eJournal of Tax Research (2023) vol. 21, no. 1, pp. 2-26

Accounting for uncertain tax positions and lenders' risk evaluations

Sungsil Lee*

Abstract

This study explores whether publicly traded US firms' unrecognised tax benefit (UTB) disclosures are associated with the cost of debt. Using UTB comovement, a measure of UTB comparability, I find that the UTB balance is positively associated with the cost of debt, but this association is less pronounced when UTB disclosures are comparable to those of other firms. In addition, these associations are more predominant when firms have a considerable amount of foreign sales or engage in research and development (R&D) activities.

Keywords: unrecognised tax benefit (UTB); uncertain tax positions; tax risk; tax uncertainty; cost of debt

* Ajou University, Republic of Korea. Email: sungsillee@ajou.ac.kr.

1. INTRODUCTION

This study explores whether corporate disclosures for uncertain tax positions are associated with the cost of debt. Since 2007, the Financial Accounting Standards Board (FASB) has required publicly traded US corporations to recognise a contingent liability for uncertain tax positions, referred to as unrecognised tax benefits (UTBs). UTBs are expected to provide helpful information to lenders' loan decisions because they show potential cash outflow due to uncertain tax positions, and such cash outflow affects the default probability of borrowing firms. Nevertheless, little evidence exists of whether UTB disclosures provide decision-useful information to lenders. This study fills this void by examining the association between UTB disclosures and the cost of debt.

This study particularly investigates how the comparability of UTB disclosures is associated with the cost of debt. The UTB balance indicates potential tax cash flow from uncertain tax positions; thus, it has been used as a tax risk measure (Hanlon, Maydew & Saavedra, 2017; Dyreng, Hanlon & Maydew, 2019). However, this measure should be used cautiously because the UTB balance is driven not only by tax uncertainties but also by financial reporting incentives (Hanlon & Heitzman, 2010). As managers determine whether tax positions are uncertain, they can exclude relevant but unfavourable information from UTB disclosures. This managerial discretion is a cause of variations among firms in how uncertain tax positions are disclosed as UTBs in financial statements (De Simone, Robinson & Stomberg, 2014; Nesbitt, 2014). Given this diversity in practice, the comparability of UTB disclosures is likely associated with the cost of debt. Sengupta (1998) shows that firms disclosing higher quality information tend to have lower costs of debt because a higher disclosure quality implies a lower likelihood of withholding unfavourable information. Similarly, UTB disclosures comparable to those of other peer firms may properly inform the potential outcomes of uncertain tax positions without concealing unfavourable news, thus lowering the cost of debt.

To measure how UTB disclosures are comparable to the disclosure of other firms adopting similar uncertain tax positions, this study develops the UTB comovement measure. Since UTB disclosures are subject to managerial discretions, comparability is an important characteristic of informative UTB disclosures (FASB, 2006; Blouin & Robinson, 2014). Adopting the idea of earnings comovement to measure earning comparability from De Franco, Kothari and Verdi (2011), this study uses UTB comovement to measure UTB comparability. When peer firms share common tax strategies and comparably recognise UTBs regarding the tax strategies, these firms' UTBs will move in the same way, thus showing high UTB comovement.

I find that the effective tax rates (ETRs) of high UTB comovement firms tend to be more stable than those of low UTB comovement firms in the large tax settlement years. Even in the large tax settlement years, firms with informative UTBs are less likely to have spikes in their ETRs because they have already recognised tax expenses and contingent liabilities (UTBs) in advance. Therefore, the finding in this study suggests that UTB disclosures with high comovement tend to be more informative about future tax settlements.

My sample includes 1,710 bank loans issued to US public firms in the period 2012-2015.[1] I focus upon bank loans because bank loans are a predominant source of external financing for US corporations (e.g., Bharath, Sunder & Sunder, 2008). Furthermore, compared to other investors, such as bondholders or equity investors, banks usually retain a larger share of the loans; therefore, they tend to be more exposed to tax risk (Sufi, 2007).

In the main test, loan spread is positively associated with UTB balance but negatively associated with an interaction term of UTB balance and UTB comovement. That is, higher UTB comovement moderates a positive association between the UTB balance and loan spread. All else being equal, if the mean firm in my sample increases its UTB balance by one standard deviation, then the firm's loan spread increases by 19.31 basis points. However, if a one standard deviation increase in the UTB balance is combined with a one standard deviation increase in UTB comovement, the increase in loan spread would be 15.82 basis points. These findings suggest that, while lenders demand a tax-related risk premium for uncertain tax positions, they also incorporate the quality of tax risk disclosures into the risk premium. In addition, I test whether the influence of UTB disclosures on the loan spread is more pronounced when UTBs are more relevant to the lenders' loan decisions and find that UTB comovement particularly affects the loan spread when a firm reports large foreign sales or research and development (R&D) expenditures.

This study makes three primary contributions. First, this study explores whether a new accounting standard, FASB Interpretation No. 48 (FIN48)/Financial Accounting Standards Codification 740-10 (ASC740-10), provides useful information for lenders. While UTB studies to date have been limited to examining whether UTB disclosures are useful to equity investors (Song & Tucker, 2008; Koester, 2011; Robinson & Schmidt, 2013), this study demonstrates that UTB disclosures are also decision-relevant information for lenders. The findings of this study indicate that although the practice of UTBs varies among firms, UTB disclosures are informative about a firm's overall tax risk.

Second, I propose a new measure, UTB comovement, to measure the comparability of UTB disclosures. UTB comovement has at least two strengths. First, this measure focuses on comparability, which is the FASB's main concern in recording UTBs (Blouin & Robinson, 2014). Second, the measure enhances our understanding of how UTB balances evolve. Although assessing an uncertain tax position is a continuous process, previous studies mostly focus on UTB balances within a single period across firms, and little is known about time series changes in UTBs (e.g., Dyreng et al., 2019). This study indicates that informative UTBs have high covariance with the UTBs of peers.

Third, this study shows the impact of lenders' tax risk perceptions on the cost of debt. While this study confirms the previous finding that aggressive tax avoidance increases the cost of debt (e.g., Hasan et al., 2014; Shevlin, Urcan & Vasvari, 2020), it is in line with Isin (2018) showing that lenders may not price tax risk under certain circumstances. This study shows that the impact of aggressive tax avoidance is less

[1] To compute UTB comovement, I require five years of UTB data. As UTB disclosure has been mandated since 2007, the first year of UTB comovement available is 2011. I test the impact of UTB quality on debt contracts the following year; hence, my bank loan sample starts from 2012.

pronounced when UTBs are more informative about the consequences of uncertain tax positions, suggesting that lenders' perceptions of a borrower's tax risk are influenced by tax risk disclosures as well as tax risk itself.

The remainder of this article proceeds as follows. Section 2 provides background information about FIN48/ASC 740-10 and develops the hypotheses. Section 3 presents the data sample and research design, section 4 establishes the empirical results, and section 5 concludes the article.

2. THEORETICAL BACKGROUND AND HYPOTHESES

2.1 Background on FIN 48/ASC 740-10

Since 2007, FIN 48 (mostly codified as ASC Topic 740-10) has required publicly traded US corporations to disclose information regarding uncertain tax positions. In accordance with FIN 48, managers are required to evaluate every tax position to determine whether it is more likely than not that a tax position will be sustained upon examination by taxing authorities based upon its technical merits. If firms do not meet the more-likely-than-not threshold, they are not allowed to recognise tax positions in the financial statements. Nevertheless, those benefits are already claimed in tax returns; hence there are differences in the tax benefit recognitions in the tax returns compared with the financial statements. Such differences represent a contingent liability, widely known as a UTB. Firms should continuously evaluate uncertain tax positions until those positions are resolved. As of each balance sheet date, management must determine whether the factors underlying the sustainability assertion have changed and whether the amount of the UTB is still appropriate.

2.2 Hypotheses development

It has been an important debate in recent tax research whether and how corporate tax risk is associated with the cost of debt. On the one hand, the lender may view aggressive tax positions positively as the cash tax savings aspect of aggressive tax strategies may reduce the default risk (e.g., Kim, Li & Li, 2010; Lim, 2011). Since statutory tax rates in the past have been greater than one-third of firms' profit, cash savings from aggressive tax strategies can be a significant source of financial slack. Furthermore, cash tax savings can reduce firms' leverage by acting as a replacement for debt-induced interest expense deductions (Graham & Tucker, 2006; DeAngelo & Masulis, 1980). On the other hand, lenders' fixed income makes them focus more on downside risk than on upside potential (Jensen & Meckling, 1976). This is consistent with the findings of recent studies that the cost of debt is higher when firms engage in aggressive tax strategies (e.g., Hasan et al., 2014; Shevlin et al., 2020; Saavedra, 2019). Aggressive tax strategies risk being challenged by tax authorities, and this challenge may cause significant direct and indirect costs to be incurred and impair the firm's repayment ability (Wilson, 2009; Hasan et al., 2014). In addition, firms tend to be reluctant to provide detailed information about aggressive tax strategies to avoid being detected by tax authorities (Desai & Dharmapala, 2006). Such opaque tax positions provide managers with opportunities to divert corporate resources to the manager's private benefit (Desai & Dharmapala, 2009; Chen et al., 2010).

In recent studies, the balance of UTB is used as an alternative tax risk measure (Hanlon et al., 2017; Dyreng et al., 2019). The UTB balance illustrates the degree of tax-related uncertainties or risk because this balance indicates potential cash outflow as a result of

uncertain tax positions. Since a lender's main concern is cash holdings and the default probability of borrowing firms, UTBs measure the tax risk with which lenders are most concerned. A larger potential cash flow indicates that the impact of uncertain tax positions upon a borrower's repayment ability could be more serious. Hasan et al. (2014) in fact find that lenders impose larger risk premiums on the borrowing firms presenting larger UTB balances.

Although UTB is an ideal measure of tax risk in theory, previous studies emphasise that UTB should be used as a tax risk measure with caution (Hanlon & Heitzman, 2010). UTBs are driven not only by tax uncertainties but also by financial reporting incentives. If the tax position is included in UTB reporting, this reporting increases tax expenses, consequently decreasing the net income. For this reason, managers may exclude tax positions from UTB reporting even though the position is more likely than not to be denied by the taxing authorities. Thus, previous research reveals variations among firms in how uncertain tax positions are recorded in UTBs in financial statements (De Simone et al., 2014; Nesbitt, 2014).

When there is a diversity in UTB recognition practice, the informativeness of UTB disclosures will affect lenders' perceptions about the tax risk of borrowing firms. Sengupta (1998) finds a negative association between disclosure quality and the cost of debt. Lenders evaluate the default risk based on all the available information when lending money to borrowing firms. One factor involved in risk evaluation is the probability of borrowers withholding unfavourable information that would increase the firm's default risk. Lenders believe that firms with high disclosure quality are less likely to hide unfavourable information and, therefore, charge high disclosure quality firms lower risk premiums. In the same manner, lenders would offer lower risk premiums for a given level of UTBs to firms disclosing informative UTBs including unfavourable information about uncertain tax positions.

Informative UTBs are likely to show high comparability with the UTB disclosures of other firms. UTB disclosures are considered comparable if two firms produce similar financial statements for a given set of uncertain tax positions. If two firms adopting similar tax positions disclose all available information about these positions similarly, UTB disclosures of the two firms would be comparable as well as informative about uncertain tax positions. Therefore, my first hypothesis is as follows:

H_1: *Ceteris paribus, UTBs increase loan spread less when UTB disclosures are more comparable to those of other firms.*

Although lenders have access to non-public information, such access may not eliminate the important role of UTB disclosure. The Internal Revenue Service (IRS) uses UTB disclosures to assess the tax uncertainties of firms even though it has access to non-public tax information, including tax returns (Bozanic et al., 2017). Several IRS documents explain the role of public tax reporting including UTB disclosure in the conduct of IRS audits. For example, when UTB disclosures were initially mandated, the IRS developed a Field Examiners' Guide, 'FIN 48 Implications', and provided training programs about how field examiners should use UTB information to conduct risk assessments (IRS, 2007). Similarly, bond rating agencies with access to non-public information also use tax-related disclosures on financial statements to increase their understanding of the issuer's tax risk (Bonsall, Koharki & Watson, 2017). Such evidence suggests that UTB disclosures play an important role in tax risk evaluation.

The impact of UTB disclosures on loan spread would be prominent for firms where the disclosures are more relevant to the lenders' loan decisions. Since UTB disclosures mostly involve international transfer pricing, business deductions, and R&D credits (Towery, 2017), they are expected to be more important when firms are largely involved in foreign sales or R&D activities. Thus, I predict the following:

H_{2a}: *Ceteris paribus, the impact of UTB disclosures on loan spread is prominent when a firm has a significant amount of foreign sales*; and

H_{2b}: *Ceteris paribus, the impact of UTB disclosures on loan spread is prominent when a firm is involved in R&D activity.*

3. RESEARCH DESIGN

3.1 Sample selection

My sample includes all US-domiciled firms reporting UTBs during the years 2011-2014 (*N = 37,435*). The sample begins in 2011 because UTB disclosures are mandated for the fiscal periods beginning after 15 December 2006 and five consecutive years of UTB observations are required to generate UTB comovement. For example, to calculate the UTB comovement for 2011, UTB data from 2007 to 2011 are required. Firm-year observations in the financial (SIC Code 6000-6999) and utility (SIC Code 4900-4999) industries are eliminated because they have different tax and financial reporting incentives. Firms whose industry is not defined (SIC Code 9000-9999) are also eliminated because it is difficult to identify their peers. To control for any potential measurement error in the UTB data, observations with any missing UTBs over the five-year period are dropped.[2] Firms whose UTBs are zero over five consecutive years are also excluded from the sample. In addition, I delete firm-years with less than five peer firms in the same industry during the year. This generates an initial sample of 6,324 with the UTB comovement variable.

Table 1: Sample Selection

US-domicile firm-years on Compustat Annual File for fiscal years 2011-2014	37,435
Less:	
Financial firms, utilities, and non-classified firms	(15,473)
Firm-years missing data on unrecognised tax benefits	(8,574)
Firm-years missing data on unrecognised tax benefits in the last four years	(6,051)
Firms whose UTB is zero over five consecutive years	(903)
Firms with less than five peer firms in the same industry and year	(110)

[2] Lisowsky, Robinson and Schmidt (2013) compared the IRS-Large Business and International Division's UTB data and Compustat's UTB data and found a large number of missing values in Compustat for the UTB balances at the end of the year (*TXTUBEND*), especially in the early years of the FIN 48 adoption. They suggest dropping the firms with missing UTBs if Compustat's UTB data is used. Following this suggestion, I remove missing values from the test, rather than considering missing values as zero. Lisowsky et al. (2013) replicate their analysis using Compustat instead of the IRS-Large Business and International Division's UTB data and find that the results are not significantly altered if firms with missing UTBs are dropped from the sample.

UTB Comovement Sample (Firm-Years)	**6,324**
UTB Comovement Validation	
UTB comovement sample	6,324
Less:	
Firm-years missing large tax payment year variable	(2,981)
Firm-years missing control variables	(67)
Sample (Firm-Years)	**3,276**
UTB Disclosures and Loan Spread	
UTB comovement sample	6,324
Less:	
Firm-years missing loan terms	(4,566)
Firm-years missing large tax payment year variable	(577)
Firm-years missing control variables	(163)
Sample (Firm-Years)	**1,018**
Sample (Loan Issuances)	**1,710**

To conduct the UTB comovement validation test, I exclude firm-year observations without the large tax settlement year (*LGTAX_D*) variable. Following Bauer and Klassen (2014), I calculate *LGTAX_D*, an indicator of a large tax settlement year. As calculating *LGTAX_D* requires firms to have at least seven years of the return on assets (ROA) greater than or equal to 0.5% and positive cash ETR and generally accepted accounting principles (GAAP) ETR, this requirement excludes 2,981 observations. I also exclude 67 observations with missing control variables. Thus, the final sample for validation testing is 3,276 firm-years. In the main test, I remove 4,566 firm years with missing loan terms, 577 firm years missing the *LGTAX_D* variable and 163 firm years with missing control variables. Accordingly, the final sample consists of 1,018 firm years with 1,710 loan issuances. Table 1 summarises the sample selection process.

3.2 Variable measurement: UTB comovement

To measure the comparability of UTB disclosures, I develop a 'UTB comovement' measure. I adopt the idea of 'earnings comovement', a measure of earnings

comparability (De Franco et al., 2011).[3] De Franco et al. (2011) claim that firms show high earnings comovement when the accounting is comparable between the firms and the firms have experienced similar sets of economic events. Similarly, if peer firms have similar uncertain tax positions and their UTB recognitions are comparable, their UTBs will also be highly comoved. For example, if a new ruling related to the common tax positions of peer firms is released, the ruling's effect on both firms should be in the same direction. A new ruling may increase (or decrease) the likelihood that the tax authority would deny the tax positions of both firms upon audit. Therefore, if peer firms recognise the impact of new rulings on UTBs in the same way, both firms' UTBs will also move similarly. When such comparable recognition accumulates over time, the UTBs of peer firms will demonstrate high comovement.

I expect peer firms in the same industry to have similar tax positions and face similar tax uncertainties. For example, many US-based pharmaceutical companies had been keen on tax inversions until the enactment of the *Tax Cuts and Jobs Act of 2017*. The most important motivation for these tax inversions of pharmaceutical companies had been a follow-the-leader effect. Pharmaceutical companies that do not invert are worried that paying higher US taxes will place them at a competitive disadvantage to those who move overseas (Weissmann, 2015). Academic research also provides similar evidence that firms tend to mimic the tax positions of their product market leader (Kubick et al., 2015). The above evidence supports the notion that peer firms are likely to take similar tax positions in the same industry and, thus, they are likely to face similar tax uncertainties. Therefore, these peer firms will show high UTB comovement if they disclose comparable UTBs for similar tax uncertainties.

To implement the UTB comovement measure, I calculate the pair-wise correlation between the UTBs of two firms among all possible pairs of firms in the same industry. Using five years of UTB data, I estimate:

$$UTB_{it} = \alpha_{0ij} + \alpha_{1ij} UTB_{jt} + \varepsilon_{ijt} \quad (1)$$

The R^2 from Equation (1) is defined as the comparability between firms *i* and *j*. I obtain a correlation measure for each firm *i* – firm *j* pair for *J* firms in the same two-digit SIC industry. Then I compute a firm-year measure of comovement as the median R^2 for all *j* in the same industry.

While a UTB comovement measure is aimed at capturing comparability of UTB disclosure, similarities and differences in a firm's economic performance and uncertain tax positions as compared with those of peer firms may also affect UTB comovement. To control for these perplexing factors, I control for earnings comovement and cash ETR comovement measured analogously to UTB comovement. By doing so, the association between UTB comovement and loan spread is expected to be driven by the accounting of uncertain tax positions.

[3] De Franco et al. (2011) provide two models to capture earnings comparability, the matching model and the earnings comovement model. I choose the comovement model because UTBs satisfy the assumption that the underlying tax uncertainties of the two peer firms are similar. In contrast, the matching model requires a proxy of a distinguishable economic event, which may not exist.

3.3 UTB comovement validation test

Before conducting the main test, I validate whether high UTB comovement indicates that UTB disclosures are informative for future tax consequences. If a firm determines that its uncertain tax position would not be sustained upon tax audit, it would instantly report UTB (contingent liability) and tax expenses related to this tax position. Instead, they do not need to report additional tax expenses when the tax positions are denied. In this regard, in the large tax settlements years (i.e., the year the tax position is denied), firms with informative UTBs would have relatively stable GAAP ETRs compared to other firms that did not report UTBs related to the denied tax positions.

I test whether high UTB comovement firms have stable GAAP ETRs during years of large settlements by estimating the following model:

$$ABETR_{it} = \gamma_0 + \gamma_1 UTB_{it-1} + \gamma_2 UTBCOMV_{it-1} + \gamma_3 UTB_{it-1} \times UTBCOMV_{it-1} + \gamma_4 LGTAX\_D_{it} \ (or\ \gamma_4 LGTAX\_C_{it}) + \gamma_5 LGTAX_{it} \times UTB_{it-1} + \gamma_6 LGTAX_{it} \times UTBCOMV_{it-1} + \gamma_c CONTROL_{ci,t-1} + \sum \gamma_j YEAR_t + \sum \gamma_m IND_{m,t} + \varepsilon_{it} \quad (2)$$

where *ABETR* represents abnormal changes in GAAP ETR in year *t*, defined as a firm's absolute GAAP ETR in year *t* minus its 10-year average GAAP ETR. *UTB* is the UTB balance at the end of year *t-1* scaled by total assets at the beginning of the year. *UTBCOMV* is UTB comovement at *t-1* and calculated based on the method explained in section 3.2.

LGTAX_D (or *LGTAX_C*) indicates whether year *t* is a large tax settlement year. Tax settlement data are not accessible; therefore, I employ the methodology used in previous research to identify potential large tax settlement firm-years (Bauer & Klassen, 2014; Finley, 2015). Firm years are identified as large tax settlement years (*LGTAX_D*) if a firm's cash ETR is greater than its own 10-year cash ETR mean by more than two industry standard deviations. I require firms to have ROAs greater than or equal to 0.5% to ensure that high cash ETRs are driven by high taxes paid (numerator) and not by low pre-tax income (denominator). I delete firm-years from the sample if the cash ETR is not calculable for more than three years over the past 10 years. I also calculate an alternative *LGTAX_C* measure that is a continuous variable equal to cash ETR minus the 10-year average cash ETR of the firm.

I include several variables at year *t-1* to control for the effects of firm characteristics on changes in GAAP ETR. The control variables include firm characteristics such as size, leverage, ROA, the market-to-book ratio, net operating loss (NOL), foreign sales, and R&D expenditure. Finally, I add industry and year fixed effects. In general, firms in the large tax settlement years show greater changes in GAAP ETR. However, firms with high UTB comovement would experience smaller changes in their GAAP ETRs compared to other firms in the large tax settlement years. Hence, my prediction is that $\gamma_6 < 0$.

3.4 Main tests

To test whether the comparability of UTB disclosures is associated with the cost of debt (H_1), I estimate the following regression model:

$$\begin{aligned}\log\,(LOANSPREAD_{i,t}) &= \gamma_0 + \gamma_1 UTB_{i,t-1} + \gamma_2 UTBCOMV_{i,t-1} \\ &+ \gamma_3 UTB_{i,t-1} \times UTBCOMV_{i,t-1} + \gamma_4 CETRCOMV_{i,t-1} \\ &+ \gamma_5 UTB_{i,t-1} \times CETRCOMV_{i,t-1} + \gamma_6 EARNCOMV_{i,t-1} \\ &+ \gamma_7 UTB_{i,t-1} \times EARNCOMV_{i,t-1} \\ &+ \sum \gamma\, FIRM\ CHARACTERISTICS_{it-1} \\ &+ \sum \gamma\, LOAN\ CHARACTERISTICS_{it} + YEAR_{t-1} + IND_{m,t-1} \\ &+ \varepsilon_{i,t}\end{aligned} \tag{3}$$

where $\log\,(LOANSPREAD_{i,t})$ is the natural logarithm of the loan interest payment at year *t* in basis points over the London Interbank Borrowing Rate (LIBOR) or the LIBOR equivalent for each dollar drawn down (i.e., the all-in spread) for a loan facility.

In Equation (3), the loan variables are measured in year *t*, whereas the firm characteristics, such as *UTB*, *UTBCOMV*, and other control variables, are measured in year *t-1*. This is because this test aims to investigate how loan spreads change after UTB is disclosed. $UTB \times UTBCOMV$ is a variable of interest and is expected to be negative because comparable UTB reduces the risk premium on uncertain tax positions. I focus on the coefficient of the interaction term rather than the coefficient of *UTBCOMV* because comparable UTB disclosure does not reduce the general risk on debt; instead, it mainly reduces the risk on given uncertain tax positions. Thus, *UTBCOMV* may affect the loan spread by reducing risk premium on given UTBs.

I control for cash ETR comovement (*CETRCOMV*), earnings comovement (*EARNCOMV*) and their interactions with *UTB*. As mentioned earlier, a potential concern with the UTB comovement measure is that it could be driven by similarities and differences in uncertain tax positions and firms' performance. I attempt to control for these confounding factors by controlling for cash ETR comovement and earnings comovement. The control variables also include cash ETR and cash ETR volatility over five years (e.g., Dyreng, Hanlon & Maydew, 2008; Guenther, Matsunaga & Williams, 2017; Drake, Lusch & Stekelberg, 2019). Following Graham, Li and Qiu (2008), I include several variables to control for the effects of firm and loan characteristics on the loan spread. The definitions of these variables are the same as those in Equation (2).

To test whether UTB disclosures are more closely related to loan spread when the UTBs are more relevant to the loan decisions (H_{2a} and H_{2b}), I separate the sample into two groups based on the foreign sales and R&D expenditure and estimate the Equation (3).

4. RESULTS

4.1 Validation test

Table 2, Panel A (see Appendix) reports the descriptive statistics for the variables used in the validation test. The mean of UTBs indicates that the size of UTBs on average is approximately 1.03% of total assets. This is similar to the amounts reported in previous research (e.g., Lisowsky et al., 2013; Nesbitt, 2014). The mean of UTB comovement is 33.27%, and the descriptive statistics of the other control variables are consistent with previous studies. I compare the descriptive statistics of the firms in the large tax

settlement year with those of the firms that are not in the large tax settlement year.[4] Approximately 4% of the firm-years are considered large tax settlement years. Firms in the large tax settlement years have a significantly larger mean *ABETR* (18.91% vs. 7.16%) and tend to have a smaller firm size, lower leverage, lower ROA, lower market-to-book ratios, and more tax losses.

Table 3 reports the results of the validation test using Equation (2). In Column (1), *LGTAX_D* is a dummy variable that equals one if a firm's cash ETR exceeds its 10-year average by two industry standard deviations. In Column (2), *LGTAX_C* is a continuous variable that equals cash ETR minus the 10-year average cash ETR. In both columns, the coefficients of UTB are significantly positive. Firms with larger UTBs tend to have more tax uncertainties and, thus, tend to have greater abnormal changes in GAAP ETR. The coefficients of *LGTAX_D* and *LGTAX_C* are also significantly positive. Firms are likely to have greater abnormal changes in GAAP ETR in the large tax settlement years. The coefficient of the interaction terms of *LGTAX_D* (or *LGTAX_C*) and *UTBCOMV* is -0.130 (or -0.201). Compared to others, firms with higher UTB comovement tend to have smaller abnormal changes in GAAP ETR in the large tax settlement years, supporting the conclusion that high UTB comovement firms reflect tax expenditures related to large tax settlements in tax expenses in advance. Hence, these findings support the conclusion that high UTB comovement indicates more informative UTB disclosures.

Table 3: UTB Comovement Validation

	Dependent Variable = $ABETR_t$	
	(1) *LGTAX_D*: Dummy Variable	(2) *LGTAX_C*: Continuous Variable
UTB_{t-1}	0.703**	0.667**
	(2.10)	(1.96)
$UTBCOMV_{t-1}$	0.002	-0.001
	(0.14)	(-0.07)
$UTB_{t-1} \times UTBCOMV_{t-1}$	0.726	1.102
	(0.75)	(1.12)
$LGTAX_t$	0.114***	0.133***
	(4.63)	(4.08)
$LGTAX_t \times UTB_{t-1}$	3.317**	0.708
	(2.08)	(0.48)
$LGTAX_t \times UTBCOMV_{t-1}$	-0.130**	-0.201***
	(-2.02)	(-2.19)
$SIZE_{t-1}$	-0.010***	-0.011***
	(-8.32)	(-8.91)
LEV_{t-1}	0.012	0.012
	(1.33)	(1.33)

[4] In Table 2, a firm-year is considered a large tax settlement year if its tax payments are larger than its 10-year mean by two industry standard deviations.

ROA_{t-1}	-0.235***	-0.258
	(-10.81)	(-11.72)
$MTOB_{t-1}$	0.000	0.000
	(0.07)	(-0.06)
$TAXLOSS_{t-1}$	0.115***	0.117***
	(7.90)	(7.87)
$FOREIGN_{t-1}$	0.012*	0.015**
	(1.85)	(2.14)
RND_{t-1}	0.050	0.050
	(1.03)	(1.00)
Number of observations	3,276	3,276
R-squared	18.0%	15.4%
Year-fixed effect	Yes	Yes
Industry-fixed effect	Yes	Yes

Note: There are two forms of the *LGTAX* variable. In column (1), *LGTAX_D* is a dummy variable that equals 1 if the firm's cash ETR is greater than its 10-year average by two industry standard deviations. In column (2), *LGTAX_C* is a continuous variable that equals CETR minus the 10-year average CETR. T-statistics are reported in parentheses below each coefficient estimate. Continuous variables are winsorised at the 1% level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Table 7 (see Appendix) provides variable definitions.

4.2 Main tests

Table 4, Panel A (see Appendix) presents descriptive statistics for the variables used in Equation (3). The mean of *UTB* is 0.98% with a standard deviation of 1.09%, whereas the mean of *UTBCOMV* is 33.33%, with a standard deviation of 16.57%, similar to the descriptive statistics in Table 2. The mean of *EARNCOMV* is 25.29%, and that of *CETRCOMV* is 17.65%. Consistent with prior studies, the mean of *CETRV* is 18.47%, and that of *CETR5* is 24.38% (e.g., Drake et al., 2019). About 3.14% of the firm-years are identified as large tax settlement years. The descriptive statistics pertaining to other firm and loan characteristics are consistent with previous studies. Table 4, Panel B shows the associations between UTB comovement, earnings comovement, and cash ETR comovement. While cash ETR comovement is mainly driven by differences in uncertain tax positions, UTB comovement is determined not only by tax positions but also by the accounting of these tax positions. Hence, an insignificant association between UTB comovement and cash ETR comovement indicates that firms adopting similar tax strategies do not necessarily incorporate the effect of these strategies on UTBs in similar ways.

Table 5 reports the results of Equation (3), which tests whether loan spread is associated with the UTB balance and UTB comovement. In Column (1), I test the association between *UTB* and log(*LOANSPREAD*) without controlling for *UTBCOMV* and find an insignificant association between the UTB balance and loan spread. However, after controlling for *UTBCOMV* and its interaction with *UTB* in Column (2), the coefficients of UTB and the interaction term are consistently positive and negative, respectively. This suggests that lenders impose higher risk premiums on the borrowing firms with

more tax uncertainties, but the degree of the imposed risk premium would be lower when the borrowing firm reports more comparable UTBs. If a mean firm were to increase its UTB balance by one standard deviation, its loan spread would increase by 19.31 basis points (= 10.018×176.86×0.0109) or by 11% relative to a sample average loan spread of 176.86 basis points. However, if the one standard deviation increase in the UTB balance is combined with a one standard deviation increase in UTB comovement, the increase in loan spread is 15.82 basis points (= (10.018-10.936 × 0.166) × 176.86 × 0.0109). The mean value of the loan size is approximately USD 821.73 million, and the average time to maturity is around 54.95 months (see Table 4, Appendix); therefore, the firm with a one standard deviation increase in UTBs over the life of the loan pays USD 7.27 million (= 821.73 × 0.001931 × 54.95/12) more interest than the mean firm. However, the increase in interest would be USD 5.95 million (= 821.73 × 0.001582 × 54.95/12) if a one standard deviation increase in UTBs is combined with a one standard deviation increase in UTB comovement.

Table 5: The Association between UTB Disclosures and Loan Spread

	Dep Var = Log($LOANSPREAD_t$)	
UTB_{t-1}	0.332	10.018***
	(0.39)	(2.88)
$UTBCOMV_{t-1}$		0.071
		(1.01)
$UTB_{t-1} \times UTBCOMV_{t-1}$		-10.936**
		(-2.01)
$CETRCOMV_{t-1}$		0.243
		(1.32)
$UTB_{t-1} \times CETRCOMV_{t-1}$		-23.403
		(-1.50)
$EARNCOMV_{t-1}$		-0.051
		(-0.52)
$UTB_{t-1} \times EARNCOMV_{t-1}$		-12.586
		(-1.48)
$CETRV_{t-1}$	0.051**	0.060**
	(2.14)	(2.49)
$CETR5_{t-1}$	0.020	0.044
	(0.26)	(0.55)
$SIZE_{t-1}$	-0.128***	-0.128***
	(-13.38)	(-13.44)
LEV_{t-1}	0.397***	0.387***
	(7.31)	(7.08)
ROA_{t-1}	-1.260***	-1.235***
	(-7.79)	(-7.59)
$MTOB_{t-1}$	-0.006*	-0.005
	(-1.74)	(-1.49)
CFV_{t-1}	-0.938	-0.828
	(-1.45)	(-1.28)

$ZSCORE_{t-1}$	-0.044***	-0.046***
	(-3.23)	(-3.40)
$CASHHOLD_{t-1}$	0.237***	0.239***
	(3.02)	(3.01)
$TANGIBILITY_{t-1}$	-0.029	-0.030
	(-0.50)	(-0.51)
$LGTAX\_D_{t-1}$	0.158***	0.150***
	(3.08)	(2.93)
$Log(LOANMATURITY_t)$	0.247***	0.241***
	(8.08)	(7.87)
$Log(LOANAMT_t)$	-0.029***	-0.028***
	(-3.02)	(-2.85)
SYN_t	-0.074	-0.077
	(-1.14)	(-1.19)
Number of observations	1,710	1,710
R-squared	56.5%	56.8%
Year-fixed effect	Yes	Yes
Industry-fixed effect	Yes	Yes
Loan purpose and type control	Yes	Yes

Note: T-statistics are reported in parentheses below each coefficient estimate. Continuous variables are winsorised at the 1% level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Table 7 (Appendix) provides variable definitions.

Table 6 reports the test results of H_{2a} and H_{2b}, which examine the association between UTB disclosures and loan spread when UTB disclosures would be more decision-relevant to the loan decisions. In Column (1), I divide the sample into two groups based on the foreign sales. When foreign sales are median or above, the coefficient of *UTB* is significantly positive (12.649), and the coefficient of the interaction term of *UTB* and *UTBCOMV* is significantly negative (-16.417). By contrast, when foreign sales are below the median, both coefficients of *UTB* and its interaction term with *UTBCOMV* are insignificant. Column (2) compares the impact of UTB disclosures on loan spread depending on firms' engagement in R&D activities. While the coefficient of the interaction term of *UTB* and *UTBCOMV* is significantly negative when borrowing firms incur R&D expenditure, the coefficient of this interaction term is insignificant for borrowing firms which have no R&D expenditure. Both columns support the conclusion that, when borrowing firms have more opportunities of tax avoidance strategies, lenders may rely more on tax risk information provided by firms and consider the quality of information important.

Table 6: The Association between UTB Disclosures and Loan Spread When UTB Is More Relevant to Loan Decisions

	Dependent Variable = Log ($LOANSPREAD_t$)			
	(1) *FOREIGN*		(2) *RND*	
	Median or above	Below median	Above zero	Zero
UTB_{t-1}	12.649**	7.258	11.007**	10.597**
	(2.55)	(1.14)	(2.06)	(1.82)
$UTBCOMV_{t-1}$	0.117	0.043	0.101	0.049
	(1.03)	(0.49)	(0.85)	(0.59)
$UTB_{t-1} \times UTBCOMV_{t-1}$	-16.417**	-1.276	-14.123*	2.659
	(-2.22)	(-0.14)	(-1.71)	(0.38)
$CETRCOMV_{t-1}$	-0.020	0.493*	-0.192	0.622***
	(-0.06)	(1.88)	(-0.56)	(2.67)
$UTB_{t-1} \times CETRCOMV_{t-1}$	-27.686	-19.810	-13.243	-45.604*
	(-1.24)	(-0.71)	(--0.59)	(-1.69)
$EARNCOMV_{t-1}$	-0.026	0.041	-0.199	-0.062
	(-1.36)	(0.30)	(-1.09)	(-0.52)
$UTB_{t-1} \times EARNCOMV_{t-1}$	-15.263	-4.905	-21.525*	-0.656
	(-1.31)	(-0.34)	(-1.68)	(-0.05)
Number of observations	855	855	832	878
R-squared	62.3%	58.8%	60.3%	59.1%
All controls	Yes		Yes	
Year-fixed effect	Yes		Yes	
Industry-fixed effect	Yes		Yes	
Loan purpose and types control	Yes		Yes	

Note: In Table 6, Column (1) presents the results when foreign sales are median or above, or foreign sales are below median. Column (2) shows the results when firms spend R&D expenditure, or have zero R&D expenditure. T-statistics are reported in parentheses below each coefficient estimate. Continuous variables are winsorised at the 1% level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Table 7 (Appendix) provides variable definitions.

5. CONCLUSION

This study examines whether and how UTB disclosures are associated with the cost of debt. The study finds that the cost of debt is positively associated with the balance of UTBs of borrowing firms, but this positive association is less pronounced when the tax risk disclosures of borrowing firms are more comparable. Further, the study finds that

the impacts of tax risk and the related disclosures are pronounced when firms have large amounts of foreign sales or engage in R&D activities. From these findings, I infer that a lender's perception of a borrowing firm's tax risk is influenced by accounting for the tax uncertainty of the borrowing firm as well as the risk of the borrowing firm's tax position.

This study contributes to the understanding of the field by regulators, professions, and academics by examining the implementation of a new accounting policy, FIN 48. In addition to the literature on whether UTB disclosures are useful to equity investors, the study reveals that accounting for uncertain tax position is incorporated in loan spread, suggesting that UTB disclosures also provide decision-useful information to lenders. Moreover, the UTB comovement measure proposed in this study may help the exploration of UTBs in future research. Although researchers have paid attention to UTB as it is a newly implemented and theoretically ideal indicator of tax risk, managerial discretion that can arise from UTB reporting has disrupted UTB research to date. By identifying such discretion in relation to UTBs, the UTB comovement measure could allow researchers to investigate various determinants and consequences of UTB disclosures.

6. REFERENCES

Altman, E I 1968, 'Financial ratios, discriminant analysis and the prediction of corporate bankruptcy', *The Journal of Finance*, vol. 23, no. 4, pp. 589-609.

Bauer, A M & Klassen, K J 2014, 'Estimating downside tax risk: Exploration of unfavorable tax settlements', working paper, University of Illinois at Urbana-Champaign and University of Waterloo.

Bharath, S T, Sunder, J & Sunder, S V 2008, 'Accounting quality and debt contracting', *The Accounting Review*, vol. 83, no. 1, pp. 1-28.

Blouin, J L & Robinson, L A 2014, 'Insights from academic participation in the FAF's initial PIR: The PIR of FIN 48', *Accounting Horizons*, vol. 28, no. 3, pp. 479-500.

Bonsall, S B, IV, Koharki, K & Watson, L 2017, 'Deciphering tax avoidance: Evidence from credit rating disagreements', *Contemporary Accounting Research*, vol. 34, no. 2, pp. 818-848.

Bozanic, Z, Hoopes, J L, Thornock, J R & Williams, B M 2017, 'IRS attention', *Journal of Accounting Research*, vol. 55, no. 1, pp. 79-114.

Chen, S, Chen, X, Cheng, Q & Shevlin, T 2010, 'Are family firms more tax aggressive than non-family firms?', *Journal of Financial Economics*, vol. 95, no. 1, pp. 41-61.

DeAngelo, H & Masulis, R W 1980, 'Optimal capital structure under corporate and personal taxation', *Journal of Financial Economics*, vol. 8, no. 1, pp. 3-29.

De Franco, G, Kothari, S P & Verdi, R S 2011, 'The benefits of financial statement comparability', *Journal of Accounting Research*, vol. 49, no. 4, pp. 895-931.

Desai, M A & Dharmapala, D 2006, 'Corporate tax avoidance and high-powered incentives', *Journal of Financial Economics*, vol. 79, no. 1, pp. 145-179.

Desai, M A & Dharmapala, D 2009, 'Corporate tax avoidance and firm value', *The Review of Economics and Statistics*, vol. 91, no. 3, pp. 537-546.

De Simone, L, Robinson, J R & Stomberg, B 2014, 'Distilling the reserve for uncertain tax positions: The revealing case of Black Liquor', *Review of Accounting Studies*, vol. 19, no. 1, pp. 456-472.

Drake, K D, Lusch, S J & Stekelberg, J 2019, 'Does tax risk affect investor valuation of tax avoidance?', *Journal of Accounting, Auditing and Finance*, vol. 34, no. 1, pp. 151-176.

Dyreng, S D, Hanlon, M & Maydew, E L 2008, 'Long-run corporate tax avoidance', *The Accounting Review*, vol. 83, no. 1, pp. 61-82.

Dyreng, S D, Hanlon, M & Maydew, E L 2019, 'When does tax avoidance result in tax uncertainty?', *The Accounting Review*, vol. 94, no. 2, pp. 179-203.

Financial Accounting Standards Board (FASB) 2006, 'Accounting for uncertainty in income taxes – an interpretation of FASB statement no. 109', FASB interpretation no. 48, June.

Finley, A R 2015, 'The impact of large tax settlements on firms' subsequent tax avoidance', working paper, University of Arizona.

Graham, J R, Li, S & Qiu, J 2008, 'Corporate misreporting and bank loan contracting', *Journal of Financial Economics*, vol. 89, no. 1, pp. 44-61.

Graham, J R & Tucker, A L 2006, 'Tax shelters and corporate debt policy', *Journal of Financial Economics*, vol. 81, no. 3, pp. 563-594.

Guenther, D A, Matsunaga, S R & Williams, B M 2017, 'Is tax avoidance related to firm risk?', *The Accounting Review*, vol. 92, no. 1, pp. 115-136.

Hanlon, M & Heitzman, S 2010, 'A review of tax research', *Journal of Accounting and Economics*, vol. 50, no. 2, pp. 127-178.

Hanlon, M, Maydew, E L & Saavedra, D 2017, 'The taxman cometh: Does tax uncertainty affect corporate cash holdings?', *Review of Accounting Studies*, vol. 22, no. 3, pp. 1198-1228.

Hasan, I, Hoi, C K S, Wu, Q & Zhang, H 2014, 'Beauty is in the eye of the beholder: The effect of corporate tax avoidance on the cost of bank loans', *Journal of Financial Economics*, vol. 113, no. 1, pp. 109-130.

Internal Revenue Service (IRS) 2007, 'FIN 48 implications LB&I field examiners' guide'. Available at: https://www.irs.gov/businesses/corporations/fin-48-implications-lbi-field-examiners-guide.

Isin, A A 2018, 'Tax avoidance and cost of debt: The case for loan-specific risk mitigation and public debt financing', *Journal of Corporate Finance*, vol. 49, pp. 344-378.

Jensen, M C & Meckling, W H 1976, 'Theory of the firm: Managerial behavior, agency costs and ownership structure', *Journal of Financial Economics*, vol. 3, no. 4, pp. 305-360.

Kim, J B, Li, O Z & Li, Y 2010, 'Corporate tax avoidance and bank loan contracting', working paper, City University of Hong Kong.

Koester, A 2011, 'Investor valuation of tax avoidance through uncertain tax positions', working paper, Georgetown University.

Kubick, T R, Lynch, D P, Mayberry, M A & Omer, T C 2015, 'Product market power and tax avoidance: Market leaders, mimicking strategies, and stock returns', *The Accounting Review*, vol. 90, no. 2, pp. 675-702.

Lim, Y 2011, 'Tax avoidance, cost of debt and shareholder activism: Evidence from Korea', *Journal of Banking and Finance*, vol. 35, no. 2, pp. 456-470.

Lisowsky, P, Robinson, L & Schmidt, A 2013, 'Do publicly disclosed tax reserves tell us about privately disclosed tax shelter activity?', *Journal of Accounting Research*, vol. 51, no. 3, pp. 583-629.

Nesbitt, W L N 2014, 'Unrecognized tax benefits: Disentangling the effects of tax aggressiveness and financial reporting discretion', working paper, Michigan State University.

Robinson, L A & Schmidt, A P 2013, 'Firm and investor responses to uncertain tax benefit disclosure requirements', *The Journal of the American Taxation Association*, vol. 35, no. 2, pp. 85-120.

Saavedra, D 2019, 'Is tax volatility priced by lenders in the syndicated loan market?', *European Accounting Review*, vol. 28, no. 4, pp. 767-789.

Sengupta, P 1998, 'Corporate disclosure quality and the cost of debt', *The Accounting Review*, vol. 73, no. 4, pp. 459-474.

Shevlin, T, Urcan, O & Vasvari, F 2020, 'Corporate tax avoidance and debt costs', *Journal of American Taxation Association*, vol. 42, no. 2, pp. 117-143.

Song, W & Tucker, A 2008, 'Corporate tax reserves, firm value, and leverage', working paper. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1086827.

Sufi, A 2007, 'Information asymmetry and financial arrangements: Evidence from syndicated loans', *Journal of Finance*, vol. 62, no. 2, pp. 629-668.

Towery, E M 2017, 'Unintended consequences of linking tax return disclosures to financial reporting for income taxes: Evidence from Schedule UTP', *The Accounting Review*, vol. 92, no. 5, pp. 201-226.

Weissmann, J 2015, 'Once again, Pfizer is trying to move overseas to avoid US taxes', *Slate*, 23 November. Available at: http://www.slate.com/blogs/moneybox/2015/11/23/pfizer_announces_merger_with_allergan_that_will_let_it_avoid_u_s_taxes.html.

Wilson, R J 2009, 'An examination of corporate tax shelter participants', *The Accounting Review*, vol. 84, no. 3, pp. 969-999.

Table 2: Descriptive Statistics – UTB Comovement Validation Sample

Panel A. Summary Statistics

	All Years (N=3,276)					Large Settlement Year (N=132)		Other Years (N=3,144)	
	Mean	SD	P25	P50	P75	Mean	SD	Mean	SD
ABETR (%)	7.64	10.44	1.50	3.90	9.44	18.91	17.42	7.16	9.77
UTB (%)	1.03	1.26	0.23	0.61	1.36	1.22	1.49	1.02	1.25
UTBCOMV (%)	33.27	16.66	18.90	33.66	45.91	33.35	16.36	33.25	16.68
SIZE	7.72	1.68	6.55	7.62	8.86	7.37	1.79	7.74	1.67
LEV (%)	23.92	22.04	5.63	20.41	34.23	21.37	19.98	24.03	22.12
ROA (%)	11.13	8.60	5.84	9.55	14.75	8.22	7.87	11.24	8.59
MTOB	3.29	4.15	1.57	2.49	3.87	2.53	2.66	3.32	4.20
TAXLOSS (%)	6.94	12.58	0.00	1.83	7.49	8.67	14.59	6.89	12.48
FOREIGN (%)	35.37	31.05	4.38	30.73	56.88	39.15	33.01	35.18	30.96
RND (%)	2.67	4.35	0.00	0.46	3.41	3.39	5.20	2.63	4.31

Note: Panel A presents summary statistics of variables used to validate UTB comovement as a measure of informative UTB. It consists of three parts. The first part provides summary statistics for all sample firm-years. The second and third parts provide summary statistics for large tax settlement years and non-large tax settlement years, respectively. Continuous variables are winsorised at the 1% level. Table 7 (Appendix) provides variable definitions.

Panel B. Pearson (Above Diagonal) and Spearman (Below Diagonal) Correlations

	ABETR	***UTB***	***UTBCOM***	***SIZE***	***LEV***	***ROA***	***MTOB***	***TAXLOSS***	***RND***	***FOREIGN***	***LGTAX_D***
ABETR		**0.15**	-0.02	**-0.12**	-0.01	**-0.21**	**-0.07**	**0.23**	**0.13**	**0.11**	**0.22**
UTB	**0.12**		**-0.04**	**0.13**	-0.03	**0.07**	**0.07**	**0.22**	**0.34**	**0.28**	0.03
UTBCOMV	**-0.05**	**-0.06**		0.02	-0.03	**0.03**	0.00	**-0.05**	-0.03	-0.02	0.00
SIZE	**-0.10**	**0.22**	0.01		**0.31**	**-0.08**	**0.06**	**-0.07**	**-0.07**	**0.18**	**-0.04**
LEV	-0.01	**-0.03**	-0.03	**0.42**		**-0.13**	0.03	**0.06**	**-0.22**	**-0.09**	-0.02
ROA	**-0.29**	**0.06**	**0.04**	**-0.04**	**-0.19**		**0.27**	**-0.17**	**0.05**	**-0.05**	**-0.07**
MTOB	**-0.18**	**0.17**	0.01	**0.13**	**0.05**	**0.45**		**-0.08**	**0.08**	0.00	**-0.04**
TAXLOSS	**0.24**	**0.15**	**-0.05**	0.02	**0.07**	**-0.24**	**-0.08**		**0.18**	**0.14**	0.03
RND	**0.15**	**0.35**	**-0.03**	-0.03	**-0.20**	**0.04**	**0.18**	**0.20**		**0.35**	**0.03**
FOREIGN	**0.17**	**0.35**	-0.01	**0.20**	**-0.05**	**-0.06**	0.03	**0.23**	**0.49**		0.03
LGTAX_D	**0.16**	0.03	0.00	**-0.04**	-0.02	**-0.08**	**-0.08**	0.03	0.02	0.03	

Note: Panel B presents correlations of variables used to validate UTB comovement as a measure of informative UTB. Correlations that are significant at the 5% level or lower are marked in bold. Continuous variables are winsorized at the 1% level. Table 7 (Appendix) provides variable definitions.

Table 4: Descriptive Statistics – Loan Sample

Panel A. Summary Statistics

Variable	N	Mean	SD	P25	P50	P75
Tax-related Variables						
UTB (%)	1,018	0.98	1.09	0.24	0.63	1.28
UTBCOMV (%)	1,018	33.33	16.57	19.06	34.36	45.87
EARNCOMV (%)	1,018	25.29	11.90	16.39	23.82	32.14
CETRCOMV (%)	1,018	17.65	6.04	13.48	17.12	20.94
CETRV (%)	1,018	18.47	37.65	4.69	7.64	14.77
CETR5 (%)	1,018	24.38	11.66	17.75	24.45	30.84
LGTAX_D (%)	1,018	3.14	17.46	0.00	0.00	0.00
Firm Characteristics						
SIZE	1,018	8.16	1.39	7.12	8.08	9.10
LEV (%)	1,018	26.25	19.59	13.17	23.68	35.76
ROA (%)	1,018	10.72	7.01	5.80	9.29	13.96
MTOB	1,018	3.54	3.20	1.72	2.61	4.02
CFV (%)	1,018	4.56	1.83	3.27	4.20	5.46
ZSCORE	1,018	2.14	1.01	1.43	2.06	2.73
TANGIBILITY (%)	1,018	26.86	23.63	10.06	19.03	36.30
CASHHOLD (%)	1,018	13.17	12.69	3.81	9.26	18.58

Loan Terms						
LOANSPREAD	1,710	176.86	93.26	120.00	150.00	200.00
LOANMATURITY	1,710	54.95	16.56	60.00	60.00	60.00
LOANAMT	1,710	821.73	1,120.80	191.67	428.00	1,000.00
SYN (%)	1,710	98.42	12.47	100.00	100.00	100.00

Note: Panel A presents summary statistics of variables used to test the association between UTB disclosures and loan spread. Continuous variables are winsorised at the 1% level. Table 7 (Appendix) provides variable definitions.

Panel B. Pearson (Above Diagonal) and Spearman (Below Diagonal) Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1)*UTB*		**-0.07**	**-0.08**	**-0.06**	-0.02	**-0.12**	**0.19**	-0.04	0.02	**0.08**	0.03	**-0.10**	**-0.25**	**0.33**	0.01	**-0.09**	**-0.09**	**0.13**	-0.01
(2)*UTBCOMV*	**-0.05**		-0.02	-0.04	-0.03	0.04	0.00	**-0.07**	0.04	0.04	**0.07**	0.03	**0.07**	**0.06**	-0.01	-0.03	-0.01	-0.04	-0.02
(3)*EARNCOMV*	**-0.05**	-0.04		0.01	**0.08**	0.03	-0.05	0.03	0.01	0.00	-0.01	0.03	0.00	**-0.11**	-0.02	0.04	0.02	0.03	-0.02
(4)*CETRCOMV*	-0.03	-0.05	0.01		**-0.10**	**-0.08**	-0.01	0.01	**0.08**	0.04	-0.03	-0.01	**0.05**	**-0.05**	-0.02	0.00	0.00	-0.02	-0.02
(5)*CETRV*	**-0.05**	-0.05	**0.07**	-0.03		**0.13**	**-0.15**	**-0.06**	**-0.16**	**-0.12**	0.04	**-0.09**	**0.07**	-0.03	**0.18**	**0.15**	**0.05**	**-0.16**	0.02
(6)*CETR5*	**-0.11**	**0.06**	**0.07**	-0.03	**0.19**		**-0.07**	**-0.19**	**0.13**	0.01	**0.14**	**0.20**	**-0.05**	-0.03	**0.17**	0.00	0.04	-0.04	0.02
(7)*SIZE*	**0.22**	0.01	**-0.07**	-0.02	**-0.21**	**-0.10**		**0.22**	**-0.06**	0.03	**-0.2**	**-0.21**	**0.11**	**-0.1**	-0.01	**-0.37**	**-0.26**	**0.66**	0.02
(8)*LEV*	-0.03	**-0.06**	0.01	-0.01	**-0.10**	**-0.20**	**0.29**		**-0.16**	**0.13**	**-0.34**	**-0.40**	**0.24**	**-0.25**	**-0.05**	**0.17**	0.00	**0.11**	**0.05**
(9)*ROA*	0.02	0.02	0.05	**0.08**	**-0.31**	**0.19**	-0.05	**-0.19**		**0.41**	**0.45**	**0.49**	-0.01	**0.36**	**-0.09**	**-0.31**	**-0.10**	**0.09**	0.00
(10)*MTOB*	**0.20**	0.04	0.03	**0.09**	**-0.33**	0.01	**0.08**	**0.12**	**0.45**		**0.25**	**0.14**	**-0.11**	**0.19**	0.00	**-0.16**	**-0.06**	**0.11**	-0.02
(11)*CFV*	**0.09**	**0.07**	-0.01	-0.03	-0.01	**0.14**	**-0.18**	**-0.36**	**0.40**	**0.23**		**0.45**	0.00	**0.31**	**0.06**	**-0.18**	-0.01	**-0.08**	0.03
(12)*ZSCORE*	**-0.08**	0.02	0.02	0.01	**-0.10**	**0.26**	**-0.23**	**-0.42**	**0.51**	**0.13**	**0.47**		**-0.16**	**0.21**	**-0.06**	**-0.23**	-0.02	**-0.08**	**0.05**
(13)*TANGIBILITY*	**-0.28**	**0.07**	-0.03	0.01	**0.07**	**-0.05**	**0.07**	**0.17**	0.02	**-0.1**	**0.11**	-0.03		**-0.23**	**0.05**	-0.02	0.02	0.02	**0.05**
(14)*CASHHOLD*	**0.37**	**0.06**	**-0.09**	-0.02	**-0.06**	0.02	**-0.06**	**-0.34**	**0.26**	**0.25**	**0.35**	**0.25**	**-0.22**		0.03	**-0.07**	**-0.07**	-0.04	0.02
(15)*LGTAX_D*	0.02	-0.02	-0.02	-0.02	**0.21**	**0.12**	-0.01	-0.05	**-0.14**	-0.05	**0.07**	**-0.06**	**0.05**	**0.05**		**0.08**	-0.03	0.00	0.02
(16)log(*LOANSPREAD*)	**-0.14**	-0.04	0.01	0.00	**0.28**	**-0.06**	**-0.35**	**0.18**	**-0.37**	**-0.26**	**-0.25**	**-0.27**	**-0.05**	**-0.13**	**0.07**		**0.18**	**-0.28**	0.01
(17)log(*LOANMATU*)	**-0.05**	0.01	0.03	-0.01	**0.08**	0.04	**-0.19**	0.00	**-0.08**	**-0.06**	-0.04	-0.05	-0.04	**-0.06**	-0.01	**0.24**		**-0.19**	**0.09**
(18)log(*LOANAMT*)	**0.16**	-0.03	0.02	-0.02	**-0.19**	**-0.05**	**0.67**	**0.16**	**0.12**	**0.13**	**-0.06**	-0.07	0.01	-0.02	0.00	**-0.31**	-0.04		0.04
(19)*SYN*	-0.03	-0.03	-0.04	-0.03	0.01	0.02	0.03	**0.05**	0.01	0.00	0.04	**0.05**	**0.06**	0.00	0.02	0.01	**0.06**	**0.05**	

Note: Panel B presents correlations of variables used to test the influence of UTB disclosures to loan spread. Correlations that are significant at the 5% level or lower are marked in bold. Continuous variables are winsorised at the 1% level. Table 7 (Appendix) provides variable definitions.

Table 7: Variable Definitions

ABETR	Absolute of the difference between GAAP ETR for the year and the mean of GAAP ETR over 10 years. GAAP ETR equals total income taxes (*TXT*) divided by a firm's pre-tax income (*PI*) less special items (*SPI*).
CASHHOLD	Cash and marketable securities (*CHE*) scaled by beginning of year total assets (*AT*).
CETR5	Sum of income tax paid (*TXPD*) over the previous five years divided by the sum of a firm's pre-tax income (*PI*) less special items (*SPI*). *CETR5* is set as missing when the denominator is zero or negative. I winsorise *CETR5* to the range [0,1].
CETRCOMV	The R^2 from a regression of firm *i*'s cash ETR on the cash ETR of firm *j* is calculated for each firm *i* – firm *j* pairs over five-year rolling windows, ($i \neq j$), j=1 to *J* firms in the same two digit SIC industry as firm *i*. A firm level measure is calculated by taking the median of the firm *i* – firm *j* measures.
CETRV	Standard deviation of annual cash ETRs over five years.
CFV	The volatility of quarterly pre-tax cash flow (*OANCFY*) over the previous five years scaled by beginning of year total assets (*AT*).
EARNCOMV	The R^2 from a regression of firm *i*'s earnings on the earnings of firm *j* is calculated for each firm *i* – firm j pair over five-year rolling windows, ($i \neq j$), j=1 to *J* firms in the same two-digit SIC industry as firm *i*. A firm level measure is calculated by taking the median of the firm *i* – firm *j* measures.
FOREIGN	Sum of foreign sales scaled by total sales, taken from the Compustat segment dataset. If foreign sales are missing, but pre-tax foreign income (*PIFO*) is not missing, I reset the missing value of *foreign* equal to pre-tax foreign income (*PIFO*) scaled by pre-tax income (*PI*). If foreign sales are missing and pre-tax foreign income (*PIFO*) is missing, but foreign income taxes (*TXFO*) is not missing, I reset the missing value of *foreign* equal to foreign income taxes (*TXFO*) scaled by total income taxes (*TXT*).
GAAP ETR	Total income taxes (*TXT*) divided by a firm's pre-tax income (*PI*) less special items (*SPI*).

LEV	Long-term debt (*DLTT*) + short-term debt (*DLC*), scaled by beginning of year total assets (*AT*).
LGTAX_D	Equals 1 if the cash ETR is greater than its 10-year mean by two industry standard deviations.
LGTAX_C	Cash ETR minus the 10-year average cash ETR.
LOANAMT	Natural log of the total amount of the loan facility (in millions of US dollars) obtained by a firm.
LOANMATURITY	Natural log of the number of months to maturity of a loan facility obtained by a firm.
LOANSPREAD	Loan spread is measured as all-in spread drawn in the DealScan database. All-in spread drawn is defined as the amount the borrower pays in basis points over the LIBOR or LIBOR equivalent for each dollar drawn down.
MTOB	Ratio of market value of equity (*CSHO*PRCC_F*) to book value of equity (*CEQ*).
ROA	Pre-tax income (*PI*) scaled by beginning of year total assets (*AT*).
RND	Research and development expenses (*XRD*) scaled by beginning of year total assets (*AT*) or zero for missing values.
SIZE	Logarithm of total assets (*AT*) at the end of the year.
SYN	Equals 1 if the loan obtained in year *t* is syndicated and zero otherwise.
TANGTIBILITY	Net property, plant, and equity (*PPENT*) scaled by beginning of year total assets (*AT*).
TAXLOSS	Tax loss carry forward (*TLCF*) scaled by beginning of year total assets (*AT*).
UTB	Unrecognised tax benefit at the end of the year (*TXTUBEND*) scaled by total assets (*AT*) at the beginning of the year.
UTBCOMV	The R^2 from a regression of firm *i*'s *UTB* on the *UTB* of firm *j* is calculated for each firm *i* – firm j pair over five-year rolling windows, ($i \neq j$), j=1 to *J* firms in the same two digit SIC industry as firm *i*. A firm level measure is calculated by taking the median of the firm *i* – firm *j* measures.
ZSCORE	Modified Altman (1968) Z-score as in Graham et al. (2008) =1.2 (working capital/ total assets) + 1.4 (retained earnings/total assets) + 3.3 (EBIT/total assets) + 1.0 (sales/total assets).