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The Information Content of Tax Expense: A Firm- and Market-Level Return Decomposition

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I investigate the information content of income tax expense using variance decomposition to separate stock returns into cash flow and discount rate news components. While prior literature has focused on linking tax expense with expected future cash flows, I provide arguments for why tax expense should also be informative about firm risk. Consistent with these arguments, my results indicate that the previously documented positive association between firm-level tax expense surprises and contemporaneous stock returns is driven in part by discount rate news. I then extend the firm-level analyses to the stock market level to determine whether tax is useful for market valuation and whether the firm-level discount rate news is idiosyncratic or systematic in nature. My results show that aggregate tax expense surprises contain information associated with increased macroeconomic risk. This result also suggests that the information in a firm's tax expense surprise is reflective of priced idiosyncratic risk.

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1. Introduction

I investigate the information content of tax expense for both firm and market valuation. Prior research documents a positive association between a firm's tax expense surprise and its contemporaneous returns (Hanlon, Laplante and Shevlin [2005], Thomas and Zhang [2014]), suggesting that firms with a larger *increase* in tax expense earn *higher* returns, holding pre-tax book income constant. The prevailing explanation for this finding is that increases in tax expense convey favorable news about the firm's future cash flow despite the fact that tax payments decrease a firm's cash available for distribution. However, the traditional dividend discount model shows that there are two reasons why an unanticipated piece of information is incorporated into returns: it either changes expectations about future cash flows (cash flow news) or it changes expectations about firm risk (discount rate news).

While the prior literature has solely focused on a cash flow explanation for the positive cross-sectional tax expense-return relation, I advance explanations for why a tax expense surprise is also informative about firm risk. In addition, I examine the information content of an aggregate measure of tax expense surprise for market returns to determine whether tax expense is useful in a valuation context outside the firm level and to assess whether the risk-related information content of tax expense is idiosyncratic or systematic in nature.

The study of the valuation implications of tax expense is important because tax expense is material to both the average firm, totaling 30 percent or more of its pre-tax income, and the economy as a whole, comprising almost 40 percent of the market's average pre-tax earnings in my sample. Further, financial statement tax expense is particularly interesting because it is

affected by two sets of measurement standards (GAAP and the IRC), with oftentimes divergent purposes. Thus, a better understanding of the exact mechanisms through which tax expense enters into firm and market returns is important to researchers and policy makers for assessing the potential capital market implications of a change in its measurement due to changes in tax or financial reporting policy. Further, the study of aggregate tax expense and market returns contributes to our understanding of how investors set expectations of macroeconomic conditions. Macroeconomic expectations affect not only firm decisions, such as the type and timing of investments, but they also influence government policy and investors' portfolio allocation decisions. While a great deal of research is focused on understanding the valuation of accounting information at the firm level, there is less evidence regarding whether and how financial statement information is used to set expectations of economy-wide activity.[1]

The idea that an unanticipated change in tax expense conveys information about a firm's risk is plausible, yet remains relatively unexplored in the extant literature.[2] To understand why tax expense may convey information about a firm's discount rate, consider that an unexpected decrease in tax expense generates negative contemporaneous returns on average. Although the firm has increased the cash flow available for distribution, this increase in cash flow through a reduction in tax expense does not come without risk, as firm may unexpectedly decrease tax expense through opportunistic earnings management (Dhaliwal, et al. [2004], Krull [2004], Frank and Rego [2006], Gupta, Lynch and Laux [2013]) or through risky tax avoidance.

Both earnings management and tax avoidance activities serve to increase investors' perceptions of the riskiness of the firm's underlying cash flows because earnings management

[1] For an overview of the extant literature see Ogneva [2013].
[2] An exception is Dhaliwal et al. [2013], who examine the relation between the variability of tax expense and firm risk.

reduces the extent to which accruals map into a firm's future cash flows and tax avoidance introduces the potential for significant future cash outlays arising from unfavorable judgments by taxing authorities. This increased uncertainty is reflected in revisions to the firm's discount rate to the extent that: 1) risk arising from earnings management and tax avoidance activities is systematic in nature due to their joint impact on non-diversifiable information risk and the likelihood that each of these activities are undertaken in response to macroeconomic conditions, and/or 2) to the extent that idiosyncratic risk is priced. As a result, I expect that a firm's tax expense surprise is negatively associated with the discount rate news component of its unexpected return. Stated another way, my arguments suggest that unexpected decreases (increases) in tax expense will increase (decrease) firm value through the discount rate channel.

To provide evidence on the discount rate news implications of tax expense surprises in the cross-section, I decompose a firm's return into cash flow news and discount rate news components following the methodology of Vuolteenaho [2002] and Callen and Segal [2010] and assess the ability of tax expense surprises to explain each component. Measuring tax expense surprises as the price-scaled change in year to year tax expense per share, I find a negative association between a firm's total, current, and deferred tax expense surprise and discount rate news. I also confirm the results of prior studies by documenting a positive association between tax expense surprises and cash flow news. While the prior literature attributes the positive information content of tax expense solely to a cash flow explanation, my results suggest that it is due tax expense's ability to impact *both* expected future cash flows and expected returns. In numeric terms, a one standard deviation increase in tax expense is associated with a 3.36 percent excess return due to an increase in investors' expectations of the firm's future cash flows and a 1.40 percent excess return due to a decrease in the firm's discount rate. Further, the overall

negative discount rate news result is concentrated in the subsample of firms with unexpected tax expense decreases, suggesting it is tax expense decreases which impact investor perceptions of firm risk through their potential to convey earnings management and tax avoidance activities.

After establishing the theoretical and empirical links between cross-sectional tax expense surprises and discount rate news, I extend my analyses to the aggregate, or overall market level. It is *ex ante* unclear whether the risk-related information contained in tax expense surprises is reflective of systematic or priced idiosyncratic risk because earnings management and tax avoidance activities plausibly generate both. To the extent any activities or reporting decisions which are conveyed by a firm's tax expense (incremental to pre-tax earnings) are influenced by the economy or are non-diversifiable in nature, then tax expense surprises convey information about a firm's systematic risk which would not diversify away in the aggregation process. If this is the case, the negative firm-level association between tax expense surprises and discount rate news will extend to the market level. To the extent that the change in risk perceptions associated with a tax expense surprise are firm-specific in nature, the firm-level negative association between tax surprises and discount rate news will become insignificant or even reverse in the aggregate.[3]

In contrast to the firm-level findings, my tests of the aggregate information content of tax expense show a *positive* and significant relation between aggregate tax expense surprises and the discount rate news component of market returns. This result has two important implications for our understanding of the valuation of tax expense. First, it suggests that the valuation implications of tax expense extend beyond those of the firm-specific level. Aggregate tax

[3] The aggregate tax expense surprise-overall market return relation is driven by the market-level discount rate news finding because discount rate news is relatively more important for market valuation than cash flow news (Campbell [1991] and Vuolteenaho [2002]).

expense is useful for market valuation because higher levels of aggregate taxation indicate higher levels of macroeconomic risk due to taxation's negative impact on aggregate investment and capital accumulation (Croce et al. [2012]). Second, it suggests that the discount rate news contained in firm-level tax expense represents priced idiosyncratic risk, as opposed to non-diversifiable information risk or general systematic risk. Thus, the earnings management or tax avoidance activities communicated via tax expense surprises are undertaken in response to firm-specific circumstances and not due to managers' macroeconomic expectations.

The valuation of tax literature collectively suggests tax expense surprises contain favorable information about firms' future cash flows, which are reflected in contemporaneous returns. My study extends this literature in three important ways. First, my arguments and results are consistent with tax expense being positively associated with firm returns because it provides investors with information about changes in firm risk in addition to future cash flows. Second, analyses provide evidence about the nature of the information content of tax expense; I find that both the priced risk- and cash flow-related information content of tax expense at the firm level are largely reflective of firm-specific, or idiosyncratic, characteristics and activities. Third, my results extend our understanding of the valuation implications of tax expense beyond the firm-specific context by suggesting that tax expense is useful for market valuation, as it positively impacts expectations of macroeconomic risk.

In addition, the implications of my study extend to several other, more broad, streams of literature. There is continued debate in both academic finance and accounting literature as to whether idiosyncratic risk is or is not priced. I contribute to this debate by showing that a specific and material financial statement account conveys information about a firm's idiosyncratic risk that is incorporated into share price. I also document that a decrease in tax expense, which is

potentially reflective of tax avoidance activities, results in an increase to a firm's discount rate, providing further evidence of potential costs to tax avoidance activities. Finally, I contribute to a growing body of literature which examines whether financial statement information can be used to set macroeconomic expectations.

2. Prior Literature and Hypothesis Development

2.1. The Information Content of Tax Expense

The valuation of tax literature suggests that firm-level tax expense and its components convey positive news to market participants, incremental to that conveyed via reported earnings. Specifically, both total and current tax expense exhibit a positive association with contemporaneous returns in the cross-section (Hanlon, Laplante and Shevlin [2005], Thomas and Zhang [2014]). The widely-held explanation for this result is that an increase in a firm's tax expense conveys positive cash flow news on average because it contains information about a firm's core, or underlying, profitability that is incremental to that contained in reported earnings. Tax expense possesses this ability because it is related to a firm's taxable income, which is computed under the Internal Revenue Code (IRC) as opposed to U.S. GAAP. The determination of firm income under a separate set of rules results in an additional summary measure of firm performance that is correlated with information used by market participants in setting expectations of a firm's future performance (Lev and Nissim [2004], Hanlon, Laplante and Shevlin [2005], Thomas and Zhang [2011]). Thomas and Zhang [2013] further test the cash flow implications of tax expense in price levels and return regressions and find that, under general research conditions (i.e., cross-sectional return regressions estimated on a pooled sample of profit and loss firms), changes in tax expense are positively associated with returns and changes in expectations of future cash flows.

2.2. Tax Expense and Discount Rate News

While the previous literature provides a detailed examination of the potential for tax expense to convey cash flow news (i.e., the valuation numerator) to market participants, a direct link between the information content of tax expense and changes in investor perception of firm risk (i.e., the valuation denominator) has been unexplored. To understand why tax expense would possess unanticipated information about the firm's discount rate, consider a firm with an unexpected decrease in tax expense. The results of prior studies (e.g., Hanlon, Laplante and Shevlin [2005], Thomas and Zhang [2014]) suggest that this firm would experience negative contemporaneous returns. Although this firm has increased cash flow available for distribution, this increased cash flow through an unexpected decrease in tax expense does not come without risk due to the source of the tax expense reduction. Unexpected decreases in tax expense can be the result of increased earnings management and risky tax avoidance, each of which should increase investors' perceptions of the riskiness of the firm's underlying cash flows. Similarly, unexpected increases in tax expense may be due to less opportunistic financial and tax reporting choices, which should decrease the discount rate applied to a firm's expected future cash flows.[4]

The first potential driver of an unexpected decrease in tax expense is earnings management undertaken to increase net income. Tax expense is a particularly attractive potential earnings management source because: 1) it results in a dollar for dollar increase in net income,[5] 2) it is one of the last accounts closed at the end of a firm's fiscal year, providing a "last chance" for earnings management (Dhaliwal et al. [2004]), and 3) several components of a firm's total

[4] Changes in earnings management or tax avoidance are not the only potential sources of tax expense surprises. A firm may experience a negative tax expense surprise because its managers undertake new investments or activities which are favorable for income tax purposes (e.g., increased capital expenditures or research and development) or otherwise alter the firm's business structure in a tax-favorable way (e.g., changing ownership structure or corporate form of its subsidiaries). The overall effect of these potential drivers of tax expense surprises on investors' expectations of firm risk, however, is ambiguous.

[5] Earnings management in pre-tax accounts yields $1*(1-τ) of after-tax net income, where τ is the firm's tax rate.

tax expense, such as the valuation allowance, the tax contingency reserve or unrecognized tax benefit, and the permanently reinvested earnings designation, allow significant managerial discretion and subjectivity. For these reasons, earnings management via the tax accounts has been well documented in previous research.[6] Managing earnings, in general, serves to increase firm risk because it reduces the extent to which a firm's accruals map into future cash flows. Consistent with this, earnings management has an empirically documented influence on a firm's discount rate (Hribar and Jenkins [2004], Francis et al. [2004]).

The second source of an unanticipated decrease in tax expense is additional, unanticipated tax avoidance. Aggressive tax avoidance strategies are risky in that they involve a significant amount of uncertainty with respect to the firm's future outcomes due to the possibility that they may ultimately be challenged and disallowed by the tax authorities or courts at some future date. Further, the firm faces significant additional penalty and interest costs as a result of disallowed positions.[7] Several recent studies provide support for the notion that risky tax avoidance has a meaningful impact on a firm's returns or its overall level of risk. For example, Hanlon and Slemrod [2009] document a negative stock price reaction to the first press mention of a firm's involvement in tax shelter activity, one of the most aggressive forms of tax avoidance. Rego and Wilson [2012] and Armstrong et al. [2013] find that managers will increase risky tax avoidance in response to equity incentives to increase overall firm risk. In addition, results in Campbell et al. [2014] suggest that tax is the only risk factor with a statistically significant

[6] For example, Dhaliwal, Gleason and Mills [2004] find that firms decrease their tax expense at year end when earnings absent tax management fall short of the analyst consensus forecast. Within the tax accounts, Krull [2004] finds evidence of earnings management via the permanently reinvested earnings designation, Gupta et al. [2013] show that the pre-FIN 48 tax contingency reserve is used to meet analyst forecasts, and Frank and Rego [2006] and Schrand and Wong [2003] find evidence of earnings management via the valuation allowance portion of tax expense to meet analyst forecasts.

[7] Accuracy related penalties may reach as high as 40 percent of the increase in tax due to the disallowance of a tax return position and interest costs are approximately 6 percent of the additional tax plus penalties due, compounded daily.

negative association with pre-disclosure returns, suggesting that firms become more fundamentally risky as tax risk increases.

To the extent tax expense surprises are driven by earnings management or tax avoidance activities, the risk-related information they convey will be priced: 1) if it is related to the firm's systematic, or non-diversifiable risk, and/or 2) to the extent that idiosyncratic risk is priced. It is possible that risk arising from earnings management in the tax accounts and tax avoidance activities will be non-diversifiable for two reasons. First, earnings management and tax avoidance activities both serve to generate non-diversifiable information risk. Theoretical models developed by Easley and O'Hara [2004] and Lambert, Leuz and Verrecchia [2007] suggest that information risk, defined as the likelihood that firm-specific information relevant for investor decision making is of poor quality, is priced because it is either non-diversifiable by uninformed investors, or because it impairs the coordination between investors and firms' capital investment decisions. Earnings management generates information risk because it reduces the overall quality of the firm's accruals by inhibiting their ability to map into future cash flows (Francis et al. [2005]). Tax avoidance can also generate non-diversifiable information risk because aggressive tax planning is also associated with lower corporate transparency and accruals quality (Balakrishnan et al. [2012]) and higher levels of financial reporting aggressiveness (Frank et al. [2009]). Prior literature shows that both low accruals quality and low earnings quality generates information risk, which impacts a firm's discount rate and represents a priced risk factor.[8,9]

[8] Accruals quality represents the uncertainty in cash flows and is typically measured as the mapping of accruals into realized operating cash flows (Dechow and Dichev [2002]). Accruals quality is affected by the measurement error in accruals which is driven, in part, by earnings management activities (Francis et al. [2005]).

[9] For example, Francis et al. [2005], Nichols [2006] and Ogneva [2008] show that accruals quality is a priced risk factor, Francis et al. [2004] show that firms with low accrual quality have cost of capital estimates that are approximately 260 basis points higher than other firms, and both Hribar and Jenkins [2004] and Kravet and Shevlin [2010] show that accounting restatements, an external indicator of earnings quality or earnings management, lead to economically significant increases in a firm's implied cost of equity capital or an increased factor loading on information risk, respectively.

The second reason tax expense surprises could generate non-diversifiable risk is that the earnings management and tax avoidance activities underlying the surprises are undertaken in response to systematic conditions. The recent theoretical work of Strobl [2013] makes the case that earnings manipulation, and hence the quality of accounting information, actually constitutes a systematic risk factor that is priced in large economies. The intuition underlying his model is that firms manipulate earnings in response to economic conditions, and as a result, overall earnings management varies across the business cycle. Due to the dependence of a manager's earnings manipulation strategy on the state of the economy, earnings management can influence a firm's cost of capital despite the diversification abilities of investors.

Although the model in Strobl [2013] implies the opposite, the discussion of his model by Bertomeu [2013] and the empirical results in Kang, Liu, and Qi [2010] suggest that aggregate earnings management and systematic risk are positively related. In the context of managing earnings to minimize tax payments, Guenther [1994] shows that firms shift income into low tax rate years in response to impending tax rate changes, providing further support for the idea that managers opportunistically manage taxable earnings and tax expense through financial statement earnings in response to macroeconomic factors. Thus, there is both theoretical and empirical evidence suggesting that systematic factors impact both earnings management and tax avoidance behavior, resulting in changes in expectations of a firm's non-diversifiable risk.

Even if tax expense surprises are driven by factors that are firm-specific in nature, investors will revise expected returns with respect to these changes to the extent that idiosyncratic risk is priced. The traditional CAPM's implication that only systematic risk is priced is based on the assumption that all investors hold a fully diversified market portfolio in equilibrium. However, this assumption is overly restrictive and not necessarily reflective of the

actual investment choices of investors. For example, the estimated number of randomly selected stocks needed to achieve relatively complete diversification is fifty (Campbell et al. [2001]) and, in reality, investors' portfolios rarely contain greater than ten (Goetzmann and Kumar [2002]). Malkiel and Xu [2006] incorporate this notion into a variation of the CAPM by relaxing the assumption that investors are fully diversified in equilibrium to show that firms with substantial idiosyncratic risk will be penalized with additional risk premiums to compensate rational investors for an inability to hold the market portfolio.[10] Consistent with the theoretical predictions in Malkiel and Xu [2006], the evidence in Goyal and Santa-Clara [2003], Fu [2009], and Fu and Schutte [2009], among others, suggests that idiosyncratic risk is positively incorporated into expected returns.

In sum, prior literature shows that decreases in a firm's tax expense reflect the product of both earnings management and tax avoidance activities, both of which serve to increase uncertainty with respect to the firm's future cash flows. This uncertainty will be reflected in revisions to the firm's discount rate to the extent that: 1) the risk arising from earnings management and tax avoidance is systematic in nature because of their joint impact on non-diversifiable information risk and the likelihood that each of these activities are undertaken in response to macroeconomic conditions, and/or 2) to the extent that idiosyncratic risk is priced. As a result, I expect a firm's tax expense surprise is negatively associated with the discount rate news component of its unexpected return. Further, much of the prior literature focuses on the role of earnings management and tax avoidance in *decreasing* tax expense and the role of increased risk in generating higher discount rates, suggesting that information about increased

[10] Malkiel and Xu [2006] state that, if some investors do not or cannot hold the market portfolio for exogenous reasons (e.g., transaction costs), then the remaining investors are also unable to hold the market portfolio.

firm risk contained in unexpected tax expense decreases will possess a more salient impact on discount rate revisions. As such, I test the following two hypotheses:

H1a: *Tax expense surprises are negatively associated with the discount rate news component of a firm's unexpected returns.*

H1b: *The negative relation between tax expense surprises and the discount rate news component of a firm's unexpected returns is relatively larger in magnitude for negative tax expense surprises.*

3. Methodology

3.1.Empirical Specification

To test my hypotheses, I regress a firm's stock return (*Ret_firm*) and its discount rate (*DRN*) and cash flow news (*CFN*) components on contemporaneous pre-tax earnings (Δ*PTI*) and tax expense surprises (Δ*TXT*) and several control variables:

$$Ret\_firm_{it} = \alpha + \beta_1 \Delta PTI_{it} + \beta_2 \Delta TXT_{it} + \beta_3 B2M_{it-1} + \beta_4 MKVAL_{it-1} + \beta_5 Ret\_firm_{it-1} + \varepsilon_t \quad (4)$$

$$News\_firm_{it} = \alpha + \beta_1 \Delta PTI_{it} + \beta_2 \Delta TXT_{it} + \beta_3 B2M_{it-1} + \beta_4 MKVAL_{it-1} + \beta_5 Ret\_firm_{it-1} + \varepsilon_t \quad (5a,b)$$

All coefficient estimates and *t*-statistics are based on averages of the annual coefficient and standard error estimates following the procedure outlined in Fama and MacBeth [1973].

3.2.Measurement of Dependent Variables

Firm-level returns (*Ret_firm*) are calculated as the buy-and-hold return for each firm, compounded over the twelve months beginning in the fourth month of the current fiscal year (i.e., April of year *t*) and ending in the third month of the following year (i.e., March of year *t+1*) in excess of the annualized one-month Treasury bill rate. This compounding period is chosen to

ensure public disclosure of earnings and tax information to market participants. I decompose a firm's annual return into its cash flow and discount rate news components following the methodology of Vuolteenaho [2002] and Callen and Segal [2010]. The Vuolteenaho [2002] return decomposition expresses a firm's unexpected returns as a linear function of changes in expectations of future return on equity and changes in expectations of the firm's discount rate; i.e., cash flow news minus discount rate news. The theoretical underpinnings for the Vuolteenaho [2002] return decomposition are provided in Appendix A. To implement the return decomposition, I use the following first-order vector autoregressive (VAR) model:

$$\boldsymbol{z}_t = A + \boldsymbol{\Gamma} \boldsymbol{z}_{t-1} + \boldsymbol{u}_t \tag{6}$$

where $\boldsymbol{z_t}$ is a vector of state variables describing the firm at time *t*, $\boldsymbol{z_{t-1}}$ represents the one-period lag of the state variables, $\boldsymbol{\Gamma}$ is the matrix of VAR parameters, and $\boldsymbol{u}$ is the vector of error terms with a covariance matrix $\boldsymbol{\Sigma}$.

By assuming that the firm's stock return is the first element in the VAR system, Campbell [1991] shows that cash flow news (*NCF*) and discount rate news (*NDR*) may be calculated as linear functions of the shock vector $\boldsymbol{u}$:

$$NCF_t = (e_1 + \lambda_1)' u_t \tag{7}$$
$$NDR_t = \lambda_1' u_t \tag{8}$$
$$\lambda_1' = e1' \rho \boldsymbol{\Gamma} (I - \rho \boldsymbol{\Gamma})^{-1} \tag{9}$$

Where *e1′*= (1 0 … 0) and $(I - \rho\boldsymbol{\Gamma})^{-1}$ is the matrix version of a present value of a sum with ρ as the discount rate set equal to 0.967.[11] From the equations above, discount rate news is computed directly. Cash flow news is then calculated as the difference between unexpected returns and discount rate news. I use this general framework to decompose both firm-level and market

[11] ρ represents a capitalization factor which captures the long-term significance of the news. In my estimations, it is set equal to 0.967 consistent with the prior VAR literature (i.e., Vuolteenaho [2002], Campbell and Vuolteenaho [2004], Callen and Segal [2010]).

unexpected returns into its news components. It is important to note that the residual computation of cash flow news yields a measure of changes in expectations of future cash flows which incorporates some error in the unexpected return relation. To ensure the robustness of my cash flow news regressions, I also estimate both cash flow and discount rate news directly.

To implement the VAR system in the cross-section, the first state variable, or the discount rate fundamental, is the firm's log annual buy and hold return in excess of the one-month T-bill return over the same period. Vuolteenaho [2002] uses the assumption of clean surplus accounting to generate an accounting-based present value formula which uses a firm's log return on equity (*ROE*) as its cash-flow fundamental and second state variable. The final state variable included is the firm's log book to market ratio (*B2M*).[12] As in Callen and Segal [2010], each variable is demeaned, and the VAR regressions are estimated by industry using weighted least squares where the weight in each cross section is the number of firms in the corresponding industry each year.[13] The VAR system is estimated separately for each of the thirty Fama-French industry categories. Thus, the calculation of a firm's news series is done using the firm's realizations for each state variable and industry-level VAR parameters.

3.3.Measurement of Independent Variables

The main variable of interest is a firm's tax expense surprise, ΔTXT, and the primary control variable is pre-tax income surprise, ΔPTI. Following the methodology of previous studies which examine the valuation implications of tax expense (e.g., Thomas and Zhang [2013]), I define a tax expense surprise as a firm's total tax expense per share in year *t* minus tax expense

[12] In additional analyses, I also include the firm's dividend yield as a fourth state variable consistent with the analysis in Engsted, Pedersen, and Tanggaard [2012].
[13] For more specific details regarding the calculation of firm-level discount rate and cash flow news, refer to Callen and Segal [2010]. In addition, Callen [2009] provides an excellent discussion of the theory surrounding variance decomposition in accounting research.

per share in year *t-1*, scaled by stock price as of the end of the third month of year *t*.[14] I measure pre-tax income surprises in an identical manner. I also decompose total tax expense surprise into its current (Δ*CTE*) and deferred portions (Δ*DTE*).

The control variables utilized include a firm's beginning of year book-to-market ratio (*B2M*), the beginning of year market value of equity (*MKVAL*), and the firm's prior year annual buy and hold return. The control variables are included to ensure that tax expense surprises are not simply capturing well-known risk factors and are chosen based on Fama and French [1992], who find that firm size and the book-to-market ratio explain a large portion of the cross-sectional variation in average stock returns, and the return momentum risk factor identified by Jegadeesh and Titman [1993]. Detailed variable definitions are included in Appendix B.

4. Sample and Descriptive Statistics

Construction of my sample begins with all firm-year observations at the intersection of the Compustat annual file and the CRSP monthly stock file from 1974 through 2011.[15] Sample firms are restricted to those with December fiscal year ends to ensure that earnings are measured and announced for all firms in the same period.[16] Firms must have sufficient data to compute all regression variables. To mitigate the impact of influential observations, all firm-level variables, with the exception of returns, are winsorized at 1 and 99 percent each year.[17]

Table 1 presents summary statistics for the variables used in the return regressions. My sample consists of 105,630 firm-year observations from 1974 through 2011 for the sample of

[14] I also measure tax expense surprises as the forecast error from an AR(1) model because Blouin, Core and Guay [2010] suggest that a random walk specification may be an inappropriate forecasting approach for taxable income.
[15] This time period is chosen to approximately replicate the sample periods used in previous studies examining the valuation implications of tax expense (e.g., Lev and Nissim [2004]) which would result in the longest annual time-series possible for market-level tests.
[16] Approximately 38 percent of sample firms are dropped due to this restriction.
[17] My results are also robust to truncating the top and bottom 1 percent of scaled tax expense and pre-tax earnings surprises each year.

firms with non-missing returns, total tax expense surprises, pre-tax income surprises, and VAR state variables. The sample of 87,152 firm-year observations with non-missing values of current and deferred tax expense is slightly smaller, due to missing values of both in Compustat. The average excess firm-level return is 13.20 percent, while the average beginning of year log of market value is 5.2908 and the beginning of year book to market ratio is approximately 84 percent. Each of these values are consistent with descriptive statistics presented in Thomas and Zhang [2013].[18] The positive mean value of ΔPTI (0.0674) and ΔTXT (0.0032) indicates that both pre-tax earnings and tax expense are increasing for the average firm.

Table 2 presents the decomposition of unexpected returns into their cash flow news and discount rate news components using a three-equation VAR system. The VAR parameter estimates, standard errors, and R^2 presented in the firm-level decomposition represent averages of the thirty industry values of each. The parameter estimates and R-squares for each forecasting equation in the system are consistent with expectations based on the results from prior literature (Vuolteenaho [2002], Hecht and Vuolteenaho [2006]). The lags of each state variable explain relatively little of the variation in period *t* returns (R^2 of 3.15 percent). In addition, lagged ROE is the single most important factor in explaining current period ROE (coefficient estimate of 0.3289 and *t*-statistic of 14.88) and lagged book-to-market ratio is the most important factor in explaining current period book-to-market (coefficient estimate of 0.7961 and *t*-statistic of 50.07). Summary statistics for firm level discount rate news and cash flow news show both are decreases in expectations, on average, and the mean decrease in expected future cash flows is larger than the average downward revision in the estimated discount rate for the firm. This is consistent with the evidence in Vuolteenaho [2002] which suggests that cash flow news is relatively more

[18] Thomas and Zhang [2013] study raw firm-returns, while I adjust each firm's twelve month buy and hold return by the risk-free rate over the same period. The mean raw return in my sample (approximately 18 percent) is equivalent to that in Table 1 of Thomas and Zhang [2013].

important than discount rate news for explaining a firm's unexpected returns. Cash flow news is also more variable across firms than discount rate news, which is consistent with smaller cross-sectional variation in cost of capital than in expected cash flows.

Table 3 presents correlations among returns, the news components of returns, and income and tax variables. The simple firm-level correlations confirm that total tax expense surprise is positively correlated with returns in my sample of firms (Pearson correlation of 0.0740 and *p*-value of <0.0001). The current portion of tax expense surprise is more strongly correlated with returns (Pearson correlation of 0.0710 and *p*-value of <0.0001) relative to the deferred portion (Pearson correlation of 0.0589 and *p*-value of <0.0001), confirming the positive return-current tax expense association. In addition, tax expense surprise and its components are all significantly positively correlated with cash flow news.

The correlations between discount rate news and tax expense provide some preliminary evidence on the risk-related information content of tax expense. Both total tax expense and its current, taxable income driven, portion are significantly negatively correlated with discount rate news in a univariate sense (Pearson correlation of -0.0254 for $\Delta TXTsurp$ and -0.0347 for ΔCTE). Deferred tax expense surprise ($\Delta DTEsurp$), however, is positively correlated with discount rate news (Pearson correlation of 0.0048), but this correlation is statistically insignificant.

5. Firm Returns, Cash Flow News and Discount Rate News

Table 4 presents the results from regressing a firm's contemporaneous returns, cash flow news, and discount rate news on pre-tax income surprises, tax expense surprises, and control variables.[19] In addition, Table 4 presents results from partitioning the sample on positive versus

[19] To replicate the results of prior studies examining the information content of tax expense, I regress excess returns (i.e., a measure of expected plus unexpected returns) on tax expense and pre-tax income surprises. Note that the Vuolteenaho (2002) return decomposition is applied to *unexpected* returns. Thus, the difference between coefficient estimates from the cash flow news column and the discount rate news column will not equal the coefficient

negative total tax expense surprises (Δ*TXT*) and decomposing total tax expense surprises into current (Δ*CTE*) and deferred (Δ*DTE*) components. Panel A focuses on total tax expense surprises and confirms the positive information content of a firm's tax expense surprises (coefficient estimate in the returns regression of 0.3281 and *t*-statistic of 6.47), exhibited in previous studies (e.g., Hanlon, Laplante and Shevlin [2005], Thomas and Zhang [2013]).[20] This result provides additional evidence in support of the notion that tax expense surprises contain incremental, unanticipated information which is correlated with that used by market participants in setting a firm's share price.

Consistent with the prior literature, I document a positive association between Δ*TXT* and the cash flow news component of firm returns. While the prior studies attribute the positive information content of tax expense solely to this cash flow explanation, results from regressing discount rate news on tax expense surprises suggests it is due to tax expense's ability to impact *both* expected future cash flows and expected returns. Consistent with H1a, the coefficient on Δ*TAX* in the discount rate news regressions in the full sample of firms is significant and negative (coefficient estimate of -0.0897 and *t*-statistic of -3.44). Thus, a one standard deviation increase in tax expense is associated with a 3.36 percent excess return due to an increase in investors' expectations of the firm's future cash flows and a 1.40 percent excess return due to a decrease in the firm's discount rate. The positive association between Δ*PTI* and discount rate news is consistent with arguments made in previous studies that earnings surprises increase the

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estimates from the returns column, but do equal coefficient estimates from regressing unexpected returns on tax expense and pre-tax income surprises.

[20] Thomas and Zhang [2013] suggest including some measure of expected future cash flows in return regressions as a way to understand the cash flow implications of tax expense and show that, consistent with tax expense's ability to forecast a firm's future cash flows, the coefficient on tax expense surprises in return regressions becomes negative when controlling for analysts' expectations of future cash flows and terminal values. In untabulated analyses, I control for cash flow news in return regressions to ascertain the comparability of my results to Thomas and Zhang [2013] and find that the cash flow implications of tax expense surprises are greatly reduced (although the coefficient is still significantly different from zero in my analysis), which is broadly consistent with their conclusions.

uncertainty with which investors can forecast a firm's future cash flows and therefore increase its cost of capital (Mikhail, Walther and Willis [2004]).

I also document results consistent with H1b in the second and third portions of Table 4, Panel A. While unexpected decreases in tax expense yield value decreasing discount rate news (coefficient estimate of -0.0992 and *t*-statistic of -2.82), the association between unexpected increases in tax expense and discount rate news is statistically indistinguishable from zero (coefficient estimate of 0.0293 and *t*-statistic of 1.01). This discount rate results varies across the subsamples in ways that are consistent with my arguments for why tax expense should impact investors' perceptions of firm risk. Decreases in tax expense are likely due to increased tax avoidance and earnings management activities, which should have an impact on the expected returns demanded by investors for a particular firm. However, it appears that tax expense increases are either due to other factors that do not impact risk perceptions or that investors are unlikely to reduce perceptions of firm risk in the face of tax expense increases resulting from reduced earnings management or tax avoidance activities.

It is also interesting to note that the positive cash flow news result is also concentrated in the negative *ΔTXT* sample (coefficient estimate of 0.3079 and *t*-statistic of 4.19). As the decrease in tax expense becomes larger (i.e., more negative) investors revise expectations of future cash flow downward and the discount rate upward, reflecting the notion that decreases in tax expense are reflective of risky tax avoidance that would serve to decrease future cash flows through penalties and interest payments or opportunistic earnings management indicating poor future performance. This result also suggests that both increases and decreases in tax expense serve to decrease investor expectations of future cash flow, supporting the recent work of Guenther et al. [2012] which suggests that the positive association Δ*TXT* and a firm's contemporaneous return

spuriously arises due to the combination of dissimilar subsamples in the full sample of firms. This result in particular highlights the importance of understanding implications of tax expense for the underlying drivers of returns (i.e., cash flow and discount rate news) as opposed to simply taking the results from cross-sectional return regressions at face value.

Panel B of Table 4 presents results of regressing a firm's returns, cash flow news and discount rate news on tax expense when it is split into its current (Δ*CTE*) and deferred (Δ*DTE*) components. My results indicate that both current and deferred tax expense surprises exhibit a significant positive relation with a firm's contemporaneous returns. The positive overall association between Δ*CTE* and returns is driven by both positive cash flow news and negative (value-increasing) discount rate news, while the positive association between Δ*DTE* and returns is driven solely by the cash flow channel.

Splitting total tax expense surprise into its current and deferred portions sheds additional light on the negative (insignificant) coefficient on Δ*TXT* in the cash flow (discount rate) news regression for the positive Δ*TXT* sample of firms. Within the positive Δ*TXT* sample, Δ*CTE* is positively associated with cash flow news (coefficient estimate of 0.1257 and *t*-statistic of 2.03) and unassociated with discount rate news (coefficient estimate of 0.0565 and *t*-statistic of 1.05), suggesting that increases in Δ*CTE*, which indicate increased taxable income, do convey positive cash flow news to investors and do not impact expected returns. However, increases in deferred tax expense serve to decrease expected future cash flows (coefficient estimate of -0.3517 and *t*-statistic of -5.44) and increase perceptions of firm risk (coefficient estimate of 0.0764 and *t*-statistic of 2.09). This result is not surprising, given that deferred tax expense represents expected future tax payments and several studies that suggest deferred tax expense provides incremental information about the quality of the firm's pre-tax earnings (Phillips et al. [2003],

Hanlon [2005]); i.e., larger deferred tax expense indicates lower earnings quality. For the negative ΔTXT subsample, larger decreases in current tax expense are associated with value decreasing changes in the firm's discount rate and both current and deferred tax expense decrease expectations of future cash flow.

6. The Nature of the Risk-Related Information Content of Tax Expense

6.1.Idiosyncratic versus Systematic Risk

The results of my firm-level analyses suggest that the positive information content of tax expense documented in previous studies is partially through its association with changes in expectations about a firm's discount rate. The risk relevance of tax expense exists because tax expense surprises driven by changes in a firm's earnings management or tax avoidance activities, among other factors, and both of these activities should directly affect investors' assessments of firm risk. However, it is unclear from the discussion in Section 2 or prior literature whether the risk-related information that is correlated with a firm's tax expense surprise is systematic or idiosyncratic in nature.[21]

One way to determine the nature of the information about a firm's risk contained in tax expense surprises is to examine the relation between aggregate, or market-level, tax expense surprises and market returns. To the extent that any firm activities or reporting decisions which are conveyed by tax expense (incremental to pre-tax earnings) generate information risk or are influenced by the economy or factors common among firms, the priced risk associated with them would be nondiversifiable, or systematic in nature. If this is the case, the negative association between tax information and discount rate news at the firm level will lend itself to a negative

[21] Dhaliwal et al., [2013] show that the variability of estimated taxable income is positively associated with the level of a firm's stock return volatility, the level of beta, and cost of capital. This indicates that tax expense variability is associated with *both* idiosyncratic and systematic risk, but does not suggest whether directional tax expense surprises are associated with *changes in expectations* of either idiosyncratic or systematic risk.

association between aggregate tax expense surprises and the discount rate news component of market returns. Because discount rate news is relatively more important than cash flow news for market valuation than firm valuation (Campbell [1991] and Vuolteenaho [2002]), any discount rate news contained in aggregate tax expense will drive an overall positive relation between aggregate tax expense and market returns. If the association between tax expense surprises and changes in priced risk is primarily driven by firm-specific factors, then the aggregation process will serve to diversify this risk away resulting in no association or even a positive association between aggregate tax expense and the discount rate news component of market returns.

To test whether the discount rate news contained in tax expense surprises is reflective of systematic or idiosyncratic risk, I model the association between aggregate tax expense and market returns similar to that of the firm-level analyses:

$$Ret\_mkt_t = \alpha + \beta_1 \Delta PTI\_mkt_t + \beta_2 \Delta TXT\_mkt_t + \sum_{j=3}^{N} \beta_j CONTROL_t + \varepsilon_t \quad (10)$$

$$News\_mkt_t = \alpha_0 + \beta_1 \Delta PTI\_mkt_t + \beta_2 \Delta TXT\_mkt_t + \sum_{j=3}^{N} \beta_j CONTROL_t + \varepsilon_t \quad (11)$$

where market returns (*Ret_mkt*) are measured by compounding the CRSP monthly returns on the value-weighted NYSE/AMEX/Nasdaq/Arca index.[22] The contemporaneous market return is accumulated over the twelve months beginning in the fourth month of the current fiscal year (i.e., April of year *t*) and ending in the third month of the following year (i.e., March of year *t+1*). The three state variables included in the VAR system to decompose market returns include the excess value-weighted market return, the term spread (*TERM*), and the log price-earnings ratio (*PE10*), consistent with the primary variables utilized in Campbell and Vuolteenaho [2004]. The aggregate, financial statement variables are calculated as the value weighted average of firm

[22] I also consider equal-weighted returns on the NYSE/AMEX/Nasdaq/Arca index and construct both and equal- and value-weighted quarterly "market" returns using monthly returns for only the firms included in the earnings and tax expense sample. Results are substantively similar.

level pre-tax earnings and tax surprises in a given year.[23] Thus, my market level tests focus on a time series of 38 yearly values of market returns (*Ret_mkt*), market-wide tax expense surprises (Δ*TXT_mkt*) and market-wide pre-tax earnings surprises (Δ*PTI_mkt*).

Control variables include several other market-level and macroeconomic indicators previously shown to explain and/or forecast market returns. These variables are categorized as proxies for cash flow news, discount rate news proxies, and other market return forecasting variables. Cash flow news proxies include the Gross Domestic Product growth rate (*ΔGDP*), the growth rate in industrial production (*ΔIPROD*) and the growth rate in personal consumption (*ΔCONS;* Fama [1981], Fama [1990]). Discount rate proxies include innovations in the short-term interest rate (*ΔTbill3mo;* Fama and Schwert [1977]), the term spread (*ΔTERM;* Keim and Stambaugh [1986], Fama and French [1989]), and the default premium (Δ*DEFAULT;* Keim and Stambaugh [1986], Fama and French [1989]) for year *t*. Innovations are calculated as the change in each variable. Other market return forecasting variables include the consumption-aggregate wealth ratio (*CAY;* Lettau and Ludvigson [2001]), the equity share in new issues (*EQ_SHR*; Baker and Wurgler [2000]), and the aggregate book to market ratio (*B2M*; Kothari and Shanken [1997]). Detailed variable definitions are provided in Appendix B.

Summary statistics and the return decomposition for market-level returns are presented in Table 5. Pre-tax income and tax expense surprises are both statistically indistinguishable from zero on average and insignificantly autocorrelated, suggesting that my measure of surprises in these variables are unpredictable. Further, while aggregate pre-tax income is decreasing

[23] Aggregate financial statement variables were also calculated as equal-weighted cross sectional averages each year and as the cross sectional sum of each variable scaled by the cross sectional sum of the scalar each year. In addition aggregate pre-tax income and tax expense surprises were also measured as the forecast error from an AR(1) process for the level of each. In this case, the aggregate level of pre-tax income and tax expense were measured as the value-weighted and equal-weighted averages of cross sectional pre-tax income and tax expense levels. Results are substantively similar for each measurement and aggregation method.

throughout my sample period, aggregate tax expense is increasing. Panel B of Table 5 presents results from decomposing excess annual market returns into their cash flow news and discount rate news components. Parameter estimates, standard errors, and R^2 for the market-level VAR system are consistent with those in Campbell and Vuolteenaho [2004].

Correlations between market returns and aggregate tax expense surprises in Panel C of Table 5 provide an interesting contrast to the firm level correlations. First, aggregate current tax expense surprises are *negatively* correlated with market returns, (Pearson correlation of -0.2441), although the correlation is statistically insignificant. Further, the signs of the correlations between aggregate tax expense surprises and the cash flow news and discount rate news portions of returns are consistent with expectations based on the firm-level results.

Table 6 presents the results from examining the relation between aggregate measures of tax expense and pre-tax income surprises and market returns and their cash flow and discount rate news components. Panel A focuses on market-level total tax expense surprises, while Panel B presents evidence with respect to the current and deferred portions of aggregate tax expense surprises. The *t*-statistics provided in both Panels A and B are computed using Newey-West standard errors with a lag length of four to correct for serial correlation in the error terms.

In contrast to the firm-level results, aggregate total tax expense surprises are unrelated to the cash flow news component (coefficient estimate of 2.8475 and *t*-statistic of 0.61) and *positively* related to the discount rate news component of unexpected market returns (coefficient estimate of 9.6002 and *t*-statistic of 2.39), resulting in a negative, but insignificant, association between *ΔTXT_mkt* and *Ret_mkt*. This result suggests that the valuation implications of tax expense extend beyond those of the firm-specific level. Aggregate tax expense is useful in setting macroeconomic expectations in that it is positively correlated with changes in expected

market returns. Although this result is inconsistent with the positive firm-level results, it is consistent with Croce et al. [2012] who develop a model to examine the aggregate asset pricing, or more specifically, aggregate risk premium effects of tax policy in a general equilibrium. One of the primary results of the model is that the average level of corporate taxation impacts the level of the aggregate risk premium because, when the tax rate is constant, higher taxation reduces capital accumulation and investment, which serve has hedging mechanisms against economic volatility. Thus, the model in Croce et al. [2012] implies that large increases in the average level of corporate taxation signal decreases in market-wide capital accumulation and investment, thus increasing the market risk premium demanded by investors.

In addition, the reversed association between tax expense surprises and market returns and discount rate news when moving from the firm to the aggregate level is consistent with a growing number of studies which provide that well documented firm-level associations between financial statement information and returns either do not extend to or even reverse in the aggregate (e.g., Kothari, Lewellen and Warner [2006], Hirshleifer, Hou and Teoh [2009], Kang, Liu and Qi [2010]) due to the dominance of discount rate news at the market level.

The results from the market-level tests also have a significant implication for our understanding of the information content of tax expense at the firm level. That the positive association between tax expense surprises and discount rate news at the firm-level reverses at the market-level suggests that the discount rate news contained in firm-level tax expense represents priced idiosyncratic risk, as opposed to non-diversifiable information risk or general systematic risk. Thus, the earnings management or tax avoidance activities communicated via tax expense surprises are undertaken in response to firm-specific circumstances and not due to managers' macroeconomic expectations.

7. Robustness Tests and Limitations

7.1.Profit versus Loss Firms

Although the sample studied in my primary firm-level analyses include both profit and loss firm-years, several recent studies motivate a separate analysis for each subsample. For example, Li [2013] studies the information content of losses and finds that they are associated with decreases in expectations of future cash flows (which are value-decreasing) and decreases in expectations of discount rates (which are value-increasing), explaining the muted earnings-return relation for loss firm observations. Dhaliwal, et al. [2013] suggest that tax expense, specifically the portion attributed to changes in a firm's valuation allowance account (VA), provides incremental information about the persistence of accounting losses which, in turn, impacts investors' pricing of accounting losses. In addition, Guenther et al. [2012] provides evidence that the positive association between changes in tax expense and contemporaneous firm returns can occur spuriously when observations from profit years and loss years are included in the same sample. Taken together, these studies suggest that the information content of tax expense surprises may vary across profit and loss observations.

To shed additional light on the relative valuation of tax expense for profit versus loss firms, I separate my sample into profit firm years (earnings before extraordinary items, Compustat item IB, greater than zero in both year *t* and year *t-1*) and loss firm years (IB less than or equal to zero in both year *t* and year *t-1*) and estimate the firm-level return and news component regressions for each subsample. Results for this estimation are provided in Table 7. The associations between tax expense surprises and the news components of returns for profit and loss firms yield several interesting insights. Discount rate news is significantly and negatively related to tax expense surprises for both profit and loss firm-years, although the

magnitude of the estimated coefficient on ΔTXT is larger in magnitude for the profit subsample. This negative association is attributed to only the current portion of tax expense in the loss subsample, but attributed to *both* the current and deferred portions of tax expense in the profit firm-year sample. ΔTXT conveys positive cash flow news in the profit firm subsample and is unassociated with cash flow news in the loss subsample. This result is consistent with the assertions in Hanlon [2003] that tax expense is fairly uninformative for firms in a loss position. Thus, my primary results regarding the impact of tax expense surprises on firm returns via the discount rate channel are consistent across both profitable and loss firms.

7.2.Treatment of Outliers

As discussed above, Guenther et al. [2012] provide insight into how research design choices impact conclusions about the value relevance of tax expense. Their primary conclusions are that the results in "value relevance of tax" studies may be spuriously driven by: 1) including observations from profit and loss years in the same sample, or 2) extreme observations influencing results. Although, I winsorize regression variables at 1 and 99 percent to mitigate the influence of outliers in my primary analyses, Guenther et al. [2012] suggest truncation as a more appropriate method. As such, I repeat my primary analyses when truncating the sample at 1 and 99 percent. Results (untabulated) are substantively unchanged.

7.3.VAR Specification

Although the use of the Vuolteenaho [2002] variance decomposition approach to separate cash flow news and discount rate news components of returns is widely accepted in the finance literature, it is not without limitations. Specifically, the discount rate news component of returns is calculated directly from the VAR system, while cash flow news is computed as the residual from returns and discount rate news in order to guarantee that the equality in equation (2) holds.

Chen and Zhao [2009] suggest that this approach may lead to incorrect inferences because any measurement error in the estimation of discount rate news is inherited by cash flow news. They suggest computing both discount rate news and cash flow news directly regardless of whether their sum equals unexpected returns to address this limitation in the measurement of each news series. My cash flow news results at both the firm level (untabulated) are either unchanged or strengthened by a direct measure of cash flow news.

Engsted, Pedersen, and Tanggaard [2012] show that, in order for a VAR decomposition to be valid, asset price must be included as a state variable in the VAR system. If this requirement is met it makes no difference whether a news component is backed out residually or computed directly. To account for this, I re-estimate the VAR system including the firm or market dividend yield, where applicable, as a fourth state variable. Both the distributions of the news variables and my results are almost identical when dividend yield is included.

7.4. Limitations

The interpretation of my results relies heavily on the Vuolteenaho [2002] return decomposition as an appropriate method to measure changes in expected returns. I implement the Vuolteenaho [2002] return decomposition because it is widely accepted in the finance literature and imposes fewer assumptions and sample and data restrictions than alternative methods. It is important to note that Easton and Monahan [2005] presents an alternative methodology for decomposing returns. However, their methodology requires the use analyst forecast data and one or more implied cost of capital measures, all of which impose severe sample restrictions. Further, cost of capital estimates may be biased upward or downward due to analyst optimism or pessimism. While this is only a concern if this bias is correlated with my variable of interest, tax expense surprises, there is evidence that analysts are systematically biased with respect to tax

information (Plumlee [2003], Weber [2009]). As a result, the use of implied cost of capital estimates based on biased analyst forecasts could produce biased inferences.

8. Conclusions

The valuation of tax literature collectively suggests that tax expense surprises contain favorable information about firms' future cash flows, which are reflected in contemporaneous returns. While the prior literature is silent regarding the discount rate news impact of tax expense surprises, my results suggest that it is due tax expense's ability to impact *both* expected future cash flows and expected returns. I argue that tax expense's ability to impact investor perceptions of firm risk is due to its ability to communicate information about the firm's earnings management and tax avoidance activities, each of which increase uncertainty about future cash flows. Specifically, earnings management reduces the extent to which accruals map into a firm's future cash flows and tax avoidance introduces the potential for significant future cash outlays arising from unfavorable judgments by taxing authorities. Thus, I expect and find that tax expense surprises are negatively associated with the discount rate news component of a firm's unexpected returns.

I also find that an aggregate measure of tax expense is positively associated with changes in market-level (or systematic) discount rate news. This result suggests that tax expense aids investors in setting expectations of macroeconomic conditions, and thus it is useful not just for firm valuation, but for valuing the market as a whole. Because the tax expense-discount rate news relation is reversed at the market- relative to the firm-level, my results also suggest that the discount rate news contained in a firm's tax expense surprises is largely reflective of priced idiosyncratic risk.

A particularly interesting avenue for future research is to further explore the market-level implications of tax expense. Several recent working papers attempt to explain the underlying macroeconomic information content of aggregate earnings by examining its association between future inflation (Kothari, Shivakumar, and Urcan [2013]), GDP growth (Konchitchki and Patatoukas [2013]), and the Federal Reserve's future monetary policy stance (Gallo, Hann, and Li [2013]). Thus, it might prove interesting to apply the analyses in these studies to aggregate tax expense to better understand the macroeconomic risk content of tax expense.

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Appendix A: Theoretical Framework for the Vuolteenaho [2002] Return Decomposition

Campbell [1991] provides a simple framework for understanding the components of unexpected stock returns. Using a log-linear approximation of the standard dividend discount model, this study expresses the period *t* unexpected stock return ($r_t - E_{t-1}[r_t]$) as a function of changes in rational expectations of future dividend growth and future stock returns:

$$r_t - E_{t-1}[r_t] = \Delta E_t \sum_{j=0}^{\infty} \rho^j \, \Delta d_{t+j} - \Delta E_t \sum_{j=1}^{\infty} \rho^j \, r_{t+j} \qquad (1)$$

Where:

Δ = first difference operator
E_t = expectations operator
r_t = log real return in excess of the risk free rate
d_t = log real dividend paid during time *t*
ρ = a discounting term, whose value is slightly less than one.

For simplicity, define:

$N_{cf,t} \equiv \Delta E_t \sum_{j=0}^{\infty} \rho^j \, \Delta d_{t+j}$ $\equiv$ news about future cash flows
$N_{r,t} \equiv \Delta E_t \sum_{j=1}^{\infty} \rho^j \, r_{t+j}$ $\equiv$ news about future returns.

It then follows that equation (1) may be expressed in simple form as:

$$r_t - E_{t-1}[r_t] = N_{cf,t} - N_{r,t} \qquad (2)$$

Equations (1) and (2) express unexpected returns as the difference between cash flow news ($N_{cf,t}$) and expected return, or discount-rate, news ($N_{r,t}$). Thus, if a factor measured at time *t* contemporaneously explains stock returns, it must be correlated with unanticipated information about cash flows and/or the expected return demanded by investors.

Vuolteenaho [2002] extends the general framework of the Campbell [1991] return decomposition to firm-specific returns. By assuming clean surplus accounting, he uses a firm's

return on equity (ROE) instead of dividend growth as the basic cash flow fundamental in the following log-linear approximation:

$$r_t - E_{t-1}[r_t] = \Delta E_t \sum_{j=0}^{\infty} \rho^j \left(roe_{t+j} - i_{t+j}\right) - \Delta E_t \sum_{j=1}^{\infty} \rho^j r_{t+j} \quad (3)$$

Where:

roe_t = log book return on equity in period *t*
i_t = log of 1 plus the risk free rate in period *t*

and all other variables are defined above. From equation (3), it is clear that cash flow news in the Vuolteenaho [2002] firm-specific application is represented by changes in rational expectations of a firm's return on equity in all future periods, while the definition of discount rate news remains consistent. Although they enter into returns in equation (1) with opposite signs, theoretical and empirical evidence shows that cash flow news and discount rate news covary positively at both the firm (Vuolteenaho [2002]) and the aggregate level (Hecht and Vuolteenaho [2006], Patatoukas [2014]). [24] The net effect, which is impounded into current period returns, depends on which type of news dominates.

[24] In explaining his findings that firm level cash flow and discount rate news series are positively related, Vuolteenaho [2002] conjectures that, at the firm level, all projects undertaken are theoretically zero net present value. If a firm enters into an unexpected high-risk project, the cash flows must also be unexpectedly high to reach the zero net present value equilibrium point.

Appendix B: Variable Definitions

Variable	Definition
Firm-level Variables:	
Ret_firm	The annual buy-and-hold return for each firm, compounded over the twelve months beginning in the fourth month of the current fiscal year (i.e., April of year *t*) and ending in the third month of the following year (March of year *t+1*). Firm-level returns are those in excess of the three-month Treasury bill return over the same period and are computed using CRSP monthly data.
NCF	A firm's cash flow news, calculated residually from the VAR calculation, which is the difference between returns and directly estimated discount rate news (defined below). Cash flow news represents the portion of a firm's unexpected annual buy and hold return attributed to changes in rational expectations of future dividend growth. Firm-level cash flow news is calculated using the vector autoregressive (VAR) approach of Vuolteenaho [2002] and Callen and Segal [2010]. See Table 2 for details.
ROE	Return on equity, calculated as the log ratio of year *t* earnings (IB) to beginning period book equity (CEQ). Used as a state variable in the VAR system to estimate the firm-level return news series.
ΔPTI	Pre-tax income surprise, measured as the year to year change in a firm's pre-tax earnings (PI) per share scaled by the CRSP share price as of the end of the third month of year *t*.
ΔTXT	Total tax expense surprise, measured as the year to year change in a firm's total tax expense (TXT) per share scaled by the CRSP share price as of the end of the third month of year *t*.
ΔCTE	Current tax expense surprise, measured as the year to year change in a firm's current tax expense (TXC) per share scaled by the CRSP share price as of the end of the third month of year *t*. If current tax expense is missing and deferred tax expense is not, current tax expense is set equal to total tax expense (TXT) less deferred tax expense (TXDI).
ΔDTE	Deferred tax expense surprise, measured as the year to year change in a firm's deferred tax expense (TXDI) per share scaled by the CRSP share price as of the end of the third month of year *t*. If deferred tax expense is missing and current tax expense is not, deferred tax expense is set equal to total tax expense (TXT) less current tax expense (TXC).
$lnMKVAL_{t-1}$	The log of a firm's market value of assets (PRCC_F*CSHO) at the beginning of the period.
$B2M_{t-1}$	The ratio of a firm's book value (CEQ) to market value (PRCC_F*CSHO) of equity at the beginning of the period.

Market-level Dependent Variables and Independent Variables of Interest:

Ret_mkt	Excess market return, equal to the twelve month buy and hold return on the CRSP value-weighted NYSE/AMEX/Nasdaq/Arca index in excess of the annualized 3-month Treasury-bill return. Raw market returns and 3-month T-bill returns are compounded over the twelve months beginning in the fourth month of the current fiscal year (i.e., April of year *t*) and ending in the third month of the following year (March of year *t+1*).
NCF_mkt	Market-level cash flow news, calculated residually from the VAR calculation, which is the difference between returns and directly estimated discount rate news (defined below). Market-level cash flow news represents the portion of the excess market return attributed to changes in rational expectations of future dividend growth. Market-level cash flow news is calculated using the vector autoregressive (VAR) approach of Campbell [1991] and Campbell and Vuolteenaho [2004]. See Panel B of Table 5 for details.
NDR_mkt	Market-level discount rate news, which represents the portion of the excess market return attributed to changes in rational expectations of future discount rates. Market-level discount rate news is calculated using the vector autoregressive (VAR) approach of Campbell [1991] and Campbell and Vuolteenaho [2004]. See Table 2 for details.
Δ*TXT_mkt*	Aggregate total tax expense surprise, measured as the value-weighted yearly average of firm-level tax expense surprises.
Δ*CTE_mkt*	Aggregate current tax expense surprise, measured as the value-weighted yearly average of firm-level current tax expense surprises.
Δ*DTE_mkt*	Aggregate total tax expense surprise, measured as the value-weighted yearly average of firm-level deferred tax expense surprises.

Market-level Control Variables:

ΔGDP	The Gross Domestic Product growth rate, equal to the annual percent change in GDP. GDP growth rate data is obtained from the Bureau of Economic Analysis's (BEA) Interactive Data.
ΔIPROD	The growth rate in industrial production, calculated as the percent change in annual industrial production. Information on industrial production is downloaded from the Federal Reserve Statistical Release's Data Download Program.
ΔCONS	The growth rate in personal consumption, calculated as the percent change in personal consumption over personal consumption. Personal consumption data is obtained from the Bureau of Economic Analysis's (BEA) Interactive Data.
ΔTBill3mo	The change in 3-month Treasury-bill rate at the end of year *t* over the 3-month Treasury-bill rate at the end of prior year. Data is for this variable

	is downloaded from the Federal Reserve Statistical Release's Data Download Program.
ΔTERM	The change in the term spread, where the term spread is equal to the difference between the yield of a 10-year Treasury bond over the yield of a three-month Treasury bill in the month of year end. Data is for this variable is downloaded from the Federal Reserve Statistical Release's Data Download Program.
ΔDEFAULT	The change in the default spread, where default spread is equal to the difference between Baa-rated corporate bond yields over Aaa-rated corporate bond yields in the month of year end. Data is for this variable is downloaded from the Federal Reserve Statistical Release's Data Download Program.
TERM	The term spread, equal to the difference between the yield of a 10-year Treasury bond over the yield of a three-month Treasury bill in the month of year end. Data is for this variable is downloaded from the Federal Reserve Statistical Release's Data Download Program.
CAY	Consumption-aggregate wealth ratio, downloaded from Martin Lettau's website.
EQ_SHR	The equity share of new issues, measured as the percentage of aggregate new issues (i.e., new debt issues plus new equity issues) which are comprised of equity issues. Debt and equity issues are obtained from the Federal Reserve Statistical Release's Data Download Program.
B2M	The aggregate book-to-market ratio, calculated as the value-weighted average of the firm-level book-to-market ratio of all sample firms.
PE10	The Shiller price-earnings ratio, equal to the level of the S&P 500 divided by the trailing 10-year moving average of the aggregate earnings of the S&P 500 (Shiller [2000]). This variable is obtained from Robert Shiller's website (http://www.econ.yale.edu/~shiller/data.htm).

Table 1: Summary Statistics for Returns, Income, and Tax Expense
For all calendar years from 1974 – 2011

	N	Mean	Std. Dev.	Min.	25th Pct.	Median	75th Pct.	Max.
Ret_firm	105,630	0.1320	0.7723	-1.0493	-0.2310	0.0308	0.3202	53.6533
Δ*PTI*	105,630	0.0674	2.2673	-50.8044	-0.0249	0.0048	0.0348	52.1343
Δ*TXT*	105,630	0.0032	0.1589	-2.3972	-0.0054	0.0004	0.0090	3.3043
Δ*CTE*	87,152	0.0008	0.0798	-1.6474	-0.0041	0.0000	0.0070	0.9178
Δ*DTE*	87,152	0.0023	0.1081	-1.2879	-0.0041	0.0000	0.0042	2.7973
$lnMKVAL_{t-1}$	105,630	5.2908	2.2042	-0.4337	3.7098	5.2197	6.7933	11.7636
$B2M_{t-1}$	105,630	0.8391	0.7371	0.0003	0.3818	0.6467	1.0535	8.0726

This table reports summary statistics for the panel of firm-years beginning in 1974 and ending in 2011. The firms comprising the sample represent all firms in a given year with December year ends, sufficient financial statement information, and with corresponding returns on CRSP. *Ret_firm* represents the annual buy-and-hold return for each firm in excess of the three-month Treasury bill return over the same period and are computed using CRSP monthly data. Δ*PTI* is the firm's pre-tax income surprise, Δ*TXT* is the firm's total tax expense surprise, Δ*CTE* is the firm's current tax expense surprise, and Δ*DTE* is the firm's deferred tax expense surprise. *lnMKVAL* and *B2M* represent ex-ante risk factors, and are equal to the prior year's natural log of market value and book to market ratio. See Appendix B for detailed variable definitions.

Table 2: Decomposition of Returns into News Components
For the panel of firm returns from 1974-2011.

Firm-level returns are decomposed using the following VAR system:

$$r_t = \alpha_1 r_{t-1} + \alpha_2 roe_{t-1} + \alpha_3 b2m_{t-1} + \varepsilon_t$$
$$roe_t = \beta_1 r_{t-1} + \beta_2 roe_{t-1} + \beta_3 b2m_{t-1} + u_t$$
$$b2m_t = \gamma_1 r_{t-1} + \gamma_2 roe_{t-1} + \gamma_3 b2m_{t-1} + v_t$$

1. Distributions of VAR State Variables

	Mean	**Std Dev.**	**Min.**	**25th Pct**	**Median**	**75th Pct.**	**Max.**
Ret_firm_t	0.1320	0.7723	-1.0493	-0.2310	0.0308	0.3202	53.6533
ROE	0.1424	0.3445	-0.9998	0.0202	0.1585	0.2758	4.0947
B2M	0.8602	0.7690	0.0001	0.3937	0.6583	1.0678	8.5554

2. VAR Coefficient Estimates

	r_{t-1}	roe_{t-1}	$b2m_{t-1}$	R^2
r_t	-0.0335	0.0736	0.0886	3.15%
	(0.0261)	(0.0369)	(0.0151)	
roe_t	0.1227	0.3289	-0.0452	24.50%
	(0.0162)	(0.0221)	(0.0094)	
$b2m_t$	-0.0781	0.0832	0.7961	64.15%
	(0.0293)	(0.0395)	(0.0159)	

3. Distributions of Firm-level Cash Flow and Discount Rate News

	Mean	**Std Dev.**	**Min.**	**25th Pct**	**Median**	**75th Pct.**	**Max.**
NCF	-0.0015	0.4566	-5.0126	-0.1846	0.0348	0.2365	3.7133
NDR	-0.0003	0.2072	-3.2739	-0.0800	0.0016	0.0868	2.0656

This table reports the methodology and results from decomposing unexpected 12 month buy and hold returns into their cash flow news and discount rate news components. The firms comprising the sample represent all firms in a given year with December year ends, sufficient financial statement information, and with corresponding returns on CRSP. Descriptive statistics are presented for each variable included in the VAR system before any log or de-meaning modifications (represented by capital letters). Lowercase variable names represent logged and demeaned values. *Ret_firm* is the firm's annual buy and hold return, *ROE* is return on equity, and *B2M* is the book to market ratio. The VAR system is estimated by industry using the Fama-French 30 industry categories obtained from Ken French's website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/changes_ind.html. Coefficient estimates and standard errors presented above represent the averages across industries. *NCF* represents cash flow news calculated residually, or as the difference between returns and directly estimated discount rate news. *NDR* represents discount rate news estimated directly from the VAR system. See Appendix A for the theory underlying the decomposition and Appendix B for detailed variable definitions.

Table 3: Pearson (above diagonal) and Spearman (below diagonal) Correlations Among Returns, News, Income, and Tax Expense
For all firm-years from 1974 – 2011

	Ret_firm	*NCF*	*NDR*	Δ*PTI*	Δ*TXT*	Δ*CTE*	Δ*DTE*
Ret_firm		0.7006	-0.4433	0.0706	0.0740	0.0710	0.0589
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
NCF	0.9001		-0.1269	0.0841	0.0838	0.0942	0.0555
	(0.0001)		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
NDR	-0.5449	-0.2730		-0.0005	-0.0254	-0.0347	0.0048
	(0.0001)	(0.0001)		(0.8840)	(0.0001)	(0.0001)	0.1549
Δ*PTI*	0.2886	0.3261	-0.0740		0.3771	0.2032	0.2388
	(0.0001)	(0.0001)	(0.0001)		(0.0001)	(0.0001)	(0.0001)
Δ*TXT*	0.2130	0.2259	-0.0847	0.6748		0.5147	0.6541
	(0.0001)	(0.0001)	(0.0001)	(0.0001)		(0.0001)	(0.0001)
Δ*CTE*	0.1895	0.1962	-0.0962	0.4800	0.6156		-0.0786
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)		(0.0001)
Δ*DTE*	0.0563	0.1519	0.0037	0.2717	0.4424	-0.1842	
	(0.0001)	(0.0001)	(0.2799)	(0.0001)	(0.0001)	(0.0001)	

This table reports correlations between returns, news, income, and tax variables. *Ret_firm* is the firm's annual buy and hold return. *NCF* represents cash flow news calculated residually, or as the difference between returns and directly estimated discount rate news. *NDR* represents discount rate news estimated directly from the VAR system. *PTI* represents pre-tax income. *TAX, CTE,* and *DTE* represent total tax expense and its current and deferred portions. Δ*PTI,* Δ*TXT,* Δ*CTE,* and Δ*DTE* represent surprises in each variable, calculated as the year to year change in per share values of each, scaled by beginning share price. See Appendix B for detailed variable definitions. Pearson correlations are reported above the diagonal and Spearman correlations are reported below it. *P*-values are reported in parentheses.

Table 4: Firm-Level Returns, Discount Rate News, Cash Flow News and Tax Expense Surprises

Fama MacBeth regressions of firm-level returns and decomposed returns on pre-tax income, tax expense surprises, and control variables

For all December year-end firm-years with sufficient data from 1974– 2011

$$Ret\_firm_{i,t} = \alpha_0 + \beta_1 \Delta PTI_{i.t} + \beta_2 \Delta TXT_{i,t} + \beta_3 B2M_{i,t-1} + \beta_4 MKVAL_{i,t-1} + \beta_5 R_{i,t-1+} \varepsilon_t$$

Panel A: Total Tax Expense Surprises

	Full Sample			**Positive ΔTXT**			**Negative ΔTXT**		
	Returns	**Cash Flow News**	**Discount Rate News**	**Returns**	**Cash Flow News**	**Discount Rate News**	**Returns**	**Cash Flow News**	**Discount Rate News**
Intercept	0.1255	-0.0363	-0.0110	0.3333	0.1720	-0.0006	-0.1043	-0.1460	0.0441
	(1.75)	(-0.98)	(-0.54)	(4.27)	(4.82)	(-0.03)	(-2.08)	(-4.30)	(2.23)
ΔPTI_t	0.0539	0.0774	0.0179	0.0718	0.0827	0.0113	0.0633	0.1017	0.0273
	(4.46)	(4.33)	(2.31)	(4.86)	(5.87)	(3.78)	(4.22)	(3.38)	(1.66)
ΔTXT_t	0.3281	0.2115	-0.0897	-0.2405	-0.3714	0.0293	0.2314	0.3079	-0.0992
	(6.47)	(6.03)	(-3.44)	(-3.54)	(-6.19)	(1.01)	(3.72)	(4.19)	(-2.82)
$B2M_{t-1}$	0.0548	-0.0348	0.0049	0.0325	-0.0649	-0.0051	0.1009	-0.0021	-0.0111
	(3.29)	(-2.50)	(0.91)	(1.80)	(-4.87)	(-1.15)	(6.27)	(-0.15)	(-1.90)
$MKVAL_{t-1}$	-0.0138	0.0102	0.0028	-0.0321	-0.0084	0.0006	0.0048	0.0151	-0.0019
	(-1.97)	(2.96)	(1.70)	(-4.32)	(-2.46)	(0.38)	(1.00)	(4.95)	(-1.13)
Ret_firm_{t-1}	-0.0123	0.0314	-0.0042	-0.0137	0.0108	-0.0098	-0.0405	0.0064	-0.0011
	(-0.31)	(1.85)	(-0.80)	(-0.34)	(0.67)	(-2.16)	(-1.06)	(0.35)	(-0.15)
N	105,630	105,630	105,630	55,476	55,476	55,476	40,036	40,036	40,036
Adj. R^2	5.72%	6.67%	2.89%	5.95%	6.78%	3.51%	6.67%	8.04%	3.65%

Panel B: Current and Deferred Tax Expense Surprises

	Full Sample			Positive ΔTXT			Negative ΔTXT		
	Returns	**Cash Flow News**	**Discount Rate News**	**Returns**	**Cash Flow News**	**Discount Rate News**	**Returns**	**Cash Flow News**	**Discount Rate News**
Intercept	0.1432	-0.0474	-0.0180	0.3716	0.1775	-0.0085	-0.1062	-0.1532	0.0489
	(1.78)	(-1.14)	(-0.81)	(4.11)	(4.40)	(-0.41)	(-2.01)	(-4.10)	(2.24)
ΔPTI_t	0.0500	0.0715	0.0147	0.0571	0.0665	0.0084	0.0607	0.1020	0.0254
	(4.05)	(4.36)	(2.53)	(4.15)	(5.39)	(3.03)	(4.19)	(3.79)	(1.86)
ΔCTE_t	0.9409	0.6754	-0.1650	0.4096	0.1257	0.0565	0.5607	0.5417	-0.2317
	(8.52)	(8.21)	(-5.08)	(3.48)	(2.03)	(1.05)	(5.85)	(5.63)	(-4.51)
ΔDTE_t	0.2941	0.2120	-0.0316	-0.2615	-0.3517	0.0764	0.1506	0.3383	-0.0219
	(4.83)	(6.28)	(-1.30)	(-3.05)	(-5.44)	(2.09)	(1.76)	(5.23)	(-0.88)
$B2M_{t-1}$	0.0494	-0.0367	0.0087	0.0178	-0.0781	-0.0023	0.0968	-0.0043	-0.0106
	(2.88)	(-2.54)	(1.56)	(0.92)	(-5.12)	(-0.49)	(6.50)	(-0.32)	(-1.77)
$MKVAL_{t-1}$	-0.0155	0.0121	0.0034	-0.0362	-0.0084	0.0011	0.0061	0.0171	-0.0025
	(-1.97)	(3.31)	(1.84)	(-4.24)	(-2.37)	(0.63)	(1.22)	(5.32)	(-1.32)
Ret_firm_{t-1}	-0.0216	0.0259	-0.0036	-0.0182	0.0081	-0.0104	-0.0458	0.0017	-0.0004
	(-0.54)	(1.55)	(-0.69)	(-0.47)	(0.52)	(-2.30)	(-1.29)	(0.10)	(-0.05)
N	87,152	87,152	87,152	44,560	44,560	44,560	32,570	32,570	32,570
Adj. R^2	6.19%	7.20%	3.18%	6.33%	6.53%	4.03%	7.09%	8.79%	4.09%

This table reports the results of cross-sectional Fama MacBeth regressions of contemporaneous firm-level returns, cash flow (or earnings) news, and discount rate news on a firm's pre-tax income and tax expense surprises. Panel A reports results with regard to a firm's total tax expense surprises, controlling for pre-tax income surprises and other factors known to explain firm-level returns. Panel B reports results when total tax expense is decomposed into its current and deferred portions. Results are presented for the full sample of firm-year observations and separate for firm-year observations with positive and negative tax expense surprises (ΔTXT). Firm-level returns are calculated as the buy and hold return for a given firm beginning in April of year *t* and ending in March of year *t+1*. Cash flow news and discount rate news represent the portion of total firm-level returns driven by earnings news and all other news, respectively, and are calculated following the methodology of Callen and Segal [2010]. *PTI* represents pre-tax income. *TAX*, *CTE*, and *DTE* represent total tax expense and its current and deferred portions. ΔPTI, ΔTXT, ΔCTE, and ΔDTE represent surprises in each variable, calculated as the year to year change in per share values of each, scaled by beginning share price. Control variables include the firm's beginning of year book-to-market ratio ($B2M_{t-1}$), market value ($MKVAL_{t-1}$) and its prior year buy and hold return. Detailed variable definitions are provided in Appendix B. T-statistics are reported in parentheses below the coefficient estimate.

Table 5: Summary Statistics and Return Decomposition for Market-Level Returns and Aggregate Tax Expense

Descriptive statistics for market returns on aggregate pre-tax income, aggregate tax expense surprises, various cash flow and discount rate proxies, and other factors shown to predict market returns.

For all calendar years from 1974 – 2011

Panel A: Summary Statistics

	Mean	**Std. Dev.**	**Min.**	**Median**	**Max.**	**Auto-corr**	**(*p*-Value)**
Ret_mkt	0.0740	0.2042	-0.3954	0.0792	0.5415	-0.3300	(0.9660)
Δ*PTI_mkt*	-0.0009	0.0619	-0.1644	0.0069	0.1335	-0.1720	(0.8109)
Δ*TXT_mkt*	0.0003	0.0085	-0.0273	0.0029	0.0134	0.0270	(0.2924)
Δ*CTE_mkt*	-0.0001	0.0052	-0.0159	0.0011	0.0090	-0.0010	(0.3223)
Δ*DTE_mkt*	0.0003	0.0044	-0.0098	0.0002	0.0145	-0.0960	(0.6488)
ΔGDP	0.0275	0.0215	-0.0280	0.0330	0.0730	0.2970	(0.0091)
ΔIPROD	0.0204	0.0433	-0.1128	0.0278	0.0892	0.1580	(0.1118)
ΔCONS	3.0105	1.8389	-1.6000	3.2500	5.7000	0.4800	(0.0001)
ΔTBill3mo	-0.0009	0.0152	-0.0409	-0.0007	0.0567	0.1620	(0.1150)
ΔTERM	0.0008	0.0136	-0.0210	-0.0001	0.0358	0.0540	(0.2823)
ΔDEFAULT	0.0001	0.0062	-0.0196	-0.0003	0.0213	-0.2920	(0.9294)
CAY	0.0031	0.0185	-0.0329	0.0036	0.0361	0.8190	(0.0001)
EQ_SHR	-0.4411	2.9714	-9.8713	-0.1103	7.2768	0.1270	(0.1425)
B2M_mkt	0.6325	0.2261	0.3506	0.5578	1.1898	0.6150	(0.0001)

Panel B: Market-level Return Decomposition

Firm-level returns are decomposed using the following VAR system:

$$r\_mkt_t = \alpha_1 r\_mkt_{t-1} + \alpha_2 TERM_{t-1} + \alpha_3 pe10_{t-1} + \varepsilon_t$$
$$TERM_t = \beta_1 r\_mkt_{t-1} + \beta_2 TERM_{t-1} + \beta_3 pe10_{t-1} + u_t$$
$$pe10_t = \gamma_1 r\_mkt_{t-1} + \gamma_2 TERM_{t-1} + \gamma_3 pe10_{t-1} + v_t$$

1. Distributions of VAR State Variables

	Mean	**Std Dev.**	**Min.**	**25th Pct**	**Median**	**75th Pct.**	**Max.**
Ret_mkt	0.0740	0.2042	-0.3954	-0.0306	0.0792	0.1778	0.5415
TERM	0.0171	0.0133	-0.0114	0.0066	0.0206	0.0278	0.0374
PE10	0.1952	0.9474	0.0783	0.1025	0.1918	0.2643	0.4420

2. VAR Coefficient estimates

	r_mkt_{t-1}	$TERM_{t-1}$	$pe10_{t-1}$	R^2
r_mkt_t	-0.1678	0.0408	-0.0625	6.40%
	(-2.15)	(2.30)	(-1.25)	
$TERM_t$	-1.4336	0.4881	-0.0793	24.64%
	(-1.86)	(6.85)	(-0.23)	
$pe10_t$	0.1130	0.0445	0.9295	87.75%
	(0.93)	(2.96)	(20.40)	

3. Distributions of Market-level Cash Flow and Discount Rate News

	Mean	**Std Dev.**	**Min.**	**25th Pct**	**Median**	**75th Pct.**	**Max.**
NCF_mkt	0.0000	0.0927	-0.2377	-0.0796	0.0131	0.0637	0.1777
NDR_mkt	0.0000	0.1215	-0.1869	-0.0937	-0.0066	0.0606	0.3684

Panel C: Pearson (above diagonal) and Spearman (below diagonal) Correlations Among Market Returns, Market-Level News, Aggregate Income, and Aggregate Tax Expense

	Ret_mkt	*NCF_mkt*	*NDR_mkt*	Δ*PTI_mkt*	Δ*TXT_mkt*	Δ*CTE_mkt*	Δ*DTE_mkt*
Ret_mkt		0.7561	-0.8233	0.2291	0.0433	-0.2441	0.2141
		(0.0001)	(0.0001)	(0.1666)	(0.7962)	(0.1397)	(0.1968)
NCF_mkt	0.6886		-0.5179	0.0535	0.0776	0.0241	-0.0106
	(0.0001)		(0.0009)	(0.7496)	(0.6433)	(0.8860)	(0.9494)
NDR_mkt	-0.8085	-0.4308		-0.2033	-0.0528	0.1715	-0.1358
	(0.0001)	(0.0069)		(0.2208)	(0.7528)	(0.3031)	(0.4163)
Δ*PTI_mkt*	0.1137	0.1159	0.0235		0.8519	0.4206	0.7755
	(0.4967)	(0.4884)	(0.8885)		(0.0001)	(0.0086)	(0.0001)
Δ*TXT_mkt*	-0.0157	0.1115	0.1828	0.8039		0.7624	0.6717
	(0.9257)	(0.5051)	(0.2719)	(0.0001)		(0.0001)	(0.0001)
Δ*CTE_mkt*	-0.0548	0.1870	0.1877	0.5345	0.7761		0.0881
	(0.7438)	(0.2609)	(0.2592)	(0.0005)	(0.0001)		(0.5988)
Δ*DTE_mkt*	0.1154	0.0332	0.0119	0.5448	0.6299	0.2404	
	(0.4901)	(0.8434)	(0.9433)	(0.0004)	(0.0001)	(0.1460)	

This table reports descriptive statistics for market-level variables and results from the decomposition of market returns into their cash flow and discount rate news components. Panel A provides summary statistics for the annual time series of aggregate return and financial statement variables beginning in 1974 and ending in 2011. The *p*-values in Panel A are the result of testing for positive autocorrelation in each aggregate variable listed. Panel B reports the methodology and results from decomposing market returns into their cash flow news and discount rate news components. Descriptive statistics are presented for each variable included in the VAR system before any log modifications (represented by capital letters). Lowercase variable names represent logged values. Coefficient estimates and standard errors (in parentheses) are presented in Part 3 of Panel B. Panel C reports correlations among the market-level variables. Pearson correlations are reported above the diagonal and Spearman correlations are reported below it. *P*-values are reported in parentheses. *Ret_mkt* are excess market returns, calculated as the annual buy and hold return on the CRSP value-weighted index from April of year *t* to March of year *t*+1 less the 1 month t-bill return over the corresponding period. *NCF_mkt* and *NDR_mkt* represent the cash flow news and discount rate news component of market returns, respectively. Δ*PTI_mkt* is aggregate pre-tax earnings surprise, Δ*TXT_mkt* is aggregate tax expense surprise, and Δ*CTE_mkt* and Δ*DTE_mkt* represent aggregate current and deferred tax expense surprise. Aggregate financial statement variables are calculated as the value weighted average of scaled firm level variables. Δ*Tbill3mo* is the change in the 3-month t-bill rate at the end of year *t*. Δ*TERM* is the change in the term spread. Δ*DEFAULT* is the change in the default spread. ΔGDP_t, $\Delta IPROD_t$, and $\Delta CONS_t$ represent GDP, industrial production, and personal consumption growth. CRSPret_vw_{t-1} is the lagged value-weighted market return. *CAY* is the consumption-aggregate wealth ratio. *EQ_SHR* is the equity share of new issues in year *t*. *B2M* is the value-weighted average of individual firms' book-to-market ratios. *TERM* represents the term spread and *PE10* represents the Shiller price-earnings ratio. See Appendix B for detailed variable definitions.

Table 6: Market Returns and Aggregate Tax Expense

Time-series regressions of market returns on aggregate pre-tax income, aggregate tax expense surprises, various cash flow and discount rate proxies, and other factors shown to predict market returns.

For all calendar years from 1974 – 2011

$$Ret\_mkt_t = \alpha_0 + \beta_1 \Delta PTI\_mkt_t + \beta_2 \Delta TXT\_mkt_t + \beta_3 \Delta Tbill3mo_t + \beta_4 \Delta TERM_t + \beta_5 \Delta DEFAULT_t + \beta_6 \Delta GDP_t + \beta_7 \Delta IPROD_t + \beta_8 \Delta CONS_t + \beta_9 CRSPret_{t-1} + \beta_{10} CAY_t + \beta_{11} EQ\_SHR_t + \beta_{12} B2M\_mkt_t + \varepsilon_t$$

Panel A: Aggregate Total Tax Expense Surprises

	Market Returns	**Cash Flow News**	**Discount Rate News**
Intercept	0.1654	0.0224	0.0016
	(1.64)	(0.93)	(0.11)
ΔPTI_mkt_t	0.6258	-0.1752	-0.7898
	(0.67)	(-0.40)	(-1.38)
ΔTXT_mkt_t	-9.1347	2.8475	9.6002
	(-0.95)	(0.61)	(2.39)
$\Delta Tbill3mo_t$	3.9568	—	-2.6081
	(1.99)	—	(-3.39)
$\Delta TERM_t$	-2.1533	—	1.4636
	(-0.81)	—	(1.18)
$\Delta DEFAULT_t$	-12.1235	—	8.3182
	(-2.42)	—	(2.35)
ΔGDP_t	-2.0452	-1.5695	—
	(-0.62)	(-0.64)	—
$\Delta IPROD_t$	-0.3046	0.1837	—
	(-0.15)	(0.31)	—
$\Delta CONS_t$	0.0202	0.0054	—
	(0.88)	(0.24)	—
$CRSPret\_vw_{t-1}$	-0.1577	—	-0.0791
	(-1.40)	—	(-0.93)
CAY	-0.7835	—	—
	(-0.59)	—	—
EQ_SHR_t	-0.0162	—	—
	(-2.54)	—	—
$B2M\_mkt_t$	-0.1033	—	—
	(-0.97)	—	—
Adj. R^2	18.23%	-11.22%	27.87%

Panel B: Aggregate Current and Deferred Tax Expense Surprises

	Market Returns	**Cash Flow News**	**Discount Rate News**
Intercept	0.1485	0.0228	0.0032
	(1.59)	(1.03)	(0.19)
ΔPTI_mkt_t	0.3629	0.0654	-0.5741
	(0.41)	(0.23)	(-0.84)
ΔCTE_mkt_t	-15.5356	2.7893	11.3021
	(-1.47)	(0.71)	(2.46)
ΔDTE_mkt_t	-5.4988	-0.0323	7.9623
	(-0.45)	(-2.43)	(1.14)
$\Delta Tbill3mo_t$	4.3380	—	-2.4884
	(2.77)	—	(-3.83)
$\Delta TERM_t$	-1.9257	—	1.5174
	(-0.88)	—	(1.24)
$\Delta DEFAULT_t$	-10.1186	—	6.9862
	(-1.85)	—	(1.80)
ΔGDP_t	-1.2835	-1.7804	—
	(-0.44)	(-0.73)	—
$\Delta IPROD_t$	0.1336	0.1321	—
	(0.07)	(0.19)	—
$\Delta CONS_t$	0.0140	0.0094	—
	(0.61)	(0.42)	—
$CRSPret\_vw_{t-1}$	-0.1668	—	-0.0823
	(-1.61)	—	-1.02)
CAY	-0.8380	—	—
	(-0.70)	—	—
EQ_SHR_t	-0.0168	—	—
	(-2.96)	—	—
$B2M\_mkt_t$	-0.0956	—	—
	(-0.92)	—	—
Adj. R^2	17.59%	-12.40%	28.17%

This table reports the results of regressing contemporaneous excess market returns and their cash flow and discount rate news components on aggregate pre-tax income and tax expense surprises and other variables previously shown to explain market returns. Excess market returns (*Ret_mkt*) are calculated as the annual buy and hold return on the CRSP value-weighted index from April of year *t* to March of year *t*+1 less the 1 month t-bill return over the corresponding period. Market-level cash flow news and discount rate news are calculated using the variance decomposition methodology of Campbell [1991] as set forth in Table 5. Panel A reports results with regard to aggregate total tax expense surprises. Panel B reports results when aggregate total tax expense is decomposed into its current and deferred portions. Δ*PTI_mkt* is aggregate pre-tax earnings surprises, Δ*TXT_mkt* represents aggregate tax expense surprises, and Δ*CTE* and Δ*DTE* represent aggregate current and deferred tax expense surprises. Aggregate financial statement variables are calculated as the value weighted averages of scaled firm level variables. Δ*Tbill3mo* is the change in the 3-month t-bill rate at the end of year *t*. Δ*TERM* is the change in the term spread. Δ*DEFAULT* is the change in the default spread. ΔGDP_t, $\Delta IPROD_t$, and $\Delta CONS_t$ represent GDP, industrial production, and personal consumption growth. $CRSPret\_vw_{t-1}$ is the lagged value-weighted market return. . *CAY* is the consumption-aggregate wealth ratio. *EQ_SHR* is the equity share of new issues in year *t*. *B2M* is the value-weighted average of individual firms' book-to-market ratios. Detailed variable definitions are presented in Appendix B. T-statistics are reported in parentheses below the coefficient estimate.

Table 7: Firm-Level Returns, Discount Rate News, Cash Flow News and Tax Expense Surprises for Profit versus Loss Firms

Fama MacBeth regressions of firm-level returns and decomposed returns on pre-tax income, tax expense surprises,and control variables.

For subsamples of profitable and loss firm-years with December year-ends and sufficient data from 1974– 2011.

$$Ret\_firm_{i,t} = \alpha_0 + \beta_1 \Delta PTI_{i.t} + \beta_2 \Delta TXT_{i,t} + \beta_3 B2M_{i,t-1} + \beta_4 MKVAL_{i,t-1} + \beta_5 R_{i,t-1+} \varepsilon_t$$

Panel A: Total Tax Expense Surprises

	Profit Firm-Years			**Loss Firm-Years**		
	Returns	**Cash Flow News**	**Discount Rate News**	**Returns**	**Cash Flow News**	**Discount Rate News**
Intercept	0.1895	0.1249	0.0274	0.0604	-0.2065	-0.0797
	(3.47)	(4.35)	(1.80)	(0.65)	(-4.45)	(-2.67)
ΔPTI_t	0.0688	0.0649	-0.0066	0.0557	0.1008	0.0342
	(2.16)	(1.98)	(-1.00)	(3.75)	(3.58)	(2.23)
ΔTXT_t	0.5805	0.4018	-0.0901	0.1776	0.0922	-0.0942
	(7.00)	(6.24)	(-5.19)	(3.23)	(1.39)	(-2.14)
$B2M_{t-1}$	0.0624	-0.0379	0.0016	0.0570	-0.0078	0.0168
	(3.85)	(-3.57)	(0.33)	(3.08)	(-0.48)	(2.03)
$MKVAL_{t-1}$	-0.0201	-0.0076	-0.0026	-0.0254	0.0100	0.0121
	(-4.15)	(-3.09)	(-1.99)	(-2.78)	(2.24)	(5.82)
Ret_firm_{t-1}	-0.0217	-0.0115	-0.0112	-0.0757	0.0041	0.0003
	(-0.65)	(-0.76)	(-2.46)	(-1.59)	(0.23)	(0.05)
N	73,930	73,930	73,930	31,700	31,700	31,700
Adj. R^2	6.78%	5.68%	3.73%	5.84%	6.60%	3.08%

Panel B: Current and Deferred Tax Expense Surprises

	Profit Firm-Years			Loss Firm-Years		
	Returns	**Cash Flow News**	**Discount Rate News**	**Returns**	**Cash Flow News**	**Discount Rate News**
Intercept	0.2255	0.1364	0.0246	0.0681	-0.2158	-0.0871
	(3.45)	(4.24)	(1.46)	(0.73)	(-4.51)	(-2.84)
ΔPTI_t	0.0703	0.0666	-0.0043	0.0539	0.0976	0.0324
	(2.37)	(2.26)	(-0.77)	(3.90)	(3.60)	(2.22)
ΔCTE_t	1.3507	0.8330	-0.2121	0.5607	0.4249	-0.1490
	(8.48)	(8.93)	(-6.54)	(6.15)	(4.13)	(-2.95)
ΔDTE_t	0.4979	0.3226	-0.0556	0.2003	0.1315	-0.0376
	(5.12)	(4.60)	(-2.56)	(3.25)	(2.02)	(-0.72)
$B2M_{t-1}$	0.0541	-0.0423	0.0058	0.0561	-0.0073	0.0203
	(3.22)	(-4.08)	(1.18)	(3.05)	(-0.45)	(2.46)
$MKVAL_{t-1}$	-0.0237	-0.0082	-0.0026	-0.0258	0.0128	0.0130
	(-4.05)	(-3.26)	(-1.78)	(-2.78)	(2.67)	(5.35)
Ret_firm_{t-1}	-0.0326	-0.0154	-0.0117	-0.0815	-0.0007	0.0019
	(-1.00)	(-1.06)	(-2.60)	(-1.65)	(-0.04)	(0.25)
N	59,455	59,455	59,455	27,697	27,697	27,697
Adj. R^2	7.26%	6.02%	4.00%	6.06%	6.93%	3.44%

This table reports the results of cross-sectional Fama MacBeth regressions of contemporaneous firm-level returns, cash flow (or earnings) news, and discount rate news on a firm's pre-tax income and tax expense surprises on subsamples of profitable and loss firms. Panel A reports results with regard to a firm's total tax expense surprises, controlling for pre-tax income surprises and other factors known to explain firm-level returns. Panel B reports results when total tax expense is decomposed into its current and deferred portions. Results are presented for the full sample of firm-year observations and separate for firm-year observations with positive and negative tax expense surprises (ΔTXT). Firm-level returns are calculated as the buy and hold return for a given firm beginning in April of year *t* and ending in March of year *t+1*. Cash flow news and discount rate news represent the portion of total firm-level returns driven by earnings news and all other news, respectively, and are calculated following the methodology of Callen and Segal (2010). *PTI* represents pre-tax income. *TAX*, *CTE*, and *DTE* represent total tax expense and its current and deferred portions. ΔPTI, ΔTXT, ΔCTE, and ΔDTE represent surprises in each variable, calculated as the year to year change in each, scaled by price at the end of the third month of year *t*. Control variables include the firm's beginning of year book-to-market ratio ($B2M_{t-1}$), market value ($MKVAL_{t-1}$) and its prior year buy and hold return. Detailed variable definitions are provided in Appendix B. T-statistics are reported in parentheses below the coefficient estimate.