Valuation of tax expense

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September 4, 2012

Discussions with Dave Guenther and Doug Shackelford spurred work on this paper. We received helpful comments and suggestions from anonymous reviewers, Jeff Gramlich, Michelle Hanlon, Gordon Richardson, Cathy Schrand, Terry Shevlin, Jim Wahlen, Jerry Zimmerman, and participants at workshops at Columbia University, University of Kentucky, University of Texas-Austin, University of Toronto, the Yale summer conference, and AAA annual meetings (2010). We are grateful for financial support from the Yale School of Management.

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Abstract

Both intuition and evidence suggest that tax expense reflects value lost to taxes paid. Inconsistent with this traditional valuation role for tax expense, some recent research finds that tax expense surprise, especially its current component, is *positively* associated with stock returns. Holding pre-tax income surprise constant, a higher tax expense surprise is associated with higher returns, even though net income is lower. To reconcile this apparent conflict, we propose that a) tax expense can reflect both value lost to taxes paid and underlying profitability, and b) the proxy-for-profitability role is more important when profitability is weakly related to pre-tax book income *and* strongly related to tax expense. As a result, the coefficient on tax expense in valuation regressions varies across samples and specifications based on the relative ability of pre-tax book income and tax expense to reflect profitability. While the conditions that favor the proxy-for-profitability role may appear restrictive and not frequently encountered, in fact that role generally dominates the traditional value-lost-to-taxes role because pre-tax book income reflects profitability poorly for most samples and specifications. The main implication is that inferences based on the valuation coefficients associated with different tax variables should be made with caution, as they could be affected substantially by other correlated factors.

1. Introduction

We re-examine the value implications of tax expense, an important focus of the emerging literature on accounting for income taxes (Graham et al., 2012). Intuition and prior evidence (e.g., Lipe, 1986) suggest that unexpected changes in revenues are positively related to value changes whereas unexpected changes in expenses, including tax expense, are negatively related to value changes.[1] More recent results (e.g., Ohlson and Penman, 1992), however, suggest the opposite: higher tax expense surprise is good news even though it implies *lower* net income surprise when surprises in revenues and other expenses are controlled for. This apparent contradiction motivates us to investigate why the coefficient on tax expense surprise varies across studies. If such variation is due to reasons unrelated to tax effects, it might bias inferences from investigations of the value implication of tax variables.

The intuition for why higher tax expense is bad news is that it implies value lost in the form of additional tax payments. Consider an unexpected increase in a firm's tax rate. The value lost to additional taxes paid should be associated with higher tax expense and lower returns. Similarly, tax planning designed to lower tax expense should be viewed as good news (e.g., Schmidt, 2006).[2] And there is evidence to support this intuition. In addition to Lipe (1986), other studies (e.g., Guenther and Jones 2006) find negative coefficients on surprises in tax expense and effective tax rates (ratio of tax expense to pre-tax income).

The opposite view that higher tax expense is good news is not as prevalent, possibly because it is unintuitive and evidence consistent with it is often indirect and not emphasized. Ohlson and Penman (1992) find a positive coefficient on tax expense in regressions of stock

[1] Some expenses, such as those related to Research & Development and certain write-offs, have been shown to be positively related to stock returns. Revenues and other expenses are not held constant, however, in those cases.

[2] Consistent with this intuition, tax departments are evaluated on (e.g., Robinson et al., 2010) and tax department managers are compensated for (e.g., Armstrong et al., 2011) their ability to lower effective tax rates.

returns on levels of revenues and various expenses, but the unexpected positive sign is not discussed. More recently, studies investigating the incremental value-relevance of taxable income, beyond that of book income, document a significant positive coefficient on unexpected taxable income (e.g., Hanlon et al, 2005). Even though tax expense is not taxable income, taxable income in these studies is derived substantially from the current portion of tax expense. We confirm that both the current and deferred components of tax expense surprise are in general positively related to returns.

While this opposite view has not been emphasized, the prior literature (e.g. Lev and Nissim, 2004) provides reasons why an increase in the current and deferred components might be viewed as good news. The current component reflects taxable income reported on the tax return, which is an alternative measure of profit based on tax rather than GAAP rules. Reasons why taxable income could reflect underlying profitability not reflected in pre-tax income include: a) tax rules generate value-relevant information not generated by GAAP rules, and b) tax rules are applied more homogeneously than GAAP rules.[3] The deferred component could represent a signal that is positively related to underlying profitability. For example, firms attempting to conceal declining profitability might at the same time understate deferred tax expense and overstate pre-tax income.[4]

To explain why the sign of the coefficient on tax expense surprise varies across studies, we propose that both sets of arguments mentioned above, justifying positive and negative

[3] Readers familiar with the preparation of corporate tax returns might dispute this rationale. Tax rules are not designed to and corporations do not seek to convey value-relevant information via taxable income. But that does not preclude the possibility that taxable income provides incremental information about profitability. More important, even if levels of taxable income do not reflect profitability levels, *changes* in taxable income might still be informative about changes in profitability.

[4] Whereas these explanations for a positive coefficient on tax expense surprise rely on tax expense surprise containing incremental value-relevant information not contained in pre-tax income surprise, an alternative explanation is that it does not actually contain incremental information but appears to do so when regressions are misspecified (e.g., Guenther et al., 2012).

relations with value, play a role: while tax expense directly reflects the value lost in tax payments, it may also serve as a proxy for profitability and reflect value gained. The ability of tax expense surprise proxy for profitability is determined indirectly as that role emerges only when the value relevance of pre-tax income declines. Also, while low value relevance of pre-tax income is necessary for tax expense to reflect profitability, it is not sufficient, as tax expense must still proxy well for profitability. For cases where it proxies poorly for profitability, the coefficient on tax expense surprise will remain low or negative even if the value-relevance of pre-tax income is low.

Stated differently, the coefficient on tax expense surprise in a regression of returns on surprises in pre-tax income and tax expense reflects the net effect of the following three factors: a) the ability of pre-tax income to reflect profitability, b) the ability of tax expense to reflect any residual profitability not explained by pre-tax income, and c) the ability of tax expense to reflect value lost to taxes paid. Variation in the relative strength of these three factors and the relevant interactions amongst them across the samples and regression specifications selected in different studies explains variation in the sign and magnitude of the coefficient on tax expense. We focus here on variation in the first two factors above, as they pertain to value-relevance or the ability to reflect underlying profitability, and leave the third factor to tax research.

Consistent with the first factor's effect, we find that there is less (more) opportunity for tax expense surprise to assume its proxy-for-profitability role, and the coefficient on tax expense surprise is more likely to be negative (positive), when the value relevance of pre-tax income surprise is high (low). For our empirical tests, value relevance is high (low) when pre-tax income is positive (negative) and the magnitude of pre-tax income surprise is small (large).

Consistent with the second factor's effect, we find that the coefficient on tax expense increases with its ability to reflect profitability, when the value-relevance of pre-tax income surprise is held constant. As with the value relevance of pre-tax income surprise, we use the sign of tax expense and magnitude of tax expense surprise to indicate when tax expense is better able to reflect profitability. Overall, when the value-relevance of pre-tax income is high (low), the coefficient on tax expense surprise becomes less negative (more positive) as its ability to proxy for profitability increases.

The main implication of our results is that care should be taken when interpreting the value impact of tax variables, as the coefficient on tax variables is a function of all three factors mentioned above. Tax research, which typically studies the value lost to taxes (third factor) or more recently the extent to which tax variables proxy for profitability (second factor), should recognize that the results are influenced by variation in the other two factors. We replicate the analyses in Ayers et al. (2009) to illustrate a more subtle point: care should also be taken when linking variation in the coefficient on tax variables to a specific source of variation in the three factors, because of correlation among sources underlying the same factor. While we focus in this study on tax expense and its current and deferred components, the same implication arises for studies investigating the value impact of related tax variables, such as the components of book-tax differences.

One potential solution, when studying the value lost to taxes paid, is to consider a "clean" subsample that is restricted to cases where the value-relevance of pre-tax income is high, to reduce the likelihood that tax expense proxies for profitability. Another potential solution is to consider alternative regression specifications. For example, the results in Bell and Gyeszly (2012) suggest that the value-relevance of pre-tax income increases considerably, which reduces

the ability of tax variables to proxy for profitability, when the dependent variable is market value, rather than returns.

A second implication of our results is that a positive coefficient on tax expense surprise is expected quite often, especially for the specification and sample we label the "general case," which refers to cross-sectional regressions of returns on changes in annual pre-tax income and tax expense estimated over all firms with available data. While the conditions required for the proxy-for-profitability role to dominate the traditional role of tax expense appear restrictive, they are often satisfied. As predicted by our explanation, this is because pre-tax income surprise generally exhibits very low value relevance. We are aware of the general perception, created mainly by portfolio-level results from early research (e.g., Ball and Brown, 1968), that returns are related strongly to earnings surprise. But firm-level evidence contradicts that perception and indicates only a weak link (e.g., Lev, 1989). Recognizing that tax expense often assumes its proxy for profitability role is useful as it explains other seemingly unintuitive results.[5]

The rest of this paper is organized as follows. Section 2 provides a review of related prior literature and Section 3 describes our sample and the general case result. Section 4 investigates our predictions about variation across subsamples and regression specifications. Section 5 describes some analyses probing the robustness of our results and Section 6 concludes.

2. Prior research and empirical predictions

2.1 Prior literature.

To understand better the role played by tax expense in returns regressions, we turn to the decomposition of unexpected returns into its two components (e.g., Campbell 1991): a) cash flow news, or current-period revisions in expectations of future dividends; and b) discount rate

[5] For example, Thomas and Zhang (2011) find that predictions of next quarter's tax expense surprise are positively related to next quarter's returns, even after controlling for earnings surprise for both this quarter and the *next*.

news, or current-period revisions in expectations of future discount rates. Regressions of unexpected returns on (after-tax) earnings surprise generally focus on cash flow news rather than discount rate news, and assume that it is related positively to news about current period earnings. (After-tax earnings is referred to hereafter as earnings.) If so, it can be shown that the coefficient on earnings surprise, commonly referred to as the earnings response coefficient (ERC), reflects the relation between unexpected earnings this period and news about underlying or long-term profitability, represented by the present value of revisions in expectations of future period residual earnings (e.g., Liu and Thomas, 2002).[6]

When earnings surprise in return regressions is replaced by surprises in pre-tax income and tax expense, the coefficients on pre-tax income surprise and tax expense surprise would similarly reflect the corresponding relations between those surprises and underlying profitability. Because earnings equal pre-tax income less tax expense, it follows that the coefficient on pre-tax income (tax expense) surprise should be positive (negative) and the magnitudes of those coefficients would reflect the corresponding relations between a dollar of surprise for each component and revisions in expectations of future residual earnings. Ceteris paribus, a higher tax expense implies an increase in current and future cash tax payments. This is the traditional role for tax expense in valuation regressions: higher tax expense implies bad news.

And when decomposing pre-tax income into revenues and expenses, analogous reasoning suggests that higher revenues are good news to shareholders whereas higher expenses are bad news. Results of prior studies support this intuition. For example, Lipe (1986) estimates firm-by-

[6] Prior research has shown that the ERC is affected both by a) factors that should in theory describe the relation between unexpected earnings and the present value of revisions in future period residual earnings, such as growth prospects (e.g., Collins and Kothari 1989) and the extent to which GAAP follows mark-to-market accounting (e.g., Ramakrishnan and Thomas 1998), and b) empirical factors that reflect the "measurement error" associated with unexpected earnings, such as price-irrelevant components of unexpected earnings (e.g., Beaver et al. 1980) caused by GAAP rules and certain types of earnings management.

firm time-series regressions of annual returns on unexpected revenue and expense items and finds a positive coefficient on revenue surprises and negative coefficients on all expense surprises, including tax expense surprise.

Although capital markets research typically includes surprises in tax expense and pre-tax income (or revenues and expenses) as explanatory variables, tax research tends to deflate tax expense by pre-tax income and investigates surprises in effective tax rates.[7] Consistent with the traditional role, an unexpected decline in effective tax rates, which translates roughly into tax expense decreases when pre-tax income is held constant, is predicted to be good news. Schmidt (2006) articulates a rationale for this prediction: a declining effective tax rate reflects unexpected tax savings from a firm's strategic tax-planning and tax-optimization activities, which include tax shelters and the utilization of tax rate differentials across countries and states.[8]

Some studies regress market value of equity, rather than returns, on variables derived from the balance sheet, such as deferred tax assets and tax liabilities. For example, Ayers (1998) regresses the market value of equity on deferred tax assets, deferred tax liabilities, and the valuation allowance, as well as other explanatory variables. The general finding from these studies is that stock price is positively related to deferred tax assets and negatively related to deferred tax liabilities (Amir et al. 1997; Ayers 1998; Dhaliwal et al. 2000). As revenues (expenses) are generally associated with increases (decreases) in assets and decreases (increases) in liabilities, these results are consistent with changes in market values of equity, or stock returns, being positively related to revenue surprises and negatively related to expense surprises.

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[7] This emphasis on effective tax rates better reflects tax practice (see footnote 2) but it reduces sample size substantially, because many firm-years are deleted if observed effective tax rates in the current or prior year are outside reasonable bounds.

[8] Schmidt (2006) also discusses reasons why changes in effective tax rates might be more or less persistent than other earnings components. Bryant-Kutcher et al. (2010) study the combined effect of the persistence of both pre-tax income and changes in effective tax rates.

Market value regressions have also been estimated on book value of equity and flow variables that capture pre-tax income and tax effects (e.g., Bell and Gyeszly, 2012). An interesting twist in that paper is the focus on cash taxes paid, rather than tax expense or the current portion of tax expense. The results suggest that increased cash taxes paid are strongly negatively associated with market value, when controlling for pre-tax income.

While these empirical results and intuition support the view that higher tax expense surprise is bad news, consistent with the traditional role for tax expense, there is empirical support for the opposite view. Ohlson and Penman (1992) find a positive coefficient on tax expense levels when annual returns are regressed on annual levels of revenue and different expenses.[9] Lev and Thiagarajan (1993) document a positive relation between changes in effective tax rates and current returns, where tax rates are computed using only the *current* portion of the *federal* tax expense.[10] In effect, a lower taxable income for federal tax purposes is viewed by analysts and investors as being bad news.

That inference is supported by recent research that investigates book-tax differences and whether taxable income is incrementally value-relevant beyond GAAP income (e.g., Hanlon et al., 2005, Chen et al., 2007, and Ayers et al., 2009). Regressions of returns on changes in pre-tax income and estimates of taxable income indicate a significant positive coefficient on taxable income changes.[11] Ayers et al. (2009) show that the incremental informativeness of taxable income is higher when taxable income is high quality (indicated by firms that engage in less tax

[9] The choice of levels of revenues and expenses (e.g., Easton and Harris, 1991) versus first differences to capture surprises in those items can be linked intuitively to differences in the underlying expectation model: changes represent surprises if expectations of earnings (or revenues and expenses) equal lagged values, whereas levels represent surprises if expectations are a function of lagged prices.

[10] The relation is negative, but not significant, when the regression is estimated on a smaller sample with non-missing values for all earnings quality signals (see Table 2 in Lev and Thiagarajan, 1993).

[11] Table 4 of Bell and Gyeszly (2012) shows that the negative coefficient on cash taxes paid observed for market value regressions switches to a positive coefficient for returns regressions.

planning) and book income is low quality (indicated by firms that engage in greater management of book accruals).

The possibility that tax expense provides incremental information about profitability, beyond that contained in pre-tax income surprise, appears to be stronger for the current component, which is derived from taxable income or the profit reported under tax rules (e.g., Hanlon et al., 2005, Lev and Nissim, 2004, and Weber, 2009). Even though tax rules emphasize various governmental and political objectives, rather than value relevance, it is possible that an alternative computation of profit is incrementally informative about underlying profitability.

Note that even though taxable income might systematically understate profitability, *changes* in taxable income might still be informative about changes in underlying profitability, especially if tax rules are applied more consistently over time, relative to GAAP rules. Also, the higher consistency with which tax rules are applied across firms should result in more homogeneity, which increases value relevance in cross-sectional regressions. Finally, profit calculations under tax rules leave less room for estimates and judgment, relative to accounting profits. While managers can potentially use increased flexibility to improve the value-relevance of accounting profits, it is possible that this increased flexibility results in greater measurement error and heterogeneity, which dilutes the value-relevance of accounting profits.[12]

Although a positive link between the deferred component of tax expense and underlying profitability is less obvious than that for the current component, prior research has suggested that lower deferred tax expense might also represent bad news, similar to the current component, because it signals a decline in the "quality" of reported earnings. The deferred component of tax

[12] To be sure, there is also room for tax profits to be calculated differently for different firms; specifically, there is evidence of differential tax aggressiveness across firms (Graham and Tucker 2006; Desai and Dharmapala 2009). To the extent that tax aggressiveness does not vary much over time, however, annual *changes* in the current portion of tax expense are unlikely to be affected by this source of cross-sectional heterogeneity.

expense is presumed to be used for earnings management (e.g. Dhaliwal et al., 2004, Frank and Rego, 2006, Schrand and Wong, 2003, and Hanlon, 2005), and even though a lower tax expense results in higher after-tax earnings, it could be viewed as bad news if investors believe that tax expense was managed downward and that effort to manage earnings is associated with a higher likelihood that pre-tax income surprise is managed upward or expectations of future pre-tax incomes have fallen.

These studies that argue why tax expense surprise, or its current and deferred components, provides information incremental to pre-tax income surprise recognize that a) the ability of tax expense to proxy for profitability is inversely related to the value relevance of pre-tax income (e.g., Ayers et al, 2009) and b) the value relevance of pre-tax income varies cross-sectionally (e.g., Hanlon et al., 2005).

To review, the prior literature has offered reasons why the coefficient on tax expense surprise is affected by three factors: a) the value-relevance of pre-tax income, b) the value-relevance of tax expense, and c) the ability of tax expense to capture value lost to taxes paid. Whereas the traditional approach is to focus on the third effect, the more recent literature studying the ability of tax expense to proxy for profitability focuses on the second effect, but recognizes that the first effect also plays a role.

2.2 Our predictions.

To explain observed variation across studies in the sign and magnitude of the coefficient on tax expense surprise, we propose the following structure that governs how the three factors that influence the valuation coefficient on tax expense surprise interact with each other. First, we posit that tax expense can proxy for profitability only if pre-tax income reflects profitability poorly. In essence, the first factor is critical: an opportunity is created for tax expense to reflect

profitability only as the value relevance of pre-tax income declines. Second, the coefficient on tax expense reflects the net effect of two opposing roles: the traditional value-lost-to-taxes role (third factor) and the proxy-for-profitability role (second factor) created when the value relevance of pre-tax income is low.

Given the valuation focus of our paper, we leave a careful study of the third factor to tax researchers more familiar with the characteristics of tax variables (such as the persistence of different components of book-tax differences) that influence the extent to which those variables reflect value lost. In effect, we study cross-sectional variation in the first and second factors and assume that variation in the third factor is randomized. Based on the effects of the first two factors, the discussion above suggests the following two predictions.

Prediction 1 (P1): The coefficient on tax expense surprise is negatively related to the ability of pre-tax income surprise to reflect underlying profitability, ceteris paribus.

Prediction 2 (P2): The coefficient on tax expense surprise is positively related to the ability of tax expense surprise to incrementally reflect underlying profitability, beyond that reflected by pre-tax income surprise, ceteris paribus.

To investigate the first prediction, we reviewed various reasons documented in the earnings response coefficient (ERC) literature for variation in the value relevance of earnings. These reasons include economic factors such as interest rates and risk, accounting rules, and earnings management. As our objective is to illustrate the effects of the value relevance of pre-tax income, rather than provide a comprehensive review, we select for our main analyses two factors that have a large and clear impact on ERC: the sign of earnings and the magnitude of earnings surprise. Loss firms are associated with lower ERC than profit firms (e.g., Hayn, 1995) and firm-years with large earnings surprises are associated with much lower ERC than those with

small earnings surprises (e.g., Freeman and Tse, 1992). In robustness analyses, we consider other factors for variation in the value relevance of pre-tax income, as well as regression specifications other than the standard ERC regression specification of returns on earnings surprises.

The ability of a variable to reflect underlying profitability, also referred to as value relevance, is represented by a positive relation between surprises for that variable and returns. Higher value relevance of pre-tax income should be reflected as a more positive coefficient on pre-tax income surprise. Based on the prior research discussed earlier in this section, we expect value relevance to be higher when pre-tax income is positive and when the magnitude of surprise is small.

According to the first prediction, subsamples reporting profits and small pre-tax income surprises, for which pre-tax income surprise is associated with high value relevance and large coefficients, should be associated with negative coefficients on tax expense surprise, reflecting mainly the traditional role of tax expense. For subsamples reporting losses or large pre-tax income surprise, the coefficient on pre-tax income surprise should be smaller and the coefficient on tax expense surprise should turn positive.

Turning to the second prediction, we use the same logic as for the first prediction and select the sign of tax expense and the magnitude of tax expense surprise as the two factors that explain variation in the value relevance of tax expense. As with pre-tax income surprise, we expect the value relevance of tax expense to be higher when tax expense is positive and the magnitude of surprise is small. According to the second prediction increases in that value-relevance should be reflected as larger positive (or smaller negative) coefficients on tax expense surprise, conditional on the value relevance of pre-tax income surprise being low (high).

In the empirical analysis that follows, we first consider the general case based on cross-sectional regressions of annual returns on annual changes in pre-tax income and tax expense for all firms with available data. We then investigate whether those results vary across alternative specifications and alternative samples, based on the two predictions described above.

3. Sample data

We obtain data for our overall sample from two sources: a) annual Compustat files for earnings, tax, and other financial variables, and b) CRSP monthly return files for stock return data. Our sample contains 175,031 firm-years between 1978 and 2009 (inclusive).

Our main dependent variable is the return over a 12-month holding period (RET_t), beginning from the end of the third month of the current fiscal year (year *t*) to the end of the third month of the next year (year *t+1*). The three-month offset between fiscal years and return holding periods is designed to allow time for public disclosure of the financial variables we use.

Our main explanatory variable is tax expense surprise, and is measured as tax expense per share in year *t* minus tax expense per share in year *t-1*. We assume that all income statement variables are described by a random walk process, which allows us to use the first difference to proxy for the unexpected portion of that variable. We also consider an alternative specification where the level of income statement variables proxies for the surprise in those variables.

Since variables are measured at a per-share level, we adjust for stock splits and stock dividends to maintain consistency when computing year-to-year changes. We scale variables by lagged price to improve across-share comparisons, and we measure lagged price at the end of the third month of the current fiscal year to maintain consistency with our return measure. Each year, all variables (except returns) are Winsorized at 1 percent and 99 percent of their cross-sectional distributions. Details of all variables are provided in the Appendix.

Table 1 provides descriptive statistics for the variables we use. When investigating the relation between unexpected tax expense and returns, we control for contemporaneous changes in pre-tax income (ΔPTI_t). To control for the "normal" portion of observed returns we include three variables that explain cross-sectional variation in returns: a) the market value of equity at the end of the prior fiscal year (MV_{t-1}), b) the book-to-market ratio at the end of the prior fiscal year (BM_{t-1}), and c) observed returns over a prior 12-month period (RET_{t-1}), computed from the end of the second month of the prior fiscal year to the end of the second month of the current fiscal year. We insert a one-month gap between RET_{t-1} and RET_t to mitigate the potential for negative correlation between adjacent-period returns (see, for example, Jegadeesh and Titman, 1995).

Panel A of Table 1 provides statistics describing the pooled distribution of different variables. Despite Winsorizing all regressors at 1 and 99 percent of the cross-sectional distributions, the minimum and maximum values for some variables remain quite extreme. To mitigate the possibility that our regression results are skewed by outlier values, we confirm that our results are not affected substantively when our general case analyses are repeated based on a) regressors that have been Winsorized at the 2 and 98 percentiles as well as at the 5 and 95 percentiles and b) decile ranks of the regressors.[13]

Panel B of Table 1 provides Pearson and Spearman correlations between pairs of some of the key variables. Most correlations are significant at the 1 percent level. As expected, returns are positively related to changes in profits (both pre-tax and after-tax). Returns are also positively related to changes in tax expense. This positive correlation should not be interpreted, however, as

[13] The coefficients on changes in pre-tax income and tax expense for our general case results reported in column 4 of Table 2 for the case of Winsorization at 1 and 99 percent increase when we Winsorize at 2 and 98 percent, and then increase further when we Winsorize at 5 and 95 percent. Regressions based on decile ranks result in very significant t-statistics that are higher (lower) than those reported in column 4 of Table 2 for changes in pre-tax income (tax expense).

suggesting that increases in tax expense contain *incremental* good news, beyond that provided by changes in pre-tax income, because changes in tax expense and pre-tax income are strongly positively related.

4. Empirical results

4.1 Regressions of stock returns on earnings or earnings components

We start with the general case based on cross-sectional regressions of annual returns on annual changes in earnings for all firms with available data. Then we decompose earnings into pre-tax income and tax expense.

Table 2 contains the mean coefficients from estimating 32 annual regressions of returns on changes in profit measures and changes in tax expense. Column 1 refers to the simple regression of returns on changes in (after-tax) earnings, as described by equation (1) below.

$$RET_t = \alpha_0 + \alpha_1 \Delta E_t + \omega_t \qquad (1)$$

The slope coefficient on ΔE_t, or ERC, is 0.195 and the R^2 is 2.1 percent. While this ERC and R^2 are generally lower than the corresponding values observed in prior research, it has long been established that both ERCs and associated values of R^2 are quite low for cross-sectional regressions estimated at the firm level. For example, Lev (1989) reviews a number of extant studies and concludes that "The correlation between earnings and stock returns is very low, sometimes negligible." The ERC values are often well below 1 and R^2 values often below 5 percent. To be sure, some studies document a strong return/earnings relationship. As we show later, sample selection and treatment of outliers, such as excluding loss firms or firms with large earnings surprises, play an important role in raising the level of ERCs and R^2.

Including the three control variables that explain returns increases the slope coefficient on ΔE_t slightly to 0.201 (see results reported in column 2), and also increases the adjusted R^2 from

2.1 percent to 5.0 percent. Consistent with prior research, the coefficients on $Log(MV_{t-1})$ and BM_{t-1}, are negative and positive, respectively, though the former is not statistically significant. The coefficient on RET_{t-1} is negative but insignificant, which is inconsistent with prior research documenting significant positive momentum in adjacent period returns. [14]

Column 3 in Table 2, which represents our results for the general case, repeats the analysis in column 2 but replaces changes in net income in equation (1) with changes in pre-tax income (ΔPTI) and changes in tax expense (ΔTAX), as described by equation (2) below.

$$RET_t = \beta_0 + \beta_1 \Delta PTI_t + \beta_2 \Delta TAX_t + \varepsilon_t \qquad (2)$$

The results in column 3 of Table 2 indicate clearly that the proxy-for-profitability role for tax expense dominates its traditional role for the general case considered here. The coefficient on tax expense surprise is positive (0.584) and the t-statistic of 8.66 is almost twice as high as that on pre-tax income surprise. Note that the magnitudes of β_1 and β_1 are not directly comparable when both surprises are proxying for news about underlying profitability. If both surprises had similar effects and the tax rate is 35 percent, the coefficient on tax expense surprise (β_2) will be about three times (100/35) that on pre-tax income surprise, ceteris paribus.[15]

Finally, we consider the value-relevance of losses by partitioning the sample into profit and loss firms. The results in Hayn (1995) suggest that the value-relevance of pre-tax income declines if pre-tax income surprise is derived from firm-years reporting losses. On our first prediction, we expect firms reporting losses in either the current or lagged year to have less value-relevant pre-tax income surprise, which should in turn result in higher (more positive or less negative) coefficients on tax expense surprise.

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[14] The inconsistency is likely due to the momentum effect being weakest for the annual windows we consider here, relative to the monthly and quarterly windows also considered in the Finance literature.

[15] The magnitude of pre-tax income (tax expense) surprise will be 100/65 (35/65) of the magnitude of underlying profitability surprise, which will cause the ratio of β_1/β_2 to be 35/100.

The results reported in columns 4 and 5 of Table 2 are consistent with prediction 1. Firm-years with negative earnings in either year *t* or *t-1* are referred to as the Loss subsample, and all remaining firm-years are included in the Profit subsample. The Loss subsample, which contains just over 35 percent of our overall sample, is associated with a lower coefficient on pre-tax income surprise and a higher coefficient on tax expense surprise, relative to the results observed for the Profit subsample.[16] The coefficient on tax expense surprise for the Profit subsample is no longer positive (it is negative but insignificant), which suggests that the dominance of the proxy-for-profitability role observed for the general case (column 3) is driven by the inclusion of firms reporting losses in either year *t* or *t-1*.[17]

4.2 The effect of the magnitude of pre-tax and tax expense surprises.

Prior studies documenting a non-linear relation between returns and earnings surprises (e.g., Freeman and Tse, 1989) suggest that the value-relevance of pre-tax income is highest for small magnitudes of pre-tax income surprise and declines as pre-tax income surprise becomes more positive or more negative. Similarly, we expect lower value relevance for large tax expense surprises. Taken together, the coefficients on tax expense surprises are related to the magnitude of pre-tax income and tax expense surprises. We consider two ways to examine the impact of extreme values of pre-tax income and tax expense surprises: a) truncate larger sections of the left and right tails of the pre-tax income or tax expense surprise distribution, and b) partition the sample into groups based on magnitudes, or absolute values, of pre-tax income and tax expense surprises.

[16] The fraction of firms reporting losses in adjacent periods (persistent losses) appears to have grown over time. Dhaliwal et al. (2010) focus on firms reporting losses, and investigate how information in taxable income, net operating losses, and the valuation allowance can be used to estimate the persistence of losses.

[17] We also consider partitions based on the sign of pre-tax income. The subsample of Loss firms is much smaller and the difference between results for Profit and Loss subsamples is also smaller.

Panel A of Table 3 contains the results of estimating equation (2) on subsamples derived from truncating the top and bottom 1, 2, 5, 10, and 25 percent of the distribution of pre-tax income surprise. The first column, which is based on the overall sample with no truncation, is identical to column 3 of Table 2. Moving across from left to right, the value relevance of pre-tax income surprise—indicated by the magnitude of the coefficient on ΔPTI—increases monotonically with the extent of truncation, from 0.151 for the overall sample to 4.422 when firm-years in the top and bottom 25 percent of pre-tax income surprise are eliminated. As expected by prediction 1, the coefficient on tax expense surprise declines monotonically from 0.584 for the overall sample to -0.803 for the most truncated subsample. Eliminating extreme values of pre-tax income surprise increases the value relevance of pre-tax income, which translates into a lower opportunity for tax expense to proxy for profitability. The negative and significant coefficients on tax expense surprise in the two right-most columns suggest that the proxy-for-profitability role is suppressed substantially for those two subsamples.

The results in Panel B of Table 3 describe how the coefficient on tax expense surprise varies as we eliminate more observations from both tails of the tax expense surprise distribution. The results in the left-most column provide the benchmark reported in Table 2 for the overall sample with no truncation. As the extent of truncation increases from the top and bottom 1 percent of the distribution (in the second column) to the extreme 25 percent of the distribution (in the right-most column), the coefficient on tax expense surprise increases monotonically from 1.220 to 11.673. These results are consistent with prediction 2. Despite the correlation between surprises in tax expense and pre-tax income, deleting extreme values of tax expense surprise has very little impact on the coefficient of pre-tax income surprise: it remains within a relatively narrow range across the six columns. Taken together, the results in Table 3 suggest that the

extent to which tax expense proxies for profitability (indicated by more positive values of the coefficient) a) declines as the value relevance of pre-tax income increases, and b) increases as the value relevance of tax expense increases.

As a second approach to examine the impact of the magnitude of surprises for pre-tax income and tax expense, we conduct a two-way sort based on the absolute values of the two variables. Specifically, we first sort firms into three terciles based on the magnitude of pre-tax income surprises each year. For each resulting $|\Delta PTI|$ tercile, we further sort firms into three groups based on the magnitude of tax expense surprises.[18] In this way, we have nine groups with varying magnitudes of ΔPTI and ΔTAX.

Table 4 contains the results of estimating equation (2) on the nine subsamples created by forming groups based on the distribution of magnitudes (or absolute values) of pre-tax income and tax expense surprises each year. Firm-years with the lowest magnitudes of ΔPTI in the first tercile (G1) are projected to have the highest value relevance and firm-years in G3 with extreme negative and positive values of ΔPTI are projected to have the lowest value relevance. Similarly, ΔTAX is projected to have the highest (lowest) ability to proxy for profitability for firm-years with the lowest (highest) magnitudes of ΔTAX in Terciles G1 (G3).

Panel A of Table 4 shows that the coefficients on ΔPTI decline as we move from the left-most column to the right-most column. That is, holding constant the value relevance of tax surprise in each row, increasing the magnitude of pre-tax income surprise reduces its value relevance. Turning from rows to columns, we find that the coefficients on pre-tax income surprise are relatively stable as we move from the top row to the bottom row in each column.

[18] We also tried a two-way independent sort by the magnitudes of ΔPTI and ΔTAX and find similar results. Given the positive correlation between magnitudes of the two surprises, there is disproportionate clustering along the main diagonal, with relatively few observations in most off-main diagonal cells.

That is, the coefficient on pre-tax income surprise is unaffected by the magnitude of tax expense surprise, when the value relevance of pre-tax income is held constant.

Our main interest is, however, in variation in the coefficient on tax expense surprise across the rows and columns. Our predictions suggest that the coefficient on *ΔTAX* should decrease with the value relevance of *ΔPTI* and increase with the value relevance of *ΔTAX*. Specifically, the coefficients on *ΔTAX* should a) increase from left to right in each row as the value-relevance of pre-tax income declines while controlling for the magnitude of tax expense surprise (based on P1), and b) decline from top to bottom in each column as the value-relevance of tax expense surprise declines while controlling for the magnitude of pre-tax income surprise (based on P2). The results reported in Panel B of Table 4 strongly support both predictions.

Combining both predictions, we expect the coefficient on *ΔTAX* should increase from the bottom-left corner to the top-right corner. Consistent with that joint prediction, the coefficient on *ΔTAX* increases from -1.253 (t=-5.26) in the bottom-left cell to 11.850 (t=6.47) in the top-right cell. In sum, using the magnitude of surprises as a measure of value relevance, we find strong support for our predictions.

4.3 Time-series vs. cross-sectional regressions.

Greater sample homogeneity should increase the value relevance of pre-tax income surprise, which would lower the coefficient on tax expense surprise as it reduces the opportunity for tax expense to proxy for profitability. Prior results (e.g., Teets and Wasley, 1996) suggest that within-subsample homogeneity is greater for time-series regressions estimated separately for each firm, relative to cross-sectional regressions estimated across firms for each year. We explore the difference between time-series and cross-sectional regressions using a panel of

26,629 firm-years which represents 815 firms with at least 30 years' data available between 1978 and 2009.

Panel A of Table 5 reports coefficient estimates from cross-sectional and time-series regressions. The left (right) half describes the coefficient estimates from the annual cross-sectional (firm-specific time-series) regressions. The results are consistent with Prediction 1. The mean coefficient on pre-tax income surprise is almost seven times as high in the time-series regressions, relative to cross-sectional regressions, and the mean coefficient on tax expense surprise is smaller for the time-series regressions, and not significantly different from zero.

Firm-specific time-series regressions also offer an ideal setting to explore cross-sectional variation in the coefficient on *ΔTAX*. One advantage of time-series regressions is that we can estimate firm-specific coefficients on *ΔPTI* and *ΔTAX* and then link these coefficients to firm-specific characteristics.

In Panel B of Table 5, we report the results of regressions of the coefficients on *ΔTAX* on the coefficients on *ΔPTI* and other firm characteristics related to our predictions. The coefficient on *ΔPTI* (column 1) relates to our prediction P1, and the coefficients on *NEG_TAX* and the *magnitude of ΔTAX* (columns 2 and 3) relate to our prediction P2. *NEG_TAX* represents the fraction of years for each firm when tax expense is negative. Given that the ability of tax expense to proxy for profitability is lower when tax expense is negative and when the magnitude of *ΔTAX* gets bigger, we expect the coefficient on *ΔTAX* to be negatively correlated with *NEG_TAX* and the average magnitude of *ΔTAX* for that firm. The corresponding coefficients in column 4 describe the incremental effects of each prediction, when controlling for the remaining predictions' effects on the *ΔTAX* coefficient.

The results in column 1 and column 4 indicate that the coefficients on *ΔPTI* and *ΔTAX* are highly negatively correlated, with a t-statistic of about −26. The relatively high R^2 observed in Column 1 suggests that much of the across-firm variation in the coefficient on tax expense surprise is explained by inverse variation in the coefficient on pre-tax income surprise. This result confirms P1, as it suggests that increases in the value relevance of pre-tax income limit the opportunity for tax expense to proxy for profitability. The negative coefficients observed for *NEG_TAX* and the *magnitude of ΔTAX* in columns 2, 3, and column 4 are consistent with prediction P2. The relatively low incremental R^2 associated with these two variables (from 0.454 in Column 1 to 0.471 in Column 4) suggest that our proxies for P2 explain less across-firm variation in the coefficient on tax expense surprise, relative to that explained by our proxies for P1.

5. Additional analyses

We conduct a number of additional analyses on our predictions. Many of these analyses represent alternative empirical implementation of our predictions. We also revisit a prior study (Ayers et al 2009) and re-interpret the empirical results in light of our framework.

5.1 Current vs. deferred tax expense

Based on our discussion in Section 2.1 on the relative ability of current and deferred taxes to proxy for profitability, we offer some reasons why we expect the current component of tax expense surprise to proxy better for profitability, relative to the deferred component. For example, the current component is derived from an alternative measure of profitability, computed under tax rules, and is thus likely to proxy for underlying profitability in ways that

GAAP pre-tax income may not.[19] In contrast, the argument for why the deferred component of tax expense might proxy for profitability is more indirect, as it is based on being an inverse signal of earnings quality. If so, according to P2, we should observe more positive coefficients on the current component of tax expense surprise, relative to the deferred component.

Table 6 contains results for estimating equation (2) after splitting tax expense surprise into its two components. These results should be compared to the results reported in Panel A of Table 3, where the two components of tax expense surprise are combined. The first column provides results for the base case without truncation of the sample based on the magnitude of pre-tax income surprise. Going from left to right, we truncate more extreme values until the bottom and top 25 percent of the distribution of pre-tax income is dropped in the right-most column.

Results reported in the first column of Table 6 confirm P2 and the superior ability of the current component of tax expense surprise to proxy for profitability. The coefficient on $\Delta CTAX$ and the related t-statistic are substantially higher than those on $\Delta DTAX$. As in Table 3, greater levels of truncation increase the value relevance of pre-tax income surprise, indicated by the steady increase in coefficient values and associated t-statistics. Consistent with P1, this increase in the value relevance of pre-tax income surprise is associated with a decline in the ability of tax expense surprise to proxy for profitability: the coefficients on the current and deferred components of tax expense surprise decline from left to right. When the value relevance of pre-tax income is sufficiently high, as in the right-most column, even the current component of tax expense is unable to proxy for profitability.

[19] The results in Hanlon et al. (2005) suggest that the current component of deferred tax contains considerable ability to proxy for underlying profitability.

The coefficient on *ΔCTAX* is, however, always substantially higher (or less negative) than that on the deferred component, which is consistent with P2. Although the coefficient on the deferred component of tax expense surprise is positive and significant for the overall sample it turns negative at relatively low levels of truncation, indicating that the proxy-for-profitability role for the deferred component is low and diminishes quickly as the value relevance of pre-tax income increases. In contrast, the coefficient on the current component of tax expense remains positive and significant in all but the right-most column, where the coefficient is insignificantly negative.

5.2 Analysis of the Profit subsample

In Table 2, we find that the coefficient on tax expense surprise is no longer positive for the Profit subsample, which raises the possibility that our main results are driven by loss firms. To investigate this possibility, we repeated our main analyses on the Profit subsample. Untabulated results confirm that our results continue to hold for the Profit subsample. For example, the coefficient on *ΔTAX* becomes reliably positive (= 2.528 with a t-statistic=10.16) once we truncate the distribution of *ΔTAX* at the top and bottom 1 percent and increases further to 9.870 (t-statistic=10.09) if truncating at the extreme 25 percent of the distribution. In the two-way-sort analysis, similar to Table 4 for the overall sample, we find that the coefficient on *ΔTAX* increases from -1.841 (t-statistic=-3.25) in the bottom-left corner to 7.643 (t-statistic=10.26) in the top-right corner. This evidence suggests that our main conclusions are unaffected by the inclusion or exclusion of loss firms.

5.3 Different regression specifications

As mentioned in Section 2, whereas the prior literature has used returns most often as the dependent variable, some studies are based on market values of equity as the dependent variable.

In particular, the results in Bell and Gyeszly (2012) suggest that regressions of market value on book value and levels of pre-tax income and cash tax paid create conditions that are less conducive for cash taxes to proxy for profitability, relative to the returns regressions. We use a similar specification, shown below as equation (3), as well as estimate separate regressions on profit and loss subsamples.

$$MV_t = \beta_0 + \beta_1 BV_t + \beta_2 E_t + \varepsilon_t = \gamma_0 + \gamma_1 BV_t + \gamma_2 PTI_t + \gamma_3 TAX_t + \varepsilon_t \qquad (3)$$

The results reported in Table 7 confirm that the general tenor of the results obtained in Bell and Gyezly (2012) for cash taxes are observed for tax expense. Columns 1 and 2 are estimated on the overall sample with earnings and levels of pre-tax income and tax expense, respectively. The coefficient on pre-tax income in column 2 is positive and similar in magnitude to the coefficient on earnings in column 1. And the coefficient on tax expense in column 2 is negative and smaller, but not substantially smaller, than the coefficient on pre-tax income.

The results in columns 3 and 4 are based on estimating the two regressions on the profit subsample, with positive earnings. Relative to the results in columns 1 and 2, the magnitudes of all coefficients rise substantially, but the coefficient on tax expense remains negative and of the same order of magnitude as that on pre-tax income. The coefficient on book value is now insignificant, and the valuation regression is effectively a price-earnings model: prices are about 11 times earnings, and earnings can be restated as pre-tax income less tax expense.

The results in columns 5 and 6 repeat the same regressions on the loss subsample, with negative earnings. The coefficients on earnings and pre-tax income are negative, and the coefficient on tax expense is negative but insignificant. Equation (3), especially in the price-earnings model form that seems to fit the profit subsample well, is fundamentally inappropriate for negative earnings as prices cannot be negative. We believe the loss subsample results are not meaningful.

The main implication of the market value regressions estimated in Table 7 is that tax researchers, focused on the traditional role for tax expense and its components, might wish to consider this specification over the return specification that is more popular in the literature. This specification appears to boost the value relevance of pre-tax income and suppress the proxy-for-profitability role for tax expense. An alternative approach is to use the return specification, but truncate a substantial amount of the left and right tails of the pre-tax income distribution, as in Table 3. The level of truncation required to get reliably negative coefficients for tax expense is quite substantial, however, and the results obtained from such heavily truncated sample might be less generalizable. Two other potential ways to increase the value relevance of pre-tax income are discussed next.

5.4 Other robustness analyses

Prior literature shows that the relationship between returns and earnings surprise is weaker for one-time items, such as write-offs, than it is for other earnings components (e.g., Elliott and Hanna, 1996). If so, separating one-time items from pre-tax income should increase the value relevance of pre-tax income surprise and thus reduce tax expense's proxy-for-profitability role.

To identify one-time items, we focus on the difference between GAAP EPS as reported on COMPUSTAT and "Actual" EPS as reported on IBES, for a subsample of 71,206 firm-years with non-missing values of required data between 1985 and 2009. We assume that the IBES number, which represents the EPS components that analysts seek to forecast, contains core or recurring components of earnings and the difference represents one-time or non-recurring items. We then separate changes in pre-tax income into core (*ΔPTI_CORE*) and one-time (*ΔPTI_ONE*)

components.[20] In untabulated results, we find that the coefficient on surprises in core pre-tax income is higher than that on one-time items. More important, the coefficient on tax expense surprise is cut in half (coeff.=0.307, t=2.02) when compared with the case of no separation (coeff.=0.622, t=5.96), which suggests that the higher value-relevance exhibited by the two components of pre-tax income surprise leaves less room for tax expense surprise to proxy for profitability.

To consider a different specification, we compare the traditional case of deflating regressors by market price with the alternative of leaving them undeflated. Some prior research (e.g., (DeGeorge et al. 1999) has considered undeflated earnings surprises, and more recently the results in Cheong and Thomas (2012) suggest that the value relevance of earnings surprise is increased in undeflated regressions because deflation increases the influence of small firms with less value-relevant earnings surprise. In untabulated analysis, we estimate undeflated regressions by regressing annual changes in price per share (cum dividend) on changes in pre-tax income and tax expense per share. The results confirm the results in Cheong and Thomas (2012): the coefficient on pre-tax income surprise is now 4.259, which is considerably higher than the 0.151 reported for the deflated regression reported in column 3 of Table 2. Consistent with our prediction, the coefficient on tax expense surprise for the undeflated regression is much lower than that reported for the deflated regression (-1.153 versus 0.584).

5.5 Implications for prior studies – revisit Ayers et al. (2009).

In this subsection, we revisit the analyses in Ayers et al (2009) to illustrate how inferences are affected by different proxies for the value relevance of pre-tax income and tax variables. The results in Ayers et al. (2009) suggest that the incremental informativeness of

[20] Given that the COMPUSTAT and IBES EPS numbers are after-tax measures of earnings, we compute the core and one-time components of pre-tax income as follows: a) *PTI_ONE* is GAAP EPS minus IBES EPS divided by (1-35 percent), and b) *PTI_CORE* is *PTI* minus *PTI_ONE*.

taxable income is higher when taxable income is high quality (indicated by firms that engage in less tax planning) and book income is low quality (indicated by firms that engage in greater management of book accruals). In effect, the first (second) finding is related to our prediction P2 (P1), given the assumption that more tax planning (earnings management) reduces the value relevance of taxable income (pre-tax income). The main difference between the two papers is the specific proxies used for value relevance of pre-tax income and tax variables.[21] Whereas we use the signs and surprise magnitudes, Ayers et al (2009) use corresponding measures of quality: low effective tax rates imply low quality of taxable income and large accruals imply low quality of pre-tax income. We investigate whether inferences about the relevance of their quality measures are affected when we also consider our proxies for value relevance.

Following Ayers et al. (2009), we define the incremental information content of taxable income ($R^2_{\Delta PTI+\Delta TI} - R^2_{\Delta PTI}$) as the change in adjusted R^2 from model (4) to model (5) below.

$$R_t = \alpha_0 + \alpha_1 \Delta PTI_t + e_t \qquad (4)$$

$$R_t = \beta_0 + \beta_1 \Delta PTI_t + \beta_2 \Delta TI_t + e_t \qquad (5)$$

where R_t is the 16-month buy-and-hold market-adjusted return starting at the beginning of fiscal year t and ending 4 months after the end of fiscal year t. ΔPTI_t and ΔTI_t are changes in pre-tax income and taxable income, deflated by the market value of equity at the start of fiscal year t. Details of all variables are provided in the Appendix.

Similar to Ayers et al. (2009), we define high tax planning firm-years as those for which five-year effective tax rates are in the bottom quintile, ranked by two-digit SIC industry and year, where five-year effective tax rate is current tax expense divided by pre-tax income, each summed

[21] As taxable income in Ayers et al. (2009) is effectively a grossed up version of the current portion of tax expense, it is reasonable to expect our findings regarding surprises in tax expense and the current portion of tax expense surprise to carry over to taxable income.

over five years from *t-4* to *t*. High abnormal accrual firms are those firm-years for which absolute values of abnormal accruals are in the top quintile, ranked within two-digit SIC industry and year, where abnormal accruals are based on the following modified Jones model estimated cross-sectionally each year within two-digit SIC industries with a minimum of 10 observations.

$$TACC_t / TA_{t-1} = \alpha_0 + \alpha_1(1/TA_{t-1}) + \alpha_2(\Delta SALE_t - \Delta REC_t)/TA_{t-1} + \alpha_3(PPE_t / TA_{t-1}) + e_t \quad (6)$$

where *TACC* is total accruals measured as the change in current assets plus the change in short-term debt less the change in current liabilities, the change in cash, and depreciation and amortization expense; *ΔSALE* is the change in sales, *ΔREC* is the change in accounts receivable; *PPE* is gross property, plant, and equipment, and *TA* is total assets. As we need five previous years' data to calculate effective tax rates, our sample period extends from 1983 to 2009.

Panel A of Table 7 shows the results of replicating the analysis in Ayers et al (2009) for our sample. Consistent with the finding in Ayers et al., we find that *ΔTI* has lower incremental information content for high tax planning firms than for other firms. Adding *ΔTI* to the regression model increases adjusted R^2 by 0.003 for high tax planning firms, compared with 0.010 for other firms. The difference in these two incremental R^2 is statistically significant at the 0.01 level. Also consistent with Ayers et al, we find that the incremental information content of *ΔTI* is higher for high accrual firms than for other firms and that the difference in $R^2_{\Delta PTI+\Delta TI}$ - $R^2_{\Delta PTI}$ is statistically significant at the 0.10 level.

Next we examine the extent to which the quality of taxable and book income used in Ayers et al. to capture levels of corresponding value relevance overlaps with one of our measures of value relevance for taxable and book income: smaller values of surprise are associated with higher value relevance. To determine the relation between the value relevance measures in the

two studies, we regress effective tax rates and absolute abnormal accruals on magnitudes of surprise in pre-tax income and taxable income, estimated by two-digit SIC industry and year. The following models summarize our results based on the distribution of coefficient estimates we observe across industries and years. The coefficients reported below are mean values for those distributions and the t-statistics (provided in parentheses) are based on the associated standard deviations.

$$ETR_t = \underset{(33.20)}{0.297} + \underset{(2.53)}{0.221}^{*} |\Delta PTI_t| + \underset{(1.64)}{1.071}^{*} |\Delta TI_t| + e_t \quad (7)$$

$$|Abnormal\_TACC_t| = \underset{(50.44)}{0.059} + \underset{(3.18)}{0.072}^{*} |\Delta PTI_t| + \underset{(0.03)}{0.001}^{*} |\Delta TI_t| + e_t \quad (8)$$

These results show that both effective tax rates and absolute abnormal accruals are positively correlated with the magnitude of pre-tax income surprises. The magnitudes of taxable income surprise appear to be unrelated to the two quality measures. Given that value relevance of pre-tax income is negatively related to the magnitude of pre-tax income surprise, which is in turn negatively related to the coefficient on surprises in tax expense and taxable income, the results observed in Panel A of Table 7 may simply be reflecting the correlation between magnitudes of pre-tax income surprise and the two measures of quality of taxable income and book income proposed in Ayers et al. (2009).

To investigate the incremental relevance of these quality measures, we use the residuals from Models (7) and (8) to sort firm-years into quintiles based on *residual* effective tax rates and *residual* magnitude of abnormal accruals, after controlling for magnitudes of surprises in pre-tax income and taxable income. Conceptually, the residuals are independent of the magnitudes of surprise for pre-tax income and taxable income but still capture the effects of tax planning and earnings management proposed by Ayers et al. (2009). Panel B of Table 7 reports the results

based on these residual measures. We find that the significant results in Panel A are no longer observed when we control for our measure of the value relevance of pre-tax income and taxable income.

As a final test, we repeat the empirical analysis on a relatively clean sample, which excludes negative values of pre-tax income and taxable income, and extreme values (> 100 percent of market value of equity) of surprises for those two variables. Our premise is that the clean sample is less likely to be affected by observations with low value relevance of pre-tax income and taxable income. If the results in Panel A are due to the effects of the quality measures proposed by Ayres et al. (2009), they should not be affected by deleting these observations with low value relevance. The results for this clean sample are reported in Panel C of Table 8. Again, we find that the difference in incremental information content of taxable income observed in Panel A for firm-years associated with high tax planning and low earnings quality is no longer observed for the clean sample.

The main implication of our results in Table 8 is that care should be taken when inferring that particular measures of value relevance for pre-tax income and tax variables are responsible for cross-sectional variation in coefficients on the tax variables. Value relevance for book and tax income is affected by a host of factors that are correlated to each other, and it is not easy to link specific factors to observed variation in the valuation coefficients on tax variables.

6. Conclusion

We investigate two seemingly contradictory sets of results regarding the valuation implications of tax expense surprise, holding constant surprises in pre-tax income. One set of results suggests that more tax expense is bad news; i.e., a regression of returns on surprises in pre-tax income and tax expense indicates a negative coefficient on tax expense surprise. This

negative relation with value is consistent with intuition as tax expense should reflect the value lost to taxes paid and represents the traditional valuation role for tax expense. The other set of results are consistent with the opposite view—more tax expense is good news. The two opposite sets of results appear to have evolved independently in the literature and the apparent contradiction has not been emphasized. One possible reason for the lack of emphasis is that many of the results in the second set document a positive relation between returns and the current component of tax expense surprise, rather than tax expense.

We first confirm that the second set of results is representative of the general case for cross-sectional regressions of returns on surprises in pre-tax income and tax expense estimated over all firm-years. Also, the coefficients on both the current and deferred components of tax expense for the general case are reliably positive. Apparently, tax expense proxies incrementally for underlying after-tax profitability, beyond that reflected in pre-tax income, where higher current and deferred tax expense represent higher, rather than lower, underlying profitability. The prior literature suggests that the current portion of tax expense might reflect profitability because it is derived from taxable income—the profit measure computed under tax rules, and the deferred portion might reflect profitability because it might be inversely related to earnings quality, which is itself negatively related to value.

We then propose an explanation for variation in the sign and magnitude of the coefficient on tax expense surprise across different samples and regression specifications. The observed coefficient represents the net effect of the two conflicting roles that tax expense can assume—proxy for profitability and traditional measure of value lost to taxes—but the strength of the proxy-for-profitability role is inversely related to the extent that pre-tax income reflects profitability. If pre-tax income surprise is related strongly to news about underlying profits

(represented by revisions in the market's expectations of future earnings), we expect the traditional role to dominate and the coefficient on tax expense surprise should be negative. If, however, pre-tax income surprise is only weakly related to news about underlying profits, an opportunity is created for tax expense surprise to proxy for unexplained news about underlying profits. That opportunity is realized in cases where tax expense is in fact related strongly to underlying profit news, and in those cases the coefficient on tax expense surprise is positive.

Our explanation suggests two predictions relating to variation in the coefficient on tax expense surprise based on a) variation in the ability of pre-tax income surprise to reflect profitability, and b) variation in the ability of tax expense surprise to proxy for profitability. Our results are consistent with these two predictions.

Overall, our results suggest that the coefficient on tax expense and its components or on components of book-tax differences be interpreted with caution, because it reflects the net effect of the abilities of pre-tax income and tax expense to reflect profitability as well as the traditional view of tax expense capturing value lost in tax payments. As the relative importance of these factors varies across samples and specifications, inferences are clouded unless researchers can control for the separate impact of each factor.

Appendix: Variable definitions

(Annual COMPUSTAT data items are provided in parentheses under Description)

Variables	Description
RET_t	The 12-month buy-and-hold stock returns starting from the end of the 3rd month of year *t* to the end of the 3rd month of year *t+1*.
ΔE_t	Changes in earnings per share (IB/(CSHO*AJEX)) from year *t-1* to year *t* scaled by stock price at the end of the 3rd month of the current fiscal year.
ΔTAX_t	Changes in tax expense per share (TXT/(CSHO*AJEX)) from year *t-1* to year *t* scaled by stock price at the end of the 3rd month of year *t*.
ΔPTI_t	changes in income before tax per share from year *t-1* to year *t* scaled by stock price at the end of the 3rd month of year *t*. Calculated as $\Delta E_t + \Delta TAX_t$
$\Delta CTAX_t$	Changes in current tax expense per share from year *t-1* to year *t* scaled by stock price at the end of the 3rd month of year *t*, where current tax expense per share is TXC/(CSHO*AJEX) if TXC is non-missing and (TXT-TXDI)/(CSHO*AJEX) otherwise.
$\Delta DTAX_t$	Changes in deferred tax expense per share from year *t-1* to year *t* scaled by stock price at the end of the 3rd month of year *t*. Calculated as $\Delta TAX_t - \Delta CTAX_t$
BM_{t-1}	The book-to-market ratio (CEQ/(CSHO*PRCC_F)) at end of year *t-1*.
RET_{t-1}	Prior year's 12-month stock returns with a one-month lag relative to RET_t (from the end of the 2nd month of year *t-1* to the end of the 2nd month of year *t*).
MV_{t-1}	The market value of equity (CSHO*PRCC_F) at end of year *t-1*.
MV_t (Table 7)	The market value of equity three months after a firm's fiscal year end.
BV_t (Table 7)	The book value of equity (CEQ) at the end of fiscal year t.
R_t (Table 8)	The 16-month buy-and-hold market-adjusted return starting at the beginning of fiscal year t and ending 4 months after the end of fiscal year t.
ΔTI_t (Table 8)	The change in taxable income deflated by the market value of equity at the start of fiscal year t, where taxable income is current tax expense (TXC) grossed up by the top US statutory tax rate minus the change in net operating loss carryforwards (TLCF). If current tax expense is missing, we measure current tax expense as the difference between total tax expense (TXT) and deferred tax expense (TXDI).
TACC (Table 8)	Total accruals measured as the change in current assets (ACT) plus the change in short-term debt (DLC) less the change in current liabilities (LCT), the change in cash (CHE), and depreciation and amortization expense (DP).

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Table 1
Descriptive statistics

Panel A: Univariate statistics

Variable	N	Mean	Stdev	Min	Q1	Median	Q3	Max
RET_t	175031	0.171	0.884	-0.999	-0.245	0.050	0.375	58.68
ΔE_t	175031	0.034	1.141	-23.29	-0.031	0.006	0.037	19.09
ΔPTI_t	175031	0.039	1.218	-22.80	-0.041	0.009	0.053	19.92
ΔTAX_t	175031	0.004	0.110	-1.193	-0.008	0.000	0.013	1.380
$\Delta CTAX_t$	175031	0.002	0.060	-0.589	-0.003	0.000	0.008	0.949
$\Delta DTAX_t$	175031	0.002	0.094	-1.760	-0.006	0.000	0.007	1.746
MV_{t-1}	171393	1522.8	6391.8	0.50	25.3	109.9	566.4	117626
BM_{t-1}	171331	0.729	0.672	-1.641	0.315	0.575	0.953	7.644
RET_{t-1}	173126	0.168	1.307	-0.995	-0.222	0.050	0.349	408.26

Panel B: Correlation matrix for key variables Pearson (Spearman) correlations are shown above (below) the main diagonal. 170,971 firm-year observations with non-missing variables

	RET_t	ΔE_t	ΔPTI_t	ΔTAX_t	MV_{t-1}	BM_{t-1}	RET_{t-1}
RET_t	1	0.096**	0.101**	0.103**	-0.025**	0.118**	-0.050**
ΔE_t	0.308**	1	0.961**	0.263**	-0.007**	-0.011**	-0.022**
ΔPTI_t	0.312**	0.960**	1	0.375**	-0.007**	-0.003	-0.021**
ΔTAX_t	0.238**	0.527**	0.655**	1	-0.008**	0.055**	-0.001
MV_{t-1}	0.023**	-0.054**	-0.057**	-0.010**	1	-0.107**	0.007**
BM_{t-1}	0.164**	-0.014**	-0.010**	0.017**	-0.292**	1	-0.112**
RET_{t-1}	-0.003	0.038**	0.040**	0.093**	0.172**	-0.184**	1

** Significant at the 1 percent level.

RET_t is the 12-month buy-and-hold stock return from the end of the 3rd month of the current fiscal year to the end of the 3rd month of the following year. ΔE_t is change in earnings per share. ΔPTI_t is change in pre-tax income per share. ΔTAX_t is change in tax expense per share. $\Delta CTAX_t$ is change in current tax expense per share. $\Delta DTAX_t$ is change in deferred tax expense per share. Changes in earnings can also be expressed as changes in its components: $\Delta SALE_t$ is change in sales per share, $\Delta COGS_t$ is change in cost of goods sold per share, ΔSGA_t is change in selling, general, and administrative expense per share, ΔDEP_t is change in depreciation expense per share, ΔINT_t is change in interest and related expense per share. $\Delta OTHER_t$ is change in other expense per share ($=\Delta SALE_t - \Delta COGS_t - \Delta SGA_t - \Delta DEP_t - \Delta INT_t - \Delta TAX_t - \Delta E_t$). MV_{t-1} is the market value of equity at prior fiscal year end. BM_{t-1} is the book-to-market ratio at prior fiscal year end. RET_{t-1} is prior year's 12-month stock return with a one-month lag relative to RET_t (from the end of the 2nd month of the prior year to the end of the 2nd month of the current fiscal year). All variables are described in more detail in the Appendix. The sample includes 175,031 firm-year observations with non-missing RET_t , ΔPTI_t, and ΔTAX_t from 1978 to 2009. Each year, all variables except for return variables are Winsorized at 1 percent and 99 percent, and all earnings and earnings component variables are scaled by stock price at the end of the 3rd month of the current fiscal year.

Table 2
Regressions of returns on surprises in earnings, pre-tax income, and tax expense

	1	2	3	4	5
Sample	All	All	All	Profit	Loss
Intercept	0.170 (3.59)	0.149 (1.85)	0.149 (1.85)	0.242 (4.62)	0.172 (1.76)
ΔE_t	0.195 (5.80)	0.201 (5.57)			
ΔPTI_t			0.151 (4.48)	1.851 (9.28)	0.038 (3.06)
ΔTAX_t			0.584 (8.66)	-0.134 (-0.64)	0.133 (4.67)
$Log(MV_{t-1})$		-0.011 (-1.43)	-0.011 (-1.36)	-0.019 (-3.99)	-0.041 (-4.12)
BM_{t-1}		0.079 (4.13)	0.073 (3.82)	0.062 (3.79)	0.046 (2.92)
RET_{t-1}		-0.035 (-0.88)	-0.037 (-0.92)	-0.064 (-1.81)	-0.091 (-1.89)
Adj. R^2	0.021	0.050	0.059	0.122	0.037
# of observations	175,031	175,031	175,031	106,930	64,109

This Table describes regressions of contemporaneous returns (RET_t) on earnings surprises (ΔE_t) and its components (ΔPTI_t and ΔTAX_t). Profit firms are defined as those with positive earnings before extraordinary items in both years *t-1* and *t*. Loss firms are defined as those with negative earnings before extraordinary items in year *t-1* or *t*. RET_t is the 12-month buy-and-hold stock return from the end of the 3rd month of the current fiscal year to the end of the 3rd month of the following year. ΔE_t is change in earnings per share. ΔPTI_t is change in pre-tax income per share. ΔTAX_t is change in tax expense per share. All surprise measures are scaled by stock price at the end of the 3rd month of the current fiscal year. MV_{t-1} is the market value of equity at prior fiscal year end. BM_{t-1} is the book-to-market ratio at prior fiscal year end. RET_{t-1} is prior year's 12-month stock return with a one-month lag relative to RET_t (from the end of the 2nd month of the prior year to the end of the 2nd month of the current fiscal year). All variables are described in more detail in the Appendix. The sample includes 175,031 firm-year observations from 1978 to 2009. Each year, all variables except for returns are Winsorized at 1 percent and 99 percent. The coefficient estimates are averages of annual estimates over 32 years; t-statistics in parentheses are Fama-MacBeth t-statistics.

Table 3
Sample truncation based on distributions of surprises in pre-tax income and tax expense

Panel A: Truncation on *ΔPTI*

	No truncation	Top and bottom 1%	Top and bottom 2%	Top and bottom 5%	Top and bottom 10%	Top and bottom 25%
Intercept	0.149 (1.85)	0.148 (1.89)	0.130 (1.68)	0.124 (1.62)	0.107 (1.49)	0.045 (0.71)
ΔPTI_t	0.151 (4.48)	0.303 (6.14)	0.654 (10.22)	1.294 (14.08)	2.144 (16.80)	4.422 (18.70)
ΔTAX_t	0.584 (8.66)	0.580 (7.99)	0.340 (5.04)	0.103 (1.01)	-0.223 (-2.01)	-0.803 (-4.39)
CONTROLS	YES	YES	YES	YES	YES	YES
Adj. R^2	0.059	0.069	0.085	0.097	0.099	0.092
# of obs.	175,031	171,503	168,002	157,491	139,991	87,493

Panel B: Truncation on *ΔTAX*

	No truncation	Top and bottom 1%	Top and bottom 2%	Top and bottom 5%	Top and bottom 10%	Top and bottom 25%
Intercept	0.149 (1.85)	0.143 (1.79)	0.137 (1.71)	0.127 (1.56)	0.111 (1.33)	0.093 (1.00)
ΔPTI_t	0.151 (4.48)	0.187 (5.24)	0.182 (5.23)	0.167 (5.13)	0.157 (5.07)	0.148 (4.73)
ΔTAX_t	0.584 (8.66)	1.220 (12.82)	2.257 (14.37)	3.875 (14.52)	5.947 (14.42)	11.673 (6.81)
CONTROLS	YES	YES	YES	YES	YES	YES
Adj. R^2	0.059	0.068	0.075	0.076	0.073	0.061
# of obs.	175,031	171,567	168,065	157,555	140,051	87,517

This table describes regression results when truncating the sample based on pre-tax income surprises (ΔPTI_t) or tax surprises (ΔTAX_t). In panel A, each year we truncate the sample at different levels based on ΔPTI_t, whereas in panel B we truncate the sample based on ΔTAX_t. The regression model is:

$$RET_t = \beta_0 + \beta_1 \Delta IBT_t + \beta_2 \Delta TAX_t + \beta_3 \log(MV_{t-1}) + \beta_4 BM_{t-1} + \beta_5 RET_{t-1} + \varepsilon_t$$

Where RET_t is the 12-month buy-and-hold stock return from the end of the 3rd month of the current fiscal year to the end of the 3rd month of the following year. ΔPTI_t is change in pre-tax income per share. ΔTAX_t is change in tax expense per share. All surprise measures are scaled by stock price at the end of the 3rd month of the current fiscal year. The regressions include controls for the following three variables that explain returns. MV_{t-1} is the market value of equity at prior fiscal year end. BM_{t-1} is the book-to-market ratio at prior fiscal year end. RET_{t-1} is prior year's 12-month stock return with a one-month lag relative to RET_t (from the end of the 2nd month of the prior year to the end of the 2nd month of the current fiscal year). All variables are described in more detail in the Appendix. The sample period is from 1978 to 2009. Each year, all variables except for returns are Winsorized at 1 percent and 99 percent for the original sample. The coefficient estimates are averages of annual estimates over 32 years; t-statistics in parentheses are Fama-MacBeth t-statistics.

Table 4
Two-way sort by the informativeness of surprises in pre-tax income and tax expense

Panel A: Mean *ΔPTI* coefficient (t-statistic)

		Value relevance of *ΔPTI*		
		G1 (High)	G2 (Medium)	G3 (Low)
Vale relevance of *ΔTAX*	G1 (High)	4.441 (9.29)	2.046 (11.80)	0.135 (4.10)
	G2 (Medium)	5.990 (13.65)	2.590 (12.09)	0.204 (6.20)
	G3 (Low)	5.165 (21.34)	2.869 (20.12)	0.142 (4.19)

Panel B: Mean *ΔTAX* coefficient (t-statistic)

		Value relevance of *ΔPTI*		
		G1 (High)	G2 (Medium)	G3 (Low)
Vale relevance of *ΔTAX*	G1 (High)	5.204 (1.74)	8.122 (8.01)	11.850 (6.47)
	G2 (Medium)	-0.373 (-0.31)	2.975 (4.81)	3.831 (12.90)
	G3 (Low)	-1.253 (-5.26)	-0.693 (-6.28)	0.357 (5.84)

This Table reports the coefficients on *ΔPTI* and *ΔTAX* from the regressions of contemporaneous returns (RET_t) on pre-tax income surprises (ΔPTI_t), tax expense surprises (ΔTAX_t), size, book-to-market, and past momentum for subsamples partitioned on the value relevance of pre-tax income surprises and tax expense surprises. RET_t is the 12-month buy-and-hold stock return from the end of the 3rd month of the current fiscal year to the end of the 3rd month of the following year. ΔPTI_t is change in pre-tax income per share. ΔTAX_t is change in tax expense per share. Both surprise measures are scaled by stock price at the end of the 3rd month of the current fiscal year. MV_{t-1} is the market value of equity at prior fiscal year end. BM_{t-1} is the book-to-market ratio at prior fiscal year end. RET_{t-1} is prior year's 12-month stock return with a one-month lag relative to RET_t (from the end of the 2nd month of the prior year to the end of the 2nd month of the current fiscal year). All variables are described in more detail in the Appendix. Each year, we sort all firms into three terciles based on the value relevance of pre-tax income surprises. For each resulting tercile, we further sort firms into three groups based on the value relevance of tax expense surprises. Value relevance is assumed to be inversely related to the magnitude of surprises; i.e., the lowest (highest) tercile contains firm-years with the smallest (most extreme) values of surprise. The sample includes 175,031 firm-year observations from 1978 to 2009. Each year, all variables except for returns are Winsorized at 1 percent and 99 percent. The coefficient estimates are averages of annual estimates over 32 years; t-statistics in parentheses are Fama-MacBeth t-statistics.

Table 5
Firm-specific time-series regressions

Panel A: Cross-sectional vs. time-series regressions

	Cross-sectional regressions			Time-series regressions		
	Mean	t	Median	Mean	t	Median
Intercept	0.210	4.18	0.200	0.556	11.42	0.498
ΔPTI_t	0.160	3.19	0.068	1.153	7.06	0.658
ΔTAX_t	0.832	5.55	0.760	0.468	0.21	0.011
$Log(MV_{t-1})$	-0.015	-3.25	-0.012	-0.093	-12.07	-0.068
BM_{t-1}	0.050	4.06	0.063	0.220	9.73	0.165
RET_{t-1}	-0.064	-1.34	-0.012	-0.069	-9.00	-0.072
Adj. R^2	0.091	9.17	0.077	0.205	29.20	0.172

Panel B: Variation in tax expense surprise coefficients from time-series regressions

	1	2	3	4
Intercept	2.940 (11.34)	1.167 (2.50)	1.313 (3.14)	4.332 (11.81)
Coefficient on ΔPTI_t	-1.763 (-26.04)			-1.795 (-26.85)
NEG_TAX		-1.954 (-1.29)		-3.049 (-2.65)
Magnitude of ΔTAX_t			-15.56 (-2.09)	-21.57 (-3.81)
Adj. R^2	0.454	0.001	0.004	0.471

Panel A describes cross-sectional and time-series regressions of contemporaneous returns (RET_t) on pre-tax income surprises (ΔPTI_t) and tax expense surprises (ΔTAX_t). The sample includes 815 firms with at least 30 years' data available from 1978 to 2009, with a total of 26,629 firm-year observations.The left three columns report results of cross-sectional regressions and the right three columns report results of time-series regressions. The t-statistics are equal to $\sqrt{n}$*(*mean*/*stdev*), where *n*, *mean*, and *stdev* are the number, mean, and standard deviation of the distribution of estimated coefficients in each setting. RET_t is the 12-month buy-and-hold stock return from the end of the 3rd month of the current fiscal year to the end of the 3rd month of the following year. ΔPTI_t is change in pre-tax income per share. ΔTAX_t is change in tax expense per share. Both surprise measures are scaled by stock price at the end of the 3rd month of the current fiscal year. MV_{t-1} is the market value of equity at prior fiscal year end. BM_{t-1} is the book-to-market ratio at prior fiscal year end. RET_{t-1} is prior year's 12-month stock return with a one-month lag relative to RET_t (from the end of the 2nd month of the prior year to the end of the 2nd month of the current fiscal year). All variables are described in more detail in the Appendix. In Panel B, the dependent variable is the coefficient on tax expense surprises (ΔTAX_t) from time-series regressions in Panel A. The coefficient on ΔPTI_t is from the same time-series regressions. *NEG_TAX* is the percentage of years with negative tax expense. The magnitude of ΔTAX_t is the average of the absolute values of ΔTAX_t across years. All variables are firm-specific in Panel B. We run OLS regressions of the coefficient on ΔTAX_t on other firm-specific variables, with 815 observations in each regression. The coefficient on ΔTAX_t and ΔPTI_t are Winsorized at 1% and 99%.

Table 6
Split tax expense into current and deferred components
(different levels of truncation based on distribution of pre-tax income surprise)

	No truncation	Top and bottom 1%	Top and bottom 2%	Top and bottom 5%	Top and bottom 10%	Top and bottom 25%
Intercept	0.149 (1.85)	0.148 (1.88)	0.130 (1.68)	0.123 (1.61)	0.106 (1.47)	0.045 (0.70)
ΔPTI_t	0.142 (4.51)	0.288 (6.44)	0.626 (10.70)	1.230 (14.36)	2.051 (17.29)	4.325 (19.16)
$\Delta CTAX_t$	1.720 (9.20)	1.780 (9.84)	1.434 (8.54)	1.129 (5.59)	0.756 (3.25)	-0.195 (-0.85)
$\Delta DTAX_t$	0.218 (3.57)	0.182 (2.69)	-0.067 (-0.85)	-0.286 (-3.20)	-0.544 (-5.56)	-1.030 (-5.48)
CONTROLS	YES	YES	YES	YES	YES	YES
Adj. R^2	0.065	0.076	0.091	0.101	0.102	0.092
# of obs.	175,031	171,392	167,889	157,396	139,904	87,428

This table describes regression results when truncating the sample based on pre-tax income surprises (ΔPTI_t). Each year we drop extreme observations at different levels based on the distribution of ΔPTI_t. The regression model is:

$$RET_t = \beta_0 + \beta_1 \Delta IBT_t + \beta_2 \Delta CTAX_t + \beta_3 \Delta DTAX_t + \beta_4 \log(MV_{t-1}) + \beta_5 BM_{t-1} + \beta_6 RET_{t-1} + \varepsilon_t$$

Where RET_t is the 12-month buy-and-hold stock return from the end of the 3rd month of the current fiscal year to the end of the 3rd month of the following year. ΔPTI_t is change in pre-tax income per share. $\Delta CTAX_t$ is change in current tax expense per share. $\Delta DTAX_t$ is change in deferred tax expense per share. All surprise measures are scaled by stock price at the end of the 3rd month of the current fiscal year. The regressions include controls for the following three variables that explain returns. MV_{t-1} is the market value of equity at prior fiscal year end. BM_{t-1} is the book-to-market ratio at prior fiscal year end. RET_{t-1} is prior year's 12-month stock return with a one-month lag relative to RET_t (from the end of the 2nd month of the prior year to the end of the 2nd month of the current fiscal year). All variables are described in more detail in the Appendix. The sample period is from 1978 to 2009. Each year, all variables except for returns are Winsorized at 1 percent and 99 percent for the original sample. The coefficient estimates are averages of annual estimates over 32 years; t-statistics in parentheses are Fama-MacBeth t-statistics.

Table 7
Regressions of market value on book value, pretax income, and tax expense

	1	2	3	4	5	6
Sample	All	All	Profit	Profit	Loss	Loss
Intercept	361.37 (5.58)	342.47 (5.56)	263.21 (3.49)	244.55 (3.42)	171.32 (5.02)	157.27 (4.97)
BV_t	0.531 (6.98)	0.465 (6.66)	0.023 (0.28)	0.012 (0.15)	0.782 (6.59)	0.775 (6.90)
E_t	6.443 (8.29)		10.49 (11.99)		-0.379 (-1.69)	
PTI_t		5.849 (8.96)		11.06 (14.72)		-0.546 (-3.25)
TAX_t		-3.397 (-2.74)		-11.78 (-11.77)		-0.584 (-0.52)
Adj. R^2	0.562	0.574	0.624	0.631	0.541	0.580

This Table describes regressions of market value of equity (MV_t) on book value of equity (BV_t), earnings (E_t) and its components (PTI_t and TAX_t). MV_t is the market value of equity three months after a firm's fiscal year end. BV_t is the book value of equity at fiscal year-end. E_t is earnings before extraordinary items in year *t*. PTI_t is pre-tax income. TAX_t is tax expense. Profit (loss) firms are defined as those with positive (negative) E_t. The sample includes 188,370 firm-year observations from 1978 to 2009. The coefficient estimates are averages of annual estimates over 32 years; t-statistics in parentheses are Fama-MacBeth t-statistics.

Table 8
Revisiting Ayers et al. (2009)

Panel A: Replication of Ayers et al. (2009). Compare firms in the lowest quintile of effective tax rates (high tax planning firms) and firms in the highest quintile of abnormal accruals with all other firms.

	Obs	ΔPTI_t	$R^2_{\Delta PTI}$	ΔPTI_t	ΔTI_t	$R^2_{\Delta PTI+\Delta TI}$	$R^2_{\Delta PTI+\Delta TI} - R^2_{\Delta PTI}$
High tax planning firms	12269	1.999 (14.46)	0.125	1.955 (13.79)	0.130 (2.10)	0.128	0.003
All other firms	52215	1.837 (14.88)	0.121	1.463 (12.83)	0.640 (7.34)	0.131	0.010
Difference							-0.007*** (-5.10)
High abnormal accrual firms	21349	1.253 (12.32)	0.070	1.112 (11.67)	0.414 (5.90)	0.075	0.006
All other firms	86850	1.183 (20.30)	0.071	1.056 (19.15)	0.330 (7.72)	0.075	0.004
Difference							0.002* (1.76)

Panel B: Quintiles formed based on residual tax planning and abnormal accrual magnitudes, after controlling for the magnitude of ΔPTI and ΔTI (our proxies for value relevance).

	Obs	ΔPTI_t	$R^2_{\Delta PTI}$	ΔPTI_t	ΔTI_t	$R^2_{\Delta PTI+\Delta TI}$	$R^2_{\Delta PTI+\Delta TI} - R^2_{\Delta PTI}$
Residual high tax planning firms	12270	1.833 (16.00)	0.133	1.670 (15.63)	0.334 (3.95)	0.140	0.007
All other firms	52214	1.865 (14.17)	0.118	1.534 (11.88)	0.568 (6.52)	0.126	0.008
Difference							-0.001 (-1.23)
Residual high abnormal accrual firms	21354	1.476 (12.43)	0.071	1.323 (11.62)	0.448 (5.32)	0.075	0.004
All other firms	86845	1.129 (19.72)	0.070	1.006 (18.23)	0.322 (8.00)	0.076	0.005
Difference							-0.001 (0.82)

Panel C: A relatively clean sample: delete negative *PTI* and *TI* and extreme (> 1) values of *ΔPTI* and *ΔTI*

	Obs	ΔPTI_t	$R^2_{\Delta PTI}$	ΔPTI_t	ΔTI_t	$R^2_{\Delta PTI+\Delta TI}$	$R^2_{\Delta PTI+\Delta TI} - R^2_{\Delta PTI}$
High tax planning firms	8935	3.372 (11.94)	0.169	3.138 (11.07)	0.487 (3.10)	0.177	0.008
All other firms	38644	3.607 (11.81)	0.171	3.140 (11.88)	0.586 (3.20)	0.176	0.005
Difference							0.003 (1.30)
High abnormal accrual firms	10765	4.273 (10.52)	0.190	3.736 (11.61)	0.746 (2.98)	0.197	0.006
All other firms	44387	3.525 (15.67)	0.163	3.245 (14.53)	0.392 (4.20)	0.167	0.004
Difference							0.002 (1.69)

This table describes regression results for the following two models:

$$R_t = \beta_0 + \beta_1 \Delta PTI_t + \varepsilon_t$$

$$R_t = \beta_0 + \beta_1 \Delta PTI_t + \beta_2 \Delta TI_t + \varepsilon_t$$

Where RET_t is the 16-month buy-and-hold market-adjusted return starting at the beginning of fiscal year *t* and ending 4 months after the end of fiscal year t. ΔPTI_t is the change in pre-tax income deflated by the market value of equity at the start of fiscal year *t*, where pre-tax income is pretax income (*PI*) minus minority interest (MII). ΔTI_t is the change in taxable income deflated by the market value of equity at the start of fiscal year *t*, where taxable income is current tax expense (*TXC*) grossed up by the top US statutory tax rate minus the change in net operating loss carryforwards (*TLCF*). If current tax expense is missing, we measure current tax expense as the difference between total tax expense (*TXT*) and deferred tax expense (*TXDI*). High tax planning firms are those firm-years whose five-year effective tax rates are in the bottom quintile, ranked by two-digit SIC industry and year, where five-year effective tax rate is current tax expense divided by pre-tax income, each summed over five years from *t-4* to *t*. High abnormal accrual firms are those firm-years whose absolute values of abnormal accruals are in the top quintile, ranked by two-digit SIC industry and year, where abnormal accruals are based on the modified Jones model estimated cross-sectionally by year and two-digit SIC code. In Panel B, we control for the magnitude of *ΔBTI* and *ΔTI* by regressing effective tax rate and the magnitude of abnormal accruals on the magnitudes of *ΔPTI* and *ΔTI*. Residuals from these regressions are used to form quintiles to identify the quintiles engaged in the most tax planning and the most earnings management (high abnormal accruals). In Panel C, the relatively clean sample includes observations with positive pretax income and taxable income in both years *t-1* and *t*. The sample period is from 1983 to 2009. Observations with the absolute value of ΔPTI_t or ΔTI_t above 1 are deleted. The coefficient estimates are averages of annual estimates over 27 years; t-statistics in parentheses are Fama-MacBeth t-statistics.