Conforming Tax Avoidance and Capital Market Pressure

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ABSTRACT: In this study we develop a measure of corporate tax avoidance that reduces both financial and taxable income, which we refer to as "book-tax conforming" tax avoidance. We use LIFO/FIFO inventory method conversions, samples of private and public firms, and simulation analyses to validate our measure of conforming tax avoidance. We then investigate the prevalence of conforming tax avoidance within a sample of public firms. Results from the validation tests indicate that our measure of conforming tax avoidance successfully captures book-tax conforming transactions and thus, variation in conforming tax avoidance across firms. Consistent with expectations, we also find that the extent to which public firms engage in conforming tax avoidance varies systematically with the capital market pressures to which they are subject. For example, public firms that lack analyst following, do not issue equity securities, report lower sales growth, or smaller discretionary accruals engage in relatively more conforming tax avoidance and less nonconforming tax avoidance. Our study develops a new measure of conforming tax avoidance that should be useful in future research and provides new insights on the extent to which public firms are willing to reduce income tax liabilities at the expense of reporting lower financial income.

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1. Introduction

Accounting research has long examined corporate tax practices, especially income tax avoidance. Recent studies focus almost exclusively on tax strategies that reduce income tax liabilities but not financial statement (i.e., book) income, which we refer to as *nonconforming* tax avoidance. However, firms can also reduce their income tax liabilities by engaging in transactions that reduce *both* book and taxable incomes, which we refer to as *conforming* tax avoidance. Although recent accounting research generally disregards the existence of conforming tax avoidance, older accounting research assumes that in some circumstances (e.g., when capital market pressure is low, or in anticipation of large tax rate changes) firms adopt conforming tax strategies (e.g., Penno and Simon 1986; Guenther 1994; Maydew 1997).[1] These studies examine specific transactions that reduce both book and taxable incomes, such as LIFO inventory decisions (e.g., Hunt, Moyer, and Shevlin 1996) or gains and losses from sales and divestitures (e.g., Klassen 1997). However, the accounting literature lacks a broad measure specifically designed to capture conforming tax avoidance. In this study, we develop such a measure. We use LIFO / FIFO inventory method conversions, simulation analyses, and samples of private and public firms, to validate our measure of conforming tax avoidance. We then investigate the prevalence of conforming tax avoidance within a large sample of public firms.

Following Shackelford and Shevlin's (2001) call for research on the determinants of tax aggressiveness, and Weisbach's (2002) recognition of the undersheltering puzzle,[2] accounting researchers have extensively examined corporate tax avoidance. Consistent with Hanlon and Heitzman (2010, p. 137) we define tax avoidance broadly as "all transactions that have any effect

[1] Guenther (1994) and Maydew (1997) refer to these practices as "tax-induced earnings management."

[2] Weisbach (2002) was among the first to ask why many firms do not fully take advantage of tax planning opportunities, which has since been referred to as the "undersheltering puzzle."

on the firm's explicit tax liability," and conforming tax avoidance as all book-tax conforming transactions that reduce a firm's explicit tax liability. Most studies measure tax avoidance with effective tax rate (ETR) or book-tax difference-based measures, and thus by construction focus on *non*conforming tax strategies. While nonconforming tax avoidance is without question an important, if not dominant, tax planning strategy, it is not the *only* tax strategy. If we are to have a more complete understanding of the determinants of corporate tax avoidance and the undersheltering puzzle, we require empirical measures of both conforming and nonconforming tax avoidance.

Understanding the extent to which firms utilize conforming tax strategies is important because some firms could exhibit high effective tax rates (or low book-tax differences) and thus cause outsiders to conclude the firms do not avoid income taxes, when in fact they are relying on previously undetected, book-tax conforming tax strategies. In this case, studies measuring the extent of tax avoidance in the economy would be understating the amount of income tax avoidance if they solely rely on nonconforming measures of tax avoidance. Research examining the cross-sectional determinants of tax avoidance could generate incorrect inferences regarding the types of firms or managers that avoid income taxes if conforming tax avoidance is not considered. Further, investors and analysts may incorrectly evaluate the tax planning effectiveness of these firms and their managers. In sum, our new measure of conforming tax avoidance, in combination with existing measures of nonconforming tax avoidance, provides a more complete picture of the tax planning effectiveness of firms and their managers.[3]

[3] Univariate analyses reveal that the distribution of our measure of conforming tax avoidance is not related to the distribution of a common measure of nonconforming tax avoidance (i.e., five-year cash ETR), consistent with our new measure capturing unique aspects of corporate tax planning.

Our measure of conforming tax avoidance is based on the ratio of cash taxes paid to lagged total assets, which captures total tax avoidance, as well as non-tax operating decisions. Like cash ETR, this ratio is decreasing in tax avoidance. The numerator focuses on actual income tax payments and excludes tax accruals, which can distort a firm's current tax expense.[4] The denominator is a lagged balance sheet measure that is sensitive to neither current period transactions (e.g., earnings manipulations) nor to Henry and Sansing's (2014) observation that cash ETRs are distorted in the presence of low pretax income.[5] However, both conforming and nonconforming tax strategies reduce the ratio of cash taxes paid to lagged total assets. To remove the impact of nonconforming tax strategies, we orthogonalize the ratio to book-tax differences. Specifically, we regress the ratio of cash taxes paid to lagged total assets on positive and negative book-tax differences, by industry (3-digit NAICS code) and fiscal year combinations, and extract the residuals from these regressions as our measure of conforming tax avoidance, *CONFORM_TAX*. As a result, our measure largely captures transactions that affect both book and taxable income.[6]

We validate *CONFORM_TAX* as a measure of conforming tax avoidance through a series of empirical tests. First, we identify samples of firms that convert from the FIFO inventory method to the LIFO inventory method (and vice versa). Under U.S. federal income tax rules,

[4] Prior research indicates managers sometimes use specific tax accruals (e.g., income tax reserves or valuation allowances) to manage earnings and thus meet or beat an earnings benchmark (Dhaliwal, Gleason, and Mills 2004; Schrand and Wong 2003; Krull 2004; Frank and Rego 2006; Cazier, Rego, Tian, and Wilson 2015).

[5] An alternative denominator for this measure is cash flow from operations. However, conforming tax planning can involve real earnings management activity such as increased spending on administrative costs near year-end. This increased spending would reduce cash tax payments and operating cash flows and would not change the ratio of cash taxes paid to operating cash flows (unless the increased spending dropped the firm into a different tax rate bracket or caused the firm to report a pretax loss). As a result, using cash flow from operations as the scalar would result in a measure of overall tax avoidance that would fail to detect important types of conforming tax avoidance. Nevertheless, in the robustness section we report results of using cash flow from operations as the denominator.

[6] The estimation model also controls for NOLs, changes in NOLs and for a proxy for firm performance and operating efficiency (i.e., the sales-to-net-operating-asset ratio). See section 3 for more details.

firms that adopt LIFO for federal income tax purposes must also adopt that method for financial accounting purposes. Thus, the conversion from FIFO to LIFO, which represents an increase in book-tax conformity, should be captured by our measure of conforming tax avoidance.[7] Results for empirical tests that examine the mean change in *CONFORM_TAX* from the year prior to LIFO conversion to the year after LIFO conversion confirm that *CONFORM_TAX* captures an increase in book-tax conformity. In contrast, the average value of *CONFORM_TAX* remains constant through time for a propensity score-matched sample of firms that do *not* change inventory methods.

Second, we compare *CONFORM_TAX* for matched samples of private and public-firm years. Prior research provides evidence that private firms are more willing to engage in book-tax conforming tax strategies that reduce both book and taxable incomes than public firms, since public firms are typically subject to greater capital market pressure and thus prefer to avoid income taxes through methods that reduce tax but not book income (e.g., Penno and Simon 1986; Cloyd et al. 1996; Mills and Newberry 2001). We utilize two different types of private firms in our analyses, including firms with privately-owned equity but publicly-traded debt ("quasi-private" firms) and also "pure-private" firms, whose debt and equity are both privately-held.[8] For each private firm sample, we create a propensity score-matched, control sample of firms with publicly-traded equity ("public firms"). Both of our private vs. public firm comparisons reveal that private firms have significantly lower values of *CONFORM_TAX* than matched samples of

[7] This assumption holds provided inventory costs are increasing through time, causing a firm's income tax deduction for cost of goods sold to be higher, and thus cash taxes paid to be lower under LIFO than under FIFO.

[8] We compare both quasi-private and pure-private firms to separately-matched public firms because each private firm sample has unique limitations. For example quasi-private firms are typically larger, more highly levered, and less profitable than pure-private firms. However, quasi-private firms are more similar to public firms with respect to management and organizational structure than the pure-private firms. To the extent inferences are consistent across the two sets of private vs. public firm comparisons, we have higher confidence in the validity of our results.

public firms, consistent with private firms engaging in more conforming tax avoidance than similar public firms. We also identify sub-samples of firms that transition between public and quasi-private ownership. We demonstrate that as firms transition from public-to-private ownership (and vice versa), they engage in more (less) conforming (nonconforming) tax avoidance as measured by *CONFORM_TAX* and cash effective tax rates. Taken together, the results for tests that examine FIFO / LIFO conversions and that compare *CONFORM_TAX* at private and public firms consistently indicate that *CONFORM_TAX* captures conforming tax avoidance.

Third, we perform simulation analyses to further validate our measure of conforming tax avoidance. We first seed our public firm data with increasing amounts of conforming tax avoidance, which reduces cash taxes paid but does not affect total book-tax differences and thus, should decrease *CONFORM_TAX*. As expected, we find that the mean and median values of the seeded *CONFORM_TAX* variable are significantly lower than the non-seeded values of *CONFORM_TAX*. We also run a falsification test that seeds the public firm data with increasing amounts of *non*conforming tax avoidance, which reduces both cash taxes paid and total book-tax differences and thus, should *not* be reflected in *CONFORM_TAX*. As expected, we find that the mean and median values of the seeded *CONFORM_TAX* variable are *not* significantly different from those for non-seeded *CONFORM_TAX*. We conclude that our measure of conforming tax avoidance only captures the tax avoidance strategies we intended. Results from multivariate tests further demonstrate that *CONFORM_TAX* has sufficient power to detect increasing amounts of conforming tax avoidance in the seeded sample, further validating our measure.

Our final tests use the new measure of tax avoidance to examine the extent to which public firms engage in conforming tax avoidance. Recent research relies exclusively on tax

measures that only capture book-tax *non*conforming tax avoidance (e.g., ETR or book-tax difference measures). As a result, we have little knowledge of the extent to which public firms adopt conforming tax strategies. Prior research asserts firms that are subject to less capital market pressure are more likely to adopt book-tax conforming tax strategies, as they are less concerned with the amount of income reported in financial reports (e.g., Penno and Simon 1986; Cloyd et al. 1996). Thus, we predict public firms that are subject to lower capital market pressure engage in more conforming tax avoidance and less nonconforming tax avoidance than other public firms. Our empirical results are consistent with these predictions, where lower capital market pressure is proxied by a lack of analyst following, no stock issuance in the current and two subsequent years, lower sales growth, and smaller discretionary accruals. We conclude that conforming tax avoidance is a significant – albeit overlooked – aspect of corporate tax strategies at public firms.

To support our contention that conclusions drawn in prior research may be altered if both conforming and nonconforming tax avoidance are considered, we compare the tax avoidance of family-owned and non-family-owned firms. Relying solely on measures of *non*conforming tax avoidance, Chen, Chen, Cheng, and Shevlin (2010) conclude that family-owned firms avoid *less* income tax than non-family-owned firms. We first replicate their findings with cash effective tax rates (a measure of nonconforming tax avoidance) and then provide new evidence that family-owned firms engage in *more* conforming tax avoidance than non-family-owned firms. Thus, we identify at least one research setting where having a measure of conforming tax avoidance modifies inferences about corporate tax practices.

Our study makes several contributions to the accounting literature. To our knowledge, our study is the first to develop and validate a measure of tax avoidance that is specifically

designed to capture only book-tax conforming tax avoidance. This measure will allow researchers to consider a broader set of corporate tax strategies than those examined in prior research. For example, researchers can potentially use this measure to further evaluate the "undersheltering puzzle." Perhaps some firms that appear to be undersheltering are simply utilizing book-tax conforming tax strategies. Increasing our understanding of the extent to which firms avoid income taxes in a conforming vs. nonconforming manner should also increase our understanding of how tax avoidance impacts firm value, an issue for which the accounting literature currently provides mixed evidence. Although we do not tackle these research questions in this study, we are hopeful that our measure of conforming tax avoidance can be used in future research to investigate these and other important corporate tax issues.

Lastly, we acknowledge that it is difficult to disentangle earnings that are low due to poor performance vs. earnings that are low due to conforming tax avoidance. To overcome these concerns, we rely on prior research to identify settings where we would expect to observe conforming tax avoidance (e.g., LIFO firms, private firms, and public firms subject to low capital market pressure); we control for firm performance and operating efficiency throughout all of our analyses; and we propensity score-match treatment and control firms. Nonetheless, we cannot entirely eliminate the possibility that the documented conforming tax avoidance is related to firm performance. The remainder of this study proceeds as follows. Section 2 describes prior research. Section 3 develops our measure of conforming tax avoidance. Section 4 validates our conforming tax avoidance measure, while Section 5 examines variation in conforming tax avoidance at public firms. Robustness tests are described in Section 6. Section 7 concludes.

2. Background and Literature Review

2.1 Extant Measures of Corporate Tax Avoidance

Although previously described as a measure of corporate "tax burden" (e.g., Callihan 1994), the average effective tax rate (ETR) is one of the first measures of corporate tax avoidance commonly used in the accounting literature (e.g., Phillips 2003; Rego 2003).[9] Recent research typically calculates the average ETR as the ratio of total tax expense to pretax income, although other variations of this ratio exist in the literature. Because the numerator is based on a firm's taxable income (plus deferred tax expense), while the denominator is based on financial statement income, the average ETR roughly captures "permanent" differences between book and taxable incomes. There are many sources of permanent book-tax differences, but most are related to income taxation (e.g., foreign and state tax rate differentials, tax credits, income from municipal bonds, structured transactions subject to different book and tax treatment). As a result, the average ETR is now considered a measure of nonconforming tax avoidance.

Due to flaws in the ability of average ETR to accurately measure cash tax payments in a given year, Dyreng, Hanlon, and Maydew (2008) develop an alternative ETR measure, the cash ETR. Recent research calculates the cash ETR as the ratio of cash taxes paid to adjusted pretax income, where both the numerator and the denominator are summed over a multi-year time period – often 3 or 5 years – to smooth out transitory shocks to cash taxes paid and pretax income. Importantly, the numerator is not affected by tax accruals, such as changes in tax reserves or the valuation allowance, which can distort the numerator of average ETR as a proxy for income taxes paid. Cash ETRs also differ from average ETRs because they capture both

[9] The average ETR is also referred to as the "GAAP" ETR because firms that are required to file financial statements with the SEC must disclose this measure in the tax footnotes of their financial statements.

temporary and permanent book-tax differences, while average ETRs only capture permanent differences. Nonetheless, both are considered measures of nonconforming tax avoidance.

Recent accounting research also employs several book-tax difference-based measures as proxies for nonconforming tax avoidance. First, total book-tax differences are calculated as the difference between pretax income and estimated taxable income (e.g., Mills 1998, Desai 2003), and by construction include both temporary and permanent book-tax differences. Second, some researchers isolate permanent book-tax differences as a measure of nonconforming tax avoidance, since anecdotal evidence suggests that many tax planning strategies generate permanent rather than temporary book-tax differences (e.g., Weisbach 2002; McGill and Outslay 2004). Third, other researchers calculate discretionary permanent book-tax differences, which exclude permanent differences over which managers have little control (e.g., Frank et al. 2009). All three of these book-tax difference-based measures capture nonconforming tax strategies.[10]

For several reasons research on corporate tax avoidance focuses on measures that only capture nonconforming tax strategies. First, as discussed below, public firms generally prefer to avoid income taxes in ways that reduce taxable income but not book income; that is, they prefer nonconforming tax strategies. Second, even if researchers would like to examine conforming tax avoidance, there is no widely-accepted measure of conforming tax avoidance in the accounting literature. Hanlon and Heitzman (2010) in footnote 49 mention the ratio of cash taxes paid to cash flow from operations as a potential measure of conforming tax avoidance, but acknowledge that this measure only captures tax avoidance via tax accruals that reduce cash taxes paid but not

[10] Henry and Sansing (2014) develop a measure of nonconforming tax avoidance that is based on cash taxes paid but avoids the truncation and scaling bias problems of ETR-based measures. Their measure, Δ, is a ratio where the numerator is the difference between cash taxes paid and the product of the statutory tax rate and adjusted pretax income, while the denominator is the market value of a firm's assets. This ratio primarily captures nonconforming tax avoidance because the numerator essentially compares a 'tax return number' (i.e., cash taxes paid) to a 'financial statement number' (i.e., the amount of tax expense if the firm paid tax on book income at the statutory tax rate).

cash flow from operations.[11] As a result, it excludes book-tax conforming tax strategies involving the acceleration of expenses or the deferral of revenue that affect cash flow from operations. We also note that older accounting studies (discussed below) rely on features unique to their research setting to measure conforming tax avoidance, which they refer to as "tax-induced earnings management."

2.2 Research on Book-Tax Conforming Tax Avoidance

There are two streams of research on corporate tax avoidance that are most salient to our study. First, some prior research examines whether firms engage in tax-motivated earnings management to take advantage of changes in corporate tax rates. Second, more recent research examines the incentives for tax avoidance at public and private firms.

2.2.1 Tax-Induced Earnings Management

The Tax Reform Act of 1986 reduced the corporate federal income tax rate from 46 percent in 1986 to 34 percent in 1988. This large tax rate decrease incentivized firms to shift taxable income and losses from one time period to another. Several studies examine the extent to which firms engaged in such income shifting behaviors, including Scholes, Wilson, and Wolfson (1992), Guenther (1994), and Maydew (1997). Although these studies adopt different research methodologies, they each assume that firms shift income and losses in a book-tax conforming manner, which we refer to as conforming tax avoidance but they refer to as tax-induced earnings management.

While Scholes et al. (1992) examine income shifting through gross margins and selling, general, and administrative expenses, Guenther (1994) utilizes current accruals as his proxy for

[11] In untabulated robustness tests Dyreng, Hanlon, and Maydew (2010) are the first to suggest and use the ratio of cash taxes paid to cash flow from operations as an alternative to average and cash ETRs; however, they do not evaluate the types of tax avoidance this ratio does (or does not) capture. We are not aware of other studies that utilize this measure.

tax-motivated income shifting, and Maydew (1997) evaluates income shifting through both recurring (i.e., gross margin) and nonrecurring (i.e., one-time asset dispositions) revenues and expenses.[12] Consistent with the intuition in these studies, we assume that conforming tax avoidance can be achieved through transactions that affect gross margin, selling, general, and administrative expenses, or gains and losses on one-time asset dispositions. However, we develop a measure that is designed to capture *all* conforming tax avoidance, while those studies focus on predictable changes in specific revenues or expenditures. See Appendix B for specific examples of book-tax conforming tax planning strategies.

2.2.2 Tax Avoidance at Public and Private Firms

Accounting research has long recognized that public and private firms are subject to different non-tax costs, and thus face different tax and non-tax tradeoffs. For example, Penno and Simon (1986) assert that because public firms depend on external capital markets for equity financing they are more likely than private firms to use income-increasing accounting methods. They also explain that relative to private firms, the greater separation of ownership and control at public firms causes the compensation contracts for public firm managers to rely more heavily on accounting numbers and thus may further influence the accounting choices of managers at public firms. The questionnaire results in Penno and Simon (1986) imply that managers at private firms are more likely to adopt book-tax conforming tax strategies than managers at public firms.

Cloyd, Pratt, and Stock (1996) survey financial executives at public and private firms and confirm that public firm managers are less likely to select conforming tax strategies than private

[12] Other studies also assume that firms avoid income taxes in a book-tax conforming manner; however, many of these studies focus on specific types of transactions, such as inventory choice (e.g., Dopuch and Pincus 1988; Hunt, Moyer, and Shevlin 1996), compensation decisions (Matsunaga, Shevlin, and Shores 1992), or asset dispositions (Klassen 1997). Because we are interested in a broad measure of conforming tax avoidance, we focus our main discussion on prior studies that examine broad-based, tax-motivated income shifting.

firm managers. Mills and Newberry (2001) extend Cloyd et al. (1996) by investigating the book-tax differences of public and private firms. Using firm-level tax return data, Mills and Newberry (2001) is the first study to provide large sample evidence that public firms report larger book-tax differences than private firms, consistent with public firms facing greater non-tax (i.e., financial reporting) costs. Taken together, the results in these studies indicate that public firms are more likely than private firms to adopt nonconforming tax strategies. They also imply that private firms are more likely to adopt conforming tax strategies.[13] However, prior research does not examine cross-sectional variation in conforming tax avoidance amongst public firms, since an aggregate measure of conforming tax avoidance has not been available.

3. Developing a New Measure of Conforming Tax Avoidance

3.1 Research Design: Measuring Conforming Tax Avoidance

We base our measure of conforming tax avoidance on the ratio of cash taxes paid to lagged total assets. Tax avoidance strategies that reduce income tax payments to tax authorities reduce the numerator of this ratio. For example, a firm that accelerates expense recognition (e.g., advertising or selling, general, and administrative expenditures) from January 2017 to December 2016 will pay less income tax on its 2016 U.S. income tax return than it otherwise would have. Moreover, the numerator of the ratio is not distorted by tax accruals that affect financial accounting income but not income tax payments, including changes in tax reserves, the valuation allowance, and deferred income taxes on foreign earnings *not* designated as permanently reinvested abroad. The denominator of the ratio is a lagged balance sheet measure that is

[13] In related research, Beatty and Harris (1998) provide some evidence that private banks avoid more income taxes than public banks, and Mikhail (1999) utilizes marginal tax rate measures and finds that private insurance companies engage in more tax planning than public insurance companies. However, these studies examine specific types of transactions and are limited to regulated industries such as banks and insurance companies.

sensitive to neither current period transactions (e.g., earnings manipulations) nor to Henry and Sansing's (2014) observations that cash ETRs are distorted in the presence of low pretax income and are sensitive to variation in pretax profitability. Using lagged total assets as the scaler implicitly assumes, holding all else equal (including tax avoidance), that firms of similar asset size pay similar amounts of income taxes.[14]

However, both conforming and nonconforming tax strategies reduce the ratio of cash taxes paid to lagged total assets. For example, given a corporate tax rate of 35 percent, the tax benefit from selling an asset that generates a $100 loss that reduces both book and taxable incomes is equal to the tax benefit from claiming $100 of bonus depreciation that reduces taxable income but not book income. Both tax benefits would reduce the ratio of cash taxes paid to lagged total assets; however, while the former would be considered conforming tax avoidance, the latter would be considered nonconforming tax avoidance. Thus, we require a means of eliminating nonconforming tax avoidance from the ratio of cash taxes paid to lagged total assets.

To remove the impact of nonconforming tax strategies, we orthogonalize the ratio to both positive and negative book-tax differences. Specifically, we regress the ratio of cash taxes paid to lagged total assets (*TAXESPAID_TO_ASSETS*) on total book-tax differences (*BTD*), an indicator variable (*NEG*) set to one for observations with negative book-tax differences (and zero otherwise), the interaction of *BTD* and *NEG,* and other control variables discussed below. We use ordinary least squares regression to estimate equation (1) by industry (3-digit NAICS code) and fiscal year combinations:

[14] Obviously, firms of similar asset size do not necessarily pay similar amounts of income tax, due to variation in industry membership, operational structure, and other non-tax operating decisions. We control for these other sources of variation in the ratio of cash taxes paid to lagged total assets in our research design discussed below.

$$TAXESPAID\_TO\_ASSETS_{it} = \beta_0 + \beta_1 BTD_{it} + \beta_2 NEG_{it} + \beta_3 BTD_{it} \times NEG_{it} + \beta_4 NOL_{it} + \beta_5 \Delta NOL_{it} + \beta_6 SALES\_TO\_NOA + \varepsilon_{it} \quad (1)$$

In most analyses, we estimate equation (1) using Compustat data for all public firm-year observations for which we have requisite data. See Appendix A for detailed variable definitions. We interact the indicator variable *NEG* with *BTD* to allow for the fact that positive and negative book-tax differences could have different effects on cash taxes paid. While positive book-tax differences are likely a result of nonconforming tax planning, negative book-tax differences may reflect other factors such as changes in the valuation allowance. We also control for the level of net operating loss carryforwards (*NOL*) and changes in NOLs (ΔNOL) because the utilization of NOLs will reduce cash taxes paid, but is not indicative of conforming tax avoidance.

Lastly, to control for variation in firm performance that is unrelated to tax planning, we include in equation (1) the ratio of net sales to net operating assets (*SALES_TO_NOA*). This ratio measures the amount of net sales generated by a firm's net operating assets and thus, captures aspects of both operating efficiency and firm performance. For example, relative to other firms in the same industry-year, some firms could pay higher wages or incur greater marketing costs primarily for strategic (non-tax) operating reasons. These increased expenditures would initially reduce both book and taxable income, and thus our measure of conforming tax avoidance. These increased expenditures could eventually lead to greater worker productivity, sales revenue, and larger cash tax payments. Thus, by including *SALES_TO_NOA* in equation (1), we are attempting to control for variation in cash tax payments that is related to operating efficiency and firm performance, but is unrelated to tax planning.[15]

[15] Alternatively, if we view conforming tax avoidance as including *all* book-tax conforming transactions that reduce a firm's explicit tax liability, then we should exclude *SALES_TO_NOA* from our estimation of *CONFORM_TAX*. This approach would be similar to ETR-based measures of *non*conforming tax avoidance, which capture all book-

We extract the residual (ε) from equation (1) as our measure of conforming tax avoidance, *CONFORM_TAX*. The residual captures deviations in *TAXESPAID_TO_ASSETS* from the expected value of that ratio, for that industry-year combination. Thus, our estimation method assumes the average firm in the same 3-digit NAICS industry and fiscal year is the appropriate benchmark for measuring an individual firm's relative amount of conforming tax avoidance. Based on the properties of ordinary least squares regression, *CONFORM_TAX* is not correlated with *BTD,* negative *BTD, NOL,* Δ*NOL,* or *SALES_TO_NOA* and in fact, is orthogonal to *non*conforming tax avoidance and one measure of firm performance and operating efficiency (*SALES_TO_NOA*). As a result, *CONFORM_TAX* captures conforming tax avoidance that reduces a firm's scaled cash taxes paid below the average scaled cash taxes paid for a specific industry and fiscal year combination. However, it also captures measurement error to the extent that the variables in equation (1) do not adequately measure the underlying constructs of nonconforming tax avoidance and operating efficiency, respectively.[16]

3.2 Discussion of Results from the Estimation of CONFORM_TAX

tax differences regardless of source (e.g., tax planning, earnings management, and differences between financial and tax accounting rules). However, we note there are fundamental differences between measuring conforming and nonconforming tax avoidance. Most transactions do *not* generate book-tax differences and so book-tax difference-based measures of nonconforming tax avoidance capture only a subset of all transactions, many of which are unusual or infrequent. In contrast, the ratio of cash taxes paid to lagged total assets captures all transactions (operating and non-operating) that reduce cash tax payments, the majority of which are *not* tax motivated (e.g., most wages, cost of goods sold, and other operating expenditures are not tax motivated but reduce explicit tax liabilities). Thus, because we are most interested in transactions that are at least in part tax-motivated, we assert it is appropriate to include a proxy for operating efficiency and firm performance (i.e., *SALES_TO_NOA*) in equation (1) to better capture the underlying construct of conforming tax avoidance: all book-tax conforming transactions that reduce a firm's explicit taxes that are at least in part tax-motivated. Nonetheless, in robustness tests (untabulated) we re-run all of our tests excluding *SALES_TO_NOA* from our estimation model (but including it as a control variable in regression analyses) and obtain qualitatively similar results.

[16] We acknowledge that *CONFORM_TAX* captures the impact of interest expense on cash taxes paid, and thus is correlated with a firm's debt capacity. Because we (and many others) view debt as a corporate tax shield, we assert it is appropriate for *CONFORM_TAX* to reflect the impact of interest expense and debt capacity.

We estimate equation (1) based on all public firm-year observations in Compustat with data available for fiscal years 1993 through 2015, excluding observations for financial institutions or firms in regulated industries (SIC codes 6000–6999 and 4800–4900). We require that all observations have non-negative *TAXESPAID_TO_ASSETS* and have data necessary to calculate all variables included in equation (1). These data requirements generate a sample of 39,401 public firm-year observations. We winsorize all continuous variables at the 1st and 99th percentiles.

Table 1, Panel A provides descriptive statistics for the variables included in equation (1), while Panel B provides Pearson and Spearman correlation coefficients among these variables. Panel A shows that the mean (median) value of cash taxes paid to total assets (*TAXESPAID_TO_ASSETS*) is 0.031 percent (0.021 percent), while the mean (median) values of *BTD* are 0.012 (0.013), *NEG* are 0.361 (0.000), *BTD*×*NEG* are -0.018 (0.000), *NOL* are 0.312 (0.000), Δ*NOL* are 0.003 (0.000), and *SALES_TO_NOA* are 0.024 (0.018). The correlations in Panel B indicate that *TAXESPAID_TO_ASSETS* is negatively correlated with the NOL indicator variable (ρ = -0.193) but positively correlated to *SALES_TO_NOA* (ρ = 0.265). The large (in magnitude) correlations among *BTD*, *NEG*, and *BTD*×*NEG* (> 0.80) suggest that including these variables in equation (1) adds multicollinearity to our estimation model. However, given the different explanatory power for positive vs. negative book-tax differences in explaining *TAXESPAID_TO_ASSETS* (see discussion of results for Panel C below), we include all three of these variables in our estimation model.[17]

[INSERT TABLE 1 HERE]

[17] In untabulated robustness tests we re-estimate all tests but exclude the negative book-tax difference indicator variable (*NEG*) and its interaction with *BTD*. Results for these tests are qualitatively similar to those shown in Tables 1-7.

Panel C reports descriptive statistics for the 968 regressions (by 3-digit NAICS industry and fiscal year combinations) that generate firm-year values of *CONFORM_TAX*. The statistics in Panel C indicate the mean and median coefficients on *BTD* are both negative, and across all 968 regressions only 35.85 percent of the coefficients on *BTD* are positive. These results suggest that firms with more positive book-tax differences have lower ratios of cash taxes paid to lagged total assets (*TAXESPAID_TO_ASSETS*). In addition, the positive mean and median coefficients on negative book-tax differences (*BTD*×*NEG*) indicate that firms with more negative book-tax differences have even lower ratios of *TAXESPAID_TO_ASSETS*. The mean and median coefficients on *NOL* are both negative, consistent with NOL carryforwards generally being associated with lower ratios of *TAXESPAID_TO_ASSETS*. The mean and median coefficients on Δ*NOL* are both positive, consistent with firms that utilize NOL carryforwards paying less tax. Finally, the mean and median coefficients on *SALES_TO_NOA* are positive and fairly large in magnitude (0.514 and 0.239, respectively), consistent with a firm's operating efficiency and performance having a significant impact on cash tax payments. The mean (median) adjusted R-squared is 29.3 percent (25.2 percent), which suggests the variables in equation (1) jointly explain a significant portion of the variation in *TAXESPAID_TO_ASSET* for most industry-year combinations, although much variation remains unexplained. By construction, the mean value of *CONFORM_TAX* is 0 for the sample of public firm-years used to estimate *CONFORM_TAX*.

Panel D contains information about the distribution of *CONFORM_TAX* relative to the distribution of five-year cash ETR (*CASH_ETR5*) based on our sample of public firm-year observations. We first separately rank and partition all observations into quintiles based on *CONFORM_TAX* and *CASH_ETR5*. We then calculate what proportion of observations in each *CASH_ETR5* quintile falls into each *CONFORM_TAX* quintile. If *CASH_ETR5* and

CONFORM_TAX are perfectly positively (negatively) correlated, we expect to see most observations appearing on the diagonal starting in the upper (lower) left corner of the table and ending in the lower (upper) right corner. If these variables are *not* correlated, then we would expect each cell of the table to include approximately 20 percent (i.e., each *CASH_ETR5* quintile would be randomly distributed across each *CONFORM_TAX* quintile). The results in Panel D are most consistent with the latter possibility, since 14 out of 25 cells in the table (56 percent) indicate between 14 and 26 percent. Thus, inferences from tests based on a common measure of nonconforming tax avoidance (i.e., *CASH_ETR5*) could vary substantially from those based on *CONFORM_TAX*, since these variables' distributions are largely independent of each other.

4. Validating *CONFORM_TAX* as a New Measure of Conforming Tax Avoidance

4.1 CONFORM_TAX before and after FIFO / LIFO Inventory Method Conversions

We validate our measure of conforming tax avoidance through a series of empirical tests. In our first validation test, we identify public firms (from Table 1) that convert from primarily using the first-in-first-out (FIFO) inventory method to primarily using the last-in-first-out (LIFO) inventory method (or vice versa). Specifically, we use the Compustat inventory valuation method code (INVVAL) to identify firms that use the FIFO inventory method (INVVAL = 1) in one year and the LIFO inventory method (INVVAL = 2) in an adjacent year. Based on these data requirements, we obtain a sample of 138 public firms that transition from LIFO to FIFO and 61 public firms that transition from FIFO to LIFO (i.e., 'inventory switch' firms).

We then perform a propensity score matching procedure to match each of these inventory switch firms to a similar firm that does *not* switch inventory methods during our sample period, in the same 3-digit NAICS industry and fiscal year with the same inventory method in year *t-1* (i.e., 'non-switch' firms). We propensity score-match inventory switch and non-switch firms

based on gross margin (*GR_MARGIN*), total assets (*ASSETS*), cost of goods sold (COGS), and reported inventory levels (INVVAL).[18] We then compare the mean and median values of *CONFORM_TAX* for inventory switch and non-switch firms, in the years before and after a FIFO to LIFO (or LIFO to FIFO) conversion.

Under U.S. federal income tax rules, firms that adopt the LIFO inventory method must also use that method for financial reporting purposes. Thus, we expect inventory switch firms to exhibit greater book-tax conformity under LIFO than under FIFO. In addition, provided inventory costs are increasing through time, we expect the inventory costs of LIFO firms to be higher than those of FIFO firms. Taken together, we expect the mean *CONFORM_TAX* of inventory switch firms to be lower (higher) in LIFO (FIFO) years due to the larger (smaller) tax deductions for inventory costs under LIFO (FIFO). (Recall that lower values of *CONFORM_TAX* indicate lower tax costs and greater tax avoidance.) In contrast, we expect the mean *CONFORM_TAX* of non-switch firms to remain relatively stable through time.

Table 2 presents basic descriptive statistics for the samples of inventory switch and non-switch firms, where the first set of results focuses on firms that switch from FIFO to LIFO (and their matched non-switch firms) and the second set of results focuses on firms that switch from LIFO to FIFO (and their matched non-switch firms). Among the inventory switch firms, the statistics suggest that the FIFO to LIFO-switch firms are on average larger and carry more inventory than LIFO to FIFO-switch firms, although their gross margins are similar. The results in Table 2 also suggest that the propensity score matching procedure for

[18] To ensure that each inventory switch and non-switch firm are similar to each other, we restrict the two firms to have propensity scores within 0.10 of each other.

each sample of inventory switch firms was successful, since the non-switch firms are similar to the inventory switch firms to which they were matched.

[INSERT TABLE 2 HERE]

Figure 1 provides a graphical representation of the mean values of *CONFORM_TAX* for inventory switch and non-switch firms in years *t-1*, *t*, and *t+1*, where year *t* is the year of the inventory method change for inventory switch firms. As expected, the results for FIFO to LIFO inventory switch firms indicate these firms experience a significant decrease in the mean value of *CONFORM_TAX* going from year *t-1* (the final FIFO year) to year *t* (the first LIFO year), consistent with an increase in book-tax conformity for inventory switch firms. In contrast, the mean value of *CONFORM_TAX* for the matched non-switch firms is relatively constant through time. Also as expected, the results for the LIFO to FIFO switch firms indicate a significant increase in the mean value of *CONFORM_TAX* going from year *t-1* (the final LIFO year) to year *t* (the first FIFO year), consistent with a decrease in book-tax conformity for these firms. In contrast, the mean value of *CONFORM_TAX* for the matched non-switch firms is relatively constant through time. Overall, we interpret the results in Figure 1 as validating that our measure (*CONFORM_TAX*) effectively detects changes in the level of conforming tax avoidance.

[INSERT FIGURE 1 HERE]

4.2 Comparisons of CONFORM_TAX for Samples of Private and Public Firms

In our second validation test, we examine whether *CONFORM_TAX* systematically differs across matched samples of private and public firm-years. In these analyses we use two different samples of private firms, including quasi-private and "pure private" firms, as described below. Recall that quasi-private firms are firms with privately-owned equity but

public debt. To identify quasi-private firms, we follow Katz (2009) and Givoly et al. (2010) and select all firm-year observations on Compustat in fiscal years 1993 through 2010 that satisfy the following criteria: (1) the firm's stock price at fiscal year-end is *unavailable*; (2) the firm has total debt and total revenues exceeding $1 million; (3) the firm is a U.S. domiciled company; (4) the firm is not a subsidiary of another public firm; and (5) the firm is not a financial institution or in a regulated industry (SIC codes 6000–6999 and 4800–4900).[19] These procedures generate a sample of 2,796 quasi-private firm-years with data necessary to calculate all variables in equation (1). We then combine these quasi-private firm-years with the public firm-years in Table 1 and re-estimate equation (1) to calculate *CONFORM_TAX* for tests that compare quasi-private and public firms.

We obtain the pure-private firm data from Sageworks Inc.[20] To construct our sample of pure-private companies, we follow Minnis (2011) and Badertscher, Shroff, and White (2013) and exclude non-U.S. based companies and all observations with data quality issues. Specifically, we delete all firm-years that fail to satisfy basic accounting identities and those with net income (NI), cash flow from operations (CFO), accruals (ACC), or property, plant, and equipment (PPE) that are greater than total assets at year-end. We also require firm-years to have total assets and sales greater than $100,000 (Minnis 2011). We remove financial firms (NAICS 52) and regulated utilities (NAICS 22). Finally, we drop firm-year observations with missing values for gross fixed assets, total assets, sales, and net income.

[19] To ensure our sample of quasi-private firms includes only private firms with public debt, we remove firms with only historical prospectus information, firms with public equity, firms lacking required financial statement data, firms involved in bankruptcy proceedings, and foreign-domiciled firms.

[20] Sageworks provides data from income statements and balance sheets along with basic demographic information, such as the NAICS industry codes and geographic location. Although firms are anonymous, each firm in the Sageworks database has a unique identifier allowing us to construct a panel dataset.

Applying the above sampling restrictions and requiring all observations to be obtained from audited financial statements generates an initial sample of 15,251 pure-private firm-years for fiscal years 2001 - 2010.[21] We then combine these pure-private firm-years with the public firm-years in Table 1 and re-estimate equation (1) to calculate *CONFORM_TAX* for tests that compare pure-private and public firms.[22]

Public firms differ from quasi-private and pure-private firms based on several important attributes. Thus, we propensity score-match each private firm-year observation to a public firm in the same 3-digit NAICS industry and fiscal year based on gross margin (*GR_MARGIN*), long-term debt (*LTDEBT*), and total assets (*ASSETS*).[23] These matching procedures generate a matched sample of 937 (1,274) pairs of quasi-private (pure-private) and public firm-year observations. We then test whether the mean and median values of *CONFORM_TAX* differ across the private and public firm matched samples. Consistent with assertions in prior research (e.g., Penno and Simon 1986), we predict that private firms are more likely to use conforming tax strategies and thus have lower *CONFORM_TAX* than similar public firms.

Table 3 presents descriptive statistics for our comparisons of matched samples of private and public firm-years. Focusing first on the quasi-private vs. public firm comparisons, the descriptive statistics in Table 3 indicate that quasi-private and public firms are similar with

[21] In the U.S., public and private companies are subject to the same set of GAAP accounting standards. Generally, private companies are not legally obligated to follow GAAP, but they may do so to satisfy lenders, venture capitalists, or other stakeholders. Based on our conversations with Sageworks, our sample of private firms adhere to GAAP-compliant financial statements.

[22] We re-estimate equation (1) because only a limited set of financial statement variables are available for the pure-private firms. As a result, for tests that include pure-private firms we need to modify our definition of the book-tax difference variable (*BTD*) included in equation (1) and due to data availability we do not include NOL or ΔNOL.

[23] To ensure that each private firm-year and its match are similar to each other, we restrict the two firms to have propensity scores within 0.10 of each other.

respect to total assets (*ASSETS*), net sales (*SALES*), and long-term debt (*LTDEBT*). These similarities suggest the propensity score matching procedure was relatively effective. However, the quasi-private firms exhibit significantly lower pre-tax return on assets (*PTROA*), gross margin (*GR_MARGIN*), and cash flow from operations (*CFO*), and higher asset turnover ratios (*SALES_TO_NOA*). With respect to the tax variables, the quasi-private firms exhibit significantly lower mean and median *TAXESPAID_TO_ASSETS* and *CONFORM_TAX*. These differences are consistent with quasi-private firms engaging in more conforming tax strategies than similar public firms.

[INSERT TABLE 3 HERE]

Moving to the pure-private vs. public firm comparisons, the descriptive statistics in Table 3 indicate that pure-private and public firms are similar with respect to total assets (*ASSETS*), but differ in all other dimensions. Specifically, pure-private firms report higher net sales (*SALES*), gross margin (*GR_MARGIN*), and cash flow from operations (*CFO*), and greater long-term debt (*LTDEBT*) and sales-to-net operating assets ratios (*SALES_TO_NOA*). However, pure-private firms report *lower* pretax return on assets (*PTROA*). Further, pure-private firms exhibit significantly *lower* mean and median *TAXESPAID_TO_ASSETS* and *CONFORM_TAX*. Taken together, the fact that pure-private firms report *higher* gross margin and cash flows from operations but *lower* pretax return on assets and *CONFORM_TAX* provides perhaps the strongest evidence that pure-private firms engage in more conforming tax avoidance (by reporting more book-tax conforming expenditures) than similar public firms.

We use private and public firm data to perform additional, descriptive analyses examining changes in *CONFORM_TAX* for firms that transition to and from public and quasi-private ownership. Specifically, Figure 2 Panel A (B) demonstrates how the mean value of

CONFORM_TAX changes for sub-samples of firms that transition from public to quasi-private (and from quasi-private to public) ownership. As expected, the results suggest that firms engage in more conforming tax avoidance (i.e., *CONFORM_TAX* is lower) in years the firm is quasi-privately-held as compared to years it is publicly-traded. In contrast, firms engage in less *non*conforming tax avoidance (i.e., *CASH_ETR* is higher) in years a firm is quasi-privately-held as compared to years it is publicly-traded. In sum, Figure 2 provides additional descriptive evidence that *CONFORM_TAX* captures conforming tax avoidance.

[INSERT FIGURE 2 HERE]

4.3 Simulation Analyses to Validate CONFORM_TAX

To further validate our conforming tax avoidance measure we also conduct simulation analyses. As noted in De Simone, Nickerson, Seidman and Stomberg (2014), simulated data can be beneficial in our setting since firms do not disclose the details of their tax avoidance activities, and thus, the amount of actual tax avoidance is measured with error. We perform two simulation analyses to evaluate whether our measure of conforming tax avoidance has sufficient power to detect known (i.e., seeded) conforming tax avoidance. First, we seed our sample of public firms (in Table 1) with increasing amounts of conforming tax avoidance, which reduces cash taxes paid but does not affect total book-tax differences or lagged total assets. One can think of the seeded conforming tax avoidance as higher discretionary expenditures incurred in the current fiscal year, which we simulate by reducing pre-tax income by either one, three or five percent. Similar to Dechow et al. (1995) and Dechow et al. (2012), we conduct the following steps:

1) From among the 39,401 public firm-years with positive pre-tax income from 1993 to 2015 (in Table 1), we randomly select 100 firm-year observations. The 100 firm-years

are designated as conforming tax avoidance years. The remaining firm-years are not designated as conforming tax avoidance years.

2) For the 100 firm-years designated as conforming tax avoidance years, we artificially induce conforming tax avoidance by recalculating *TAXESPAID_TO_ASSETS* as follows: [Cash taxes paid - (X × Pretax income × 0.35)] divided by lagged total assets, where X is either one, three, or five percent.

3) We use all 39,401 public firm-years to estimate equation (1) as described in section 3, by industry (3-digit NAICS code) and fiscal year combinations. We then calculate the amount of conforming tax avoidance (i.e., *CONFORM_TAX_SEED*) for the 100 firm-years designated as conforming tax avoidance years.

4) We repeat steps one through three 1,000 times.

5) We compare the original *CONFORM_TAX* of each firm-year observation, to the *CONFORM_TAX_SEED* from step three, when both exist (i.e., 36,251 observations). In instances where a firm-year has more than one *CONFORM_TAX_SEED* observation, we average the *CONFORM_TAX_SEED* observations created in the 1,000 simulations.[24]

We report the results from these simulation analyses in Table 4, Panel A. Both mean and median values of seeded conforming tax avoidance (*CONFORM_TAX_SEED*) are significantly more negative than non-seeded values of conforming tax avoidance (*CONFORM_TAX*). For example, the mean (median) values of *CONFORM_TAX_SEED* are statistically significantly lower than *CONFORM_TAX* by 0.0004, 0.0010, and 0.0016 (0.0002, 0.0005, and 0.0009) after artificially inducing conforming tax avoidance by one, three or five percent of pretax income,

[24] Instead of averaging multiple *CONFORM_TAX_SEED* results, our results remain quantitatively similar if we randomly select one of them.

respectively (see "Difference (1)-(2), (4)-(5), and (7)-(8)"). These results indicate that our method of calculating conforming tax avoidance has sufficient power to capture transactions that reduce both book and taxable income.

[INSERT TABLE 4 HERE]

We also perform a falsification test that seeds the sample of public firm-years (in Table 1) with an increase in *non*conforming tax avoidance, which reduces cash taxes paid but also increases total book-tax differences and thus, should *not* be captured by *CONFORM_TAX* (since we control for book-tax differences when estimating *CONFORM_TAX*). We seed nonconforming tax avoidance by following the steps described above (but replace the word "conforming" with "nonconforming"). We also replace step 2) with the following:

2) For the 100 firm-years designated as nonconforming tax avoidance years, we artificially induce nonconforming tax avoidance by recalculating *TAXESPAID_TO_ASSETS* as [Cash taxes paid × (1-X)] divided by lagged total assets, and *BTD* as {Pretax income – [((Current federal tax expense + Current foreign tax expense) / 35%) - ΔNOL] × (1-X)} divided by lagged total assets, where X is either one, three, or five percent.

We report the results from these simulation analyses in Table 4, Panel A (see "Difference (1)-(3), (4)-(6), and (7)-(9)"). None of the mean or median values of seeded nonconforming tax avoidance (*NONCONFORM_TAX_SEED*) are statistically different from the non-seeded values of conforming tax avoidance (*CONFORM_TAX*). These results suggest that including *BTD* in equation (1) effectively removes nonconforming tax avoidance from *TAXESPAID_TO_ASSETS* and that our *CONFORM_TAX* measure is robust to nonconforming tax avoidance strategies.

We also perform the multivariate analyses in De Simone et al. (2014) to further assess the power of our *CONFORM_TAX* measure to detect conforming tax avoidance. Specifically, using the simulation steps outlined above, we use the sample seeded with conforming tax avoidance (where some but not all observations are seeded) to estimate regression (2) below:

$$CONFORM\_TAX = \beta_0 + \beta_1\, CONF\_SEED\_DUMMY + \beta_2\, GR\_MARGIN + \beta_3 LOG\_ASSETS + \beta_4\, INT\_EXP + \beta_5 ACQUISITION\_D + \varepsilon \quad (2)$$

CONF_SEED_DUMMY is an indicator variable that equals one if we seed that observation with conforming tax avoidance, and zero otherwise. The coefficient of interest is β_1, where a statistically significant β_1 reflects a differential level of conforming tax avoidance for the seeded observations as compared to the unseeded observations. We include four additional control varibles to ensure our results are robust to firm performance (*GR_MARGIN*), firm size (*LOG_ASSETS*), interest expense (*INT_EXP*), and acquisition activities (*ACQUISITION_D*). We also estimate equation (2) based on the sample seeded with nonconforming tax avoidance, but replace *CONF_SEED_DUMMY* with *NONCONF_SEED_DUMMY* to assess whether our *CONFORM_TAX* measure is different for observations seeded with nonconforming tax avoidance.

Panel B of Table 4 presents results for regressions that include *CONF_SEED_DUMMY*. Consistent with the univariate analysis in Table 4, Panel A, the β_1 coefficients on *CONF_SEED_DUMMY* are statistically significant and increase in both significance and magnitude as we increase the amount of induced conforming tax avoidance from one to five percent (moving from column 1 to column 3). These findings indicate that *CONFORM_TAX* has sufficient power to detect increasing amounts of conforming tax avoidance in the seeded sample and further validates our measure of conforming tax planning. Panel C of Table 4 presents results

for regressions that include *NONCONF_SEED_DUMMY*. Recall *NONCONF_SEED_DUMMY* equals one for observations we have seeded with *non*conforming tax avoidance. Thus, we do not expect to find a significant relation between *CONFORM_TAX* and *NONCONF_SEED_DUMMY*. Consistent with the univariate analysis in Table 4, Panel A, we find that the β_1 coefficients on *NONCONF_SEED_DUMMY* are *not* statistically significant (in column 1, 2, or 3), suggesting that our *CONFORM_TAX* measure is not statistically affected by nonconforming tax avoidance.

5. Examining Variation in Conforming Tax Avoidance at Public Firms

5.1 Hypotheses Development

The results in Tables 2-4 and Figures 1 and 2 consistently indicate that *CONFORM_TAX* captures conforming tax avoidance. Thus, we now use that measure to investigate the extent to which public firms avoid taxes in a book-tax conforming manner. As discussed above, public and private firms are subject to different capital market pressures, which affect their financial and tax reporting choices (e.g., Penno and Simon 1986; Cloyd et al. 1996; Mills and Newberry 2001). We further assert that capital market pressures also vary *within* samples of publicly-traded firms. For example, public firms that require external financing are subject to greater capital market pressure than public firms with sufficient cash on hand to fund operations. We predict that this variation in capital market pressure amongst public firms should systematically influence the extent to which public firms engage in book-tax conforming vs. nonconforming tax avoidance. Specifically, we assert public firms that are subject to greater capital market pressure are less likely to avoid taxes in a book-tax conforming manner and more likely to avoid taxes in a nonconforming manner. Such behavior would allow high capital market pressure-public firms to report higher income in their financial statements than to tax authorities.

In contrast, we expect low capital market pressure-public firms to engage in more conforming tax avoidance. This expectation is based on the fact that nonconforming tax avoidance is costly and if the benefits of nonconforming strategies are smaller for firms subject to lower capital market pressure, then conforming tax planning strategies become more appealing. Prior research illustrates that, despite its obvious appeal, nonconforming tax avoidance can impose significant costs. For example, Mills (1998) demonstrates that book-tax differences (an indicator of nonconforming tax avoidance) are positively associated with IRS settlements, while Wilson (2009) shows that book-tax differences are positively associated with identified cases of tax sheltering. Both results are consistent with tax authorities using book-tax differences to identify corporate tax avoidance. Further, Hanlon (2005) finds that large temporary book-tax differences are associated with lower earnings persistence and that investors appear to recognize large temporary book-tax differences as a sign of lower earnings persistence. For firms facing lower levels of capital market pressure, we expect the benefits of conforming tax avoidance to outweigh the costs of nonconforming tax avoidance. Our formal hypotheses, stated in the alternative, are:

H1a: *Conforming tax avoidance is decreasing in capital market pressure at public firms.*

H1b: *Nonconforming tax avoidance is increasing in capital market pressure at public firms.*

We acknowledge that Mills and Newberry (2001) also examine H1b, using total book-tax differences as their measure of nonconforming tax avoidance and several proxies for capital market pressure, including debt constraints, manager bonus contracts, and benchmark beating behavior. However, their research design does not allow them to test H1a (i.e., the extent to which conforming tax avoidance varies with capital market pressure at public firms), which is

the focus of our study.[25] Further, H1a and H1b jointly imply that under specific conditions, conforming and nonconforming tax strategies are substitutes at public firms. That is, public firms subject to greater capital market pressure decide to engage in more nonconforming tax avoidance and less conforming tax avoidance. We test this empirical prediction below.

5.2 Examining Variation in Conforming Tax Avoidance at Public Firms

To test H1a and H1b, we use seemingly unrelated regression (SUR) to estimate equations (3) and (4) below. OLS estimation of these equations is inappropriate because the error terms in equations (3) and (4) are likely correlated and the regressions models include many of the same explanatory variables (e.g., Beasley 2008). We estimate equations (3) and (4) using a sample that only includes public firms with requisite data for fiscal years 1993 through 2015. We cluster the standard errors by firm.

$$CONFORM\_TAX = \beta_0 + \beta_1 AF + \beta_2 ST\_ISSUE + \beta_3 SALES\_GR + \beta_4 DACC + \beta_5 ACQUISITION\_D + \beta_6 GR\_MARGIN + \beta_7 INT\_EXP + \beta_8 LOG\_ASSETS + \varepsilon \quad (3)$$

$$CASH\_ETR3 = \gamma_0 + \gamma_1 AF + \gamma_2 ST\_ISSUE + \gamma_3 SALES\_GR + \gamma_4 DACC + \gamma_5 ACQUISITION\_D + \beta_6 GR\_MARGIN + \gamma_7 PPE + \gamma_8 LOG\_ASSETS + \delta \quad (4)$$

While *CONFORM_TAX* is our proxy for conforming tax avoidance, we use *CASH_ETR3* as our proxy for nonconforming tax avoidance because this measure captures a broad spectrum of nonconforming tax strategies. Consistent with prior research, we smooth out transitory shocks

[25] We note that zero book-tax differences do not necessarily indicate book-tax conformity. Book-tax differences can also equal zero if changes in the valuation allowance exactly offset changes in deferred tax assets for which managers do not expect to realize future tax benefits. Moreover, because low (or negative) book-tax differences do *not* capture conforming tax avoidance (i.e., they only capture book-tax differences), the analyses in Mills and Newberry (2001) do not shed light on the extent to which public firms engage in conforming tax avoidance.

to pretax income by calculating *CASH_ETR3* over a 3-year time period. Equations (3) and (4) include four proxies for capital market pressure (*AF*, *ST_ISSUE*, *SALES_GR*, *DACC*), which we briefly describe below. They also include two control variables (*ACQUISITION_D*, *LOG_ASSETS*), which are as defined in equation (2) above. Lastly, we include one unique explanatory variable in each equation, so the system of equations is properly identified. Specifically, we include *INT_EXP* in equation (3) and gross property, plant, and equipment (*PPE*) in equation (4). In each case, we expect the unique variable to be highly correlated with the dependent variable of the equation in which it is included, but exhibit little correlation with the dependent variable of the other equation. See Appendix A for complete variable definitions.

We consider a broad set of capital market pressure variables, since different firms likely face different types of capital market pressure. One common proxy for capital market pressure is anticipated equity issuances (e.g., Teoh, Welch, and Wong 1998; Shivakumar 2000). Thus, we include an indicator variable (*ST_ISSUE*) that equals one for firms that issue stock in year *t*, *t+1*, or *t+2* (and zero otherwise). Prior accounting research also suggests that managers at public firms are under intense pressure to meet or beat market expectations, especially consensus analyst forecasts (e.g., Jensen 2005; Graham, Harvey, and Rajgopal 2005). Thus, we include *AF*, an indicator variable that equals one for public firms that are followed by sell-side analysts (and zero otherwise).[26] Numerous accounting studies provide evidence that firms manage earnings to meet or beat market expectations, and often times such behaviors are associated with high growth firms (e.g., Barth, Elliott, and Finn 1999; Bartov, Givoly, and Hayn 2002; Skinner and Sloan 2002). Thus, we include sales growth (*SALES_GR*) and discretionary accruals (*DACC*) as additional proxies for capital market pressure. Note that *ST_ISSUE*, *AF*, *SALES_GR*, and *DACC*

[26] Our results are qualitatively similar if we modify our analyst following variable to equal one for firms with three or more analysts, and also for firms with five or more analysts following the firm.

are all increasing in capital market pressure. H1a (H1b) predicts that as capital market pressure increases, firms engage in less (more) conforming (nonconforming) tax avoidance. Thus, we predict that the coefficients on the capital market pressure variables will be positive (negative) in equation (3) [(4)], where *CONFORM_TAX* (*CASH_ETR3*) is the dependent variable.

5.3 Results for Conforming and Nonconforming Tax Avoidance at Public Firms

Tables 5 and 6 present results for tests of H1a and H1b. The analyses in Tables 5 and 6 are based on all public firms with requisite data in fiscal years 1993 through 2015. Table 5, Panel A provides descriptive statistics for *CONFORM_TAX*, *CASH_ETR3*, and the four proxies for capital market pressure, including analyst following (*AF*), stock issuances (*ST_ISSUE*), sales growth (*SALES_GR*), and discretionary accruals (*DACC*). These statistics reveal that the average public firm is followed by sell-side analysts (*AF*), does not issue equity securities in the current or subsequent two years (*ST_ISSUE*), experiences 13.5 percent sales growth (*SALES_GR*), and has small positive abnormal accruals (*DACC*).

[INSERT TABLE 5 HERE]

Panel B presents results for univariate comparisons of conforming (*CONFORM_TAX*) and nonconforming (*CASH_ETR3*) tax avoidance at public firms that are subject to high versus low capital market pressure, based on four separate proxies for capital market pressure. Specifically, high (low) capital market pressure is proxied by: 1) analyst following, *AF* = 1 (vs. no analyst following, *AF* = 0); 2) stock issuance during the three-year period starting in year *t*, *ST_ISSUE* = 1 (vs. no stock issuance over the same period, *ST_ISSUE* = 0); 3) top (vs. bottom) 25th percentile of sales growth (*SALES_GR*); and 4) the top (vs. bottom) 25th percentile of discretionary accruals (*DACC*). In the latter two comparisons, observations in the second and third quartiles of *SALES_GR* and *DACC* are excluded.

Consistent with H1a, we find public firms that are subject to *low* capital market pressure – as proxied by no analyst following (*AF*), no stock issuances (*ST_ISSUE*), low sales growth (*SALES_GR*), and low discretionary accruals (*DACC*) – engage in more conforming tax avoidance (*CONFORM_TAX*) than public firms subject to high capital market pressure. Consistent with H1b, we find public firms that are subject to *high* capital market pressure – as proxied by analyst following (*AF*), stock issuances (*ST_ISSUE*), high sales growth (*SALES_GR*), and high discretionary accruals (*DACC*) – engage in more nonconforming tax avoidance (*CASH_ETR3*) than public firms subject to low capital market pressure. Thus, the univariate comparisons in Table 5 provide preliminary evidence in support of H1a and H1b and suggest that firms' tax avoidance choices vary based on the level of capital market pressures to which they are subject.[27]

Table 6 provides results for seemingly unrelated regressions of conforming tax avoidance (*CONFORM_TAX*, column 1) and nonconforming tax avoidance (*CASH_ETR3*, column 2) on four proxies for capital market pressure and control variables [equations (3) and (4)]. Consistent with Table 5, Panel B, the results for *CONFORM_TAX* in Table 6, column 1 indicate public firms that are subject to *lower* capital market pressure – as proxied by no analyst following, no stock issuances, lower sales growth, and lower discretionary accruals – engage in more conforming tax avoidance than public firms subject to higher capital market pressure. These results are consistent with H1a.

[INSERT TABLE 6 HERE]

[27] We also utilized managerial stock ownership and dual class stock as proxies for capital market pressure. Although we found some evidence that firms with high managerial stock ownership (which we view as subject to less capital market pressure) engaged in more conforming tax avoidance than firms with low managerial stock ownership, we found no difference in *CONFORM_TAX* at firms with vs. without dual class stock ownership. Given the data constraints imposed by these alternative proxies, the results are not included in Tables 5 and 6.

Next we examine the association between capital market pressure and nonconforming tax avoidance, as measured by the *CASH_ETR3*. The results in column 2 indicate public firms that are subject to *higher* capital market pressure – as proxied by analyst following, stock issuances, higher sales growth, and more positive discretionary accruals – engage in more *non*conforming tax avoidance than public firms subject to lower capital market pressure. These results are consistent with H1b. In sum, the results in Tables 5 and 6 are consistent with each other and support our predictions that conforming tax avoidance is decreasing in capital market pressure, while nonconforming tax avoidance is increasing in capital market pressure, at public firms.

5.2 Examining Variation in Conforming Tax Avoidance at Family and Non-Family Firms

Chen et al. (2010) find that family-owned firms engage in less nonconforming tax avoidance than non-family owned firms. They conclude family firms do so because of concerns that investors will perceive nonconforming tax avoidance to be associated with managerial opportunism. To evaluate whether our new measure of conforming tax avoidance can alter inferences from prior research, we investigate whether firms with high family ownership engage in more conforming but less nonconforming tax avoidance than firms with less family ownership, since conforming tax avoidance is less transparent and thus, not likely to be viewed as associated with managerial opportunism.

For this analysis, we use hand-collected family ownership data for all S&P 500 firms from 1995 to 2002.[28] To test whether firms with high levels of family ownership engage in more conforming tax avoidance than firms with less family ownership, we modify equations (3) and (4). Specifically, we remove the capital market pressure variables from those equations and instead include an indicator variable, *FAM_OWN*, which equals one if a firm is in the top quartile

[28] We are grateful to Dechun Wang for sharing this hand-collected, family firm data.

of family ownership (among all S&P 500 firms with non-zero family ownership during the sample period). Family ownership is defined as stock owned by founding family members that are either on the board of directors or in the top management of the company. Untabulated results indicate that 9.4 percent of the 3,053 S&P 500 firm-year observations in our sample are in the top quartile of family stock ownership (i.e., *FAM_OWN* = 1).

Table 7, Panel A first compares the mean amounts of *CONFORM_TAX* and *CASH_ETR3* for firms with high (*FAM_OWN* = 1) vs. low (*FAM_OWN* = 0) family ownership, similar to the analyses in Table 5, Panel B. The univariate comparisons confirm the findings in Chen et al. (2010), i.e., *FAM_OWN* = 1 firms have higher mean *CASH_ETR3* than *FAM_OWN* = 0 firms. However, they also indicate high family-ownership firms have lower mean *CONFORM_TAX* than firms with less family ownership, consistent with high family-ownership firms substituting conforming tax strategies for nonconforming tax strategies.

[INSERT TABLE 7 HERE]

Table 7, Panel B then presents results for seemingly unrelated regressions of conforming tax avoidance (*CONFORM_TAX*, column 1) and nonconforming tax avoidance (*CASH_ETR3*, column 2) on *FAM_OWN* and control variables. The significant and negative coefficient on *FAM_OWN* in Table 7, column 1 indicates firms with high family ownership engage in significantly more conforming tax avoidance than firms with less family ownership. In contrast, the significant and positive coefficient on *FAM_OWN* Table 7, column 2 confirm the findings in Chen et al. (2010) that family firms engage in less nonconforming tax avoidance than non-family firms. Overall, our results suggest family firms offset less nonconforming tax avoidance with more conforming tax avoidance. This finding is consistent with conclusions in Chen et al. (2010) that family firms are concerned about the perception of nonconforming tax avoidance, but

it also suggests family firms do not necessarily engage in less overall tax avoidance than non-family firms.

6. Supplemental Tests

Our measure of conforming tax avoidance is based on the ratio of cash taxes paid to lagged total assets. In untabulated supplemental tests we instead start with the ratio of cash taxes paid to cash flow from operations, as mentioned in Hanlon and Heitzman (2010). We then orthogonalize it exactly as described in Section 3 and re-estimate all of our empirical tests based on this alternative measure of conforming tax avoidance. Results are largely similar to those tabulated in this paper. However, because the ratio of cash taxes paid to cash flow from operations does not capture all forms of conforming tax avoidance, we consider it inferior to the ratio of cash taxes paid to lagged total assets.

Although the computation of *CASH_ETR3* requires a firm to have positive cash taxes paid and adjusted pretax income over a 3-year time period, our computation of *CONFORM_TAX* does *not* impose any profitability requirements. Consequently, some firm-year observations included in Tables 1 and 3 report negative pretax income (approximately 20 and 9 percent, respectively, of the quasi-private / matched public and pure-private / matched public firm samples).[29] To evaluate whether our results are robust to the exclusion of loss observations, we re-estimate all tests after excluding firm-years with negative cash taxes paid or negative pretax income. The results (untabulated) are qualitatively similar to those shown in Tables 1-7. We conclude that our findings are not driven by loss firms.

7. Conclusions

[29] None of the observations included in Tables 2, 5, 6, or 7 report negative pretax income.

Recent tax research essentially disregards the existence of tax planning strategies that reduce *both* book and taxable incomes, which we refer to as *conforming tax avoidance*. This disregard for conforming tax avoidance is likely the product of two factors: 1) extant empirical research focuses on large, public firms that are subject to greater capital market pressure and thus primarily use nonconforming tax strategies, and 2) the lack of an empirical proxy specifically designed to capture conforming tax avoidance. We expand the accounting literature first, by developing and validating a measure of conforming tax avoidance, and second, by investigating the extent to which conforming and nonconforming tax avoidance at public firms varies with the amount of capital market pressure to which the firm is subject.

We develop our measure of nonconforming tax avoidance based on the ratio of cash taxes paid to lagged total assets. This ratio excludes tax accruals, which can distort a firm's current tax expense but captures both conforming and nonconforming tax strategies. To remove the impact of nonconforming tax avoidance from the ratio, we orthogonalize it to book-tax differences. That is, we regress the ratio of cash taxes paid to lagged total assets on book-tax differences, by industry and fiscal year combinations, and keep the residual as our measure of conforming tax avoidance. The residual captures variation in the ratio of cash taxes paid to lagged total assets that is unrelated to book-tax differences and also excludes the average value of the ratio when book-tax differences are zero for a particular industry-fiscal year combination. In short, it captures abnormal values of cash taxes paid for a particular industry-fiscal year combination, after removing nonconforming tax strategies.[30]

[30] Univariate analyses reveal that the distribution of our measure of conforming tax avoidance is not related to the distribution of a common measure of nonconforming tax avoidance (i.e., five-year cash ETR), consistent with our new measure capturing unique aspects of corporate tax planning.

We then validate our measure of conforming tax avoidance through a series of tests. First, we use a sample of firms that convert from the first-in-first-out (FIFO) inventory method to the last-in-first-out (LIFO) inventory method (and vice versa) to test whether our measure of conforming tax avoidance captures predictable changes in book-tax conformity. FIFO-to-LIFO conversions should increase book-tax conforming tax avoidance and thus cause our measure of conforming tax avoidance to decrease after the change in accounting method. Our results are consistent with expectations. We then use two different samples of private firms to examine whether private firms engage in more conforming tax avoidance than similar public firms, consistent with results in prior accounting research. Results from both propensity score-matched samples of private and public firms confirm that private firms engage in more conforming tax avoidance than public firms. In our final validation test, we perform simulation analyses to validate our measure of conforming tax avoidance. We seed our public firm data with increasing amounts of conforming tax avoidance, which reduces cash taxes paid but does not affect total book-tax differences and thus, should decrease *CONFORM_TAX*. Consistent with expectations, we find that the mean and median values of the seeded conforming tax avoidance measure are significantly lower than the non-seeded values.

Next, we predict that a public firm's decision to adopt book-tax conforming vs. nonconforming tax strategies varies with the amount of capital market pressure to which the firm is subject. We expect that firms subject to greater (lower) capital market pressure will engage in more nonconforming (conforming) tax avoidance. We measure capital market pressure through a variety of empirical proxies, including: analyst following, stock issuances, sales growth, and discretionary accruals. Our results are as predicted across all of our proxies for capital market pressure. We also extend analyses in the influential Chen et al. (2010) study by demonstrating

that firms with high family ownership engage in less nonconforming but more conforming tax avoidance than firms with less family ownership. These findings are evidence that conforming tax avoidance is an overlooked aspect of corporate tax planning, which likely affects some prior research findings.

Our research makes two important contributions to the accounting literature. We develop a measure of conforming tax avoidance that can be used in future research to obtain a deeper understanding of the tax strategies adopted by a variety of firms. We particularly expect our measure to provide new insights into the tax planning at smaller companies that are subject to less capital market pressure than larger firms. Our study also explicitly examines how conforming and nonconforming tax avoidance varies at large, public companies, with a specific focus on how capital market pressure influences tax choices. Our study differs from prior research that focuses on specific transactions that reduce both book and taxable income, and from research that examines how capital market pressure affects nonconforming tax avoidance at public and private firms.

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APPENDIX A
Variable Definitions

ACQUISITION_D	= 1 for firm *i* if the amount of acquisitions (ACQ) in year *t* is greater than 5 percent of a firm's total assets, and l0 otherwise.
ADV_EXP	= Firm *i*'s advertising expense (XAD) divided by total assets at the beginning of year *t*.
AF	= 1 if firm *i* has analyst coverage (*IBES*) and 0 otherwise.
ASSETS	= Total assets (AT) for firm *i*, at the end of year *t*.
ATROA	= Firm *i*'s net income (NI) divided by total assets at the beginning of year *t*.
BTD	= Firm *i*'s book-tax differences, which equal book income less taxable income scaled by lagged total assets. Book income is pre-tax income (PI) in year *t*. Taxable income is calculated by summing current federal tax expense (TXFED) and current foreign tax expense (TXFO) and dividing by the statutory tax rate (*STR*) and then subtracting the change in NOL carryforwards (#52) in year *t*. If current federal tax expense is missing, total current tax expense is calculated by subtracting deferred taxes (TXDI), state income taxes (TXS) and other income taxes (TXO) from total income taxes (TXT) in year *t*. Because we do not have the tax and NOL data items listed above for pure-private firms, we calculate *BTD* for pure-private firms as pre-tax income less cash taxes paid divided by 35 percent. We scale this difference by lagged total assets.
CASH_ETR	= Firm *i*'s cash effective tax rate, which equals cash taxes paid (TXPD) in year t, divided by pretax net income (PI) in year *t*. *CASH_ETR* is set to missing when the denominator is zero or negative and we winsorize *CASH_ETR* to the range [0,1]
CASH_ETR3[5]	= Firm *i*'s cash effective tax rate, which equals cash taxes paid (TXPD), over years *t-2[t-4]* to *t*, divided by the sum of pretax net income (PI) in years *t-2[t-4]* to *t*. *CASH_ETR3[5]* is set to missing when the denominator is zero or negative and we winsorize *CASH_ETR3[5]* to the range [0,1]
CFO	= Firm *i*'s cash flow from operation (OANCF) divided by total assets at the beginning of year *t*.
CONFORM_TAX	= Firm *i*'s conforming tax avoidance in year *t* is calculated as the residual (ε) from the following regression, which we estimate by 3-digit NAICS and fiscal year combinations: $TAXESPAID\_TO\_ASSETS_{it} = \beta_0 + \beta_1 BTD_{it} + \beta_2 NEG_{it} + \beta_3 BTD_{it} \times NEG_{it} + \beta_4 NOL_{it} + \beta_5 \Delta NOL_{it} + \beta_6 SALES\_TO\_NOA + \varepsilon_{it}$. We require at least 10 observations be available for each industry and fiscal year combination. *TAXESPAID_TO_ASSETS* is the ratio of cash taxes paid (CTP) to lagged total assets (AT); *BTD* is book-tax differences; *NEG* is an indicator variable set to one for observations with negative book-tax differences (and 0 otherwise); *BTD* × *NEG* is the interaction of *BTD* and *NEG*; *NOL* and Δ*NOL* capture the level and change in net operating loss carryforwards; *SALES_TO_NOA* is the ratio of sales to net operating assets.
DACC	= Firm *i*'s discretionary accruals in year *t* derived from the modified cross-sectional Jones (1991) model. To estimate the model annually by three digit NAICS code, we require that at least 10 observations be available. The regression is: $TACC_{j,t} / TAj,_{t-1} = a_1^{*}[1 / TA_{j,t-1}] + a_2^{*}[(\Delta REV_{j,t} - \Delta TR_{j,t})/TAj,_{t-1}] + a_3^{*}[PPE_{j,t} / TAj,_{t-1}]$ where: *TACC* is total accruals for firm *j* in year *t*, which is defined as income before extraordinary items (IBC) minus net cash flow from operating activities, adjusted to extraordinary items and discontinued operations

	OANCF – XIDOC). *TA* is the beginning-of-the-year total assets (lagged AT). *ΔREV* is the change in sales in year t (SALE), *PPE* is gross property, plant, and equipment in year *t* (PPEGT), and *ΔTR* is the change in trade receivables in year *t* (RECTR).
DISCR_CFO	= Firm *i*'s discretionary cash flow from operations in year t derived from the cross-sectional Roychowdhury (2006) model. To estimate the model annually by three digit NAICS code, we require that at least 10 observations be available. The regression is: $CFO_{j,t} / TAj, _{t-1} = a_1^*[1 / TA_{j, t-1}] + a_2^*[(S_{j,t})/TAj, _{t-1}] + a_3^*[\Delta S, _t / TAj, _{t-1}]$ where: *CFO* is cash flow from operations (OANCF) for firm *j* in year *t*, *TA* is the beginning-of-the-year total assets (lagged AT). *S* is sales in year *t* (SALE), *ΔS* is change in sales in year *t.* For every firm-year*, DISCR_CFO* is the actual CFO minus the "normal" CFO calculated using estimated coefficients from the model and the firm-year's sales and lagged assets.
DISCR_EXP	= Firm i's discretionary expenditures in year t derived from the cross-sectional Roychowdhury (2006) model. To estimate the model annually by three digit NAICS code, we require that at least 10 observations be available. The regression is: $DISEXP_{j,t} / TAj, _{t-1} = a_1^*[1 / TA_{j, t-1}] + a_2^*[(S_{j, t-1})/TAj, _{t-1}]$ where: *DISEXP* is discretionary expenditures in period *t* and is the sum of advertising expense (XAD), research and development expense (XRD) and selling, general, and administrative expense (XSGA), *TA* is the beginning-of-the-year total assets (lagged AT). *S* is sales in year *t-1* (lagged SALE).
DISCR_PROD	= Firm i's discretionary production costs in year t derived from the cross-sectional Roychowdhury (2006) model. To estimate the model annually by three digit NAICS code, we require that at least 10 observations be available. Following Roychowdhury we first estimate a model for "normal" COGS by estimating the following regression: $COGS_{j,t} / TAj, _{t-1} = a_1^*[1 / TA_{j, t-1}] + a_2^*[(S_{j,t})/TAj, _{t-1}]$ *wh*ere COGS is the cost of goods sold (COGS); TA is total assets (AT), and S is sales (SALE). Next we first estimate a model for "normal" inventory growth by estimating the following regression: $\Delta INV_{j,t} / TAj, _{t-1} = a_1^*[1 / TA_{j, t-1}] + a_2^*[(\Delta S_{j,t})/TAj, _{t-1}] + a_3^*[\Delta S, _{t-1} / TAj, _{t-1}]$ *wh*ere *ΔINV* is the change in inventory in year t. Production cost (PROD) is then cost of goods sold (COGS) plus change in inventory (*INV)* for firm *j* in year *t*. Using the COGS and *ΔINV* equations we estimate normal production costs from the following year-3 digit NAICS industry regression: $PROD_{j,t} / TAj, _{t-1} = a_1^*[1 / TA_{j, t-1}] + a_2^*[(S_{j,t})/TAj, _{t-1}] + a_3^*[\Delta S, _{t-1} / TAj, _{t-1}]$ where *TA* is the beginning-of-the-year total assets (lagged AT). *S* is sales in year *t* (SALE), *ΔS* is change in sales in year *t-1*.
FAM_OWN	= 1 if firm *i* is in the top quartile of family stock ownership at the end of year *t* and 0 otherwise.
FOROPER	= 1 if firm *i*'s foreign pre-tax income (PIFO) or foreign income taxes (TXFO) is positive or negative and 0 otherwise.
GR_MARGIN	= Firm's gross margin, measured as sales (SALE) minus cost of goods sold (COGS) divided by lagged total assets.
INT_EXP	= Firm *i*'s interest expense (XINT) divided by total assets at the beginning of year *t*.
LIFO_DUMM	= 1 if the primary inventory valuation method (INVVAL) is LIFO.
LOG_ASSETS	= Natural logarithm of the total assets (AT) for firm *i*, at the end of year *t*.
LTDEBT	= Firm *i*'s leverage in year *t*, measured as total long-term debt (DLTT) divided by total assets.
NOL	= 1 if firm *i* has net operating loss carryforwards (TLCF) available at the beginning of year *t*, and 0 otherwise.

Δ*NOL*	= Change in firm *i*'s net operating loss carryforwards (TLCF) available at the beginning of year *t*, scaled by total assets at the beginning of year *t*.
PPE	= Firm *i*' gross amount of property, plant, and equipment (PPEGT)
PRIVATE	= 1 if the firm does not have publicly traded securities (debt, equity, or both).
PTROA	= Firm i's pre-tax net income (PI) divided by total assets at the beginning of year *t*.
R&D	= Firm *i*'s research and development expense (XRD) divided by total assets at the beginning of year *t*.
SALES	= Firm *i* 's sales (SALE) at the end of year t divided by total assets at the beginning of year t.
SALES_GR	= Firm *i*'s sales growth, where sales growth is sales (SALE) at the end of year *t* less sales at the beginning of year *t* divided by sales at the beginning of year *t*.
SALES_TO_NOA	= Sales (SALE) at the end of year *t* divided by net operating assets (SEQ-CHE+DLC+DLTT) at the end of year *t*.
SGA_EXP	= Firm *i*'s selling, general and administrative expense (XSGA) divided by total assets at the beginning of year *t*.
SPEC_ITEMS	= -1 × (firm *i*'s special items (SPI) divided by total assets at the beginning of year *t*).
ST_ISSUE	= 1 if shares outstanding in year *t* is greater than 110 percent of shares outstanding in year *t-1*.
TAXESPAID_TO_ ASSETS	= Firm *i*'s cash taxes paid (CTP) divided by total assets at the beginning of year *t*. We require all firms to have non-negative cash taxes paid.

All continuous variables are winsorized at the 1st and 99th percentile.

APPENDIX B
Examples of Book-Tax Conforming Tax Strategies[31]

1) *Timing of discretionary expense recognition*. Managers can accelerate certain expenditures to the current time period, or to high-tax rate years. Expenses over which managers have relatively greater discretion include R&D, advertising, selling, general, and administrative expenditures, and production costs.

2) *Timing of losses recognized on the sale of assets*. Managers can accelerate sales of assets with built-in losses to the current time period, or to high-tax rate years. The assets could be capital or ordinary, depending on the presence of capital or ordinary income against which the losses can be offset. For example, the sale of an operating division that has been unprofitable or the sale of investment property whose fair market value is substantially below its adjusted tax basis. In some cases these losses will be categorized as special items in the financial statements.

3) *Timing of restructuring charges recognized for both book and tax*. Similar to #2 above. Suppose a firm announces a significant corporate restructuring that involves the termination of a large number of employees. Firms can accelerate the tax deductions related to the restructuring by accelerating the payment of severance compensation (or other restructuring-related expenses) to the current tax year. In some cases these losses will be categorized as special items in the financial statements.

4) *Losses related to sale-and-leasebacks transactions*. Managers can structure sale-and-leaseback transactions to generate a loss for both book and tax purposes. These transactions would be beneficial provided the taxpayer can use the tax loss on the current year tax return.

5) *Prepayment of financing costs*. Firms can structure debt contracts such that financing costs must be paid up front, which accelerates the recognition of financing costs on a firm's tax return. In contrast, interest expense must be deducted ratably over the contract period.

6) *Recurring item exceptions*. In some circumstances, taxpayers can deduct accrued expenses even though economic performance has not yet occurred (i.e., the goods or services have not been provided). To deduct accrued expenses under this exception, the recurring expenses must be immaterial in amount or current expensing better matches with revenue recognition.

7) *Shorter Useful Life for Depreciable Assets.* For tax purposes firms typically adopt useful lives for depreciable assets according to the Modified Accelerated Cost Recovery System (MACRS). In contrast managers have more discretion in choosing useful lives for financial reporting purposes. Shorter (longer) useful lives accelerate (decelerate) depreciation expense recognition and reduce (increase) net income. Adopting short useful lives for both book and tax purposes would reduce book-tax differences and possibly scrutiny by tax authorities.

[31] These examples are based on the authors' own professional experiences and from conversations they have had with tax partners at large public accounting firms.

To evaluate whether our measure of conforming tax avoidance captures discretionary choices by managers to reduce income tax payments, we examine the associations between *CONFORM_TAX* and three proxies for real earnings management developed in Rowchowdury (2006). In most studies these proxies are intended to capture discretionary operating decisions that *increase* financial statement income; nonetheless, they also capture discretionary operating decisions that *reduce* financial and taxable income, and thus should also capture conforming tax avoidance (i.e., tax-motivated downward earnings management). We expect our measure of conforming tax avoidance to be associated with each of the real earnings management proxies to the extent managers use their discretion over the "real" transactions that underlie each earnings management metric. Thus, these tests not only serve to validate our measure of conforming tax avoidance, but also shed light on *how* managers reduce financial and taxable income in a book-tax conforming manner.

Consistent with Roychowdhury (2006), we calculate the following proxies for real earnings management: 1) discretionary changes in cash flow from operations (*DISCR_CFO*), which captures the timing of sales through changes in product prices or credit terms; 2) discretionary changes in production (*DISCR_PROD*), which captures changes in the cost of goods sold due to changes in production; and 3) discretionary expenses (*DISCR_EXP*), which includes advertising, R&D, and SG&A expenditures.[32] We estimate each of these variables cross-sectionally using a sample that includes all public firms with requisite data. See Appendix A for details. We then regress our measure of conforming tax avoidance (*CONFORM_TAX*) on the three proxies for real earnings management, while controlling for firm size. If managers use their discretion over transactions that underlie the real earnings management variables to reduce a firm's income tax liabilities (and thus reduce both financial and taxable income), then we expect the coefficient on *DISCR_CFO* (*DISCR_PROD* and *DISCR_EXP*) to be positive (negative) and significant. Table B1 presents the results from this regression.

TABLE B1
Results for Regression of *CONFORM_TAX* on Proxies for Real Earnings Management, Including Discretionary Cash Flow (*DISCR_CFO*), Discretionary Production Costs (*DISCR_PROD*), and Discretionary Expenditures (*DISCR_EXP)*

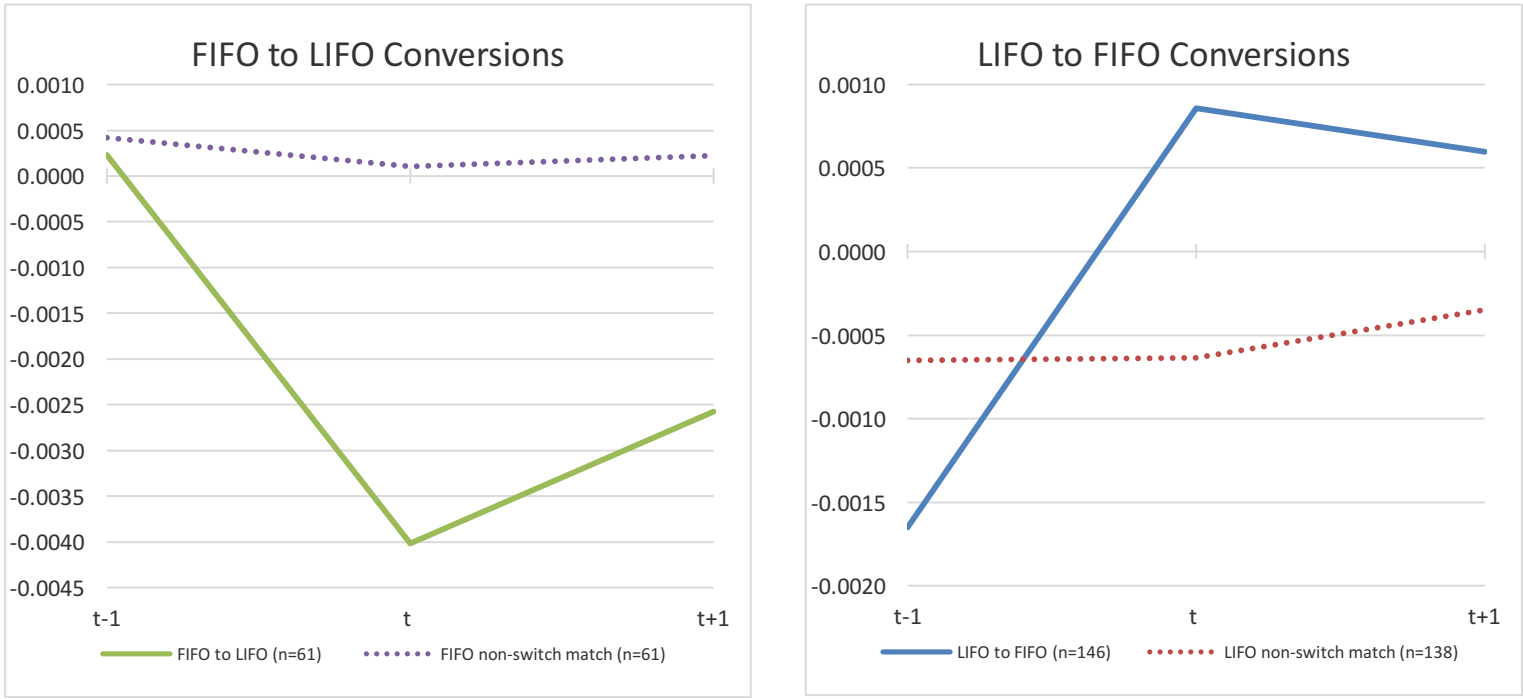
	Predicted Sign	Coefficient	T-Statistic
Intercept		0.000	-0.12
DISCR_CFO	+	0.109***	44.75
DISCR_PROD	-	-0.016***	-13.12
DISCR_EXP	-	-0.010***	-11.26
LOG_ASSETS		0.000	-0.11
Industry FE?		YES	
Year FE?		YES	
Adjusted R^2		12.16%	
# of Observations		39,401	

Notes: *,**,*** indicate significance at the 10%, 5%, and 1% level using a two-tailed t-test, respectively. The t-statistics have been adjusted to control for clustering by multiple firm observations. All variables are as defined in Appendix A. The analyses in this table are based on the sample of public firms in Table 1.

[32] Essentially, Roychowdhury (2006) estimates normal and abnormal operating activities relative to current and lagged sales and change in sales.

Consistent with managers using their discretion with respect to product pricing and credit terms (*DISCR_CFO*), production decisions (*DISCR_PROD*), and discretionary expenditures (*DISCR_EXP*), the coefficient(s) on *DISCR_CFO* (*DISCR_PROD* and *DISCR_EXP*) are positive (negative) and highly significant. These results further validate that our measure of conforming tax avoidance (*CONFORM_TAX*) captures book-tax conforming transactions, including tax-motivated downward earnings management.

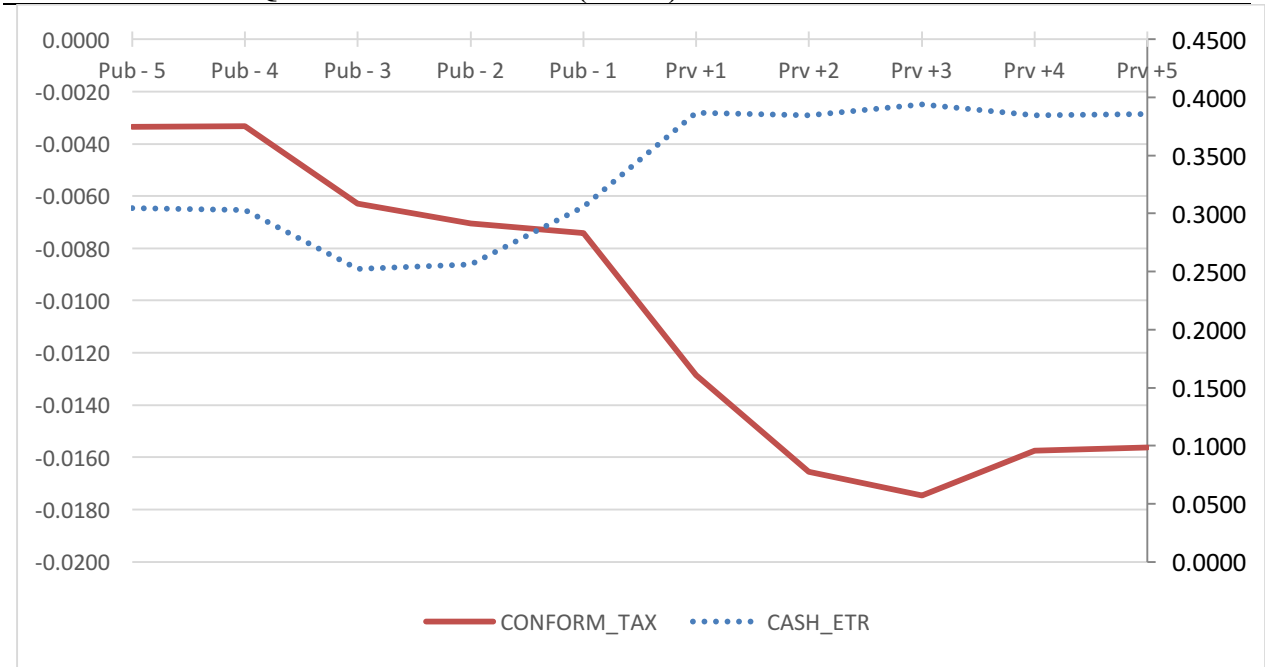
FIGURE 1
Mean Conforming Tax Avoidance (*CONFORM_TAX*) for Firms that Convert to and from the FIFO and LIFO Inventory Methods and for Similar Firms that Do Not Convert Inventory Method



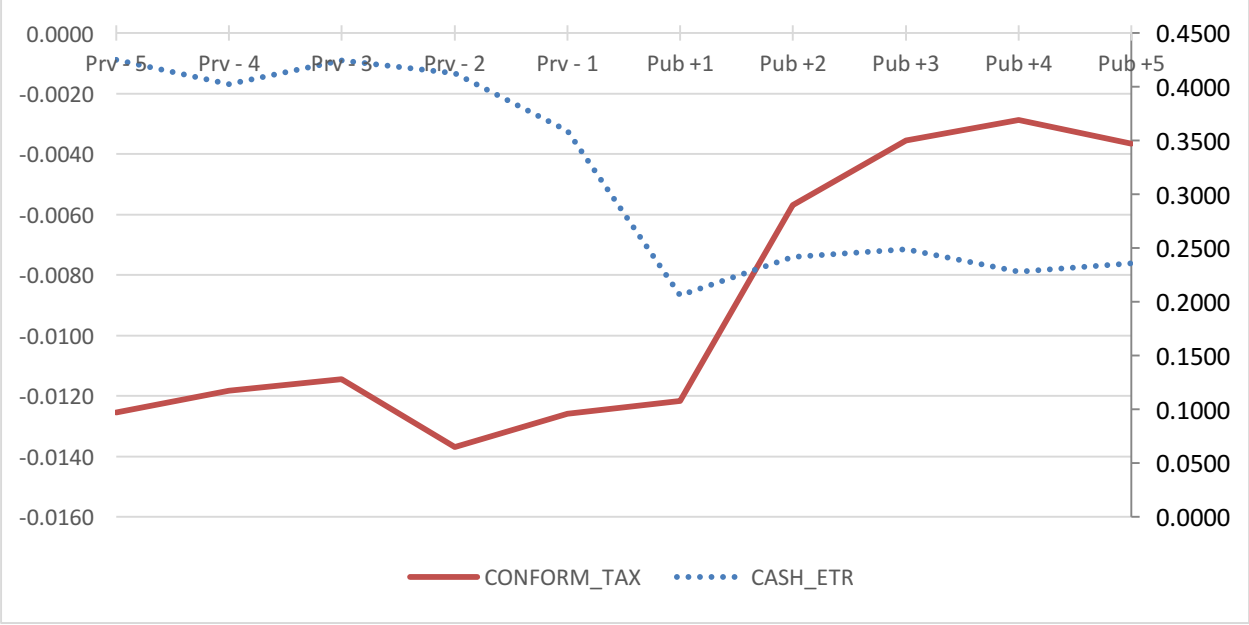
Notes: A LIFO (FIFO) firm is one where the primary inventory method (INVVAL) is Last-In, First-Out (First-In, First-Out). The FIFO match (LIFO match). We then perform a propensity score matching procedure to match each of these inventory switch firms to a similar firm that does *not* switch inventory methods during our sample period, in the same 3-digit NAICS industry and fiscal year with the same inventory method in year *t-1* (i.e., 'non-switch' match firms). We propensity score-match inventory switch and non-switch firms based on gross margin (*GR_MARGIN*), total assets (*ASSETS*), cost of goods sold (COGS), and reported inventory levels (INVVAL). We then compare the mean values of *CONFORM_TAX* for inventory switch and non-switch firms, in the years before and after a FIFO to LIFO (or LIFO to FIFO) conversion. These figures are based on public firm-year observations during fiscal years 1993 – 2015.

FIGURE 2
Mean Conforming (*CONFORM_TAX*) and Nonconforming (*CASH_ETR*) Tax Avoidance in the Five Years Prior and Subsequent to Transitions between Public and Quasi-Private Ownership

Panel A: Public-to-Quasi-Private Transition (N = 33)



Panel B: Quasi-Private-to-Public Transition (N = 62)



Note: *CONFORM_TAX* appears on the left-axis while *CASH_ETR* is represented on the right-axis. Pub+1 (Prv+1) is the first year the firm has (does not have) public equity. See Section 4.2 for detailed information about the quasi-private transition sample.

TABLE 1
Descriptive Statistics for Estimation of Conforming Tax Avoidance Measure (*CONFORM_TAX*)

Panel A: Descriptive Statistics for Input Variables for Estimation of *CONFORM_TAX*

	N	Mean	Standard Dev	25th Percentile	50th Percentile	75th Percentile
TAXESPAID_TO_ASSETS	39,401	0.031	0.033	0.006	0.021	0.045
BTD	39,401	0.012	0.068	-0.014	0.013	0.043
NEG	39,401	0.361	0.480	0.000	0.000	1.000
BTD × NEG	39,401	-0.018	0.043	-0.014	0.000	0.000
NOL	39,401	0.312	0.463	0.000	0.000	1.000
ΔNOL	39,401	0.003	0.092	0.000	0.000	0.000
SALES_TO_NOA	39,401	0.024	0.026	0.011	0.018	0.028

Panel B: Pearson (Spearman) Correlation Coefficients for Input Variables for Estimation of *CONFORM_TAX* on Top (Bottom)

	TAXESPAID_ TO_ASSETS	*BTD*	*NEG*	*BTD × NEG*	*NOL*	*ΔNOL*	*SALES_TO_NOA*
TAXESPAID_ TO_ASSETS		**-0.009**	**-0.019**	**0.053**	**-0.186**	**-0.013**	**0.159**
BTD	0.004		**-0.687**	**0.792**	**-0.031**	**-0.136**	**-0.011**
NEG	**-0.047**	**-0.832**		**-0.572**	**0.049**	**0.085**	**0.024**
BTD × NEG	**0.071**	**0.860**	**-0.968**		**-0.078**	**-0.106**	**-0.018**
NOL	**-0.193**	**-0.025**	**0.049**	**-0.065**		**0.113**	**-0.008**
ΔNOL	**-0.021**	**-0.149**	**0.119**	**-0.132**	**0.138**		**-0.027**
SALES_TO_NOA	**0.265**	**-0.029**	**0.022**	**-0.014**	**-0.045**	**-0.046**	

Notes: Correlation coefficients in **bold** are significant at the 0.10 level or better (two-tailed t-test).

Panel C: Summary Statistics for 968 Industry-Year Regressions in Estimation of *CONFORM_TAX*

Dependent Variable =	Summary Statistics for *CONFORM_TAX* Estimation (N = 968)					
TAXESPAID_TO_ASSETS	Mean	Standard Dev	25th Percentile	50th Percentile	75th Percentile	Percent > 0
Intercept	0.027	0.020	0.013	0.027	0.040	91.12%
Coefficients on *BTD*	-0.042	0.331	-0.153	-0.054	0.055	35.85%
Coefficients on *NEG*	0.003	0.145	-0.012	-0.003	0.007	38.95%
Coefficients on *BTD* × *NEG*	0.210	6.330	-0.089	0.094	0.293	64.05%
Coefficients on *NOL*	-0.011	0.120	-0.017	-0.009	-0.002	18.49%
Coefficients on Δ*NOL*	0.067	21.960	-0.038	0.006	0.072	54.34%
Coefficients on *SALES_TO_NOA*	0.514	0.865	0.005	0.239	0.747	77.17%
Adjusted R^2	0.293	0.190	0.088	0.252	0.399	
Residual (= *CONFORM_TAX*)	0.000	0.026	-0.016	-0.004	0.011	

All variables are as defined in Appendix A. These regressions are based on 39,401 public firm-year observations in Panel A, which includes fiscal years 1993 – 2015. We estimate equation (1) by 3-digit NAICS industry and fiscal year combinations, requiring at least 15 observations for each regression. This data requirement allows us to estimate 968 separate 3-digit NAICS industry-fiscal year regressions, the statistics for which are presented in Panel C above.

Panel D: Distribution of *CONFORM_TAX* Relative to Distribution of *CASH_ETR5*

	Each cell shows the proportion of *CASH_ETR5* quintile (Q) X observations that fall into the same quintile (QX) of the *CONFORM_TAX* distribution, where X = (1, 2, 3, 4, 5) and each *CASH_ETR5* QX column sums to 100 percent				
CONFORM_TAX:	*CASH_ETR5* Quintile 1 (Q1)	*CASH_ETR5* Quintile 2 (Q2)	*CASH_ETR5* Quintile 3 (Q3)	*CASH_ETR5* Quintile 4 (Q4)	*CASH_ETR5* Quintile 5 (Q5)
Quintile 1 (Q1)	23.46%	17.65%	12.76%	10.08%	13.73%
Quintile 2 (Q2)	32.56%	21.85%	15.85%	12.79%	15.27%
Quintile 3(Q3)	25.56%	22.86%	18.21%	16.33%	17.77%
Quintile 4 (Q4)	13.88%	22.77%	26.27%	24.82%	29.40%
Quintile 5 (Q5)	4.54%	14.87%	26.91%	35.98%	23.82%
Total	100.00%	100.00%	100.00%	100.00%	100.00%

All variables are as defined in Appendix A.

TABLE 2
Descriptive Statistics for Firm-Year Observations that Convert between the LIFO and FIFO Inventory Methods (Inventory Switch Firms) and Propensity Score-Matched Control Samples

	FIFO (in Year *t-1*) to LIFO (in Year *t* and *t+1*) Conversions (N = 61)			Propensity Score-Matched Control Sample (N = 61)		
	Mean	Median	St. Dev.	Mean	Median	St. Dev.
CONFORM_TAX_t-1	0.000	-0.001	0.014	0.000	-0.014	0.023
GR_MARGIN_t-1	0.356	0.343	0.130	0.341	0.320	0.147
ASSETS_t-1	5,899	1,668	9,627	6,214	1,327	16,825
INVENTORY_t-1	0.171	0.152	0.101	0.173	0.158	0.106
CONFORM_TAX_t	-0.004	-0.008	0.013	0.000	-0.013	0.023
GR_MARGIN_t	0.352	0.329	0.135	0.346	0.303	0.142
ASSETS_t	6,163	1,894	9,942	6,726	1,494	17,952
INVENTORY_t	0.161	0.142	0.093	0.161	0.140	0.101
CONFORM_TAX_t+1	-0.003*	-0.003*	0.012	0.000	-0.013	0.022
GR_MARGIN_t+1	0.351	0.326	0.137	0.343	0.302	0.145
ASSETS_t+1	6,741	2,372	10,842	6,981	1,602	19,866
INVENTORY_t+1	0.154	0.138	0.088	0.159	0.149	0.100
	LIFO (in Year *t*) to FIFO (in Year *t* and *t+1*) Conversions (N = 138)			Propensity Score-Matched Control Sample (N = 138)		
	Mean	Median	St. Dev.	Mean	Median	St. Dev.
CONFORM_TAX_t-1	-0.002	-0.005	0.017	-0.001	-0.015	0.029
GR_MARGIN_t-1	0.353	0.335	0.133	0.388	0.359	0.166
ASSETS_t-1	3,631	1,115	6,517	2,535	367	5,587
INVENTORY_t-1	0.152	0.138	0.092	0.166	0.154	0.099
CONFORM_TAX_t	0.001	-0.001	0.022	-0.001	-0.015	0.028
GR_MARGIN_t	0.356	0.339	0.135	0.388	0.364	0.165
ASSETS_t	4,043	1,404	7,114	2,841	440	6,406
INVENTORY_t	0.150	0.138	0.087	0.163	0.154	0.098
CONFORM_TAX_t+1	0.001*	-0.007	0.022	0.000	-0.011	0.025
GR_MARGIN_t+1	0.367	0.345	0.139	0.393	0.363	0.165
ASSETS_t+1	4,619	1,492	9,005	3,055	541	9,488
INVENTORY_t+1	0.144	0.134	0.082	0.158	0.141	0.099

*,**,*** indicate significance at the 10%, 5%, and 1% level using a two-tailed t-test between *CONFORM_TAX_t-1* and *CONFORM_TAX_t+1*, respectively. These analyses are based on public inventory switch firms that switch from using primarily FIFO (LIFO) to using primarily LIFO (FIFO) between the fiscal years 1993 to 2015. We then identify a propensity score-matched sample of public firms that do not switch inventory methods during our sample period. However, we calculate *CONFORM_TAX* based on the full sample of public firms as shown in Table 1, prior to identifying inventory switch and non-switch firms. See Section 4.1 for detailed information about the propensity score matching procedure.

TABLE 3
Comparisons of *CONFORM_TAX* and Other Descriptive Data for Matched Samples of Private and Public Firm-Years

	Quasi-Private Firm-Years			**Matched Public Firm-Years**			Differences between:	
	N	Mean	Median	N	Mean	Median	Means	Medians
TAXESPAID_TO_ASSETS	937	0.017	0.008	937	0.020	0.010	-0.003**	-0.002***
CONFORM_TAX	937	-0.010	-0.012	937	-0.006	-0.010	-0.004***	-0.002***
ASSETS	937	1,034	2,221	937	1,013	2,095	21.40	126.20
SALES	937	1.503	0.931	937	1.476	0.868	0.027	0.063
PTROA	937	0.047	0.072	937	0.074	0.099	-0.027***	-0.028***
GR_MARGIN	937	0.413	0.257	937	0.444	0.297	-0.031**	-0.040***
CFO	937	0.092	0.068	937	0.115	0.085	-0.022***	-0.018***
LTDEBT	937	0.603	0.294	937	0.590	0.302	0.013	-0.008
SALES_TO_NOA	937	0.027	0.025	937	0.021	0.020	0.006**	0.005**
	Pure-Private Firm-Years			**Matched Public Firm-Years**			Differences between	
	N	Mean	Median	N	Mean	Median	Means	Medians
TAXESPAID_TO_ASSETS	1,274	0.022	0.002	1,274	0.031	0.020	-0.009***	-0.018***
CONFORM_TAX	1,274	-0.003	-0.011	1,274	0.003	-0.004	-0.006***	-0.007***
ASSETS	1,274	305	13	1,274	325	26	-20.2	-13.0
SALES	1,274	2.420	2.082	1,274	1.592	1.359	0.829***	0.723***
PTROA	1,274	0.109	0.083	1,274	0.126	0.110	-0.017***	-0.027***
GR_MARGIN	1,274	0.603	0.487	1,274	0.514	0.471	0.089***	0.016*
CFO	1,274	0.160	0.116	1,274	0.141	0.123	0.019***	-0.007***
LTDEBT	1,274	0.071	0.000	1,274	0.036	0.000	0.035***	0.000
SALES_TO_NOA	1,274	0.050	0.042	1,274	0.037	0.027	0.013*	0.015*

*,**,*** indicate significance at the 10%, 5%, and 1% level using a two-tailed t-test, respectively. Differences between means are tested for significance using a two-tailed t-test; differences in medians are tested for significance using a two-tailed Wilcoxon signed rank test. All variables are as defined in Appendix A. We obtain quasi-private firm data following the procedures described in Section 4.2 and the pure-private firm data from Sageworks, as described in Section 4.2. We estimate *CONFORM_TAX* based on the full sample of public firms in Table 1 and the corresponding private sample being examined. .

TABLE 4
Results for Simulation Analyses that Compare *CONFORM_TAX* to Simulated Tax Avoidance Data

Panel A: Descriptive Statistics for *CONFORM_TAX* and Simulated Conforming and Nonconforming Tax Avoidance Data

	Level of Seed	N	Standard Deviation	25th Percentile	Mean	50th Percentile	75th Percentile
(1) *CONFORM_TAX*		36,251	0.0271	-0.0175	-0.0001	-0.0046	0.0108
(2) *CONFORM_TAX_SEED*	1%	36,251	0.0268	-0.0176	-0.0005	-0.0048	0.0108
(3) *NONCONFORM_TAX_SEED*	1%	36,251	0.0277	-0.0176	-0.0003	-0.0047	0.0107
				Difference (1) – (2)	**0.0004***	**0.0002***	
				Difference (1) – (3)	**0.0002**	**0.0001**	
(4) *CONFORM_TAX*		36,251	0.0271	-0.0175	-0.0001	-0.0046	0.0112
(5) *CONFORM_TAX_SEED*	3%	36,251	0.0264	-0.0180	-0.0011	-0.0051	0.0100
(6) *NONCONFORM_TAX_SEED*	3%	36,251	0.0305	-0.0177	-0.0002	-0.0048	0.0102
				Difference (4) – (5)	**0.0010*****	**0.0005****	
				Difference (4) – (6)	**0.0001**	**0.0003**	
(7) *CONFORM_TAX*		36,251	0.0271	-0.0175	-0.0001	-0.0046	0.0112
(8) *CONFORM_TAX_SEED*	5%	36,251	0.0261	-0.0184	-0.0017	-0.0055	0.0094
(9) *NONCONFORM_TAX_SEED*	5%	36,251	0.0298	-0.0179	-0.0006	-0.0043	0.0112
				Difference (7) – (8)	**0.0016*****	**0.0009*****	
				Difference (7) – (9)	**0.0003**	**-0.0003**	

*,**,*** indicate significance at the 10%, 5%, and 1% level using a two-tailed t-test, respectively. The t-statistics have been adjusted to control for clustering by multiple firm observations. All variables are as defined in Appendix A. We use the sample of public firms in Table 1 in all simulation analyses. We have only 36,251 observations with seeded tax conforming data.

Panel B: Results for Regressions of *CONFORM_TAX* from the Sample Seeded with Conforming Tax Avoidance, on Indicator Variables for whether an Observation Is Seeded with Conforming Tax Avoidance (*CONF_SEED_DUMMY*)

	1% Conforming Tax Avoidance Seeded		3% Conforming Tax Avoidance Seeded		5% Conforming Tax Avoidance Seeded	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
Intercept	-0.0191	-45.646	-0.0187	-45.077	-0.0184	-44.489
CONF_SEED_DUMMY	-0.0004	-2.299	-0.0010	-5.527	-0.0016	-8.814
ACQUISITION_D	0.0043	16.658	0.0043	16.621	0.0043	16.589
GR_MARGIN	0.0302	66.665	0.0297	65.825	0.0291	64.968
INT_EXP	-0.1348	-24.590	-0.1317	-24.215	-0.1286	-23.845
LOG_ASSETS	0.0011	24.854	0.0011	24.490	0.0011	24.120
Adjusted R^2	12.14%		11.88%		11.63%	
# of Obs	72,502		72,502		72,502	

Panel C: Results for Regressions of *CONFORM_TAX* from the Sample Seeded with Nonconforming Tax Avoidance, on Indicator Variables for whether an Observation Is Seeded with Nonconforming Tax Avoidance (*NONCONF_SEED_DUMMY*)

	1% Nonconforming Tax Avoidance Seeded		3% Nonconforming Tax Avoidance Seeded		5% Nonconforming Tax Avoidance Seeded	
	Coefficient	T-Statistic	Coefficient	T-Statistic	Coefficient	T-Statistic
Intercept	-0.0192	-44.790	-0.0201	-42.078	-0.0198	-42.758
NONCONF_SEED_DUMMY	-0.0002	-1.004	-0.0001	-0.549	-0.0003	-1.444
ACQUISITION_D	0.0043	16.251	0.0041	14.895	0.0041	15.301
GR_MARGIN	0.0313	65.952	0.0332	57.319	0.0320	57.903
INT_EXP	-0.1347	-23.965	-0.1300	-21.257	-0.1282	-21.913
LOG_ASSETS	0.0011	23.136	0.0011	22.294	0.0011	22.581
Adjusted R^2	12.44%		12.25%		12.10%	
# of Obs	72,502		72,502		72,502	

Notes: *,**,*** indicate significance at the 10%, 5%, and 1% level using a two-tailed t-test, respectively. The t-statistics have been adjusted to control for clustering by multiple firm observations. All variables are as defined in Appendix A. We use the sample of public firms in Table 1 as the basis for all simulation analyses. The number of observations dobules from 36,251 to 72,502 because each firm has two observations (a seeded and non-seeded).

TABLE 5
Univariate Analyses Based on the Sample of Public Firms

Panel A: Descriptive Statistics

	N	Mean	Std. Dev.	25th Percentile	50th Percentile	75th Percentile
Tax Variables:						
CONFORM_TAX	37,596	0.001	0.027	-0.017	-0.004	0.012
CASH_ETR3	37,596	0.305	0.288	0.163	0.271	0.362
Capital Market Pressure Variables:						
AF	37,596	0.529	0.499	0.000	1.000	1.000
ST_ISSUE	37,596	0.170	0.376	0.000	0.000	0.000
SALES_GR	37,596	0.140	0.258	0.005	0.094	0.218
DACC	37,596	0.017	0.072	-0.019	0.014	0.052

All variables are as defined in Appendix A.

Panel B: Univariate Comparisons of Tax Avoidance Measures for Public Firms that Are Subject to High vs. Low Capital Market Pressure

	Analyst Following (*AF*)			
	AF = 1	*AF* = 0	Mean Difference	Predicted Sign
CONFORM_TAX	0.002	-0.003	0.005***	+
CASH_ETR3	0.290	0.323	-0.033***	-

	Stock Issuance (*ST_ISSUE*)			
	ST_ISSUE = 1	*ST_ISSUE* = 0	Mean Difference	Predicted Sign
CONFORM_TAX	0.003	-0.001	0.003***	+
CASH_ETR3	0.264	0.314	-0.050***	-

	Sales Growth (*SALES_GR*)			
	Top 25% of *SALES_GR*	Bottom 25% of *SALES_GR*	Mean Difference	Predicted Sign
CONFORM_TAX	0.006	-0.007	0.013***	+
CASH_ETR3	0.268	0.354	-0.085***	-

	Discretionary Accruals (*DACC*)			
	Top 25% of *DACC*	Bottom 25% of *DACC*	Mean Difference	Predicted Sign
CONFORM_TAX	0.012	-0.008	0.020***	+
CASH_ETR3	0.291	0.343	-0.052***	-

*,**,*** indicate significance at the 10%, 5%, and 1% level using a two-tailed t-test, respectively. All variables are as defined in Appendix A. The analyses in this table are based on the sample of public firms in Table 1.

TABLE 6
Results for Seemingly-Unrelated Regressions of Tax Avoidance Measures on Proxies for Capital Market Pressure

	Predicted Sign	(1) Dependent Variable = *CONFORM_TAX* Coefficient	T-Statistic	Predicted Sign	(2) Dependent Variable = *CASH_ETR3* Coefficient	T-Statistic
Intercept		-0.031***	-13.40		0.374***	13.78
SALES_GR	+	0.007***	12.95	-	-0.078***	-12.45
AF	+	0.003***	11.34	-	-0.022***	-6.71
ST_ISSUE	+	0.001*	1.89	-	-0.024***	-5.65
DACC	+	0.083***	46.04	-	-0.282***	-13.42
ACQUISITION_D		0.004***	11.62		-0.008*	-1.86
GR_MARGIN		0.125***	63.05		-0.017**	-2.57
INT_EXP		-0.165***	-25.80			
PPE					-0.007	-1.58
LOG_ASSETS		0.001***	15.20		-0.004***	-4.27
Industry FE?		Yes			Yes	
Year FE?		Yes			Yes	
Adjusted R^2		13.06%			3.71%	
N		37,596			37,596	

*,**,*** indicate significance at the 10%, 5%, and 1% level using a two-tailed t-test, respectively. The t-statistics have been adjusted to control for clustering by multiple firm observations. All variables are as defined in Appendix A. The analyses in this table are based on the sample of public firms in Table 1.

TABLE 7
Results for Family Firm Analyses

Panel A: Univariate Comparison of Tax Avoidance Measures for Firms with High (*FAM_OWN* = 1) vs. Low (*FAM_OWN* = 0) Family Ownership

	Family Ownership (*FAM_OWN*)			
	FAM_OWN = 1	*FAM_OWN* = 0	Mean Difference	Predicted Sign
CONFORM_TAX	0.001	0.002	-0.002**	-
CASH_ETR3	0.321	0.295	0.026**	+

Panel B: Results for Seemingly-Unrelated Regressions of Tax Avoidance Measures on an Indicator Variable for High Family Firm Ownership (*FAM_OWN*) and Control Variables

		(1) Dependent Variable = *CONFORM_TAX*			(2) Dependent Variable = *CASH_ETR3*	
	Predicted Sign	Coefficient	T-Statistic	Predicted Sign	Coefficient	T-Statistic
Intercept		-0.019	-0.85		0.407**	2.08
FAM_OWN	-	-0.009***	-5.93	+	0.016*	1.74
ACQUISITION_D		0.007***	5.69		0.017*	1.69
GR_MARGIN		0.051***	26.20		-0.074***	-4.42
INT_EXP		-0.275***	-7.15			
PPE					-0.031**	-2.56
LOG_ASSETS		0.000	1.03		-0.001	-0.37
Industry FE?		Yes			Yes	
Year FE?		Yes			Yes	
Adjusted R^2		15.19%			8.99%	
N		3,053			3,053	

*,**,*** indicate significance at the 10%, 5%, and 1% level using a two-tailed t-test, respectively. The t-statistics have been adjusted to control for clustering by multiple firm observations.. The analyses in this table are based on a sample of family-owned firms. *FAM_OWN*, which equals one if a firm is in the top quartile of family ownership (among all S&P 500 firms with non-zero family ownership during the sample period). Family ownership is defined as stock owned by founding family members that are either on the board of directors or in the top management of the company. All other variables are as defined in Appendix A.