

Taxes and Financial Constraints: Evidence from Linguistic Cues

May 20, 2014

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Keywords: Tax Avoidance, Unrecognized Tax Reserve, Negative Words, Disclosure.
JEL Classifications: H25, H26, M41, G30.

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1. Introduction

Under traditional corporate finance theories, firms faced with financial constraints—broadly defined as frictions that prevent firms from funding all desired investments (Lamont, Polk, and Saá-Requejo (2001))—have higher costs of external financing. Financially constrained firms preserve internal finance to generate funds for future investment opportunities. In this paper, we examine whether financially constrained firms pursue aggressive tax planning strategies to provide additional internal funds. Our study differs from recent working papers examining the relationship of financial constraints and aggressive tax planning activities (e.g., Chen and Lai (2012) and Edwards, Schwab, and Shevlin (2014)) in three key aspects.

First, instead of using quantitative measures to quantify financial constraints, we use the qualitative measure proposed by Bodnaruk, Loughran, and McDonald (2013), who find that financially constrained firms use more negative words in their annual reports, consistent with the disclosure of negative information capturing hard-to-quantify unfavorable aspects of firms' business environments (Tetlock, Saar-Tsechansky, and Macskassy (2008)). Although the theory that financially constrained firms will attempt to generate internal funds is clear, the empirical literature provides mixed guidance on which accounting variables or index measures of constraints to use. Widely used measures often exhibit negligible or even negative correlations among themselves.¹ Although the literature proposes hand-collected qualitative-based measures based on firms' annual reports,² such measures are often criticized as being subjective, non-replicable, and non-generalizable to a large sample. Unlike the quantitative approaches to measuring financial constraints, qualitative (or linguistic) approach mitigates the concern of misidentifying accounting variables to capture financial constraint.

¹ As discussed in Whited and Wu (2006), Hadlock and Pierce (2010), Bodnaruk et al. (2013), Hoberg and Maksimovic (2013), Farre-Mensa and Ljungqvist (2014).

² For example, Kaplan and Zingales (1997) and Hadlock and Pierce (2010) conduct textual analyses into the annual reports of 49 manufacturing firms and 356 firms, respectively.

Second, our study provides novel evidence supporting how financial constraints affect firms' tax avoidance strategies. In addition to examining cross-sectional differences in firms' financial constraints, we exploit shocks to firms' credit supply channel brought by the number of failed local banks to develop an exogenous instrument for our qualitative measure. As firms primarily borrow from local banks (Petersen and Rajan (2002), Degryse and Ongena (2005)), unexpected closures of local banks provide plausibly exogenous liquidity shocks to firms' external financial constraints, and is not endogenous to firms' internal financial environment. Consistent with our conjecture that firms experience financial constraint when local banks fail, we show the association between negative words and tax aggressiveness is larger when the firm is located in a county with higher bank failures that year, even after controlling for the variations in local business cycle.

Third, the qualitative measure of firms' financial constraint not only provides contemporaneous identification of tax aggressiveness, but is effective in predicting their future tax aggressiveness. Thus, the qualitative measure of financial constraint could be useful to researchers, financial market intermediaries (e.g., analysts), and tax enforcers in the years prior to the firm eventually disclosing unrecognized tax benefits or effective tax rates consistent with claiming more tax positions.

Numerous financial studies have consistently demonstrated the power of negative words in different contexts. Investors react more strongly to firm news that uses negative words than to news with positive words (Tetlock (2007), Tetlock, Saar-Tsechansky, and Macskassy (2008), Loughran and McDonald (2011)). Negative tones also asymmetrically contain more information than positive tones (Engelberg (2009), Henry and Leone (2009), Kothari et al. (2009)).³ This research confirms the general finding in the psychology literature, where negative information is given more weight and is more thoroughly processed by humans than is positive information, across many different psychological

³ This arises in part because managers sometimes use positive words to exaggerate, but would seldom use negative words falsely, and because counting positive words (such as "improve" or "profitable") mischaracterizes negative disclosures such as "will not improve" or "not profitable."

contexts (Taylor (1991), Baumeister et al. (2001), Rozin and Royzman (2001)). However, the finding that qualitative information provides incremental explanatory power on various corporate policies is surprising, because firms with large market capitalization are under constant scrutiny by investors and equity analysts.⁴

Investors, tax authorities, shareholders, and even regulators traditionally rely on firms' quantitative information to evaluate the extent to which tax avoidance (any reduction in explicit tax paid) is aggressive (unlikely to be sustained if challenged). Financial measures like effective tax rates (ETRs) are also the primary source of information the media's high-profile investigations that spotlight firms' aggressive tax avoidance strategies (e.g., the low tax rates of Starbucks, Google, and GE). However, if negative words in annual reports provide incremental information about firms' aggressive tax planning activities beyond current accounting variables, this linguistic-based measure could help researchers and regulators to identify tax-aggressive firms that under-report tax reserves or that do not face mandatory disclosure of tax reserves.⁵ Further our evidence linking use of negative words to future year higher UTBs and lower ETRs suggests that financial constraints predict *future* tax aggressiveness.

To measure a firm's financial constraint, we compute *Use of Negative Words* as the fraction of the negative words in a firm's annual 10-K filing based on the summary word count files provided by

⁴ Numerous subsequent studies also examine the disclosure tone in various corporate settings. For example, studies have examined the disclosure tone in annual reports (Li (2008), Lehavy, Li, and Merkley (2011), Loughran and MacDonald (2011), Campbell et al. (2012), Bodnaruk et al. (2013)), management discussion and analysis section (Bryan (1997), Kothari et al. (2009), Li (2010), Brown and Tucker (2011), Ball, Hoberg, and Maksimovic (2012)), earnings announcements and press releases (Engelberg (2008), Henry and Leone (2009), Feldman et al. (2010), Davis, Piger, and Sedor (2012), Demers and Vega (2014)), analyst reports (De Franco, Hope, Vyas, and Zhou (forthcoming)), and IPO prospectus (Hanley and Hoberg (2010), Huang, Teoh, and Zhang (forthcoming)). Other studies analyze the verbal communications in earnings conference calls (Hobson, Mayew, and Venkatachalam (2012), Mayew and Venkatachalam (2012), Larcker and Zakolyukina (2012)).

⁵ Examples include firms using international accounting standards (e.g., IFRS), firms using U.S. Generally Accepted Accounting Principles (GAAP) before 2007, or firms that decrease reported reserves to minimize tax authority scrutiny, particularly after new tax return requirements in 2010 (Towery (2013)).

McDonald.⁶ We use three measures of aggressive tax planning activities: (1) firms' unrecognized tax benefits balances (*UTB Balance*),⁷ (2) short-run and long-run contemporary and future cash and GAAP ETRs (*ETRs*),⁸ and (3) use of tax havens for material operations.⁹ We construct a sample of large, publicly listed U.S. firms from 1993 to 2011, but our primary test of UTBs necessarily uses data starting in 2007. We conduct a series of cross-sectional regression tests to examine the incremental power of *Use of Negative Words* as a firm-specific financial constraint to explain our proxies for tax aggressiveness beyond known accounting variables. Such known explanatory variables include size, growth, book and tax reporting differences, operations and profitability, tax loss carry-forward (level and change), returns on assets, time and industry fixed effects. In addition to this wide set of 19 control variables for our large sample tests, we also evaluate multiple other effects in an extensive series of robustness tests.

Our overall results show that financially constrained firms pursue more aggressive tax planning activities. We summarize our main results below. First, we find that financially constrained firms have significantly higher *UTB Balance*, suggesting that firms faced with financial constraints in their business environments pursue more aggressive tax avoidance strategies.¹⁰ A one standard deviation increase in the use of negative words is associated with approximately 6% increase in standardized *UTB Balance*, which is economically significant. The top 20% percentile users of negative words (i.e., firms in the top 20th

⁶ Interested readers please refer to McDonald's website for a complete list of 2,329 negative words (<http://www3.nd.edu/~mcdonald>). We do not directly parse firms' 10-K filings to get negative word counts, nor have we discovered a way to extract only the tax footnote portion of their financial statements, to conduct a more refined test of negative words only in the tax descriptions. However, in supplemental tests, we conduct qualitative analyses by manually counting the use of negative words in the tax footnotes of 60 firms that have extremely large and small unrecognized tax benefit balances.

⁷ Since 2007, Financial Accounting Standards Board's Interpretation No. 48 (Fin 48) mandates each firm to disclose its liabilities for uncertain tax benefits that would fail to achieve a "more likely than not" threshold for recognition based on the merits of each transaction. Recent studies show that firms' UTB balances are significantly associated with their tax avoidance activities (e.g., Gupta, Mills, and Towery (2012), Lisowsky, Robinson, and Schmidt (2013)). In supplemental tests, we also consider the components of the UTB rollforward as well as associations of negative words with both contemporaneous and future UTB balances.

⁸ Dyreng, Hanlon, and Maydew (2010) show that long-run ETRs capture firms' tax avoidance strategies.

⁹ Dyreng and Lindsey (2009) find that firms that disclose material operations in tax haven countries have lower worldwide tax rates.

¹⁰ We appreciate using the public UTB data collected by the IRS and made available to one of the authors. These data are more comprehensive than that existing to date in Compustat (Lisowsky et al. (2013)).

percentile) have on average \$176 million higher *UTB Balance* per firm-year, which is significant and economically meaningful.

We also exploit local bank failures as exogenous liquidity shocks as an instrument for negative words, to offer more causality evidence on the financial constraint channel. As firms tend to borrow locally (Petersen and Rajan (2002), Degryse and Ongena (2005)), unexpected closures of local banks provide exogenous shocks to local credit supply, increasing firms' external financial constraints. This mitigates the use of endogenous firm-level accounting variables or corporate events (e.g., dividend cuts, rating downgrades), as local external financial environment is not affected by firms' internal financial environments. To implement our identification strategy, we use the number of failed banks in firms' headquarter states each year as a plausibly exogenous source of variation in firms' use of negative words. As banks are connected through interbank lending, prior studies find that the liquidity of surviving banks is often significantly affected by large deposit withdrawals triggered by local bank runs (Iyer and Peydró (2011)). Even when firms have not borrowed from local banks, prior studies show that a majority of publicly listed firms maintain at least some credit lines with local banks (Sufi (2009)). Overall, our instrumental variable (IV) estimation results show that firms located in states with high number of failed banks maintain a higher *UTB Balance*, offering direct evidence that firms' financial constraints affect their aggressive tax strategies.

We also examine the explanatory power of *Use of Negative Words* on individual components reconciling the beginning and ending *UTB Balance*. We find that financially constrained firms have higher (1) contemporaneous and *future year* additions in UTB balance related to current and prior year tax positions, (2) reduction in UTB due to settlements with tax authorities, (3) amount of UTB balance that would affect the ETR if recognized, and (4) penalties and interest relating to UTB balance. We find that a one standard deviation increase in firms' use of negative words predicts a 2.9%-3.7% increase in

standardized additions to UTB balance in the next year. We also examine the power of negative words to explain UTB incrementally to controlling for ETRs. We introduce as controls several horizons for cash and GAAP ETRs, including current year, and prior 3-, 5-, 7-, and 10-year ETRs. Even after controlling for firm fundamentals and current or long-run prior ETRs, negative words still significantly explain—either statistically or economically—a substantial variation in contemporaneous *UTB Balance*. Moreover, firms' *Use of Negative Words* explains more of the variation in *UTB Balance* than all commonly used ETRs.

In the last set of analyses, we investigate whether the predictive of negative words on short- and long-run ETRs. We find that financially constrained firms report lower current and *future* cash and GAAP effective tax rates. The lower ETRs persist as long as up to *next* 10 years. The economic magnitudes are significant: a one standard deviation increase in firms' use of negative words is associated with 6%-15% decrease in firms' standardized ETRs. The top 20th percentile users of negative words on average have 2%-4% lower ETRs, for as long as next 10 years.

We also consider a number of alternative explanations as follows.

Disclosure of Tax Risks. One potential endogeneity concern is that firms that pursue aggressive tax planning activities disclose more negative words in their annual reports, which would invalidate the causality of financial constraint on tax avoidance strategies. However, we conclude our results are unlikely to be driven by disclosures of tax risk. First, our linguistic measure is based on all words in the 10-K documents. Based on a small sample test of firms' tax footnotes, few words would be categorized as negative words in the UTB disclosure (less than 1% of all negative words, even in the firm with the highest fraction of negative words among all 2009 10-Ks). Second, we find financially constrained firms have lower *future* long-run ETRs, which contradicts the prediction under tax risk hypothesis, which posits firms with high tax risk have *higher* long-run ETRs due to possible subsequent IRS' disputes and settlements, whereas the financial constraint channel predicts *lower* long-run future ETRs. Third, we

introduce several alternative linguistic measures based on firms' use of uncertainty, possibility, and strong modal words, but none of those linguistic cues explain our tax aggressiveness measures, with or without negative words, and negative words remain significant. Perhaps the strongest evidence is our last test, where we directly compare the usage of negative words in tax footnotes of 30 firms with extremely high UTB balances (*Top UTB Firms*) and 30 firms with extremely low UTB balances (*Bottom UTB Firms*). Even with this low-power test based on 60 observations, we continue to observe that *Top UTB Firms* use more negative words in their whole 10-K filings than *Bottom UTB Firms*. However, there is no systematic difference in the use of negative words in their tax footnotes between these two groups. All these tests unanimously suggest that our results are not driven by firms' tax risk.¹¹

Litigation Risk. An intuitive explanation is that firms with higher litigation risk could disclose in a more negative tone. However, even aggressive tax avoidance is seldom illegal, the majority of disputed cases are resolved prior to litigation (Hanlon, Mills, and Slemrod (2007)). Nevertheless, we capture firms' litigation risk directly by including in our regression firms' use of litigious words (e.g., words such as court, legal, and claim) and constraining words (e.g., words such as comply, obligations, and covenants) in their annual reports. Moreover, Rogers, Buskirk, and Zechman (2011) find firms that use more optimistic words are more likely to be the targets of lawsuits, although in an earlier study, Francis, Philbrick, and Schipper (1994) find no evidence. Thus, we also include a measure of firms' use of positive words. Our results remain robust even after controlling for the use of litigious, constraining, or positive words.

Obfuscation/Readability. Another possibility is that firms who engage in aggressive tax strategies tend to obfuscate the information disclosure in their annual reports (Wang (2011)). If managers' obfuscation is correlated with the use of negative words, this alternative explanation could explain our

¹¹ We do not, however, claim that the disclosure in tax footnotes cannot provide incremental information into firms' aggressive tax strategies. Perhaps future work can evaluate a specific list of tax-related words to identify tax-avoiders.

results. However, it is not clear how negative words and readability would substitute each other in terms of the theoretical construct. Nevertheless, we introduce measures based on the number of words, several reading measures (Gunning Fox Index, Flesch Reading Ease, and Kincaid Readability following Li (2008, 2010)), and use of negation words (such as “do not benefit”). Our baseline results are not sensitive to controlling for obfuscation and readability, nor are those measures significant.

In our last set of results, we find that financially constrained firms also have more material operations in tax havens. A one standard deviation increase in the use of negative words is associated with a 2.5%-2.9% increase in the likelihood of firms to have material operations in tax havens, or a 2.3%-2.6% increase in the number of tax havens used (after controlling for a wide set of firm characteristics).

We consider several alternative explanations or refinements to the above results—controlling for executives’ pay-for-performance sensitivities, corporate governance, institutional ownership, IRS tax audit rate, local values (captured through religiosity), or industry competition, using a finer industry classification, industry-adjusted (either mean or median) dependent variables, 10-Q quarterly filings, excluding small-cap firms, high technology firms, or young firms, or using three alternative variants of negative words. Our results remain robust. Overall, our results are robust to an extensive set of alternative specifications, samples, and robustness tests.

Because our paper is the first study to show that linguistic cues in firms’ annual reports identify their aggressive tax planning activities, we contribute to two broad literatures. We extend both the literature on linguistic cues and corporate reporting as well as the literature that seeks to better understand and identify tax aggressiveness.

Regarding linguistic cues and corporate reporting, we contribute to studies that find the tone of disclosure is related to: earnings and persistence (Li (2008, 2010)), earnings conference calls (Larcker and

Zakolyukina (2012)), firm litigation (Francis, Philbrick, and Schipper (1994), Rogers, van Buskirk, and Zechman (2011)), earnings press releases (Davis, Piger, and Sedor (2012), Demers and Vega (2014), Huang, Teoh, and Zhang (2014)), analyst reports (Lehavy, Li, and Merkley (2011)). We also contribute to the stream of finance literature showing that qualitative financial information—predominantly negative words—has a strong predictability on firms’ future stock returns and earnings (Tetlock (2007), Tetlock et al. (2008), Loughran and McDonald (2011)). Our finding that negative words similarly predict tax aggressiveness extends prior evidence that negative words predict various corporate policies.

We contribute to the tax literature in several ways. We are the first study examining the association between firms’ aggressive tax planning activities and the linguistic cues in their annual reports. We consider primarily whether negative words can predict tax aggressiveness, because negative words have the most power in other corporate reporting settings.

First, we show that linguistic cues disclosed throughout firms’ annual reports are an important source of qualitative information about firms’ aggressive tax planning activities. This provides market participants, especially shareholders, investors, or even regulators who have no access to internal data, or limited resources for intensive hand-collection, with a new measure to identify a higher likelihood of current and future tax aggressiveness. Our approach helps researchers and regulators to identify tax-avoiding firms in regimes where firms are not explicitly required to disclose their uncertain tax positions. Second, by showing that the *qualitative* linguistic cues in annual reports incrementally explain aggressive tax planning activities, we complement prior research that maps tax aggressiveness to *quantitative* cross-sectional effects. Third, we complement recent studies quantifying specific components of hard-to-process tax information in firms’ annual reports (McGill and Outslay (2004), Raedy, Seidman, and Shackelford (2011), Wang (2011), Gupta, Laux, and Lynch (2013), Higgins (2013)). Moreover, the absence of any systematic and centralized database of tax footnote texts and categories creates an

empirical obstacle to tax researchers, making a large sample study generally infeasible and, to the extent requiring qualitative judgments, difficult to replicate and extend.

Our findings also have practical implications. First, if dispersed qualitative statements contain disaggregated but relevant information, market participants could better quantify firms' overall tax exposure even absent numeric disclosures about tax uncertainty. Second, analyzing linguistic cues has potential implications for tax enforcement. The required financial disclosure of UTB reserves starting in 2007 provides one measure of tax aggressiveness (Lisowsky, Robinson, and Schmidt (2013), Towery (2014), Gupta et al. (forthcoming)). Further, starting in 2010, U.S. corporate taxpayers must describe each transaction that generates a tax reserve on Schedule UTP in the corporate tax return. However, Towery's evidence suggests that firms responded by reducing their financial reserves to avoid some UTP disclosures. Perhaps the IRS could improve its audit detection models by systematically analyzing the linguistic cues in firms' annual reports or in the text of the Schedule UTP descriptions. Our measure is replicable, objectively measured, and is based on publicly available information.

2. Data and Methodology

2.1 Sample Data

Our main sample starts with Compustat firms, requiring complete and non-missing financial information from 1994 to 2011. The sample period starts in 1994 when the SEC first produced online electronic EDGAR filings. We exclude firms in the regulated industries of utilities (SIC codes 4900-4999) and financial institutions (SIC codes 6000-6999), following prior research (e.g., Mills and Newberry (2005), Hanlon (2005)). We do not directly parse firms' 10-K filings to count the negative words, but obtain from McDonald his summary file of firms' use of negative words in their 10-K filings for the sample period.¹² For each sample firm, all words in firms' 10-K filings from SEC's EDGAR are parsed and counted following the parsing procedures detailed in Loughran and McDonald (2011). The count

¹² We thank William McDonald for graciously sharing this summary file.

requires each 10-K document to have at least 2,000 words. For our tests of UTB our sample period only extends from 2007 to 2011 with 5,418 firm-year observations representing 2,340 firms.¹³ Our sample period for tests of tax havens and ETRs extends from 1993-2011 with 12,515 firm-year observations representing 3,286 firms.

2.2 Methodology

To test our hypothesis that firms' use of negative words (*Use of Negative Words*) is associated with their unrecognized tax benefit balances (*UTB Balance*), we estimate the following ordinary least squares (OLS) baseline regression:

$$UTB\ Balance_{j,t} = \alpha + \beta_1 Use\ of\ Negative\ Words_m + \beta_2 Firm\ Characteristics_{j,t} + \beta_3 Fixed\ Effects + \varepsilon_{j,t} \quad (1)$$

For each firm j in year t , we regress firm j 's *UTB Balance* in year t on *Use of Negative Words*, a k -vector of firm-level control variables X , and a wide set of fixed effects. The main coefficient of interest is β_1 which captures the association of firms' use of negative words and their balance of unrecognized tax benefit. The dependent variable, *UTB Balance*, is defined as a firm's UTB ending balance scaled by total assets. To avoid the influence of extreme outliers, *UTB* is winsorized at the 1st and 99th percentiles. *Use of Negative Words* is defined as the number of negative words divided by total number of words in a firm's annual 10-K filing using the financial word list developed by Loughran and McDonald (2011). We use OLS regressions for some tests to facilitate coefficient interpretations, maintain estimation and reporting flexibility (e.g., IV tests),¹⁴ and we note that only a quintile of sample firms report nil UTB balances. As reported in robustness checks, our results are stronger under Tobit regression.

In subsequent tests, we use alternative dependent variables to capture firms' tax avoidance behavior: (1) *Cash ETR*, (2) *GAAP ETR*, (3) *Use of Tax Havens*, and (4) *Number of Tax Havens*.

¹³ We use public UTB data collected by the IRS and made available to one of the authors. These data are more comprehensive than those existing to date in Compustat (Lisowsky et al. (2013)).

¹⁴ Reporting OLS conserves space, as there requires three sets of results—unconditional expected value, conditional expected value, and probability uncensored results—per Tobit regression.

Cash ETR is income taxes paid, divided by pre-tax income minus special items. *GAAP ETR* is income taxes, divided by pre-tax income minus special items following Dyreng, Hanlon, and Maydew (2010). We retain both profit and loss firms to avoid bias (Guenther (2011)), but consistent with Gupta and Newberry (1997), we truncate both measures at [0,1] to avoid the undue influence of outliers. *GAAP* and *Cash ETRs* capture different sources of explicit tax avoidance behavior. *Cash ETR* represents all sources of non-conforming tax avoidance, which includes temporary differences between book and taxable income, permanent differences, credits, and applicable national and sub-national (e.g. provincial, state, city) tax rates. *Cash ETR* also depends on the actual timing of cash flow, whereas *GAAP ETR* does not. *GAAP ETR* ignores temporary differences, and it captures tax avoidance measures that affect earnings per share. In additional analyses, we also examine long-run *future* variants of *Cash ETR* and *GAAP ETR*. We use these broad measures of avoidance, expecting that once we hold all other factors constant, a firm that has a lower ETR is choosing to avoid tax at a relatively more aggressive point on the reporting continuum (Lisowsky, Robinson, and Schmidt (2013)) than a comparable firm.

We construct *Use of Tax Havens* and *Number of Tax Havens* based on the disclosure of subsidiary location with material operations in Exhibit 21 of 10-K filings. *Use of Tax Havens* is an indicator that equals one if a firm reports having at least one tax haven subsidiary in the Exhibit 21 of its 10-K filing in a year, and zero otherwise. *Number of Tax Havens* is the natural logarithm of one plus the number of tax havens reported in Exhibit 21 of a firm's 10-K filings. Following Dyreng and Lindsey (2009), we consider a country a tax haven if it is listed by at least three of the following four sources: 1) Organization for Economic Cooperation and Development (OECD), 2) the U.S. Stop Tax Havens Abuse Act, 3) The International Monetary Fund, and 4) the Tax Research Organization as of March 4, 2008. We consistently apply their 2008 definition throughout our sample period but acknowledge that as more countries cooperate with OECD information sharing requirements, countries that would have

been considered tax havens initially are arguably not later in the sample.¹⁵ We predict firms that use more negative words are more likely to use tax havens for their material operations. All our main results on UTB, tax havens, and ETRs are robust to dropping loss firms.

To facilitate interpretation, unless indicated otherwise, all OLS regressions are standardized OLS regressions, where each continuous variable is standardized with mean zero and standard deviation one. So, we can directly compare the relative importance of different explanatory variables.

2.3 Control Variables: Firm Characteristics

The control variable matrix X includes a wide set of firm-level determinants identified in prior literature that affect corporate tax avoidance (Mills (1998), Manzon and Plesko (2002), Frank, Lynch, and Rego (2009), Chen, Chen, Cheng, and Shevlin (2010), Dyreng, Hanlon, and Maydew (2010), Lisowsky, Robinson, and Schmidt (2013)). These control variables can be broadly classified into three categories. The first group of controls includes firm size and growth opportunities (firm size, market-to-book ratio, merger & acquisition, and number of countries). The second group controls for the influence on tax avoidance measures arising from the difference in book and tax reporting environments (i.e., property, plant, & equipment, intangible assets, research & development, equity earnings, and use of mezzanine finance). The last group controls for firms' operations and profitability (returns on assets, leverage, foreign income, tax loss position, tax loss carry-forward (level and change), deferred revenue, comprehensive income, and stock compensation expenses). For ease of reference, the Appendix summarizes the construction details of all these firm-level variables.

In all specifications, we control for industry and year fixed effects (FEs). Including industry FEs ensures that the results are not driven by differences in industry characteristics or environment. We use Fama-French (1997) industry classifications, although our results are robust to using finer 3-digit SIC instead. Including year FEs controls for macroeconomic changes in firms' aggregate operating

¹⁵ These data are available at <http://www.globalpolicy.org>.

environments. As firms' tax avoidance is likely to be correlated within firms, we cluster all standard errors at the firm level (Petersen (2009)).¹⁶

3. Main Results

3.1 Summary Statistics and Univariate Evidence

The raw data are consistent with our hypothesis. Figure 1 plots the *UTB Balance* with *Use of Negative Words*. Financially constrained firms have larger unrecognized tax benefits (*UTB Balance*). The average *UTB Balance* increases almost monotonically with *Use of Negative Words*. The summary statistics in Table I confirm this relationship: the *Use of Negative Words* is correlated at the 1% significance level with all our tax aggressiveness measures. On the other hand, in Table I, Panel A few of the firm characteristics or other linguistic cues exhibit high correlation with *Use of Negative Words*, reducing any concern about collinearity. The average correlation between *Use of Negative Words* and all other variables is also small in magnitude (about 0.05) with the range from -0.21 (with *Property, Plant, and Equipment*) to 0.29 (with *Use of Possibility Words*).

3.2 Unrecognized Tax Benefits

Table II reports baseline OLS regression results for *UTB Balance*. Columns 1-4 use the exact set of explanatory variables used by Lisowsky, Robinson, and Schmidt (2013), whereas columns 5-8 use extended specification with five additional control variables. *Use of Negative Words* is positively and significantly associated with *UTB Balance*, consistent with our prediction that financial constraints explain firms' tax aggressiveness. Across all eight specifications, there is a strong systematic pattern showing that firms with higher unrecognized tax benefits use more negative words in their annual reports. The estimated coefficient on *Use of Negative Words* in column 1 is 0.062 (*t*-statistic: 3.33). The economic effect is meaningful and significant. A one standard deviation change in *Use of Negative Words* leads to a 6.2% (*t*-statistic: 3.33) increase in standardized *UTB Balance*, all else equal. The explanatory power of *Use of*

¹⁶ Our main results are robust to clustering standard errors at the firm and year level.

Negative Words is similar to a one standard deviation increase in *Firm Size*, and is ranked the 5th largest determinant (after *Research and Development*, *Number of Countries*, *Foreign Income*, and *Firm Size*) across all 15 variables examined in column 1.

Converting the *Use of Negative Words* to a quintile score (from 1 to 5) reduces noise in measurement and yields stronger results. Column 2 reports a coefficient estimate on *Quintile Score* of 0.070 with *t*-statistic of 4.02. Using indicator variables in columns 3 & 4 helps facilitate the interpretation of the quintile estimates. In column 3, firms in the top 20th percentile of negative words report on average 4.7% (*t*-statistic: 2.52) higher standardized *UTB Balance* than other firms. Column 4 further controls for the possible non-linearity in the association of *Use of Negative Words* with *UTB*. The estimated coefficients of *Use of Negative Words* exhibit a monotonic pattern with respect to *UTB Balance*, showing that the firms report higher *UTB Balance* as they use negative words more frequently. The top 20th percentile users of negative words have on average 7.8% (*t*-statistic: 3.69) higher in their standardized *UTB Balance* than other firms. Given the average firm size of \$13,029 million in the *UTB* sample, this finding translates into \$176 million more unrecognized tax benefits per firm-year, which is significant and economically meaningful.¹⁷ In unreported tests, we also regress the change in *UTB Balance* on the lag change in *Use of Negative Words* with changes in our control variables in column (1) and fixed effects. This ensures that the above results do not capture the unobservable time-invariant firm characteristics. We find that, while the number of observation substantially decreases due to the change specification, the estimated coefficient on the lag change in *Use of Negative Words* remains positive and significant at the 10% level (beta coefficient: 0.034; *t*-statistic: 1.71).

Overall, the above evidence indicates a significant and positive association between firms' unrecognized tax benefit balances and their use of negative words in annual reports.

¹⁷ = Average firm size \$13,029 million \times [(beta coefficient 0.078 \times *UTB Balances* standard deviation 0.019) + Average *UTB Balances* 0.012].

3.3 Instrumental Variable (IV) Regressions Using Local Bank Failure

There is an obvious endogeneity issue when interpreting as causal the evidence that firms' financial constraints affect their tax avoidance strategies. Firms with higher risks could report more negative words in their annual reports. Moreover, if there are unobserved omitted variables (that are not captured by the wide set of firm characteristics, year and industry fixed effects used in our regressions) that are correlated with *UTB Balance* and *Use of Negative Words*, the estimated coefficients could be biased and cloud any causal interpretations.

To address the endogeneity, we identify exogenous liquidity shocks to firms' financial constraints from the unexpected closure of local banks. As firms primarily borrow from local financial institutions (Petersen and Rajan (2002), Degryse and Ongena (2005)), unexpected closure of local banks provides plausibly exogenous shock to the local credit supply through a number of economic channels. First, if firms have ongoing lending relationships with a failed local bank, affected firms would unavoidably renegotiate their loans with new lenders. As new banks face information asymmetry due to an absence of long-term customer relationship (Sharpe (1990)), they would impose higher borrowing costs on new clients, who ultimately bear the switching costs. Second, other banks cannot easily arbitrage the lending opportunities resulting from the unexpected bank closure (Paravisini (2008)), as it takes time for failed banks to liquidate their assets. Thus, the financing frictions affect the overall credit supply.

Third, even firms that have no existing customer relationship with a failed bank could be affected by the contagion in interbank borrowing network. Any liquidity shock from a local bank failure could propagate to other members through interbank borrowing networks (Iyer and Peydró (2011)). Sufi (2009) shows that 85% of publicly listed firms maintain lines of credit equaling 16% of assets on average, so the local bank failures potentially affect the existing credit lines provided by other non-failed local banks.

The fundamental identification assumption of our test is that the source of variation in the number of bank failures is not correlated with firms' unrecognized tax benefit balances. We explore two challenges to this assumption. First, UTB balances and the number of failed banks could be correlated if they both capture the same underlying macroeconomic environment. If local bank failures capture the aggregate adverse macroeconomic environment, using the number of failed banks as an instrument without controlling for the sentiment in macroeconomic environment could bias the estimation of coefficients. However, as we have included year fixed effects in all our baseline and IV regressions, we are less concerned of this potential issue. Moreover, while FDIC provides insurance of up to \$250,000 per depositor-bank, it is unlikely that corporate depositors are fully immune from the unexpected closure of local banks.¹⁸

Second, the UTB balances could be correlated with bank closures through the local business cycle, although we are uncertain about the direction of the effect. If the local business environment is contracting, firms could pursue more aggressive tax planning activities because of financial constraints, or take more aggressive advantage of tax stimuli offered by legislators during recessions, resulting in higher UTBs. On the other hand, if tax enforcement is stricter during recessions, companies may be less aggressive, resulting in lower UTBs. Conversely, in a favorable business environment firms could pursue aggressive tax strategies to shield their higher earnings, although the local competition could also increase during local booms, driving down earnings and the need for tax shields. To ensure that our results are not simply driven by local business cycle, we control for *Gross State Product (GSP)* in our IV regressions. *Gross State Product* is defined as the year-on-year change in GDP by the state of the firm's headquarters, where the economic time-series data are from the Bureau of Economic Analysis (BEA).

¹⁸ Even under the FDIC's Temporary Liquidity Guarantee Program (TLGP) where deposits were guaranteed in full from 2008 to 2010 (which was subsequently extended by the Dodd-Frank Act through 2012), the protection only extends to non-interest bearing deposits. As it is not common for corporations to solely keep their assets in non-interest bearing accounts, it is unlikely for the FDIC's insurance schemes to fully cover the loss of local corporate deposits due to unexpected bank closures.

We obtain the list of failed banks from the Federal Deposit Insurance Corporation (FDIC). *Number of Failed Local Banks* equals the natural logarithm of one plus the number of failed bank in a state-year, which we match to each firm by the state of the firm's historical headquarters during the year. The top three states which have the highest number of failed banks during the sample period are Georgia, Florida, and Illinois (in order). The number of failed banks in 2010 is 157. On average, each state has nine bank failures during the sample period (median 4 banks).

Table III reports the two-stage least squares (2SLS) estimation results. For the odd columns our instrument is *Number of Failed Local Banks* (Ln), equal to the natural logarithm of one plus *Number of Failed Local Banks*. For the even columns, the instrument is quintile score (1-5) of *Number of Failed Local Banks*. The 2SLS IV regressions control for all firm characteristics and fixed effects used in Table II, column 5, and columns 3-4 additionally control for the local business cycle using *Gross State Product*.¹⁹ First, we report the first-stage F -statistics in Panel A regressing *Use of Negative Words* on the variants of *Failed Local Banks*. All F -statistics are all above 10 (in the range from 11.38-14.46), exceeding the critical value of 10 that Staiger and Stock (1997) suggest. The strong F -statistics suggest that firms' use of negative words in their annual reports is significantly affected by shocks in their external financial constraints captured by the frequency of local bank failures.

In Panel B, all second-stage coefficients on instrumented *Use of Negative Words* are all positive and significant, ranging from 0.460-0.599 (t -statistics: 2.63-2.99), even after controlling for the variation in local business cycle in columns 3-4. None of the estimated IV coefficients switch sign from the OLS regressions in Table II, which mitigates the concern of endogeneity. While the IV estimates in 2SLS are less precise than the OLS estimates, all specifications continue to be significant at least at the 5% level. These results help address the question of whether financially constrained firms pursue more aggressive

¹⁹ The number of observations drops slightly, as the historical headquarters for some firms are not available.

tax planning activities. Our IV results suggest that the effect we observe is more likely to result from firms' financial constraints, but not by their fundamental firm characteristics.

3.4 Individual UTB Components

We further examine individual components reconciling the beginning and ending *UTB Balance*. We re-estimate our regression with the full set of control variables identical to Table II, column 5. We interchange the dependent variables with the following three groups of variables. The first group of components measures the additions in *UTB Balance* (1) related to activities in current year, and (2) related to activities in prior years. The second group examines the reduction in *UTB Balance* (3) related to activities in current year, (4) related to activities in prior years, (5) due to settlements with tax authorities, and (6) due to lapsed statute of limitations. The last set measures other components, including (7) the amount of *UTB Balance*, if recognized, would affect ETR, and (8) penalties and interest relating to *UTB Balance*.

Table IV summarizes our results for the components of UTB. All dependent variables in Panel A (Panel B) are measured contemporaneously in year t (one-year-ahead in year $t+1$). In Panel A, financially constrained firms on average have higher addition in *UTB Balance* relating to firms' activities in current and prior years. A one standard deviation increase in *Use of Negative Words* is associated with 3.3% (t -statistic: 1.76 in column 1) and 4.1% (t -statistic: 2.38 in column 2) increases in standardized *Addition in UTB Balance* related to the uncertain tax positions in current and prior years, respectively. These firms also have higher reductions in UTB due to settlements with tax authorities (coefficient: 0.030; t -statistic: 1.80 in column 5). However, *Use of Negative Words* does not explain any other decreases, such as decreases for current and prior year positions or lapsed statute of limitations (in columns 3, 4, and 6). This non-result is no surprise, because the "good news" of reductions arising from new information like court cases affecting other firms in the industry, or lapsed statutes, are routine events unlikely to cause variation in language in the firms being examined. Last, we find that financially constrained firms have

higher amounts of the *UTB Balance*, that if recognized, would affect the book ETR (coefficient: 0.070; *t*-statistic: 3.72 in column 7) and higher accrued penalties and interest relating to *UTB Balance* (coefficient: 0.066; *t*-statistic: 3.37 in column 8).

In Panel B, we further examine the predictability of firms' use of negative words on *future* UTB individual components. We follow the same specification and additionally augment the corresponding contemporaneous, individual UTB components as control variables. While firms' use of negative words does not predict future UTB reductions and other UTB items, it still predicts the addition to *UTB Balance* in the next year. A one standard deviation increase in *Use of Negative Words* predicts a 3.7% (*t*-statistic: 3.24) increase in standardized *Addition to UTB Balance Related to Current Year in year $t+1$* in column 1, and 2.9% (*t*-statistic: 2.00) increase in standardized *Addition to UTB Balance Related to Prior Years in year $t+1$* in column 2. Overall, the evidence presented above shows that firm's use of negative words is strongly associated with—and even predicts—individual components reconciling the beginning and ending *UTB Balance*.

3.5 Incremental Information Beyond ETRs

In the above analyses, we show that firms' financial constraint influences their aggressive tax planning activities, even after controlling for traditional firm fundamentals. A natural question follows: does firms' use of negative words reveal their tax aggressiveness beyond the commonly used ETRs? This is especially important, as investors and regulators have more information into firms' aggressive tax planning activities following the introduction of Fin 48. If firms' unrecognized tax benefits can be adequately estimated using ETRs and other quantitative variables, linguistic cues might not provide incremental information on firms' tax avoidance strategies.

To determine whether linguistic cues provide incremental information, we control for *Cash/GAAP ETRs* when estimating *UTB Balance*. We report these results in Table V. First, in columns

1-5, we report the univariate regressions regressing *UTB Balance* on *Cash ETR* in Panel A and *GAAP ETR* in Panel B, respectively. We construct a number of variants of ETRs: current year, average based on the prior 3-year, 5-year, 7-year, and 10-year following the methods in Dyreng, Hanlon, and Maydew (2010), who show that long-run ETRs capture firms' long-run tax avoidance strategies. Panel A, columns 1-5 show that *Cash ETR* is significantly, negatively correlated with firms' *UTB Balance*. A similar but statistically weaker pattern is also observed for *GAAP ETRs* in Panel B.²⁰ While the coefficients on current-year, prior 3-year, and last 5-year *GAAP ETRs* are statistically significant, long-run *GAAP ETRs* (e.g., 7- or 10-year) do not explain current *UTB* balances.

In columns 6-10, we examine the incremental power of *Use of Negative Words* by including both *ETRs* and *Use of Negative Words* with a full set of firm fundamentals identical to those used in early analyses. A number of observations emerge. First, as expected, *Cash ETRs* and *GAAP ETRs* appear to lose explanatory power in measuring firms' *UTB Balance* after controlling for traditional firm fundamentals. Out of 10 estimated coefficients of ETRs in both panels, only one (i.e., current year *Cash GAAP*) remains statistically significant. Second, firms' *Use of Negative Words* continues to be positive across all specifications. While the statistical significance of *Use of Negative Words* weakens due to gradually decreasing number of observations in the increase of ETR measurement horizon, all estimated coefficients of *Use of Negative Words* remain statistically significant across all specifications. Moreover, as standardized regression rescales each original continuous variable linearly to have mean zero and standard deviation one, we can directly compare the relative importance of different explanatory

²⁰ Gupta et al. (forthcoming), show a similar result that the *UTB* is also related to univariate components of U.S., foreign and state ETR deviations from statutory rates. Because they were interested in multistate tax effects, they necessarily use book ETRs, because the *Cash ETR* is not separately available by jurisdiction.

variables.²¹ All beta coefficients of *Use of Negative Words* are larger than those of ETRs, suggesting that *Use of Negative Words* substantially explains more variation in *UTB Balance* than various ETRs.

To formally examine the incremental information in *Use of Negative Words*, we conduct nested *F*-tests. We compare two fully controlled models that include ETRs, where only the second model has includes *Use of Negative Words*. The nested *F*-test statistics are reported at the bottom in both Panels A and B. All *F*-test statistics are significant at least at the 5% level, indicating that the *Use of Negative Words* provides additional information on firms' aggressive tax planning strategies beyond 19 accounting variables and even commonly-used ETRs.²²

3.6 Current and Future ETRs

We further examine whether financially constrained firms have lower current and future ETRs. We use the same specification in Table II, column 5, using either *Cash ETRs* or *GAAP ETRs* as our dependent variable. To conserve space, we use the full set of 19 firm characteristics, year fixed effects, and industry fixed effects as controls. Table VI, Panel A reports the results for *Cash ETRs* in columns 1-5 and for *GAAP ETRs* in columns 6-10. First, financially constrained firms have lower ETRs. The estimated coefficients are negative and statistically significant in columns 1 & 6 of Panel A (with range of 0.061-0.062 at the 1% significance level) even after controlling for the level or change in tax loss carry-forward, returns on assets, a wide of firm characteristics, industry fixed effects, and year fixed effects. In terms of economic magnitudes, a one standard deviation increase in *Use of Negative Words* is associated with a 6% decrease in the standardized ETRs.

We further extend the estimation of ETRs to a longer horizon of *leading* 3, 5, 7, & 10 years. The estimated results are reported in columns 2-5 (7-10) for *Cash ETRs* (*GAAP ETRs*). The negative pattern persists, even when the number of observations shrinks substantially from 12,515 in columns 1 & 6

²¹ *t*-statistics of the standardized coefficients are identical to their values computed under OLS regressions (Wooldridge (2008, Chapter 6)).

²² As the regression models are nested models, Vuong test for non-nested model is not applicable here.

(*Current Year ETR*) to 700 in columns 5 & 10. The negative pattern suggests that financially constrained firms have lower cash or GAAP ETRs, either in current year or in a longer horizon as long as up to 10 future years. A one standard deviation increase in the *Use of Negative Words* is associated with 6% (*t*-statistic: 3.26) to 15.3% (*t*-statistic: 3.58) decrease in firms' standardized ETRs. This evidence is consistent with prior findings on *UTB Balance* showing that firms use of negative words are significantly associated with their tax planning activities.

As before, we also use quintile indicators to rerun our baseline regressions. Panel B reports the estimated coefficients. Panel B shows the estimated coefficients on *Use of Negative Words* mostly remain negative and statistically significant. The strong patterns are observed among the top users that are in the top 40 percentiles in *Use of Negative Words*. To facilitate interpreting the economic magnitudes of ETRs, we report the actual ETRs (in %) in brackets. For example, the top 20th percentile users on average have 1.83% (*t*-statistic: 3.91 in Panel B, column 6) to 3.98% (*t*-statistic: 2.78 in Panel B, column 10) lower ETRs, for as long as 10 years. This strong negative pattern slightly diminishes when we move down from the top users to those firms in the 3rd quintile (40th-60th percentiles), and largely disappears in the 2nd quintile (i.e., 20th-40th percentiles).

3.7 Alternative Explanation #1: Disclosure of Tax Risks

An obvious alternative explanation is that negative words proxy for firms' tax risk rather than for financial constraints. Tax planning—even for legitimate tax avoidance schemes—is risky because changing tax laws, judicial rulings, and administrative enforcements do not always provide clear and consistent guidance. However, it is unlikely that our measure of negative words captures firms' tax risk for two reasons. First, the count of negative words is based on the whole annual report than tax-specific disclosures, and the tax footnotes only comprise a small fraction of firms' annual reports. Thus, it is unlikely to capture firms' disclosure of tax risk. Second, most of the negative words capture firms' hard-to-quantify general business environment (Tetlock (2007)), but not tax-specific keywords (e.g., tax,

liabilities, Internal Revenue Service, jurisdictions, tax haven). Tax and liability are also not counted as negative words under McDonald's financial word list.

Our results are unlikely to be driven by disclosures of tax risk. First, the linguistic measure is based on the whole 10-K filing but not tax footnotes. Take the 2009 Altria's 10-K—which has the highest fraction of negative words among all 10-K filed in 2009—as an example. In the statement reconciling the beginning and closing balances of UTB in Note 16, only five words are negative, which is less than 1% of 3,609 negative words in the annual reports. Even for the whole income tax section, there are only 21 negative words, accounting again for less than 1% of negative words in total. Second, we show that financially constrained firms have lower future long-run ETRs. This contradicts the prediction under tax risk hypothesis, which posits firms with high tax-risk have higher long-run ETRs due to possible subsequent IRS' disputes and settlements, whereas the financial constraint channel predicts lower long-run future ETRs. Third, even if the inclusion of UTB schedule after 2007 were able to capture firms' use of negative words (subject to the discussion below), the inclusion of year fixed effects in our regressions will remove all time-series differences.

That being said, we conduct a number of tests to examine this alternative explanation. Our first test is a falsification test by explicitly measuring the use of negative words across two extreme groups of firms at the far tail-ends of UTB balance. If tax risk is the driver of our main results, we should observe a significantly higher (lower) use of negative words in tax footnotes of firms with extremely high (low) UTB balance. Thus, we first sort all S&P 500 firms by their level of positive UTB balance, and put the top (bottom) 30 firms into *Top UTB Firms* group (*Bottom UTB Firms* group). Then, we measure their use of negative words in their tax footnotes of their 10-K filings. We choose a small sample in 2010 for two primary reasons. First, the identification of tax footnotes is only possible manually. Second, this will sharpen the interpretation of our test and mitigate the influence of other confounding factors.

Table VII summarizes the use of negative words in these 60 firms. Even with this low-power test, row (1) shows that firms with extremely high UTB balances use more negative words in their 10-Ks than firms with extremely low UTB balances by 0.247% (*t*-statistic: 2.47), consistent with the negative words capturing financial constraint. However, row (2) shows no difference in the proportion of negative words in tax footnotes between top and bottom UTB firms reported. The proportion of negative words in tax footnotes only accounts for less than 1% of all words, which is consistent with the Altria's example discussed above. Further, row (3) shows that *Top UTB Firms* do not use any greater proportion of their negative words in the tax footnotes than do *Bottom UTB Firms*. The proportion of negative words is again very sparse, on average accounting for less than 2% of all negative words used in firms' 10-K filings.

Our second test exploits a common feature underlying tax-related disclosures: they are inherently uncertain. To illustrate this idea, consider the following 10-K filing of 2009 Altria Group, Inc.:

Altria Group, Inc.: Lease-in/Lease-out and Sale-in/Sale-out Transactions

The Internal Revenue Service (IRS)... disallowed benefits pertaining to... leverage lease transactions... approximately \$150 million of tax ... The IRS may in the future challenge and disallow more of PMCC's leveraged lease benefits based on... subsequent case law addressing specific types of leveraged leases (lease-in/lease-out ("LILO") and sale-in/lease-out ("SILO") transactions)... The total... would be approximately \$1.0 billion.

This LILO/SILO (Lease-in-lease-out/Sale-in-lease-out) disclosure describes a tax planning activity that is highly uncertain, as the IRS would in future seek to disallow the taxpayers' tax treatments.

The same uncertainty underlies Amazon's online sales:

Amazon.com, Inc.: Tax Collection from Online Sales

We do not collect sales or other taxes on shipments of most of our goods into most states in the U.S... The imposition by state and local governments of various taxes upon Internet commerce could create administrative burdens for us, put us at a competitive disadvantage if they do not impose similar obligations on all of our online competitors and decrease our future sales...A successful assertion by one or more states or foreign countries that we should collect sales or other taxes on the sale of merchandise or services could result in substantial tax liabilities for past sales, decrease our ability to compete with traditional retailers, and otherwise harm our business.

Motivated by the above, we consider three alternative linguistic categories to capture the uncertainty in firms' disclosure: (1) uncertainty words, (2) possibility words, (3) and strong words, following Loughran and McDonald (2011). Uncertainty words capture the general notion of future uncertainty. Common examples of uncertainty words include approximate, contingency, depend, fluctuate, and uncertain. Possibility (e.g., could, may, suggest, possibly, and possible) and strong (e.g., will, must, never, always, and definitely) words capture low and high levels of confidence, respectively. Loughran and McDonald (2011) show that these word categories significantly predict firms' likelihood of shareholder class action lawsuits.

Table VIII, columns 1-3, reports the results of these additional tests. None of the estimated coefficients on each word category are significant, and the strong explanatory power of negative words remains robust and significant across the different columns. The absence of systematic on other linguistic cues results suggests that our results are not driven by firms' disclosure of tax risks. Together with the evidence presented earlier, the findings of all these different tests unanimously suggest that our results are unlikely to be driven by firms' tax risk.

3.8 Alternative Explanation #2: Litigation Risks

Perhaps our association between tax aggressiveness and negative words captures firms' litigation risks. As firms pursue more aggressive tax planning activities, they could face higher likelihood of being sued by shareholders or other stakeholders. The IRS could also initiate tax litigation against firms who pursue aggressive tax avoidance strategies without economic substance. Firms could also initiate lawsuits against the tax authority to claim refunds of tax deficiencies pre-paid during audit. For instance, over half of illegal tax shelter firms sue the commissioner or the U.S. government to preserve their tax treatments (Graham and Tucker (2006)). Thus, if firms' litigation is generally disclosed in negative tones (as evidenced in Altria's example above), the use of negative words could simply capture their litigation risk.

Motivated by prior studies, we use firms' (4) use of litigious words and (5) positive words, and (6) constraining words to quantify their litigation risk. Litigious words (e.g., claimant, deposition, interlocutory, testimony, and tort) primarily capture ongoing or settled lawsuits or reflect firm-specific litigious environment following Loughran and McDonald (2011), who find that their list of litigious words predicts the likelihood of being involved in class action lawsuits. Positive words measure the positive tones in firms' annual reports. Rogers, Buskirk, and Zechman (2011) find firms that use more optimistic words are more likely to be the targets of lawsuits, although in an early study Francis, Philbrick, and Schipper (1994) find no evidence that firms that are subject to shareholder lawsuit use more optimistic words in their pre-earnings disclosures. If firms use more positive words to suppress the negative aspects of their disclosure, we should observe a weaker explanatory power of negative words after controlling for the use of positive words. Constraining words measure firms' contractual obligations and commitments (e.g., required, requirement, restricted, commitment, and covenant). Firms have higher litigation risk if they are not able to fulfill their existing contractual obligations and commitments.

Table VIII, columns 4-6, reports the estimated coefficients from these supplemental tests. None of the other linguistic cues are significantly (either economically or statistically) related to the *UTB Balance*, whereas *Use of Negative Words* continues to be positive and significant. The systematic patterns are robust under various specifications.

3.9 Alternative Explanation #3: Obstruction and Readability

While firms could pursue aggressive tax planning activities, firm managers have incentives to suppress the negative information and obfuscate the readability of their annual reports (Bloomfield (2008)). Prior research also extensively studies the readability of corporate disclosure, generally showing that market participants incorporate the information into stock prices more completely if corporate filings are easier to read (You and Zhang (2009), Miller (2010), Lehavy et al. (2011)). Because disclosing

contingent tax liabilities or reserves may reveal tax strategies, firms tend to concede their existence but rarely disclose their values pre FIN-48 (Gleason and Mills (2002), Blouin and Tuna (2007)).

Motivated by the above studies, we compute (7) the use of negation words (*Use of Negation Words*) and (8) number of words (*Number of Words*) to capture readability and obfuscation. Negation words (e.g., do not benefit) refer to one of the six words (no, not, none, neither, never, nobody) occurring within three words preceding a positive word. *Number of Words* is defined as the natural logarithm of the number of words in firm j 's annual 10-K filing in year t . Bloomfield (2008) conjectures that the increase in disclosure length correlates with firms' litigation risk.

We also use several widely-used readability measures: (9) *Gunning Fog Index*, and (10) *Flesch Reading Ease*, and (11) *Kincaid Readability*. These difference indices are all measures based on the readability of firm's annual 10-K filings, computed following Li (2008). *Gunning Fog Index* is defined as the average number of words per sentence plus the percent of complex words, multiplied by 0.4. Complex words have three or more syllables. Textual content with higher *Gunning Fog Index* is more difficult to read. *Flesch Reading Ease* is calculated as $206.835 - (1.015 \times \text{average number of word per sentence}) - (84.6 \times \text{average number of syllable per word})$. Textual content with higher *Flesch Reading Ease* is easier to read with a bound between zero (the most difficult to read) and one (the easiest to read). *Kincaid Readability* is defined as the sum of $(11.8 \times \text{average syllable per word})$ and $(0.39 \times \text{average number of word per sentence})$, minus 15.59. Textual content with higher *Kincaid Readability* requires readers with more years of education to understand.²³

Table VIII, columns 7-11 report the results of re-estimating our baseline regressions with these additional readability variables.²⁴ The same patterns emerge. First, none of the readability measures explain unrecognized tax benefit balances. Second, the coefficients on *Use of Negative Words* continue to

²³ We thank Feng Li for graciously sharing these readability measures.

²⁴ The number of observations decreases because Li (2008) requires at least 3,000 words in each filing to construct his measures.

be positive and significant. Overall, across all 11 columns in Table VIII, *Use of Negative Words* continues to be positive and significant (with little variation ranging from 0.082, *t*-statistic: 3.94 to 0.100, *t*-statistic: 4.04) with the economic magnitudes similar—and sometimes even stronger—to those reported in Table II. However, perhaps future work can re-evaluate readability in connection with IRS tax return disclosures.

3.10 Theoretical Construct of Linguistic Measures

Prior studies sometimes interchangeably use different word categories in different contexts. For example, Nelson and Pritchard (2007) show that firms subject to greater litigation risk use more readable language. Hanley and Hoberg (2010) find that, while the risk factor section in an IPO prospectus contains a significant number of legal terms, the prospectus also contains a large number of positive and negative words. Hanley and Hoberg (2012) also find that firm managers who strategically disclose more risk factors in their IPO prospectus have lower probability of being sued in subsequent lawsuits. Firms with high litigation risk could also face incentives to reduce their disclosure when there is a significant amount of judgment involved (Robinson and Schmidt (2013)). Thus, the word categories could overlap, so we finish our tests by including all the linguistic measures together.

We report the results in Table VIII, column 12. We observe the same pattern: even including all additional 11 variables, *Use of Negative Words* is the only linguistic cue that explains *UTB Balance*. In the last column 13, we also drop *Use of Negative Words* to show that our results are not driven by collinearity between negative words and other linguistic measures. Again, none of the other linguistic cues are significantly related to *UTB* and the signs on these other cues are unchanged.

3.11 Use of Tax Havens

We next examine firms' use of tax havens to provide further insights into the use of negative words in their annual reports as a signal of tax aggressiveness, for two reasons. First, firms that have material operations in at least one tax-haven country have lower worldwide effective tax rates than firms

without tax haven operations (Dyreng and Lindsey (2009)). Thus, there is a clear economic link between using tax haven for material operations and firms' tax planning activities. Second, analyzing firms' tax planning activities in tax havens provides "out-of-sample" tests on the explanatory power of negative words for years before the *UTB* data were first available in 2007. We expect financially constrained firms are more likely to establish their operations in tax havens. As firms' use of tax havens is generally persistent across time, we acknowledge that the results below could only capture the association between firms' use of negative words and their use of tax havens.

The summary statistics in Table I show that firms that use more negative words are more likely to use tax havens (*Use of Tax Havens*) and have more material operations in tax havens (*Number of Tax Havens*), where both measures are positively correlated with *Use of Negative Words* at the 1% significance level. To further examine whether these raw patterns persist after controlling for other firm characteristics, we re-run our baseline regressions with *Use of Tax Havens* and *Number of Tax Havens* as the dependent variables. Table IX summarizes the results. The estimated coefficients in columns 1-2 are marginal probabilities in percentage, whereas the estimates in columns 3-4 represent beta coefficients from standardized regressions.

We see a strong positive pattern between the use of tax havens and firms' use of negative words. First, a one standard deviation increase in the *Use of Negative Words* leads to a 2.5% (column 1; χ -statistic: 3.10) increase in the likelihood for firms to have material operations in tax havens, even controlling for the number of countries and a wide set of firm characteristics. Second, financially constrained firms have more material operations in tax havens. In columns 3-4, a one standard deviation increase in *Use of Negative Words* leads to a 2.3%-2.6% increase in the number of tax havens used. These systematic patterns persist even controlling for additional firm characteristics (19 variables in total). Our results are

robust to using an alternative *Number of Countries* based on decile ranks.²⁵ We also consider whether the association between use of negative words and tax havens is nonlinear, and find that our results are about the same.²⁶

Collectively, the above evidence suggests financially constrained firms have a higher likelihood of using a tax haven and also use more tax havens for their operations. These results supplement the earlier evidence on *UTB Balance*, as they show the explanatory power of negative words on firms' tax planning activities extends back even before the passage of Fin 48.

3.12 Other Linguistic Cues, ETRs, and Tax Havens

Our ETR results are not sensitive to other linguistic cues. We rerun the above baseline regressions by adding the other eleven linguistic cues and readability measures (19+11=30 variables in total). Table X reports our results. Columns 1-10 summarize the results for *Cash ETRs* and *GAAP ETRs*, whereas columns 11-12 report the results *Use of Tax Havens* and *Number of Tax Havens*. Specifically, columns 2-5 & 7-10 report the long-run *Cash ETRs* and *GAAP ETRs* based on the leading 3, 5, 7, and 10 years. First, the strong explanatory power of negative words continues even after controlling for all other eleven linguistic cues. The direction, statistical significance, and economic magnitudes are all similar to those reported earlier. Second, there is an absence of any systematic and consistent pattern for any other linguistic cues. While some estimated coefficients on *Number of Words* appear to be statistically significant in a few (5 out of 12) columns, there is no evidence consistently suggesting that complexity in annual reports is associated with firms' aggressive tax planning activities. Third, *Use of Negative Words* on average has a much stronger explanatory power than other linguistic cues and complexity measures when

²⁵ To examine whether our results are sensitive to the use of numeric *Number of Countries*, which is highly correlated with *Number of Tax Havens* we replace the former with indicators based on the deciles of *Number of Countries*. Our results in columns 2 & 4 are robust to using the alternative version of *Number of Countries*, suggesting that our results are not sensitive to the correlation between *Number of Countries* and *Number of Tax Havens*.

²⁶ In unreported test, the top users of negative words (i.e., the top 20 percentile) are on average 7%-8.3% (χ -statistics: 3.11-3.47) more likely to use tax havens for their material operations than other firms. Moreover, these top 20th percentile users of negative words also have 2.9%-3.6% (t -statistics: 2.87-3.71) more operations in tax havens.

we compare all estimated beta coefficients reported in Table X. In terms of economic significance (and ignoring the statistical insignificance of other linguistic cues), *Use of Negative Words* consistently ranks among the top five across all specifications when compared to other linguistic cues.

Overall, the results presented above provide strong support that firms' tax planning activities are significantly associated with their use of negative words in annual reports, even after controlling for other linguistic cues and readability measures.

3.13 Robustness Checks

3.13.1 Robustness Tests on Unrecognized Tax Benefit (UTB) Balance

First, we re-estimate our baseline regressions using censored Tobit regression, which takes into account that *UTB Balance* is truncated at zero. The results in Table XI, Panel A are robust.²⁷ The economic magnitudes estimated under the censored Tobit regression are stronger than the ones reported under the OLS. The numbers in the bracket consecutively refer to the marginal effects estimated under (1) unconditional expected value (*UEV*), (2) conditional expected value (*CEV*), and (3) probability uncensored (*PU*).²⁸ In column 1, a one standard deviation increase in *Use of Negative Words* leads to 6.7% (5.8%) higher in standardized *UTB Balance* (conditional on observing positive *UTB Balance*). This also translates into a 4.5% increase in the probability of observing a positive *UTB Balance*. The economic significance is more salient among the top users of negative words, where in Panel A, column 4, as a one standard deviation increase in *Use of Negative Words* leads to 20% (17.3%) increase in *UTB Balance*

²⁷ The estimated coefficient on *Use of Negative Words* is 0.213 (*t*-statistic: 4.29) in column 1. Replacing *Use of Negative Words* with indicator variables based on *Use of Negative Words* gives similar results, as the estimated coefficient on quintile score in column 2 remains positive and statistically significant (coefficient: 0.164; *t*-statistic: 5.05). Columns 3 & 4 further consider the sensitivity with respect to the non-linearity in *Use of Negative Words* by using quintile indicators. Similar to the above, the systematic patterns appear to be similar to the baseline results reported earlier. Overall, all estimated coefficients of *Use of Negative Words* (or its variants) are all positive and statistically significant at the 1% level.

²⁸ *UEV* reports the marginal effect of a one standard deviation (unit) increase in the independent numeric (dummy) variables. *CEV* refers to the marginal effect of a standard deviation (unit) increase in the independent numeric (dummy) variables conditional on observing positive *UTB Balance*. *PU* reports the probability of observing a positive *UTB Balance* given a one standard deviation (unit) increase in the independent numeric (dummy) variables. Collectively, these marginal effects in brackets report the decomposition of different marginal effects estimated under the censored Tobit regression.

(conditional on observing positive *UTB Balance*), which also translates into a 13.5% increase in the probability of observing a positive *UTB Balance*.

3.13.2 Robustness Tests on All Main Dependent Variables

We also consider a number of alternative explanations that we position as supplementary tests, as these tests further limit our sample size. Table XI, Panel B, reports the estimated coefficients for all five dependent variables used in our study, including (1) *UTB Balance*, (2) *Cash ETR*, (3) *GAAP ETR*, (4) *Use of Tax Havens*, and (5) *Number of Tax Havens*. In all cases, our results for *Use of Negatives Words* are not sensitive to including the variables below.

First, we examine if our results could still reflect the heterogeneous sensitivity by firms' executive to their compensation incentives (Jensen and Murphy (1990), Yermack (1995), Hall and Liebman (1998)). We control for CEOs' *Total Pay-for-Performance Sensitivities (Total PPS)*, which is defined as the natural logarithm of the dollar change in pay for a one-dollar increase in firm value divided by annual compensation (Core and Guay (2002), Edmans, Gabaix, and Landier (2009)).

Prior research finds that corporate governance is an important determinant on firms' tax avoidance behaviors (Desai and Dharmapala (2006), Cheng, Huang, Li, and Stanfield (2012)). Thus, we include two measures of corporate governance into our baseline regressions. *Corporate Governance Index* refers to the average Gompers-Ishii-Metrick Index (Gompers, Ishii, and Metrick (2003)) to capture the shareholder rights and corporate governance across firms from 1990 to 2006. *Institutional Ownership* refers to the latest quarterly level of institutional ownership from the Thomson-Reuters 13f database prior to fiscal year end. We re-run our baseline regressions.

A recent study finds that firm's tax avoidance activities are associated with the IRS' tax audit rate (Hoopes, Mescall, and Pittman (2012)), where firms are less likely to pursue aggressive tax avoidance strategies when tax audit rate is higher. We construct *IRS Tax Audit Rate*, which refers to the IRS' tax audit rates based on the information collected by Transactional Records Access Clearinghouse and

represent the proportion of corporate tax audits completed by the IRS in a specific year for firms within a specific range of asset-thresholds. We thus add *IRS Tax Audit Rate* to our baseline regressions.

We also investigate whether our results reflect firms' geographical difference in religion-induced norm (Hilary and Hui (2009), Kumar, Page, and Spalt (2011), Boone, Khurana, and Raman (2013)). We re-estimate our baseline regression by including *Religiosity*, defined as the number of religious adherents (as reported by the American Religion Data Archive) to the total population in a county (as reported by the Census Bureau). As the *UTB* data are from 2007 to 2011 whereas *Religiosity* data are from 1992 to 2006, the latest values of *Religiosity* in 2006 are used for the *UTB* analyses.²⁹

One potential concern is that our results reflect industry competition or concentration. To address this concern, we construct Herfindahl-Hirschman Index of net sales based on all firms with the same three-digit SIC in a year following Hou and Robinson (2006). Our results remain robust to including this index.

We then examine if the results are driven by industry classifications. Instead of using Fama-French (1997) industry classifications, we replace the Fama-French by a finer 3-digit SIC. We also re-estimate our baseline regression using industry-adjusted dependent variables. Specifically, we subtract the industry median based on the Fama-French industries in the same year. For the indicator dependent variable of *Use of Tax Havens*, we include additional (Fama-French industry \times Fiscal year) indicator variables.

We examine if our results are driven by some small or hard-to-value firms. We exclude small firms with less than \$50 million of total assets, firms in high technology industries, or young firms. We report robust results *Excluding Small-Cap Firms*, *Excluding High Technology Firms*, and *Excluding Young Firms*.

We also construct different versions of *Use of Negative Words* based on alternative definitions. First, instead of using 10-K, we construct *Use of Negative Words* based on the McDonald's count of the

²⁹ We appreciate Alok Kumar and Oliver Spalt in sharing the religiosity data for this robustness check.

average of a firm's 10-Q filings in a year. Interestingly, our results for *10-Q Quarterly filings* are even stronger than those using 10-K filings. Second, we re-measure *Use of Negative Words* based on the difference between use of negative and positive words in *Negative minus Positive Words*. We also construct an alternative version by scaling the difference by the sum of both in *Negative minus Positive Words, Divided by the Sum of Both*. The results again remain robust and similar.

In all the specifications shown in Table XI, Panel B, our results for *Use of Negative Words* are robust, and the signs, statistical significances and economic magnitudes are similar to those in our main tests. We conclude that our strong association between *Use of Negative Words* and tax aggressiveness measures is highly robust.

4. Conclusion

We examine whether financially constrained firms pursue aggressive tax planning activities to provide additional internal funds. Instead of using traditional quantitative measures (i.e., a financial constraint index or accounting variables) to quantify financial constraints, we use the qualitative measure proposed by Bodnaruk et al. (2013), who find that financially constrained firms use more negative words in their annual reports, consistent with the disclosure of negative information captures the hard-to-quantify unfavorable business environments (Tetlock et al. (2008)).

We find that financially constrained firms—firms which use more negative words in their annual reports—(1) report higher unrecognized tax benefits, (2) report lower short- and long-run current and future cash and GAAP ETRs, and (3) use more tax havens for their material operations. These systematic patterns persist even after controlling for a wide set of traditional accounting variables, industry and year fixed effects, and survive under an extensive set of robustness checks and alternative estimation methods.

To provide evidence on causality, we exploit the unexpected closure of local banks as exogenous liquidity shocks to show that firms' external financial constraints affect their tax avoidance strategies.

Consistent with our conjecture that firms experience financial constraint when local banks failure, we show the association between negative words and tax aggressiveness is larger when there are more local bank failures in firms' headquarter states, even after controlling for the variations in local business cycle. In subsequent analyses, we show that firms' use of negative words explains and predicts additions in UTB balance related to activities in current and prior years. We also find that use of negative words also statistically provides incremental information into firms' aggressive tax planning activities beyond traditional accounting variables or even the commonly-used ETRs.

We consider several competing hypothesis: the use of negative words capture firms' (1) tax risks, (2) litigation risk, and (3) obfuscation or readability. And we do not find support toward any of these alternative hypotheses. We also run a wide battery of cross-sectional regressions, showing that our results are robust controlling for executives' pay-for-performance sensitivities, corporate governance, institutional ownership, IRS tax audit rate, religiosity, or industry competition, using a finer industry classification, industry-adjusted (either mean or median), 10-Q quarterly filings, excluding small-cap firms, or alternative three definitions of negative words. Our results remain robust in this wide set of robustness checks.

Our evidence complements prior studies that show the tone in firms' annual reports have a strong predictability on their corporate policies and stock returns (Li (2008, 2010), Loughran and McDonald (2011)). First, we identify that firms' use of negative words have incremental power to quantify their hard-to-quantify aggressive tax planning activities. Second, we contribute the above evidence to a growing literature in finance and accounting seeking to understand the influence of linguistic cues on firms' future corporate performance and policies. Collectively, this paper furthers our understanding of the association of specific linguistic cues on firms' aggressive tax planning activities, and proposes a new, objective, and replicable measure that would allow researchers and regulators to

identify tax-avoiding firms in regimes where firms are not explicitly required to disclose their uncertain tax positions, or in cases where firms record lower reserves to decrease tax authority scrutiny (Towery 2014).

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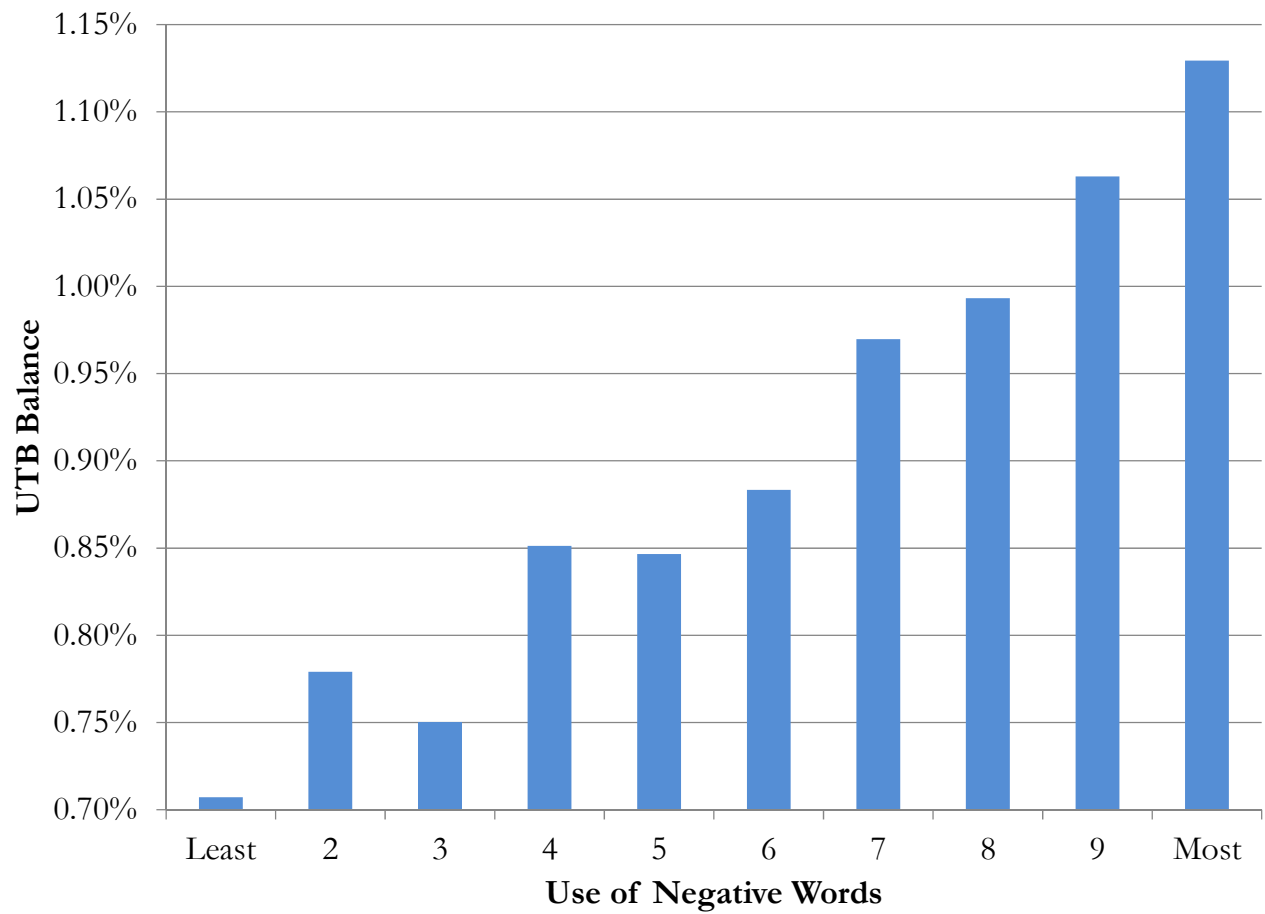
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Figure 1
Higher Unrecognized Tax Benefit (UTB) Balances



The figure reports the average UTB ending balances of firms over the sample period. At the end of each year, all firms are sorted into ten bins based on their use of negative words, defined as the number of negative words divided by the total number of words used in their 10-K filings.

Table I
Summary Statistics

Panel A reports the descriptive statistics of the variables used in this paper. *Use of Negative Words*, defined as the number of negative financial words divided by the total number of words in a firm's 10-K filing in a year. Unrecognized Tax Benefit (*UTB*) is defined as a firm's *UTB* ending balance scaled by total assets. The data are provided by the Internal Revenue Services' Large Business and International Research Division. *Cash Effective Tax Rate* is income taxes paid, divided by pre-tax income minus special items. *GAAP Effective Tax Rate* is income taxes, divided by pre-tax income minus special items. *Use of Tax Havens* is an indicator that equals one if a firm reports having at least one subsidiary in tax haven reported in Exhibit 21 of its 10-K filing in a year. *Number of Tax Havens* is the natural logarithm of one plus the number of tax havens reported in Exhibit 21 of a firm's 10-K filings. Correlation (*Corr.*) reports the Spearman correlation with *Use of Negative Words*. Superscripts A, B, and C represent significance at the 1%, 5%, and 10% levels, respectively. All sample firms must have filings with at least 2,000 words and non-missing corresponding firm characteristics from Compustat. Firms in the utilities industry and financial institutions are excluded. All variables (except dummy and logarithm variables) are winsorized at 1st and 99th percentiles to avoid extreme outliers. Additional details on all variables are summarized in the Appendix.

Panel A: Summary Statistics							
<i>Main Variables</i>	Mean	Std.	P25	P50	P75	Num.	Corr.
Use of negative words	0.018	0.004	0.015	0.018	0.020	5,418	1.00
UTB balance	0.012	0.019	0.001	0.006	0.015	5,418	0.08 ^A
Cash ETR	0.242	0.166	0.117	0.236	0.336	12,515	-0.10 ^A
GAAP ETR	0.298	0.133	0.235	0.323	0.373	12,515	-0.15 ^A
Use of tax havens	0.651	0.477	0	1	1	12,515	0.09 ^A
Number of tax havens (Ln)	0.848	0.777	0.000	0.693	1.386	12,515	0.09 ^A
<i>Firm Characteristics</i>							
Firm size	7.010	1.895	5.720	6.877	8.177	12,515	0.10 ^A
Property, plant, & equipment	0.423	0.347	0.150	0.333	0.626	12,515	-0.21 ^A
Research & development	0.030	0.058	0.000	0.000	0.037	12,515	0.12 ^A
Merger & acquisition	0.516	0.500	0	1	1	12,515	-0.03 ^A
Foreign income	0.022	0.043	0.000	0.000	0.033	12,515	0.02 ^B
Number of countries	1.648	1.240	0.693	1.609	2.708	12,515	0.04 ^A
Equity earnings	0.033	0.123	0.000	0.000	0.000	12,515	-0.01
Mezzanine finance	0.023	0.072	0.000	0.000	0.000	12,515	0.04 ^A
Other comprehensive income	0.014	0.026	0.000	0.003	0.016	12,515	0.07 ^A
Deferred revenue	0.314	0.464	0	0	1	12,515	0.26 ^A
Stock compensation exp.	0.579	0.494	0	1	1	12,515	0.27 ^A
Tax loss carry-forward	0.396	0.489	0	0	1	12,515	0.10 ^A
Wholesale, retail, & transport.	0.134	0.341	0	0	0	12,515	-0.11 ^A
Change in loss carry-forward	0.088	0.415	0.000	0.000	0.031	12,515	0.08 ^A
Returns on assets	0.134	0.104	0.089	0.133	0.184	12,515	-0.20 ^A
Leverage	0.194	0.197	0.014	0.148	0.302	12,515	-0.14 ^A
Intangible assets	0.211	0.227	0.030	0.135	0.325	12,515	-0.01
Market-to-book ratio	1.478	1.458	0.568	1.042	1.843	12,515	-0.03 ^A

Table I – *Continued*
 Summary Statistics

Panel A: Summary Statistics – <i>Continued</i>							
<i>Other Linguistic Measures</i>	Mean	Std.	P25	P50	P75	Num.	Corr.
Use of uncertainty words	0.014	0.003	0.012	0.014	0.016	5,418	0.25 ^A
Use of possibility words	0.006	0.002	0.005	0.006	0.007	5,418	0.30 ^A
Use of strong words	0.003	0.001	0.002	0.003	0.004	5,418	0.11 ^A
Use of litigious words	0.015	0.007	0.009	0.014	0.019	5,418	0.22 ^A
Use of positive words	0.007	0.001	0.006	0.007	0.008	5,418	-0.07 ^A
Use of constraining words	0.008	0.002	0.007	0.008	0.009	5,418	0.19 ^A
Use of negation words	0.000	0.000	0.000	0.000	0.000	5,418	0.19 ^A
Number of words	10.798	0.483	10.476	10.739	11.079	5,418	0.21 ^A
Gunning fog index	19.836	2.786	19.007	19.836	20.862	4,205	0.07 ^A
Flesch reading ease	20.376	5.089	17.991	20.883	23.481	4,205	-0.11 ^A
Kincaid readability	15.913	2.446	14.968	15.816	16.914	4,205	0.07 ^A

Table II
Financial Constraints and Unrecognized Tax Benefit

This table reports the standardized, pooled OLS regression results. The dependent variable is Unrecognized Tax Benefit (*UTB*), defined as firm's UTB balance at the end of year scaled by total assets. The main independent variable is *Use of Negative Words*, defined as the number of negative financial words divided by the total number of words in a firm's 10-K filing in a year. The list of negative financial words follows that in Loughran and McDonald (2011). *Quintile Score* sorts all firms into five quintiles based on *Use of Negative Words* at the end of each year. Columns 1-4 follow the exact specification of Lisowsky, Robinson, and Schmidt (2013), whereas columns 5-8 include additional control variables. *Firm Size* is the natural logarithm of total assets. *Property, Plant, & Equipment* is property, plant, and equipment divided by total assets. *Research & Development* is research and development expenses divided by total assets. *Merger & Acquisition* is an indicator that equals one if a firm is involved in a merger and acquisition in year t , and zero otherwise. *Foreign Sales* is a firm's foreign pretax income divided by total sales in year t . *Number of Countries* is the natural logarithm of the number of countries reported in Exhibit 21 of a firm's 10-K filing in year t . *Use of Tax Havens* is an indicator that equals one if a firm reports at least one subsidiary in tax haven in year t . *Equity Earnings* is the absolute of equity in earnings (loss) divided by the absolute of income in year t . *Mezzanine Finance* is convertible debt and preferred stock divided by total assets. *Other Comprehensive Income* is the absolute of accumulated other comprehensive income divided by total assets. *Deferred Revenue* is an indicator that equals one if deferred revenue is non-zero, and zero otherwise. *Stock Compensation Expenses* is an indicator that equals one if stock compensation expense is non-zero, and zero otherwise. *Tax Loss Carry-Forward* is an indicator that equals one if tax loss carry-forward is non-zero, and zero otherwise. *Wholesale, Retail, & Transportation* is an indicator that equals one if the 4-digit SIC code is between 4000 and 4899 or between 5000 and 5999, and zero otherwise. *Change in Tax Loss Carry-forward* is the change in tax loss carried forward from prior year divided by lagged total assets. *Returns on Assets* is the return on assets. *Leverage* is the long-term debt scaled by lagged total assets. *Intangible Assets* is the intangible assets scaled by lagged total assets. *Market-to-Book Ratio* is the market-to-book ratio at the beginning of year. Additional details on all variables are summarized in Appendix. The sample period runs from 2007 to 2011. *Industry Fixed Effects* are fixed effects based on Fama-French 12 industry classifications. All estimated coefficients are beta coefficients from standardized regressions, where each variable (except indicator) is scaled to have zero mean and unit standard deviation. Robust standard errors are clustered at firm level, and two-tailed t -statistics are reported in parentheses.

Table II – *Continued*
Financial Constraints and Unrecognized Tax Benefit

	Dependent Variable: <i>Unrecognized Tax Benefit (UTB) Balance</i>							
<i>Independent Variables</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Use of negative words	0.062 (3.33)				0.085 (4.07)			
- Quintile score		0.070 (4.02)				0.094 (4.91)		
- Top quintile indicator			0.047 (2.52)	0.078 (3.69)			0.060 (3.07)	0.105 (4.56)
- 4th quintile indicator				0.060 (3.10)				0.081 (3.97)
- 3rd quintile indicator				0.037 (2.21)				0.050 (2.91)
- 2nd quintile indicator				0.019 (1.22)				0.024 (1.56)
Firm size	0.063 (2.56)	0.065 (2.65)	0.065 (2.68)	0.065 (2.65)	0.057 (2.13)	0.060 (2.27)	0.061 (2.31)	0.060 (2.28)
Property, plant, & equipment	-0.015 (-0.68)	-0.016 (-0.72)	-0.018 (-0.79)	-0.016 (-0.71)	-0.047 (-1.79)	-0.047 (-1.81)	-0.052 (-1.96)	-0.047 (-1.81)
Research & development	0.203 (6.45)	0.203 (6.44)	0.205 (6.49)	0.203 (6.43)	0.245 (6.48)	0.244 (6.47)	0.245 (6.46)	0.244 (6.46)
Merger & acquisition	0.005 (0.33)	0.005 (0.35)	0.003 (0.19)	0.005 (0.35)	-0.003 (-0.24)	-0.003 (-0.22)	-0.005 (-0.35)	-0.003 (-0.23)
Foreign income	0.116 (5.14)	0.117 (5.18)	0.114 (5.04)	0.117 (5.18)	0.090 (3.96)	0.090 (3.98)	0.089 (3.88)	0.090 (3.98)
Number of countries	0.128 (4.66)	0.126 (4.61)	0.128 (4.66)	0.126 (4.60)	0.131 (4.50)	0.128 (4.41)	0.131 (4.52)	0.128 (4.41)
Use of tax havens	0.009 (0.43)	0.009 (0.43)	0.011 (0.53)	0.009 (0.43)	0.000 (0.01)	0.001 (0.03)	0.002 (0.12)	0.001 (0.02)
Equity earnings	-0.006 (-0.40)	-0.005 (-0.37)	-0.006 (-0.43)	-0.005 (-0.37)	-0.001 (-0.04)	0.000 (0.01)	-0.001 (-0.09)	0.000 (0.01)
Mezzanine finance	0.013 (0.56)	0.013 (0.56)	0.012 (0.53)	0.013 (0.56)	0.011 (0.43)	0.011 (0.45)	0.010 (0.41)	0.011 (0.44)
Other comprehensive income	0.042 (2.01)	0.043 (2.07)	0.042 (2.00)	0.043 (2.06)	0.048 (2.35)	0.050 (2.45)	0.047 (2.31)	0.050 (2.44)
Deferred revenue	0.032 (1.61)	0.035 (1.79)	0.036 (1.86)	0.035 (1.78)	0.027 (1.33)	0.031 (1.55)	0.034 (1.66)	0.031 (1.55)
Stock compensation expenses	0.029 (3.31)	0.027 (3.15)	0.030 (3.46)	0.027 (3.15)	0.024 (2.53)	0.022 (2.36)	0.026 (2.81)	0.022 (2.37)
Tax loss carry-forward	-0.013 (-0.67)	-0.013 (-0.68)	-0.011 (-0.61)	-0.013 (-0.68)	-0.018 (-0.94)	-0.019 (-0.95)	-0.018 (-0.90)	-0.019 (-0.95)
Wholesale, retail, & transport.	-0.023 (-0.45)	-0.021 (-0.41)	-0.024 (-0.47)	-0.021 (-0.41)	-0.024 (-0.47)	-0.022 (-0.42)	-0.027 (-0.51)	-0.022 (-0.41)
Change in loss carry-forward					0.083 (2.11)	0.084 (2.13)	0.084 (2.12)	0.084 (2.13)
Returns on assets					0.150 (5.40)	0.151 (5.44)	0.145 (5.28)	0.151 (5.45)
Leverage					0.055 (1.80)	0.054 (1.78)	0.053 (1.75)	0.054 (1.79)
Intangible assets					-0.038 (-1.59)	-0.037 (-1.55)	-0.043 (-1.77)	-0.037 (-1.55)
Market-to-book ratio					0.034 (1.40)	0.036 (1.47)	0.030 (1.23)	0.036 (1.47)
Constant/Year FEs/Industry FEs	Included	Included	Included	Included	Included	Included	Included	Included
Number of observations	5,418	5,418	5,418	5,418	5,076	5,076	5,076	5,076
Adjusted-R ²	0.171	0.168	0.166	0.167	0.179	0.181	0.177	0.180

Table III
IV Regressions using Local Bank Failures

This table reports the standardized coefficients from two-stage least squares regressions. The dependent variables are *Use of Negative Words* and *UTB Balance*, respectively. *Use of Negative Words* is instrumented with the number or quintile score local bank failure. *Failed Local Banks* refers to the number of failed banks in a state where a firm's headquarter is located. The failed bank list is from the Federal Deposit Insurance Corporation (FDIC). Historical headquarter locations are obtained from their 10-K filings. *Gross State Product* is from the Bureau of Economic Analysis. Robust standard errors are clustered at firm level, and two-tailed *t*-statistics are reported in parentheses.

Panel A: First-Stage Regressions				
<i>Independent Variables</i>	Dependent Variable: <i>Use of Negative Words</i>			
	(1)	(2)	(3)	(4)
Failed local banks				
- Ln number	0.070 (3.37)		0.070 (3.33)	
- Quintile score		0.074 (3.80)		0.075 (3.76)
Constant/Year FEs/Ind. FEs	Identical to column 5 of Table II with 19 control variables included			
First-stage <i>F</i> -statistics	11.38	14.46	11.11	14.15
Number of observations	4,803	4,803	4,803	4,803
Panel B: Second-Stage Regressions				
<i>Independent Variables</i>	Dependent Variables: <i>Unrecognized Tax Benefit (UTB) Balances</i>			
	(1)	(2)	(3)	(4)
Use of negative words	0.599 (2.78)	0.528 (2.99)	0.532 (2.63)	0.460 (2.81)
Firm size	-0.110 (-1.34)	-0.090 (-1.26)	-0.091 (-1.20)	-0.070 (-1.08)
Property, plant, & equip.	0.085 (1.25)	0.068 (1.17)	0.069 (1.10)	0.052 (0.97)
Research & development	0.279 (5.75)	0.273 (5.94)	0.273 (5.90)	0.267 (6.06)
Merger & acquisition	0.074 (1.96)	0.064 (1.97)	0.065 (1.84)	0.055 (1.82)
Foreign income	0.162 (4.08)	0.154 (4.31)	0.153 (4.09)	0.144 (4.31)
Number of countries	0.152 (2.91)	0.147 (3.09)	0.148 (3.06)	0.143 (3.26)
Use of tax havens	-0.058 (-1.26)	-0.048 (-1.20)	-0.051 (-1.19)	-0.041 (-1.11)
Equity earnings	0.056 (1.69)	0.049 (1.69)	0.049 (1.60)	0.042 (1.57)
Mezzanine finance	-0.002 (-0.05)	0.000 (0.01)	0.000 (0.01)	0.002 (0.07)
Other comprehensive income	0.072 (2.17)	0.070 (2.26)	0.070 (2.25)	0.068 (2.35)

Table III – *Continued*
 IV Regressions using Local Bank Failures

Panel B: Second-Stage Regressions				
Dependent Variables: <i>Unrecognized Tax Benefit (UTB) Balances</i>				
<i>Independent variables</i>	(1)	(2)	(3)	(4)
Deferred revenue	-0.162 (-1.96)	-0.138 (-2.01)	-0.140 (-1.82)	-0.115 (-1.82)
Stock compensation expenses	-0.008 (-0.23)	-0.004 (-0.13)	-0.004 (-0.13)	0.000 (0.01)
Tax loss carry-forward	-0.027 (-0.84)	-0.027 (-0.90)	-0.028 (-0.92)	-0.027 (-0.98)
Wholesale, retail, & trans.	0.050 (0.68)	0.041 (0.59)	0.041 (0.60)	0.032 (0.49)
Change in loss carry-forward	0.094 (1.87)	0.092 (1.92)	0.092 (1.92)	0.091 (1.97)
Returns on assets	0.293 (4.22)	0.273 (4.54)	0.275 (4.26)	0.255 (4.58)
Leverage	0.153 (2.59)	0.138 (2.66)	0.139 (2.54)	0.124 (2.59)
Intangible assets	0.121 (1.69)	0.100 (1.65)	0.102 (1.54)	0.081 (1.44)
Market-to-book ratio	0.150 (2.81)	0.137 (2.96)	0.139 (2.77)	0.125 (2.91)
Gross state product			-0.049 (-1.51)	-0.054 (-1.79)
Constant/Year FEs/Ind. FEs	Included	Included	Included	Included

Table IV
Financial Constraints and Individual UTB Components

This table reports standardized, pooled OLS regression results, reporting the estimated beta coefficients on the individual components reconciling the beginning and ending *UTB Balance*. Panel A (B) uses measures in year t ($t+1$) as dependent variables. Columns 1-4 refer to the movements in UTB during the year related to activities in current or prior years. *Reduction in UTB due to Tax Settlements* refers to the reduction in *UTB Balance* due to settlements with the tax authorities. *Reduction in UTB Balance due to Lapsed Statute of Limitations* refers to the reduction in *UTB Balance* resulting from lapse of applicable statute of limitations. *Amount of UTB Balance, if Recognized, Would Affect ETR* refers to the amount of *UTB Balance*, if recognized, would affect firms' effective tax rates. *Penalties and Interest Relating to UTB* refers to the amount of accrued penalties and interest related to *UTB Balance*. All estimated coefficients are beta coefficients from standardized regressions, where each variable is scaled to have zero mean and unit standard deviation. Robust standard errors are clustered at firm level, and two-tailed t -statistics are in parentheses.

Panel A: Baselines								
<i>Independent Variables</i>	Addition in UTB Balance (Year t)		Reduction in UTB Balance (Year t)				Others (Year t)	
	Related to Current Year (Year t)	Related to Prior Years (Year t)	Related to Current Year (Year t)	Related to Prior Years (Year t)	Due to Tax Settlements (Year t)	Due to Lapsed Statute of Limitations (Year t)	Amount of UTB Balance, if Recognized, Would Affect ETR (Year t)	Penalties and Interest Relating to UTB (Year t)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Use of neg words (t)	0.033 (1.76)	0.041 (2.38)	0.008 (0.50)	0.022 (1.22)	0.030 (1.80)	0.014 (0.95)	0.070 (3.72)	0.066 (3.37)
Included controls/FEs	Identical to column 5 of Table II with 19 control variables included							
Number of obs.	5,076	5,076	5,076	5,076	5,076	5,076	5,076	5,076
Adjusted R ²	0.141	0.078	0.005	0.055	0.054	0.054	0.184	0.123

Table IV – *Continued*
Financial Constraints and Individual UTB Components

Panel B: Predictive Regressions								
Independent Variables	Addition in UTB Balance (Year $t+1$)		Reduction in UTB Balance (Year $t+1$)				Others (Year $t+1$)	
	Related to Current Year (Year $t+1$)	Related to Prior Years (Year $t+1$)	Related to Current Year (Year $t+1$)	Related to Prior Years (Year $t+1$)	Due to Tax Settlements (Year $t+1$)	Due to Lapsed Statute of Limitations (Year $t+1$)	Amount of UTB Balance, if Recognized, Would Affect ETR (Year $t+1$)	Penalties and Interest Relating to UTB (Year $t+1$)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Use of neg words (t)	0.037 (3.24)	0.029 (2.00)	0.021 (1.12)	0.015 (1.02)	0.011 (0.80)	0.010 (1.21)	0.018 (1.45)	0.012 (1.51)
Addition in UTB:								
- Re current year (t)	0.503 (16.13)							
- Re prior years (t)		0.255 (10.70)						
Reduction in UTB:								
- Re current year (t)			0.197 (5.21)					
- Re prior years (t)				0.261 (10.20)				
- Settlements (t)					0.132 (5.56)			
- Lapses (t)						0.761 (35.92)		
Others:								
- Amount ETR rec. (t)							0.408 (13.88)	
- Penalties & interest (t)								0.790 (38.56)
Included controls/FEs	Identical to column 5 of Table II with 19 control variables included							
Number of obs.	4,904	4,904	4,904	4,904	4,904	4,904	4,904	4,904
Adjusted R ²	0.391	0.159	0.040	0.130	0.077	0.649	0.217	0.675

Table V
Incremental Information Tests

This table reports standardized, pooled OLS regression results, reporting the estimated beta coefficients on *UTB Balance*. Columns 1-5 are from univariate regressions, whereas columns 6-10 are from multivariate regressions with full controls (following the specification in column 5 of Table II). All estimated coefficients are beta coefficients from standardized regressions, where each variable is scaled to have zero mean and unit standard deviation. Robust standard errors are clustered at firm level, and two-tailed *t*-statistics are in parentheses.

Panel A: Cash ETRs										
Dependent Variable: Unrecognized Tax Benefit Balance										
<i>Independent Variables</i>	Univariate Regressions without Controls					Multivariate Regressions with Full Controls				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Use of negative words						0.069 (2.85)	0.069 (2.83)	0.066 (2.78)	0.043 (1.68)	0.080 (1.74)
Cash ETR										
- Current year	-0.088 (-4.23)					-0.040 (-2.11)				
- Last 3-year		-0.118 (-4.61)					-0.036 (-1.64)			
- Last 5-year			-0.113 (-3.80)					-0.019 (-0.72)		
- Last 7-year				-0.113 (-3.36)					-0.029 (-1.01)	
- Last 10-year					-0.094 (-2.16)					-0.003 (-0.08)
Included controls/FEs	No	No	No	No	No	Identical to column 5 of Table II with 19 control variables included				
Nested <i>F</i> -test statistic (<i>p</i> -value)						16.34 (0.00)	17.21 (0.00)	16.46 (0.00)	17.11 (0.00)	12.47 (0.00)
Number of observations	3,334	3,288	2,764	2,175	862	3,334	3,288	2,764	2,175	862
Adjusted R ²	0.008	0.014	0.013	0.012	0.008	0.210	0.233	0.242	0.261	0.254
Panel B: GAAP ETRs										
Use of negative words						0.071 (2.91)	0.071 (2.88)	0.066 (2.77)	0.043 (1.71)	0.079 (1.72)
GAAP ETR										
- Current year	-0.066 (-3.21)					0.013 (0.71)				
- Last 3-year		-0.058 (-2.47)					0.014 (0.72)			
- Last 5-year			-0.045 (-1.57)					0.022 (0.96)		
- Last 7-year				-0.039 (-1.19)					0.030 (1.11)	
- Last 10-year					-0.028 (-0.61)					0.020 (0.49)
Included controls/FEs	No	No	No	No	No	Identical to column 5 of Table II with 19 control variables included				
Nested <i>F</i> -test statistic (<i>p</i> -value)						12.34 (0.00)	4.13 (0.04)	4.16 (0.04)	5.07 (0.02)	4.92 (0.03)
Number of observations	3,334	3,288	2,764	2,175	862	3,334	3,288	2,764	2,175	862
Adjusted R ²	0.004	0.003	0.002	0.001	0.000	0.208	0.232	0.242	0.261	0.254

Table VI
Financial Constraints and Effective Tax Rates (ETRs)

This table reports standardized, pooled OLS regression results. The dependent variables are *Cash (GAAP) ETR*, defined as income taxes paid (income taxes) divided by pretax income minus special items. *k-Year Cash (GAAP) ETR* is the sum of income taxes paid (income taxes) for the next *k*-year divided by the pretax income minus special items for the next *k*-year. All coefficients are beta coefficients from standardized regressions, where all variables (except indicators) are standardized to have zero mean and unit standard deviation. Robust standard errors are clustered at firm level, and two-tailed *t*-statistics (ETRs) are reported in parentheses (brackets).

Panel A: Baselines										
	Dependent Variable: Cash ETRs					Dependent Variable: GAAP ETRs				
	Current Year	Next 3-Year	Next 5-Year	Next 7-Year	Next 10-Year	Current Year	Next 3-Year	Next 5-Year	Next 7-Year	Next 10-Year
<i>Independent Variables</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Use of negative words	-0.061 (-5.25)	-0.060 (-3.26)	-0.090 (-3.95)	-0.121 (-4.53)	-0.153 (-3.58)	-0.062 (-5.25)	-0.062 (-3.33)	-0.084 (-3.78)	-0.098 (-3.53)	-0.121 (-3.05)
Included controls/FEs	Identical to column 5 of Table II with 19 control variables included									
Num. of observations	12,515	6,460	4,141	2,325	700	12,515	6,460	4,141	2,325	700
Adjusted R ²	0.107	0.118	0.118	0.132	0.183	0.148	0.126	0.129	0.147	0.175
Panel B: Quintile Dummies based on the Use of Negative Words										
Use of negative words										
- Top quintile indicator	-0.066 (-4.64) [-2.73%]	-0.060 (-2.86) [-2.12%]	-0.087 (-3.51) [-3.13%]	-0.094 (-3.45) [-3.41%]	-0.096 (-2.55) [-3.80%]	-0.055 (-3.91) [-1.83%]	-0.062 (-2.91) [-1.90%]	-0.081 (-3.28) [-2.51%]	-0.103 (-3.49) [-3.23%]	-0.117 (-2.78) [-3.98%]
- 4th quintile indicator	-0.049 (-3.72) [-2.05%]	-0.046 (-2.32) [-1.60%]	-0.062 (-2.68) [-2.18%]	-0.066 (-2.47) [-2.35%]	-0.081 (-2.27) [-3.30%]	-0.066 (-5.30) [-2.21%]	-0.061 (-3.09) [-1.80%]	-0.061 (-2.74) [-1.82%]	-0.035 (-1.38) [-1.09%]	-0.065 (-1.79) [-2.28%]
- 3rd quintile indicator	-0.038 (-3.05) [-1.58%]	-0.015 (-0.79) [-0.50%]	-0.038 (-1.76) [-1.26%]	-0.034 (-1.35) [-1.09%]	-0.115 (-2.69) [-3.85%]	-0.042 (-3.59) [-1.38%]	-0.051 (-2.75) [-1.47%]	-0.054 (-2.57) [-1.54%]	-0.061 (-2.30) [-1.69%]	-0.028 (-0.71) [-0.81%]
- 2nd quintile indicator	-0.021 (-1.76) [-0.86%]	-0.001 (-0.03) [-0.02%]	-0.019 (-0.94) [-0.59%]	0.011 (0.42) [0.33%]	0.022 (0.52) [0.66%]	-0.032 (-3.17) [-1.07%]	-0.018 (-1.14) [-0.51%]	-0.012 (-0.63) [-0.33%]	-0.023 (-1.02) [-0.61%]	-0.047 (-1.25) [-1.20%]
Included controls/FEs	Identical to column 5 of Table II with 19 control variables included									
Num. of observations	12,515	6,460	4,141	2,325	700	12,515	6,460	4,141	2,325	700
Adjusted R ²	0.107	0.118	0.117	0.129	0.183	0.147	0.126	0.129	0.147	0.171

Table VII
Use of Negative Words in Tax Footnotes

The following table summarizes the use of negative words in the 10-Ks of top 60 firms with extremely high and low UTB balances in 2010. All S&P 500 firms in 2010 are first sorted by their level of positive UTB balance, and the top (bottom) 30 firms are grouped into *Top UTB Firms* group (*Bottom UTB Firms* group). We then measure their use of negative words in their tax footnotes of their 10-K filings.

Descriptions	Top UTB Firms	Bottom UTB Firms	Difference (<i>t</i> -statistic)
(1) #Negative words/#Words	1.911%	1.664%	0.247% (2.47)
(2) #Negative words in tax footnotes/#Words	0.027%	0.025%	0.002% (0.32)
(3) #Negative words in tax footnotes/#Negative words	1.453%	1.580%	-0.127% (-0.51)
Number of observations	30	30	

Table VIII
Other Linguistic Cues and Unrecognized Tax Benefit

This table reports the standardized, pooled OLS regression results. The dependent variable is *Unrecognized Tax Benefit*. *Use of Uncertainty Words*, *Use of Possibility Words* (weak modal), *Use of Strong Words* (strong modal), *Use of Litigious Words*, *Use of Positive Words*, *Use of Constraining Words*, and *Use of Negation Words* are the number of category words divided by the total number of words. *Number of Words* is the natural logarithm of the number of words in firm j 's annual 10-K filing in year t . *Use of Negation Words*, *Gunning Fog Index*, *Flesch Reading Ease*, and *Kincaid Readability* are all measures based on the readability of firm's annual 10-K filings from 2007 to 2011. Additional details on all variables are summarized in Appendix. All estimated coefficients are beta coefficients from standardized regressions, where each variable (except indicator) is scaled to have zero mean and unit standard deviation. Robust standard errors are clustered at firm level. Two-tailed t -statistics are in parentheses.

	Dependent Variable: Unrecognized Tax Benefit (UTB) Balance												
<i>Independent Variables</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Use of negative words	0.082 (3.94)	0.084 (4.01)	0.085 (4.06)	0.087 (4.06)	0.084 (4.05)	0.084 (3.96)	0.084 (4.10)	0.086 (4.07)	0.099 (4.03)	0.100 (4.04)	0.099 (4.03)	0.087 (3.38)	
Use of uncertainty words	0.014 (0.86)											0.029 (0.86)	0.067 (2.05)
Use of possibility words		0.004 (0.20)										-0.002 (-0.07)	-0.007 (-0.22)
Use of strong words			-0.006 (-0.37)									0.002 (0.15)	0.009 (0.54)
Use of litigious words				-0.008 (-0.57)								-0.010 (-0.36)	0.030 (1.08)
Use of positive words					-0.012 (-0.70)							-0.004 (-0.21)	-0.007 (-0.33)
Use of constraining words						0.006 (0.35)						0.021 (0.98)	0.027 (1.24)
Use of negation words							0.003 (0.15)					0.016 (0.59)	0.024 (0.88)
Number of words								-0.008 (-0.46)				0.022 (0.67)	0.023 (0.70)
Fog index									0.007 (0.48)			0.081 (0.80)	0.105 (1.04)
Flesch reading ease										0.012 (0.70)		0.005 (0.26)	0.004 (0.21)
Kincaid readability											0.004 (0.27)	-0.074 (-0.71)	-0.104 (-0.98)
Included controls/FEs	Identical to column 5 of Table II with 19 control variables included												
Number of observations	5,076	5,076	5,076	5,076	5,076	5,076	5,076	5,076	3,944	3,944	3,944	3,944	3,944
Adjusted-R ²	0.179	0.179	0.179	0.179	0.179	0.179	0.179	0.179	0.197	0.197	0.197	0.197	0.193

Table IX
Financial Constraints and Use of Tax Havens

The dependent variables are *Use of Tax Havens* (columns 1-2) and *Number of Tax Havens* (columns 3-4). *Use of Tax Havens* is an indicator that equals one if a firm reports having at least one subsidiary in tax haven reported in Exhibit 21 of its 10-K filing in year t . Columns 2 & 4 replace *Number of Countries* with decile dummies based on the number of countries. The coefficients in columns 1-2 refer to the marginal probabilities of one standard deviation (unit) increase in the independent numeric (indicator) variable. Columns 3-4 report the standardized, pooled OLS regression results, where each variable (except indicator) is scaled to have zero mean and unit standard deviation. Additional details on all variables are summarized in Appendix. The sample period runs from 1996 to 2010. Robust standard errors are clustered at firm level, and two-tailed z -/t-statistics are reported in parentheses.

<i>Independent Variables</i>	Dependent Variables:			
	Use of Tax Havens		Number of Tax Havens	
	(1)	(2)	(3)	(4)
Use of negative words	0.025 (3.10)	0.029 (3.04)	0.023 (2.54)	0.026 (2.99)
Included controls	Identical to column 5 of Table II with 19 control variables included			
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Num. of country fixed effects	No	Yes	No	Yes
Number of observations	12,515	12,515	12,515	12,515
Pseudo/Adjusted R ²	0.395	0.351	0.733	0.741

Table X
Other Linguistic Cues, ETRs and Tax Havens

This table reports standardized, pooled OLS regression results, reporting the estimated coefficients on linguistic cues and readability measures. Additional details on all variables are in Appendix. All estimated coefficients are beta coefficients from standardized regressions, where each variable is scaled to have zero mean and unit standard deviation. Robust standard errors are clustered at firm level, and two-tailed *t*-statistics are in parentheses.

<i>Independent Variables</i>	Dependent Variables:											
	Cash ETRs					GAAP ETRs					Use of Tax Havens	Number of Tax Havens
	Current Year	Next 3-Year	Next 5-Year	Next 7-Year	Next 10-Year	Current Year	Next 3-Year	Next 5-Year	Next 7-Year	Next 10-Year		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
Use of negative words	-0.051 (-3.40)	-0.042 (-1.90)	-0.074 (-2.72)	-0.121 (-3.73)	-0.172 (-2.99)	-0.074 (-4.70)	-0.060 (-2.54)	-0.081 (-2.92)	-0.066 (-1.93)	-0.144 (-2.55)	0.025 (2.45)	0.023 (2.08)
Use of uncertainty words	-0.012 (-0.53)	-0.041 (-1.17)	-0.039 (-0.96)	-0.032 (-0.73)	-0.109 (-1.44)	0.002 (0.10)	0.009 (0.25)	-0.014 (-0.34)	-0.074 (-1.47)	-0.053 (-0.61)	-0.002 (-0.14)	-0.030 (-1.75)
Use of possibility words	-0.013 (-0.71)	-0.015 (-0.53)	-0.029 (-0.90)	-0.020 (-0.51)	0.044 (0.61)	-0.012 (-0.59)	-0.039 (-1.35)	-0.017 (-0.49)	0.047 (1.04)	-0.018 (-0.21)	-0.005 (-0.42)	0.015 (1.07)
Use of strong words	-0.014 (-1.25)	-0.026 (-1.51)	-0.021 (-0.91)	-0.046 (-1.80)	-0.053 (-1.15)	-0.006 (-0.56)	-0.009 (-0.51)	0.008 (0.39)	-0.011 (-0.50)	0.005 (0.10)	0.007 (1.00)	0.011 (1.44)
Use of litigious words	0.061 (2.80)	0.037 (1.13)	0.043 (1.11)	0.052 (1.05)	0.045 (0.43)	0.074 (3.31)	0.059 (1.80)	0.059 (1.54)	0.024 (0.48)	0.036 (0.33)	-0.008 (-0.56)	-0.023 (-1.45)
Use of positive words	0.011 (0.82)	-0.044 (-2.29)	-0.049 (-2.17)	-0.032 (-0.86)	-0.045 (-0.91)	-0.003 (-0.21)	-0.013 (-0.65)	-0.005 (-0.23)	0.032 (0.95)	0.065 (1.18)	-0.008 (-0.87)	-0.015 (-1.43)
Use of constraining words	-0.015 (-1.02)	-0.044 (-2.06)	-0.047 (-1.53)	-0.047 (-1.18)	0.043 (0.80)	0.000 (0.01)	-0.025 (-1.25)	-0.008 (-0.30)	-0.009 (-0.23)	0.063 (1.17)	0.010 (1.12)	0.020 (1.97)
Use of negation words	-0.006 (-0.41)	0.010 (0.41)	0.034 (1.24)	0.026 (0.77)	0.063 (1.24)	0.011 (0.71)	0.018 (0.72)	0.044 (1.54)	0.000 (-0.01)	0.099 (1.82)	0.000 (0.06)	0.000 (0.04)
Number of words	-0.078 (-3.58)	-0.075 (-2.23)	-0.089 (-2.08)	-0.072 (-1.33)	-0.169 (-1.77)	-0.079 (-3.64)	-0.053 (-1.49)	-0.056 (-1.29)	-0.086 (-1.62)	-0.108 (-1.12)	0.013 (0.81)	0.001 (0.05)
Gunning fog index	0.035 (0.75)	-0.004 (-0.05)	0.006 (0.08)	0.013 (0.17)	-0.413 (-1.56)	0.088 (1.81)	-0.001 (-0.02)	0.138 (1.86)	0.079 (1.04)	0.194 (0.64)	0.009 (0.29)	-0.019 (-0.55)
Flesch reading ease	-0.015 (-1.05)	-0.015 (-0.69)	0.002 (0.08)	-0.033 (-0.92)	-0.110 (-1.09)	-0.019 (-1.24)	0.007 (0.33)	0.003 (0.12)	0.012 (0.29)	-0.018 (-0.15)	-0.004 (-0.46)	0.000 (-0.05)
Kincaid readability	-0.056 (-1.08)	-0.025 (-0.32)	0.021 (0.25)	0.005 (0.05)	0.345 (1.27)	-0.103 (-1.94)	-0.024 (-0.31)	-0.164 (-1.90)	-0.111 (-1.14)	-0.180 (-0.59)	-0.013 (-0.38)	0.029 (0.78)
Included controls/FEs	A1 of IV	A2 of IV	A3 of IV	A4 of IV	A5 of IV	A6 of IV	A7 of IV	A8 of IV	A9 of IV	A10 of IV	2 of VIII	6 of VIII
Number of observations	10,729	5,607	3,777	2,143	652	10,729	5,607	3,777	2,143	652	10,729	10,729
Adjusted-R ²	0.110	0.133	0.137	0.158	0.235	0.157	0.132	0.131	0.150	0.180	0.407	0.737

Table XI
Robustness Checks

Panel A reports the standardized estimates from Tobit regressions where each variable (except indicator) is scaled to have zero mean and unit standard deviation. The numbers separated by dash in brackets represent (1): unconditional expected value, (2) conditional expected value, and (3) probability uncensored values in percentages. Panel B reports standardized, pooled OLS regression results. The estimates in column 4 refer to the marginal probabilities of one standard deviation increase in the independent numeric variable, whereas other columns report the beta coefficients from standardized regression based on various robustness checks. *Control for Gompers-Ishii-Metrick Index on Corporate Governance* controls for the average Gompers-Ishii-Metrick index on corporate governance from 1990-2006. *Control for Total Pay-for-Performance* controls for CEOs' total pay-for-performance sensitivity, defined as the dollar change in pay for a one-dollar increase in firm value, divided by annual pay (Core and Guay (2002) and Edmans, Gabaix, and Landier (2009)). *Control for Institutional Ownership* control for the latest total level of institutional ownership (in %) prior to fiscal year-end. *Control for IRS Tax Audit Rate* controls for the IRS face-to-face audit rate of returns filed by corporations from 1994 to 2010, where the data are obtained from Transactional Records Access Clearinghouse. *Control for Religiosity* controls for religiosity, defined as the number of religious adherents (as reported by the American Religion Data Archive) to the total population in a county (as reported by the Census Bureau), at a firm's county level. *Control for Industry Competition* control for the Herfindahl-Hirschman Index of net sales based on all firms with the same three-digit SIC in a year. *Finer Industry Classification* uses 3-digit SIC industry classifications. *Industry-Adjusted* adjust the dependent variables using the industry-median. For indicator dependent variable, the specification is adjusted by including additional indicators for adjusting industry average. *Excluding Small-Cap Firms* exclude all firms with less than \$50 million of total assets. *Excluding High Technology Firms* exclude all firms in high-technology industries with SIC codes of 357 and 737). *Excluding Young Firms* exclude all firms with less than five years of age since it has first appeared in CRSP. *10-Q Quarterly Filings* alternatively constructs *Use of Negative Words* based on all 10-Q filings in a year. *Negative minus Positive Words* replaces *Use of Negative Words* with the difference between *Use of Negative Words* and *Use of Positive Words*. *Negative minus Positive Words, Divided by the Sum of Both* replaces *Use of Negative Words* with the difference between *Use of Negative Words* and *Use of Positive Words*, divided by the sum of two. Robust standard errors are clustered at firm level, and two-tailed *t*-statistics are reported in parentheses.

Panel A: Tobit Regression				
Dependent Variable: Unrecognized Tax Benefit (UTB) Balance				
Independent Variable	(1)	(2)	(3)	(4)
Use of negative words	0.213 (4.29)			
	[6.7-5.8-4.5]			
- Quintile score		0.164 (5.05)		
		[5.1-4.4-3.5]		
- Top quintile indicator			0.316 (2.99)	0.638 (4.59)
			[9.9-8.5-6.7]	[20.0-17.3-13.5]
- 4th quintile indicator				0.531 (4.25)
				[16.6-14.4-11.3]
- 3rd quintile indicator				0.393 (3.37)
				[12.3-10.6-8.3]
- 2nd quintile indicator				0.163 (1.50)
				[5.1-4.4-3.4]
Included controls/FEs	Identical to column 5 of Table II with 19 control variables included			
Num. of observations	5,076	5,076	5,076	5,076
Adjusted/Pseudo-R ²	0.106	0.107	0.104	0.107

Table XI
Robustness Checks – *Continued*

Panel B: Various Robustness Tests					
<i>Descriptions</i>	Estimated Coefficients on <i>Use of Negative Words</i>				
	Dependent Variables:				
	UTB Balance	Cash ETR	GAAP ETR	Use of Tax Havens	Number of Tax Havens
	(1)	(2)	(3)	(4)	(5)
Control for total pay-for-performance sensitivities	0.060 (2.56)	-0.068 (-4.41)	-0.081 (-4.97)	0.018 (2.62)	0.025 (2.10)
Control for Gompers-Ishii-Metrick Index on corporate governance	0.103 (3.40)	-0.055 (-3.54)	-0.070 (-4.21)	0.014 (1.87)	0.024 (2.01)
Control for institutional ownership	0.084 (4.05)	-0.061 (-5.25)	-0.062 (-5.21)	0.025 (3.07)	0.023 (2.51)
Control for IRS tax audit rate	0.082 (3.97)	-0.062 (-5.30)	-0.063 (-5.32)	0.025 (3.13)	0.024 (2.63)
Control for religiosity	0.100 (4.26)	-0.075 (-5.26)	-0.079 (-5.33)	0.036 (3.67)	0.030 (3.07)
Control for industry competition	0.085 (4.07)	-0.061 (-5.26)	-0.062 (-3.39)	0.025 (3.09)	0.023 (2.55)
Finer industry classification	0.076 (3.43)	-0.052 (-4.30)	-0.053 (-4.23)	0.016 (1.91)	0.021 (2.34)
Industry-adjusted	0.091 (4.45)	-0.060 (-5.12)	-0.052 (-4.86)	0.026 (3.23)	0.032 (3.37)
Excluding small-cap firms	0.085 (3.97)	-0.062 (-5.14)	-0.059 (-4.74)	0.024 (3.00)	0.024 (2.53)
Excluding high technology firms	0.086 (4.04)	-0.061 (-4.85)	-0.061 (-5.35)	0.023 (2.55)	0.021 (2.16)
Excluding young firms	0.094 (3.88)	-0.064 (-5.08)	-0.068 (-5.29)	0.024 (2.78)	0.021 (2.11)
10-Q Quarterly filings	0.109 (5.05)	-0.066 (-5.66)	-0.068 (-5.49)	0.025 (3.02)	0.027 (3.16)
Negative minus positive words	0.083 (3.96)	-0.058 (-5.16)	-0.056 (-4.94)	0.028 (3.47)	0.029 (3.26)
Negative minus positive words, divided by the sum of both	0.072 (3.77)	-0.052 (-4.79)	-0.047 (-4.71)	0.024 (3.09)	0.031 (3.62)
Controls/FEs/Constant identical to column of table:	5 of II	A1 of VI	A6 of VI	2 of IX	6 of IX

Appendix Variable Definitions

Variable	Description/Construction Details
Main Variables	
Unrecognized tax benefit	Firm j 's unrecognized tax benefit balance at the end of year t scaled by total assets (AT).
Cash ETR	Cash effective tax rate: income taxes paid, divided by pre-tax income minus special items ($TXPD/(PI-SPI)$). Truncated at $[0,1]$. k -Year Cash ETR is the sum of income taxes paid for the next k -year divided by the pretax income minus special items for the next k -year.
GAAP ETR	Effective tax rate: income taxes, divided by pre-tax income minus special items ($TXT/(PI-SPI)$). Truncated at $[0,1]$. k -Year GAAP ETR is the sum of income taxes for the next k -year divided by the pretax income minus special items for the next k -year.
Use of tax havens	Indicator that equals one if firm j reports at least having one subsidiary in tax havens reported in Exhibit 21 of a firm's 10-K filing in year t .
Number of tax havens	Natural logarithm of one plus the number of tax havens reported in Exhibit 21 of firm j 's 10-K filing in year t . The data are generously made available by Scott Dyreng.
Tone Measures	
Use of negative words	The number of negative words divided by the total number of words. Common examples are <u>loss, against, claims, impairment, and adverse.</u>
Use of uncertainty words	The number of uncertainty words divided by total number of words. Examples are <u>approximate, contingency, depend, fluctuate, and uncertain.</u>
Use of possibility words	The number of possibility (weak modal) words divided by total number of words. Examples are <u>could, may, suggest, possibly, and possible.</u>
Use of strong words	The number of strong modal words divided by total number of words. Examples are <u>will, must, never, always, and definitely.</u>
Use of litigious words	The number of litigious words divided by total number of words. Common examples <u>claimant, deposition, interlocutory, testimony, and tort.</u>
Use of positive words	The number of positive words divided by total number of words. Common examples are <u>gain, greater, best, benefit, improvement.</u>
Use of constraining words	The number of constraining words divided by the number of words. Examples are <u>required, requirement, restricted, commitment, covenant.</u>
Readability Measures	
Number of words	The natural logarithm of the number of words in firm j 's annual 10-K filing in year t .
Gunning fog index	$[(\text{Average number of words per sentence} + \text{Percent of complex words}) \times 0.4]$. Complex words are the words with three or more syllables. Textual content with higher <i>Gunning Fog Index</i> is more difficult to read.
Flesch reading ease	$[206.835 - (1.015 \times \text{Average number of word per sentence}) - (84.6 \times \text{Average number of syllable per word})]$. Textual content with higher <i>Flesch Reading Ease</i> is easier to read with a bound between zero (the most difficult to read) and one (the easiest to read).
Kincaid readability	$[(11.8 \times \text{Average syllable per word}) + (0.39 \times \text{Average word per sentence}) - 15.59]$. Textual content with higher <i>Kincaid Readability</i> requires readers with more years of education to understand.
Use of negation words	The number of negation words divided by total number of words. Examples are <u>no, not, none, neither, never, and nobody.</u>

Appendix

Variable Definitions – *Continued*

Variable	Description/Construction Details
Firm Characteristics	
Firm size	The natural logarithm of firm j 's total assets (AT).
Property, plant, & equip.	Property, plant, and equipment ($PPEGT$) divided by firm j 's total assets (AT).
Research & development	Research and development expenses (XRD) divided by firm j 's total assets (AT).
Merger & acquisition	Indicator that equals one if firm j is involved in a merger and acquisition in year t , and zero otherwise. The data are obtained from SDC Platinum.
Foreign sales	Firm j 's foreign pretax income ($PIFO$) divided by total sales ($SALE$) in year t .
Number of countries	The natural logarithm of the number of countries reported in Exhibit 21 of firm j 's 10-K filing in year t .
Equity earnings	The absolute of equity in earnings (loss) ($ESUB$) divided by the absolute of firm j 's income (IB) in year t .
Mezzanine finance	Convertible debt and preferred stock ($DCPSTK$) divided by total assets (AT).
Other comprehensive income	The absolute of accumulated other comprehensive income ($AOCI$) divided by total assets (AT).
Deferred revenue	Indicator that equals one if deferred revenue ($DRC+DRLT$) is non-zero, and zero otherwise.
Stock compensation expense	Indicator that equals one if stock compensation expense ($STKCO$) is non-zero, and zero otherwise.
Tax loss carry-forward	Indicator that equals one if tax loss carry-forward ($TLCF$) is non-zero, and zero otherwise.
Wholesale, retail, and transportation	Indicator that equals one if the 4-digit SIC code is between 4000 and 4899 or between 5000 and 5999, and zero otherwise.
Change in tax loss carry-forward	Change in tax loss carried forward ($TLCF$) from prior year divided by firm j 's lagged total assets (AT).
Returns of assets	Returns on assets in year t , scaled by total assets ($EBITDA/AT$).
Leverage	Long-term debt in year t , scaled by lagged total assets ($DLTT/AT$).
Intangible assets	Intangible assets in year t , scaled by lagged total assets ($INTAN/AT$).
Market-to-book ratio	Market-to-book ratio at the beginning of year t ($PRCC_F*CSHPRI/AT$).