipment (Compustat PPEGT) divided by Total assets (Compustat AT)</td>
</tr>
<tr>
<td>RetailTransp</td>
<td>Dummy variable equal to 1 if observation SIC code (Compustat SIC) is between 4000 and 4899 (retail industry SIC codes) or 5000 and 5999 (transportation industry SIC codes) and 0 otherwise</td>
</tr>
<tr>
<td>StateETRChangeTwoYr</td>
<td>State effective tax rate in year t minus state effective tax rate in year t-2</td>
</tr>
<tr>
<td>FedETRChangeTwoYr</td>
<td>Federal effective tax rate in year t minus federal effective tax rate in year t-2</td>
</tr>
</tbody>
</table>
TABLE 4
Regression of state current effective tax rate on proxies for intangible income shifting and nexus exposure, controlling for federal current effective tax rate, time and other variables, using 1995-2005 Compustat observations with positive pre-tax income, positive state current tax expense, and positive federal current tax expense (a)

\[ StateETR_{it} = \alpha_0 + \alpha_1 FederalETR_{it} + \alpha_2 R&DIntensity_{it} + \alpha_3 AdvIntensity_{it} + \alpha_4 AdvIntensity*RetailTransp_{it} + \alpha_5 MarketToBook_{it} + \alpha_6 ROA_{it} + \alpha_7 OneYearSalesGrowth_{it} + \alpha_8 Size_{it} + \alpha_9 ForeignPct_{it} + \alpha_{10} CapitalIntensity_{it} + \alpha_{11} RetailTransp + \alpha_{12} YearAfter1995_{it} + e_{it} \]  

<table>
<thead>
<tr>
<th>Variable (b)</th>
<th>Predicted Sign</th>
<th>Full Sample</th>
<th>Domestic Firms (ForeignPct&lt;0.05)</th>
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<tr>
<td>Intercept</td>
<td>+</td>
<td>0.041 ***</td>
<td>0.041 ***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(16.33)</td>
<td>(14.99)</td>
</tr>
<tr>
<td>FederalETR</td>
<td>+</td>
<td>0.191 ***</td>
<td>0.188 ***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(44.79)</td>
<td>(36.08)</td>
</tr>
<tr>
<td>R&amp;DIntensity</td>
<td>-</td>
<td>-0.010 *</td>
<td>-0.008</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-1.79)</td>
<td>(-1.54)</td>
</tr>
<tr>
<td>AdvIntensity</td>
<td>-</td>
<td>0.023</td>
<td>0.016</td>
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<tr>
<td></td>
<td></td>
<td>(1.3)</td>
<td>(0.78)</td>
</tr>
<tr>
<td>AdvIntensity*RetailTransp</td>
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<td>-0.111 ***</td>
<td>-0.109 ***</td>
</tr>
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<td></td>
<td></td>
<td>(-3.17)</td>
<td>(-2.99)</td>
</tr>
<tr>
<td>MarketToBook</td>
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<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.27)</td>
<td>(0.6)</td>
</tr>
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<td>ROA</td>
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<td>-0.083 ***</td>
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<td>(-8.15)</td>
<td>(-6.75)</td>
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<tr>
<td>OneYearSalesGrowth</td>
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<td>0.000</td>
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<td></td>
<td></td>
<td>(1.69)</td>
<td>(1.19)</td>
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<tr>
<td>Size</td>
<td>-</td>
<td>-0.004 ***</td>
<td>-0.005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-14.63)</td>
<td>(-14.43)</td>
</tr>
<tr>
<td>ForeignPct</td>
<td>?</td>
<td>0.001 ***</td>
<td>-0.121</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.57)</td>
<td>(-2.83)</td>
</tr>
<tr>
<td>CapitalIntensity</td>
<td>-</td>
<td>-0.004 ***</td>
<td>-0.003 **</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-3.16)</td>
<td>(-1.98)</td>
</tr>
<tr>
<td>RetailTransp</td>
<td>+</td>
<td>0.004 ***</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.77)</td>
<td>(3.31)</td>
</tr>
<tr>
<td>YearAfter1995</td>
<td>-</td>
<td>0.000 **</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-2.31)</td>
<td>(-1.09)</td>
</tr>
<tr>
<td>Number of observations</td>
<td></td>
<td>25,868</td>
<td>18,662</td>
</tr>
<tr>
<td>R-squared</td>
<td></td>
<td>0.3623</td>
<td>0.3546</td>
</tr>
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</table>

(a) Observations after winsorizing top and bottom one percent of StateETR (<0.0013 and >0.4865) and winsorizing top and bottom one percent of two-year change in StateETR (<-0.3378 and top >0.3073)

Variable Definitions: See Table 3

AdvIntensity*RetailTransp = Interaction between AdvIntensity and RetailTransp
YearAfter1995 = Year t minus 1995
**TABLE 5**
Unrecognized Tax Benefits

**Panel A, Descriptive Statistics for Tests of Unrecognized Tax Benefit Balance**

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Q1</th>
<th>Median</th>
<th>Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>U TB (unscaled $mill) i</td>
<td>1,490</td>
<td>81.642</td>
<td>385.562</td>
<td>0.100</td>
<td>3.996</td>
<td>27.716</td>
</tr>
<tr>
<td>Total Assets ($mill) i</td>
<td>1,490</td>
<td>8,275</td>
<td>65,014</td>
<td>231</td>
<td>833</td>
<td>3,015</td>
</tr>
<tr>
<td>U TB i</td>
<td>1,490</td>
<td>0.010</td>
<td>0.017</td>
<td>0.000</td>
<td>0.005</td>
<td>0.013</td>
</tr>
<tr>
<td>FedTxShort i</td>
<td>1,490</td>
<td>0.033</td>
<td>0.040</td>
<td>0.004</td>
<td>0.023</td>
<td>0.045</td>
</tr>
<tr>
<td>ForeignTxShort i</td>
<td>1,490</td>
<td>0.005</td>
<td>0.014</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>StateTxShort i</td>
<td>1,490</td>
<td>0.007</td>
<td>0.011</td>
<td>0.000</td>
<td>0.003</td>
<td>0.010</td>
</tr>
<tr>
<td>ForeignPct i</td>
<td>1,490</td>
<td>0.138</td>
<td>0.226</td>
<td>0.000</td>
<td>0.000</td>
<td>0.208</td>
</tr>
</tbody>
</table>

**Panel B, Regression of Unrecognized Tax Benefit at adoption of FIN 48 on federal, foreign and state components of historical (2002-2006) tax expense and any shortfalls of those components relative to statutory tax rate benchmarks, controlling for the absolute value of the percentage of foreign to total pre-tax income**

\[ U TB_i = \beta_0 + \beta_1 \text{FedTxShort}_i + \beta_2 \text{ForeignTxShort}_i + \beta_3 \text{StateTxShort}_i + \beta_4 \text{ForeignPct}_i + \epsilon_i \tag{2} \]

<table>
<thead>
<tr>
<th>Variable (b)</th>
<th>Predicted Sign</th>
<th>OLS All Firms</th>
<th>OLS Foreign = 0</th>
<th>OLS Foreign = 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td></td>
<td>0.0045***</td>
<td>0.0035***</td>
<td>0.0084***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.5</td>
<td>5.89</td>
<td>5.09</td>
</tr>
<tr>
<td>FedTxShort i</td>
<td>+</td>
<td>0.0311***</td>
<td>0.0189**</td>
<td>0.0542**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.01</td>
<td>2.07</td>
<td>2.47</td>
</tr>
<tr>
<td>ForeignTxShort i</td>
<td>+</td>
<td>0.1647***</td>
<td>N/A</td>
<td>0.1696***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.56</td>
<td></td>
<td>3.73</td>
</tr>
<tr>
<td>StateTxShort i</td>
<td>+</td>
<td>0.2266***</td>
<td>0.2166*</td>
<td>0.1814**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.79</td>
<td>6.16</td>
<td>2.22</td>
</tr>
<tr>
<td>ForeignPct i</td>
<td>+</td>
<td>0.0174***</td>
<td>-0.0058</td>
<td>0.0092**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.48</td>
<td>-0.27</td>
<td>2.47</td>
</tr>
</tbody>
</table>

Sigma

Adjusted R-Sq

<table>
<thead>
<tr>
<th></th>
<th>OLS All Firms</th>
<th>OLS Foreign = 0</th>
<th>OLS Foreign = 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations</td>
<td>1,490</td>
<td>792</td>
<td>698</td>
</tr>
</tbody>
</table>

(b) Variable Definitions:

- **UTB (unscaled $mill) i** = The liability for unrecognized tax benefits at adoption (January 1, 2007 for calendar year firms)
- **Total Assets (Smill) i** = The liability for unrecognized tax benefits at adoption (January 1, 2007 for calendar year firms), deflated by 2006 total assets
- **UTB i** = 2006 Compustat AT
- **FedTxShort i** = The greater of zero or 35% times the five-year (2002-2006) sum of domestic pre-tax income (Compustat PIDOM or PI if PIDOM missing) minus federal tax expense (Compustat TXFED), deflated by 2006 total assets
- **ForeignTxShort i** = The greater of zero or 35% times the five-year sum of foreign pre-tax income (Compustat PIFO) minus foreign tax expense (Compustat TXFO), deflated by 2006 total assets; If either PIFO or TXFO are missing, ForTxShort is set to zero
- **StateTxShort i** = The greater of zero or 7.61% times the five-year sum of imputed domestic taxable income less state tax expense (Compustat TXS), deflated by 2006 total assets; We impute domestic taxable income as domestic current tax expense (Compustat TXFED, or TXT if missing) divided by 35%
- **ForeignPct i** = The absolute value of the sum (2002-2006) of foreign pre-tax income (Compustat PIFO) divided by the sum of pre-tax income (Compustat PI); If PIFO is missing, ForeignPct is set to zero
TABLE 6
Regression of 2-year change in state current effective tax rate on proxies for prior tax avoidance, intangible income shifting and nexus exposure, controlling for change in federal current effective tax rate, time and other variables, using 1995-2007 Compustat observations with positive US pre-tax income, positive state current tax expense, and positive federal current tax expense \(^{(a)}\)

\[
\text{StateETRChange2Yri},t = \alpha_0 + \alpha_1 \text{FedETRChangeTwoYri},t + \alpha_2 \text{ForeignETRChangeTwoYri},t + \alpha_3 \text{BnmkDevi},t-2 + \alpha_4 \text{LowestQuintStateETRDec9505i} + \alpha_5 \text{YearDummy},t + \alpha_6 \text{YearDummy},t \times \text{LowestQuintStateETRDec9505i} + \alpha_7 \text{R&Dintensityi},t-2 + \alpha_8 \text{AdvIntensityi},t-2 + \alpha_9 \text{AdvIntensityi \times RetailTranspi},t-2 + \alpha_{10} \text{MarketToBooki},t-2 + \alpha_{11} \text{ROAi},t-2 + \alpha_{12} \text{OneYearSalesGrowthi} + \alpha_{13} \text{Sizei},t-2 + \alpha_{14} \text{ForeignPcti},t-2 + \alpha_{15} \text{CapitalIntensityi},t-2 + \alpha_{16} \text{RetailTranspi},t-2 + \epsilon_{it} \tag{3a}
\]

<table>
<thead>
<tr>
<th>Variable (^{(b)})</th>
<th>Predicted Sign</th>
<th>YearDummy = 2006</th>
<th>YearDummy = 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Coefficient ((t\text{-statistic)})</td>
<td>Coefficient ((t\text{-statistic)})</td>
</tr>
<tr>
<td>Intercept</td>
<td>-</td>
<td>-0.007 *** ((-4.04))</td>
<td>-0.006 *** ((-3.86))</td>
</tr>
<tr>
<td>FedETRChangeTwoYri,t</td>
<td>+</td>
<td>0.139 *** ((32.36))</td>
<td>0.139 *** ((32.48))</td>
</tr>
<tr>
<td>ForeignETRChangeTwoYri,t</td>
<td>+</td>
<td>0.147 *** ((9.64))</td>
<td>0.146 *** ((9.6))</td>
</tr>
<tr>
<td>LowestQuintStateETRDec9505i</td>
<td>-</td>
<td>-0.018 *** ((-13.51))</td>
<td>-0.019 *** ((-14.23))</td>
</tr>
<tr>
<td>YearDummy</td>
<td>+</td>
<td>0.002 ((1.54))</td>
<td>0.002 ((-0.77))</td>
</tr>
<tr>
<td>LowestQuintStateETRDec9505i * YearDummy</td>
<td>+</td>
<td>0.011 *** ((2.87))</td>
<td>0.026 *** ((6.38))</td>
</tr>
<tr>
<td>BnmkDevi,t-2</td>
<td>+</td>
<td>0.009 ** ((2.15))</td>
<td>0.009 ** ((2.15))</td>
</tr>
<tr>
<td>R&amp;DIntensityi,t-2</td>
<td>-</td>
<td>-0.045 *** ((-4.53))</td>
<td>-0.045 *** ((-4.56))</td>
</tr>
<tr>
<td>AdvIntensityi,t-2</td>
<td>-</td>
<td>-0.020 *** ((-1.63))</td>
<td>-0.019 ((-1.58))</td>
</tr>
<tr>
<td>AdvIntensityi * RetailTranspi,t-2</td>
<td>-</td>
<td>-0.018 ((-0.52))</td>
<td>-0.020 ((-0.59))</td>
</tr>
<tr>
<td>MarketToBooki,t-2</td>
<td>?</td>
<td>0.000 ((-0.4))</td>
<td>0.000 ((-0.42))</td>
</tr>
<tr>
<td>ROAi,t-2</td>
<td>?</td>
<td>0.052 *** ((9.42))</td>
<td>0.052 *** ((9.42))</td>
</tr>
<tr>
<td>OneYearSalesGrowthi</td>
<td>?</td>
<td>0.001 ((0.38))</td>
<td>0.001 ((0.39))</td>
</tr>
<tr>
<td>Sizei,t-2</td>
<td>-</td>
<td>-0.001 *** ((-2.63))</td>
<td>-0.001 *** ((-2.67))</td>
</tr>
<tr>
<td>ForeignPcti,t-2</td>
<td>?</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>
\begin{align*}
\text{CapitalIntensity}_{i,t} & \quad ? \quad 0.000 \quad 0.000 \\
\text{RetailTransp}_{i,t-2} & \quad ? \quad 0.002 \quad * \quad 0.002 \quad * \\
\text{R-squared} & \quad 0.3335 \quad 0.3345 \\
\end{align*}

Number of observations 18,662 18,662

(a) Observations after winsorizing top and bottom one percent of StateETR (<0.0013 and >0.4865) and winsorizing top and bottom one percent of two-year change in StateETR (<-0.3378 and top >0.3073)

(b) Variable Definitions:

- \( \text{StateETRChange}_{2Yr,i,t} \) = State effective tax rate in year \( t \) minus state effective tax rate in year \( t-2 \)
- \( \text{FedETRChange}_{2Yr,i,t} \) = Federal effective tax rate in year \( t \) minus federal effective tax rate in year \( t-2 \)
- \( \text{ForeignETRChange}_{2Yr,i,t} \) = Foreign effective tax rate in year \( t \) minus federal effective tax rate in year \( t-2 \)
- \( \text{LowestQuintStateETRDec9505}_{i,t} \) = Dummy variable equal to 1 if decrease in firm's state effective tax rate from 1995 to 2005 is greater than at least 80% of other firms' decrease in firm's state effective tax rate from 1995 to 2005 and 0 otherwise
- \( \text{YearDummy}_{i,t} \) = Dummy variable equal to 1 if financial reporting year begins between December of 2005 and November of 2006 (2006 Dummy) or begins between December of 2006 and November of 2007 (2007 Dummy) and 0 otherwise
- \( \text{LowestQuintStateETRDec9505}_{i,t} \times \text{Year2007Dummy}_{i,t} \) = Interaction between lowest quintile dummy variable and Year2007Dummy variable
- \( \text{LowestQuintStateETRDec9505}_{i,t} \times \text{Year2006Dummy}_{i,t} \) = Interaction between lowest quintile dummy variable and Year2006Dummy variable
- \( \text{BmkDev}_{i,t} \) = Benchmark tax rate (see Table 1 Panel A) minus state effective tax rate in year \( t-2 \)
- \( \text{R&Dintensity}_{i,t-2} \) = R&D expense (Compustat XRD) divided by sales (Compustat REVt) in year \( t-2 \)
- \( \text{AdvIntensity}_{i,t-2} \) = Advertising expense (Compustat XAD) divided by sales (Compustat REVt) in year \( t-2 \)
- \( \text{AdvIntensity}_{i,t-2} \times \text{RetailTransp}_{i,t-2} \) = Interaction between AdvIntensity and RetailTransp in year \( t-2 \)
- \( \text{MarketToBook}_{i,t-2} \) = Market value [Common shares outstanding (Compustat CSHO) multiplied by common share price at fiscal year end (Compustat PRCC_F)] divided by Book value [Total assets (Compustat AT) minus Total liabilities (Compustat LT)] in year \( t-2 \)
- \( \text{ROA}_{i,t-2} \) = Pre-tax income (Compustat PI) divided by Total assets (Compustat AT)
- \( \text{OneYearSalesGrowth}_{i,t-2} \) = Percentage change in Sales (Compustat REVt) from year \( t-1 \) to year \( t \)
- \( \text{Size}_{i,t-2} \) = Natural logarithm of reported sales (Sales REVt) in year \( t-2 \)
- \( \text{ForeignPct}_{i,t-2} \) = Absolute value of [Foreign pre-tax income (Compustat PI_FO) divided by Worldwide pre-tax income (Compustat PI)] in year \( t-2 \)
- \( \text{CapitalIntensity}_{i,t-2} \) = Gross property, plant and equipment (Compustat PPEGT) divided by Total assets (Compustat AT) in year \( t-2 \)
- \( \text{RetailTransp}_{i,t-2} \) = Dummy variable equal to 1 if observation SIC code (Compustat SIC) is between 4000 and 4899 (retail industry SIC codes) or 5000 and 5999 (transportation industry SIC codes) and 0 otherwise in year \( t-2 \)
Regression of 2-year change in taxes paid on proxies for prior tax avoidance, intangible income shifting and nexus exposure, controlling for change in federal current effective tax rate, time and other variables, using 1995-2007 Compustat observations with positive US pre-tax income, positive state current tax expense, and positive federal current tax expense \(^{(a)}\)

\[
\text{TaxPdChange}2Yri, t = \alpha_0 + \alpha_1 \text{FedETRChangeTwoYri}, t + \alpha_2 \text{ForeignETRChangeTwoYri}, t + \alpha_3 \text{BnmkDevi}, t-2 + \alpha_4 \text{LowestQuintStateETRDec9505i} + \alpha_5 \text{YearDummy}_t + \alpha_6 \text{YearDummy}_t \times \text{LowestQuintStateETRDec9505i} + \alpha_7 \text{R&Dintensityi}, t-2 + \alpha_8 \text{AdvIntensityi}, t-2 + \alpha_9 \text{AdvIntensityi} \times \text{RetailTranspi}, t-2 + \alpha_{10} \text{MarketToBooki}, t-2 + \alpha_{11} \text{ROAi}, t-2 + \alpha_{12} \text{OneYearSalesGrowthi} + \alpha_{13} \text{Sizei}, t-2 + \alpha_{14} \text{ForeignPcti}, t-2 + \alpha_{15} \text{CapitalIntensityi}, t-2 + \alpha_{16} \text{RetailTranspi}, t-2 + \epsilon_{it} \quad (3b)
\]

<table>
<thead>
<tr>
<th>Variable (^{(b)})</th>
<th>Predicted Sign</th>
<th>YearDummy = 2006</th>
<th>YearDummy = 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-</td>
<td>0.111 *** (10.10)</td>
<td>0.111 *** (10.13)</td>
</tr>
<tr>
<td>FedETRChangeTwoYri,t</td>
<td>+</td>
<td>0.655 *** (23.30)</td>
<td>0.655 *** (23.36)</td>
</tr>
<tr>
<td>ForeignETRChangeTwoYri,t</td>
<td>+</td>
<td>1.966 *** (16.28)</td>
<td>1.965 *** (16.28)</td>
</tr>
<tr>
<td>LowestQuintStateETRDec9505i</td>
<td>-</td>
<td>-0.010 (-1.18)</td>
<td>-0.010 (-1.19)</td>
</tr>
<tr>
<td>YearDummy</td>
<td>+</td>
<td>0.022 * (1.87)</td>
<td>0.032 ** (2.00)</td>
</tr>
<tr>
<td>LowestQuintStateETRDec9505i \times YearDummy</td>
<td>+</td>
<td>-0.003 (-0.10)</td>
<td>-0.007 (-0.21)</td>
</tr>
<tr>
<td>BnmkDevi,t-2</td>
<td>+</td>
<td>-0.008 (-1.22)</td>
<td>-0.008 (-1.22)</td>
</tr>
<tr>
<td>R&amp;Dintensityi,t-2</td>
<td>-</td>
<td>-0.337 *** (-5.69)</td>
<td>-0.337 *** (-5.69)</td>
</tr>
<tr>
<td>AdvIntensityi,t-2</td>
<td>-</td>
<td>0.059 (0.72)</td>
<td>0.060 (0.73)</td>
</tr>
<tr>
<td>AdvIntensityi \times RetailTranspi,t-2</td>
<td>-</td>
<td>0.092 (0.49)</td>
<td>0.089 (0.47)</td>
</tr>
<tr>
<td>MarketToBooki,t-2</td>
<td>?</td>
<td>0.000 (-0.20)</td>
<td>0.000 (-0.23)</td>
</tr>
<tr>
<td>ROAi,t-2</td>
<td>?</td>
<td>-0.070 *** (-3.35)</td>
<td>-0.070 *** (-3.37)</td>
</tr>
<tr>
<td>OneYearSalesGrowthi</td>
<td>?</td>
<td>-0.003 * (-1.65)</td>
<td>-0.003 * (-1.65)</td>
</tr>
<tr>
<td>Sizei,t-2</td>
<td>-</td>
<td>-0.013 *** (-8.49)</td>
<td>-0.013 *** (-8.54)</td>
</tr>
<tr>
<td>ForeignPcti,t-2</td>
<td>?</td>
<td>0.002 (1.44)</td>
<td>0.002 (1.44)</td>
</tr>
<tr>
<td>Variable</td>
<td>Coefficient</td>
<td>t-value</td>
<td>Coefficient</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>CapitalIntensity_{i,t}</td>
<td>-0.015</td>
<td>**(-2.05)</td>
<td>-0.015</td>
</tr>
<tr>
<td>RetailTransp_{i,t-2}</td>
<td>0.018</td>
<td>***(2.63)</td>
<td>0.019</td>
</tr>
</tbody>
</table>

Number of observations: 22,342
R-squared: 0.1998

(a) Observations after winsorizing top and bottom one percent of StateETR (<0.0013 and >0.4865) and winsorizing top and bottom one percent of two-year change in StateETR (<-0.3378 and >0.3073) and winsorizing top and bottom one percent of two-year change in two-year change in scaled Taxes Paid (<1.66 and >3.06)

(b) Variable Definitions:

- **StateETRChange2Yr_{i,t}** = State effective tax rate in year t minus state effective tax rate in year t-2
- **FedETRChange2Yr_{i,t}** = Federal effective tax rate in year t minus federal effective tax rate in year t-2
- **ForeignETRChange2Yr_{i,t}** = Foreign effective tax rate in year t minus federal effective tax rate in year t-2
- **LowestQuintStateETRDec9505**, **Year2007Dummy** = Dummy variable equal to 1 if decrease in firm's state effective tax rate from 1995 to 2005 is greater than at least 80% of other firms' decrease in firm's state effective tax rate from 1995 to 2005, and 0 otherwise
- **Yr2007Dummy** = Dummy variable equal to 1 if financial reporting year begins between December of 2006 and November of 2007, and 0 otherwise
- **Yr2006Dummy** = Dummy variable equal to 1 if financial reporting year begins between December of 2005 and November of 2006, and 0 otherwise
- **LowestQuintStateETRDec9505**, **Year2007Dummy** = Interaction between lowest quintile dummy variable and Year2007Dummy variable
- **LowestQuintStateETRDec9505**, **Year2006Dummy**, **BenchmarkDev** = Interaction between lowest quintile dummy variable and Year2006Dummy variable
- **BenchmarkDev** = Benchmark tax rate (see Table 1 Panel A) minus state effective tax rate in year t-2
- **R&Dintensity_{i,t-2}** = R&D expense (Compustat XRD) divided by sales (Compustat REVt) in year t-2
- **AdvIntensity_{i,t-2}** = Advertising expense (Compustat XAD) divided by sales (Compustat REVt) in year t-2
- **AdvIntensity*RetailTransp_{i,t-2}** = Interaction between AdvIntensity and RetailTransp in year t-2
- **MarketToBook_{i,t-2}** = Market value [Common shares outstanding (Compustat CSHO) multiplied by common share price at fiscal year end (Compustat PRCC_F)] divided by Book value [Total assets (Compustat AT) minus Total liabilities (Compustat LT)] in year t-2
- **ROA_{i,t-2}** = Pre-tax income (Compustat PI) divided by Total assets (Compustat AT)
- **OneYearSalesGrowth_{i,t}** = Percentage change in Sales (Compustat REVt) from year t-1 to year t
- **Size_{i,t-2}** = Natural logarithm of reported sales (Sales REVt) in year t-2
- **ForeignPct_{i,t-2}** = Absolute value of [Foreign pre-tax income (Compustat PIFO) divided by Worldwide pre-tax income (Compustat PI)] in year t-2
- **CapitalIntensity_{i,t-2}** = Gross property, plant and equipment (Compustat PPEGT) divided by Total assets (Compustat AT) in year t-2
- **RetailTransp_{i,t-2}** = Dummy variable equal to 1 if observation SIC code (Compustat SIC) is between 4000 and 4899 (retail industry SIC codes) or 5000 and 5999 (transportation industry SIC codes) and 0 otherwise in year t-2
TABLE 8
Regression of state corporate income tax collections scaled by gross state product on state tax policy
variables and year indicator variables, using 1,075 state-year observations from 1983 through 2007
(43 states * 25 years = 1,075 observations) (a)

\[
\text{SCIT/GSP}_{it} = \alpha_0 + \alpha_1 \text{Sales}_{it} + \alpha_2 \text{TaxRate}_{it} + \alpha_3 \text{Throwback}_{it} + \alpha_4 \text{PIC}_{it} \\
+ \alpha_{15,29} \text{YearDummy} + \epsilon_{it} \tag{4}
\]

<table>
<thead>
<tr>
<th>Variable (b)</th>
<th>Predicted Sign</th>
<th>Coefficient (t-statistic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td></td>
<td>0.000 *</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.83)</td>
</tr>
<tr>
<td>Sales_{it}</td>
<td>?</td>
<td>0.000 ***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-4.30)</td>
</tr>
<tr>
<td>TaxRate_{it}</td>
<td>+</td>
<td>0.042 ***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(18.81)</td>
</tr>
<tr>
<td>Throwback_{it}</td>
<td>+</td>
<td>0.000 ***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5.51)</td>
</tr>
<tr>
<td>AntiPIC_{it}</td>
<td>+</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.63)</td>
</tr>
<tr>
<td>YearDummy2006</td>
<td>?</td>
<td>0.001 **</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.26)</td>
</tr>
<tr>
<td>YearDummy2007</td>
<td>+</td>
<td>0.001 ***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.24)</td>
</tr>
<tr>
<td>Number of observations</td>
<td></td>
<td>1,075</td>
</tr>
<tr>
<td>Adj R-squared</td>
<td></td>
<td>0.3237</td>
</tr>
</tbody>
</table>

(a) Year indicator variables for years 1982 through 2005 have been suppressed from the tabulation
(b) Variable Definitions:

\[
\begin{align*}
\text{SCIT/GSP}_{it} & = \text{State corporate income tax collections (from U.S. Census Bureau)} \div \text{gross state product (from Bureau of Economic Analysis)} \\
\text{Sales}_{it} & = \text{State sales apportionment factor (from CCH Research Services and state revenue department websites)} \\
\text{TaxRate}_{it} & = \text{Maximum statutory marginal state corporate income tax rate (from CCH Research Services and state revenue department websites)} \\
\text{Throwback}_{it} & = \text{Dummy variable equal to 1 if state has throwback rule in place and 0 otherwise (from state revenue department websites)} \\
\text{AntiPIC}_{it} & = \text{Dummy variable equal to 1 if state disallows interest and royalty deductions related to Passive Investment Companies (PICs) and 0 otherwise} \\
\text{YearDummy}X & = \text{Dummy variable equal to 1 if year of collections is current year and 0 otherwise (25 variables)}
\end{align*}
\]

(c) Intercept represents 1983. Only 2006 and 2007 YearDummyXX shown above. Others are suppressed for space. Details available from authors.