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Tax Uncertainty and Real Investment Decisions: Evidence from Mergers and Acquisitions

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Tax Uncertainty and Real Investment Decisions: Evidence from Mergers and Acquisitions

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Dedication

To Derrick and Lito

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Tax Uncertainty and Real Investment Decisions: Evidence from Mergers and Acquisitions

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Abstract**:** This study uses corporate takeovers as a setting to examine how tax uncertainty affects managers' real investment decisions. Specifically, I investigate whether uncertainty about target firms' income taxes influences takeover premiums. Drawing on theories from finance, I predict that tax uncertainty leads to increased divergence of opinion among target shareholders about target value, which in turn leads to higher takeover premiums. I also predict a positive direct association between measures of target tax uncertainty and takeover premiums because investments with tax uncertainty provide flexibility in reporting book income that bidding managers value. Consistent with both predictions, I find a positive association between divergence of target shareholder opinion about taxes and takeover premiums as well as a positive association between target tax uncertainty and takeover premiums. The association between tax uncertainty and premiums is more positive when the acquiring firm faces greater capital market pressures. Finally, all positive associations persist in recent years despite newly required financial statement disclosures of tax uncertainty.

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Chapter 1: Introduction

This study uses corporate takeovers to examine how tax uncertainty influences managers' real investment decisions. Tax uncertainty arises because the complexity and ambiguity inherent in tax laws often make it difficult to accurately assess future tax cash flows. For example, multinational entities frequently use transfer prices to strategically allocate income across jurisdictions and minimize worldwide tax burdens. Because they must comply with rules and regulations of multiple taxing authorities, it is difficult for taxpayers to know the ultimate tax liability associated with these intercompany transactions and to accurately estimate after-tax cash flows *ex ante*. I explore how uncertainty such as this related to a target firm's income taxes influences takeover premiums and develop predictions about how it affects both target and acquirer estimates of target value.

Uncertainty can lead to increased takeover premiums by generating divergent opinions among *target* shareholders. For example, Miller (1977) theorizes that inherent uncertainty about future cash flows leads investors to develop divergent opinions about an investment's value. If short-sale constraints prevent pessimistic investors from holding shares, then securities will trade at prices that exceed their fundamental values. In the context of mergers and acquisitions (M&A), this theory predicts that divergent opinions among target shareholders about target value lead to higher takeover premiums, measured as the difference between the acquisition price and the trading price prior to the takeover announcement. This is because the bidder must meet the reservation price of the marginal target shareholder whose stock is required to complete a public company takeover.

Holding constant the average target shareholder opinion of value, the amount by which the marginal shareholder's reservation price exceeds the stock price is greater when opinions are more divergent.

Chatterjee et al. (2012) provide empirical evidence in support of predictions stemming from this theory of "heterogeneous expectations", finding a positive association between takeover premiums and divergence of target shareholder opinion measured using analyst forecast dispersion, breadth of ownership and idiosyncratic volatility. Distinct from Chatterjee et al. (2012), I focus specifically on whether uncertainty about targets' *taxes* contributes to divergent opinions among target shareholders and leads to higher takeover premiums. Despite the potentially material effect of tax uncertainty on estimates of after-tax cash flows and firm value, little research to date has explored these relations (Hanlon and Heitzman, 2010). It is also not clear whether financial statement users understand income tax disclosures or fully appreciate the tax consequences of various corporate transactions (e.g., Plumlee, 2003; Raedy et al., 2012). Thus, it remains an open empirical question whether tax uncertainty is sufficiently relevant to cause target shareholders to develop different expectations about firm value and thus lead to higher takeover premiums.

In addition to generating heterogeneous expectations among target shareholders, tax uncertainty can directly affect premiums by influencing bidders' estimation of target value. Shackelford et al. (2011) illustrate how tax uncertainty interacts with financial accounting rules to create opportunities for managerial discretion in recognizing book income. The authors assert that managers favor investment opportunities with tax

uncertainty because the uncertainty provides them with valuable financial reporting flexibility. Returning to the multinational transfer pricing example, because tax liabilities related to cross-jurisdictional intercompany transactions are often difficult to estimate, managers accrue contingency reserves for additional taxes potentially due in the future. Empirical evidence suggests that managers manipulate the timing and amount of these reserves to meet financial reporting targets (Dhaliwal et al., 2004). Acquiring a target with tax uncertainty can therefore provide opportunities for acquiring firm managers to exploit the financial reporting flexibility that these investments provide. Thus, the "reporting flexibility" theory predicts that managers find targets with tax uncertainty especially valuable because they create opportunities to strategically recognize book income.

I test the effect of tax uncertainty on takeover premiums using a sample of publicly-traded, domestic targets acquired between 2002 and 2011. I rely on predictions stemming from the theory of heterogeneous expectations to test the effect of tax uncertainty on target shareholders. Similar to McGuire et al. (2012), I measure tax uncertainty using the coefficients of variation of GAAP and cash effective tax rates. Volatile effective tax rates reflect tax uncertainty by capturing evolving tax contingency reserves, changing tax laws and frequent settlements with taxing authorities. I measure target shareholder divergence of opinion using dispersion in analysts' forecasts of targets' one-year-ahead GAAP effective tax rates. I begin by establishing that target tax uncertainty is positively associated with divergence of target shareholder opinions controlling for the target's information environment. I then test whether this divergence is

associated with higher takeover premiums and find that takeover premiums are increasing in target shareholder divergence of opinion, in line with predictions stemming from the theory of heterogeneous expectations in the context of M&A.

Next, I examine how tax uncertainty affects acquirers' estimations of target value. I find a positive relation between both measures of target tax uncertainty and takeover premiums, consistent with the reporting flexibility hypothesis. I further test this hypothesis by examining whether the relation between tax uncertainty and premiums is more positive when acquiring managers have greater financial reporting concerns. Managers of publicly-traded firms and those with a history of meeting earnings benchmarks are likely to face greater financial reporting pressures from capital markets and therefore more positively value the financial reporting flexibility that target tax uncertainty provides. Consistent with this prediction, the relation between target tax uncertainty and takeover premiums is more positive among the subset of acquirers with the greatest financial reporting concerns.

Finally, I investigate whether these positive associations persist for deals completed after the adoption of *Accounting Standards Codification (ASC) Topic 740-10, Accounting for Uncertainty in Income Taxes* (hereinafter, FIN 48). This new rule, effective in 2007, potentially reduces target shareholder opinion divergence about taxes by requiring firms to explicitly disclose reserves for uncertain tax benefits and increasing transparency about tax uncertainty. The rule also standardizes the recognition and measurement of tax reserves, making it unclear whether managers enjoy the same flexibility to exploit tax uncertainty to achieve favorable financial reporting outcomes

after adoption (Cazier et al., 2011; Dhaliwal et al., 2004; Gupta et al., 2011). The extent to which FIN 48 might change the association between tax uncertainty, opinion divergence and takeover premiums ultimately depends on whether managers faithfully apply these new rules and whether shareholders impound this newly required information into their estimates of target value. Therefore, I make no prediction as to whether or how these relations change after FIN 48.

I continue to find a positive association between both target tax uncertainty and opinion divergence and premiums in the subsample of deals completed after 2006. Further, the magnitude of the effects of tax uncertainty and opinion divergence on premiums is not significantly different after FIN 48. The positive association is also robust to measuring tax uncertainty with target FIN 48 reserve balances prior to acquisition. Thus, it does not appear that FIN 48 significantly reduces target shareholder opinion divergence about taxes or diminishes managers' perceived benefits of the flexible financial reporting that tax uncertainty provides.

This study makes several contributions to the literature. First, this study exploits a powerful setting to examine how tax uncertainty influences firm value. Because M&A are economically significant transactions, bidding managers perform extensive due diligence to gather information about the target. Thus, problems of information asymmetry are reduced relative to equity market settings. Corporate takeovers are particularly advantageous for investigating the effect of various factors on firm value because takeover announcements rarely overlap with other significant and potentially

confounding events such as earnings announcements. Takeovers also provide unique insights into corporate managers' estimates of value.

Second, although understanding how tax uncertainty influences managers' real investment decisions is important for researchers and shareholders, few studies examine the relation. My study extends this sparse line of research (e.g., Blouin et al., 2012) and offers insights into how financial reporting flexibility created by tax uncertainty affects these decisions. Similar to prior evidence that acquirers paid a premium to use the pooling method because of its favorable accounting treatment (Ayers et al., 2002), my findings suggest that the financial reporting flexibility provided by target tax uncertainty also influences managers' willingness to pay for targets. In doing so, I offer some of the first empirical support for the reporting flexibility theory developed by Shackelford et al. (2011).

Finally, I contribute to the literature examining the role of taxes in M&A. Prior studies focus on taxes associated with the corporate combination itself, such as investor level capital gains taxes or the structure of the transaction (e.g., Ayers et al., 2003; Erickson and Wang, 2007; Erickson and Wang, 2000). In contrast, my study offers new insights into the previously unexplored question of how target tax uncertainty, unrelated to the acquisition, affects takeover premiums (Hanlon and Heitzman, 2010).

The remainder of this paper proceeds as follows. Chapter two provides background information, summarizes related literature and develops hypotheses. Chapter three outlines the sample selection and provides descriptive statistics. Chapters four and five present the research designs related to the theory of heterogeneous expectations and

the reporting flexibility theory, respectively. Chapters six and seven provide results for tests of each theory. Chapter eight provides results from testing each hypothesis in the subset of deals completed after FIN 48. Chapter nine presents tests for robustness and Chapter ten concludes.

Chapter 2: Background and Prior Research

2.1 Background - Tax Uncertainty

According to Miller (1977), uncertainty occurs when the probability distribution of possible future outcomes is not known ex ante, allowing interested parties to develop different subjective probabilities. The key component of this definition is that, given the same set of limited information, reasonable parties can draw different conclusions about the probability distribution of possible outcomes and thus different expectations of the most likely outcome.

The outcomes of income tax positions, such as claiming credits to reduce income taxes otherwise payable, are often uncertain due to (a) ambiguity inherent in the tax law, (b) complex tax laws or fact patterns, (c) negotiations with taxing authorities, and (d) taxpayer choice. First, in some instances taxpayers cannot ascertain the appropriate tax treatment of a particular economic transaction because the relevant tax law is ambiguous or incomplete. For example, in 2009, several paper companies took advantage of a loophole in the tax law and claimed $6.4 billion in excise tax credit refunds (De Simone et al., 2012). Because no direct legal authority exists proscribing the proper income tax treatment of these refunds, taxpayers could not estimate their after-tax value with certainty ex ante.

In other situations, the tax law is well-developed but it is difficult for taxpayers to determine whether their particular set of facts and circumstances qualifies them for a desired tax treatment. For instance, the US tax law provides taxpayers the opportunity to claim an income tax credit for increasing their research and development (R&D)

expenditures. The law related to the credit is relatively complete but the calculation is complex and it is often not obvious to taxpayers which activities and associated expenses qualify for the credit. Third, the final assessment of a taxpayer's liability comes only after agreement with the taxing authority or a lapse in the statue of limitations. Contrary interpretations of tax laws can lead the taxpayer and the taxing authority to draw different conclusions about an agreed-upon set of facts and circumstances. Thus, despite a taxpayer's best efforts to comply with the law, the taxing authority can overturn or disallow a position based upon a disparate interpretation of the relevant legal or regulatory authority. Finally, taxpayers can choose to exploit ambiguity or complexity in the tax law to take aggressive or risky positions thereby increasing the uncertainty related to future outcomes.

These sources of tax uncertainty are closely related but incremental to uncertainty arising from business operations. R&D activities themselves introduce uncertainty about future cash flows because companies do not know at the outset which projects will be successful or what cash flow stream they will generate. However, once a company decides to implement tax planning strategies around R&D activities, such as claiming federal and state R&D credits, additional uncertainty arises related strictly to the future outcome of these tax positions. Now the company faces uncertainty about both future pre-tax cash flows that the R&D will generate and about the appropriate tax rate to use to estimate after-tax cash flows. In short, taxes create additional uncertainty beyond that related to operating and financing decisions.

Research examining the consequences of tax uncertainty is sparse but growing. Koester (2011) studies the effect of tax uncertainty on stock prices and finds that financial statement reserves for income tax uncertainty are positively associated with stock prices. She concludes that investors perceive past uncertain tax planning as a sign of future tax avoidance that will generate positive cash flows.[1] Distinct from Koester (2011), my predictions about the effect of tax uncertainty on takeover premiums arise from different theories than those examined therein.

Blouin et al. (2012) investigate how uncertain tax positions influence future investment decisions within the firm. Although tax avoidance typically increases the amount of cash available to the firm, the authors view cash inflows generated by uncertain tax avoidance as a questionable source of financing because the firm may have to repay the taxing authority if an uncertain position is overturned. Consistent with predictions, the authors find that new investments are increasing in prior uncertain tax avoidance but at a decreasing rate. In contrast to Blouin et al. (2012), my study explores how tax uncertainty arising from the investment itself (i.e. acquiring another firm) affects the level of resources a firm commits to that investment and not how the acquirer's prior tax aggressiveness affects future investments.

In the context of M&A several studies examine the effects of tax risk or aggressive tax avoidance but, to my knowledge, none have explored the implications of tax uncertainty *per se*. Mescall (2012) examines the association between transfer pricing

[1] Accounting researchers disagree about how to interpret these results. Because reserves for uncertain tax positions are a form of contingent liabilities, many researchers expected these reserves to have a negative association with price.

associated with target operations and takeover premiums. In a sample of cross-border M&A, he finds a negative association between premiums and transfer pricing risk, defined as "the risk of a decrease in future cash flows related to transfer pricing activity … [including]… the risk of a denial of a transfer pricing position and the risk of penalties incurred".

Martin et al. (2012) and Chow (2013) both focus on how aggressive tax avoidance by the target influences takeover premiums. Martin et al. (2012) find a negative association between takeover premiums and aggressive tax avoidance, which they measure using a tax shelter prediction model (Wilson 2009) and long-run cash effective tax rates (Dyreng et al. 2008).[2] Consistent with the view that managers use tax avoidance to extract rents, the authors conclude that acquirers view target tax aggressiveness as reflective of agency problems. Chow (2013) reports a positive association between disclosures by target firms that they have not engaged in tax shelters and both takeover premiums and target announcement-period abnormal returns. He views his results as suggesting that acquirers place a positive value on disclosures of non-sheltering because they signal a reduced risk of future negative earnings impacts and reduced probability of agency problems inside the target.

In contrast to these studies of tax aggressiveness and risk, I explore how tax *uncertainty* influences corporate takeovers. I consider tax uncertainty to be a broader

[2] Note that although the tax shelter prediction model developed in Wilson (2009) is highly correlated with accusations of tax sheltering, roughly 1/3 of the sheltering court cases Wilson (2009) identifies were settled in the taxpayers' favor and therefore do not reflect illegal activities. Additionally, the long-run cash ETR measure developed by Dyreng et al. (2008) captures all forms of tax avoidance and is thus a poor proxy for aggressive tax avoidance.

construct than tax risk or aggressiveness. Martin et al. (2012) define tax uncertainty as arising from "aggressive or risky activities that are supported by a relatively weak set of evidence and are, therefore, more likely to be caught upon audit". In contrast, I define tax uncertainty as any situation where interested parties do not know - and are not likely to agree on - the future outcome of the tax position. As outlined above, this uncertainty often arises for reasons other than aggressive or nefarious behavior on the part of the taxpayer such as when the tax law is unclear or ambiguous, or due to negotiations with taxing authorities. Indeed, if the taxpayer is sufficiently aggressive to claim a baseless tax position that it is sure to be overturned by the taxing authority, then the only remaining uncertainty might be about the probability of detection.

Understanding the effect of tax uncertainty on corporate takeovers is important for two reasons. First, income taxes are a material cash outflow and expense for US corporations. Income taxes are more than 20 percent of operating cash flows and pre-tax income for the median Compustat firm between 1993 and 2010 with positive pre-tax income and positive operating cash flows. Uncertainty about income taxes can therefore materially impact estimates of firm and investment value. In addition to having tax reporting implications, tax uncertainty also impacts financial reporting. Therefore, boards of directors, shareholders and researchers should all be interested in how tax uncertainty influences managers' real investment decisions.

Second, exploring how tax uncertainty influences managers' real investment decisions in the context of M&A is particularly important because corporate takeovers are one of the most substantial forms of corporate investment. Third, M&A offers a

powerful setting to examine the consequences of tax uncertainty because problems of information asymmetry are reduced compared to other settings. Prior to completing a takeover, acquiring firms gain access to otherwise unavailable information such as tax returns, tax accrual work papers and other supporting documentation that allows them to better assess the target's tax positions. In short, acquirers need not rely solely on financial statement disclosures to draw conclusions about target tax avoidance.[3] Finally, M&A offer a unique insight into how tax uncertainty influences corporate managers' assessment of investment value. It is important to understand how tax uncertainty shapes managers behaviors because they act on behalf of shareholders.

2.2 Prior Literature - Heterogeneous expectations

2.2.1 Divergent Opinions and Firm Value

Miller (1977) challenges the homothetic expectations assumption from standard capital asset pricing models and argues that uncertainty about future cash flows leads investors to develop different probability distributions of security returns. In the presence of short-sale constraints, only those investors with the most optimistic expectations will hold shares of the security and the security's price will exceed its fundamental value. This upward price bias is increasing in investor divergence of opinion.

To demonstrate an increase in price given divergent opinions, Miller (1977) assumes that each risk-neutral investor can purchase only one share of the investment and that a minority of potential investors can absorb the entire supply. For example, if 51

[3] The due diligence process cannot entirely resolve tax uncertainty. Resolution of tax uncertainty requires the position to be settled with the taxing authority, the statute of limitations for additional tax assessment to lapse or changes in tax rules, regulations or interpretations to clarify existing ambiguity.

potential investors agree that a security's value is $25, the demand curve is a horizontal line and the security trades at $25. However, if investors have different expectations about value, the demand curve slopes downward and the market clearing price can exceed $25. To illustrate, assume these 51 investors' opinions of value are uniformly distributed between $0 and $50 and that only 20 investors, holding one share each, can absorb the entire supply of the security. In this case, the market clearing price is $31, $6 above the average of all investors' expectations. Figure 1 provides a graphical representation of this theory, extracted from Miller (1977).

Some researchers view the assumptions of the model from Miller (1977), particularly the assumption about the presence of short-sale constraints, to be overly restrictive. Indeed, much early research exploring the price effect of opinion divergence in the presence of short-sale constraints provided theoretical predictions and empirical findings inconsistent with Miller (1977). For example, the model in Diamond and Verrecchia (1987) predicts no upward price bias under the assumption that a rational price-setting investor can use publicly available information to estimate an unbiased stock price.

More recent empirical studies, however, provide evidence consistent with predictions arising from Miller (1977). Boehme et al. (2006) demonstrate that short-sale constrained stocks with high divergence of investor opinion earn annual returns that are as much as 21 percent lower than a risk-adjusted benchmark. Using dispersion in analysts' earnings forecasts as a proxy for divergent opinions about value, Diether et al. (2002) present evidence that stocks with higher opinion divergence earn lower future

returns. Chen et al. (2002) argue that breadth of mutual fund ownership is a reasonable proxy for the extent to which short-sale constraints bind and that reductions in breadth should be associated with lower future returns. The authors estimate that stocks with the greatest reductions in breadth earn six-month returns that are 3.82 percent lower than stocks with the smallest reductions. Beber et al. (2010) show that divergent opinions affect the implied volatility of currency options even in the absence of short-sale constraints. Finally, Grullon et al. (2012) find evidence that an exogenous regulatory shock in the US that led to an increase in short selling is associated with a drop in stock prices.

The results of many of these studies underscore the conclusion from Hong and Stein (2003) that "short-sale constraints may play a bigger role than one might have guessed based on just the direct transactions cost associated with shorting [because] shorting is constrained by other factors". For example, it can be difficult to short small stocks, stocks with low institutional ownership or stocks with a high demand for borrowing (Lamont 2005). Furthermore, Diether et al. (2002) note that any friction that prevents pessimistic agents from revealing negative opinions – not only short-selling constraints - will contribute to upwardly biased prices as theorized by Miller (1977). Thus, even in the absence of formal short-sale constraints or high associated transaction costs, opinion divergence can lead to overpricing.

2.2.2 Divergent opinions and takeover premiums

When applied to corporate takeovers, the "heterogeneous expectations" theory predicts that divergence of opinion among *target* shareholders leads to higher takeover

premiums.[4] The maximum amount a bidder will offer for a target equals its estimate of the target's value plus any synergies expected from the merger. Target shareholders will accept a bid only if it meets or exceeds their estimation of the target's value. The reservation price of the marginal shareholder therefore dictates the offer required for the bidder to gain control (Bradley et al., 1988). If at least some target shareholders believe the target's value exceeds the current stock price, they will demand a premium to relinquish their shares.

Prior theoretical and empirical studies demonstrate that individual shareholders' preferences are relevant in determining the acquisition price. In deriving a theoretical model of the tender offer process, Bradley et al. (1988) illustrate that tender offers depend on the reservation price of the marginal tendering shareholder. The authors explain that this reservation price varies across target shareholders and represents differences in their capital gains tax rates, expectations about the outcome of the current offer and the probability of receiving other tender offers in the future. Ayers et al. (2003) empirically test the prediction that premiums are affected by individual shareholder capital gains taxes using a sample of 935 acquisitions completed between 1975 and 2000, during which time the maximum tax rate on long-term capital gains fluctuated from between roughly 20 and 35 percent. Consistent with expectations, the authors find a positive

[4] In contrast, the theory predicts that divergence of opinion among acquiring shareholders will lead to lower acquirer announcement returns. Moeller et al. (2007) test this prediction and find mixed support. The authors conclude that predictions stemming from theories related to information asymmetry better explain cross-sectional variation in acquirer announcement returns than theories related to opinion divergence.

association between takeover premiums and estimated capital gains taxes.[5] Taken together, these theoretical predictions and empirical evidence suggest that the preferences of price-setting shareholders influence takeover premiums.

Chatterjee et al. (2012) test how divergence in target shareholders' beliefs about firm value influences corporate takeovers. The authors draw on Miller (1977) and related studies to predict that total takeover premiums are increasing in target shareholder divergence of opinion about target value. The authors present a theoretical model to motivate this hypothesis, which assumes that (i) the bidding firm makes an offer to the target, (ii) the target shareholders meet to vote whether or not to accept the offer, (iii) each target shareholder has a different opinion about target value and (iv) each target shareholder will vote to accept the offer only if the value of the offer exceeds his or her valuation of the target.

Figure 2 presents a graphical representation of the association between opinion divergence and premiums, extracted from Chatterjee et al. (2012). The graph shows two demand curves for target shares, *D* and *D'*, for two different levels of opinion divergence.[6] Based on Miller (1977), the demand curve for the target's stock is steeper when divergence of opinion among target shareholders is higher (i.e. D' is steeper than

[5] The authors estimate capital gains tax liabilities of target shareholders by multiplying the applicable long-term capital gains rate by the estimated taxable gain. The authors estimate the taxable gain in three ways. First, they assume the entire gain would be subject to tax. This would be the case if the price-setting target shareholder, such as a company founder, had a zero or negligible basis in the stock. Second, they assume the taxable gain is the difference between the target's pre-announcement price and the target's lowest trading price over the five years prior to the acquisition. Third, they assume the taxable gain is the difference between the target's pre-announcement price and the target's lowest trading price over the three years prior to the announcement.

[6] These curves can also be thought of as supply curves illustrating the price at which target shareholders are willing to relinquish their shares.

D). Thus the pre-announcement market price, P, is greater when opinion divergence is high (P'>P). The bidding firm is assumed to own α shares, which is less than the 50 percent required to gain control of the target. Therefore, the bidder must acquire an additional (50 percent-α) shares to complete the takeover. Given different expectations about the target's value, the bidder has to pay a takeover price that exceeds the pre-announcement trading price to motivate those target shareholders with the most optimistic assessment of the target's value to accept the offer and relinquish their shares. The offer required to satisfy the reservation price of the target shareholder holding the ith share needed for the bidder to gain control is denoted by V. The final offer price and the premium are increasing in opinion divergence. That is, V'>V and V'-P' > V-P.

Chatterjee et al. (2012), find empirical evidence consistent with this prediction using a sample of 2,069 completed takeovers from 1984 and 2004.[7] The authors use three proxies for divergence of opinion among target shareholders: dispersion in analysts' forecasts of the targets' one-year-ahead earnings, the change in the breadth of mutual fund ownership and idiosyncratic volatility. Results are consistent across all three proxies suggesting that target shareholder opinion divergence is associated with higher takeover premiums. The authors estimate a one-standard deviation increase in analysts' forecast dispersion corresponds with a 5.6 percent increase in value premiums, all else equal. Distinct from Chatterjee et al. (2012), I investigate the relation between divergence of opinion about *taxes* and takeover premiums controlling for divergence of opinion about pre-tax earnings.

[7] Although descriptive statistics include failed deals, the main regression analyses exclude failed takeovers. The authors include failed deals as a robustness check and find similar results.

2.3 Prior Literature - Reporting Flexibility

2.3.1 Financial Reporting Flexibility

A broad stream of research documents that managers care not only about the underlying economics of transactions but also about how they are presented in financial statements. In some cases, managers are willing to incur real economic costs to secure favorable financial reporting outcomes. Erickson et al. (2004) estimate that a small sample of firms paid income taxes on fraudulently reported financial earnings to avoid raising suspicions about earnings management. Roychowdhury (2006) documents several examples of managers altering real economic decisions to avoid reporting financial losses, such as offering price discounts to boost sales. Carter et al. (2007) provide evidence consistent with firms overusing stock options before SFAS 123R due to the favorable financial reporting treatment they offered. Robinson (2010) shows that firms investing in low-income housing credits incur real costs to amortize their interests as a below-the-line tax expense to preserve higher pre-tax income.

Related to M&A, Ayers et al. (2002) offer evidence that acquiring firms incurred significant costs to structure deals to qualify for the pooling method of accounting prior to SFAS 141. The pooling method was advantageous from a financial reporting perspective because (a) it did not require acquirers to revalue appreciated assets and then subsequently amortize or depreciate this higher amount, and (b) it allowed the acquirer to include the target's income as of the beginning of the acquisition year (rather than the date of the combination as required under the purchase method). The authors find evidence of higher premiums paid in deals accounted for using the pooling method after

controlling for other factors that affect accounting choice.[8] Together these studies underscore the importance of financial reporting concerns and illustrate how managers alter real transactions to achieve favorable reporting outcomes.

2.3.2 Tax Uncertainty and Financial Reporting Flexibility

Shackelford et al. (2011) detail how tax uncertainty interacts with financial reporting rules to provide managers with flexibility to achieve desired reporting outcomes. For example, US multinational entities (MNEs) have incentives to reduce global tax burdens by shifting income to low tax jurisdictions. At the same time, tax authorities have incentives to preserve the tax base and disallow unreasonable transfer prices. These conflicting objectives can lead to contentious disputes that take years to resolve. As a result, MNEs with extensive transfer pricing establish tax contingency reserves in the current period to account for the possibility of a future unfavorable resolution. To the extent disputes are settled favorably, managers can opportunistically release reserves to boost book income. Contingency reserves can arise from transactions other than transfer pricing such as state tax planning and federal income tax credits.

Empirical evidence supports the contention that managers use tax expense to manage earnings. Dhaliwal et al. (2004) argue that the complexity and judgment involved in computing income tax expense, including establishing and releasing contingency reserves, make tax expense ripe for earnings management. They find that firms lower their effective tax rates from the third to the fourth quarter when they would otherwise

[8] To qualify for the pooling method, the combination had to satisfy several pooling criteria outlined in APB No. 16, many of which were difficult to meet without cooperation by the target. Based on prior literature, Ayers et al. (2002) predict that the value of the financial reporting benefits provided to the bidding firm by the pooling method would be incorporated into the price the target shareholders demanded.

miss the consensus earnings forecast. Similarly, Frank and Rego (2006) provide evidence that firms manipulate valuation allowances to move earnings toward the consensus analyst forecast. Schrand and Wong (2003) find that bank managers use the valuation allowance to smooth earnings. On the whole, these findings demonstrate that income tax accounting provides opportunities for earnings management when non-tax sources of earnings management are insufficient to achieve financial targets. Thus, the "reporting flexibility" explanation suggests that targets with tax uncertainty are an attractive investment opportunity for acquiring firms that value discretion in recognizing book income.

Business combinations also provide opportunities to exploit tax uncertainty to achieve desired financial reporting outcomes. First, acquirers can benefit from tax uncertainty related to target operations that arises subsequent to the acquisition. Second, acquirers can benefit from target tax uncertainty that arose prior to the combination after the effective date of SFAS 141R, *Business Combinations,* in 2009. Under SFAS 141, acquirers account for business combinations using purchase accounting whereby the fair value of all acquired assets and liabilities is recorded upon acquisition. Items related to income taxes are an exception to this fair value requirement, however, giving managers greater flexibility in recording initial tax balances upon acquisition. Under SFAS 141R, subsequent changes to these initial estimates of tax balances, including tax contingency reserves and valuation allowances, are made through the income statement. Thus, after

the effective date of SFAS 141R, acquiring firm managers have even greater flexibility to exploit target tax uncertainty to achieve favorable financial reporting outcomes.[9]

2.3.3 Changes in Financial Reporting for Tax Uncertainty

It is unclear what effect a recent accounting pronouncement had on the relation between tax uncertainty and takeover premiums. FIN 48 became effective for all fiscal years ending on or after December 15, 2006. The FASB enacted FIN 48 to increase transparency surrounding uncertain tax avoidance and to reduce cross-sectional inconsistencies in establishing tax contingency reserves. Before FIN 48, firms were not required to make explicit disclosures about tax contingencies and most firms did not voluntarily provide such details (Gleason and Mills, 2002). In contrast, FIN 48 requires firms to annually disclose the portion of all claimed tax benefits that is not more likely than not to be sustained upon audit.

This increased transparency that FIN 48 requires may change the relation between tax uncertainty and premiums by reducing opinion divergence among target shareholders. It may also discourage bidding firms from implementing uncertain tax positions that would necessitate disclosing a material contingent liability to investors or taxing authorities. Indeed, Blouin et al. (2010) present evidence that the 100 largest unregulated, nonfinancial, public firms decreased tax reserves more so in the quarters between the enactment and effective date of FIN 48 than in other quarters. The authors posit one

[9] Under both SFAS 141 and 141R, acquired tax assets and liabilities are initially recorded with an offset to goodwill. Under SFAS 141, subsequent changes to amounts initially recorded in purchase accounting were also offset to goodwill and did not have an immediate impact on reported earnings. After SFAS 141R, these changes immediately flow through the income statement.

potential motivation for reducing these reserves was to avoid tax authority scrutiny. Similarly, Gupta et al. (2012) find evidence that firms limited uncertain state tax planning around FIN 48. Thus, it is possible that FIN 48 diminished the attractiveness of using tax reserves to manipulate earnings by increasing the transparency surrounding uncertain tax positions. The specific guidelines regarding the recognition and measurement of contingency reserves required by FIN 48 could have also curtailed opportunities for managerial manipulation. For example, Gupta et al. (2011) find evidence that managers used tax contingency reserves to manage earnings before FIN 48 but no evidence that they continue to do so after FIN 48.

However, evidence from other studies suggests that FIN 48 may have done little to enhance information available to shareholders about tax uncertainty or to curb managers' flexibility in using tax accruals to manipulate earnings. De Simone et al. (2012) and Robinson and Schmidt (2013) demonstrate that accruals and disclosures of tax reserves are not comparable across firms because firms do not always comply with the measurement, recognition and disclosure guidelines in the Interpretation. Towery (2012) provides evidence consistent with managers taking steps to avoid accruing and disclosing reserves in response to newly required federal income tax filings based on FIN 48 disclosures. Finally, in contrast to Gupta et al. (2011), Cazier et al. (2011) conclude that managers continue to use tax reserves to manage earnings after FIN 48 even in the face of more stringent guidelines and increased financial auditor scrutiny. Thus it is an open empirical question whether and to what extent FIN 48 reduced shareholder divergence or opportunities for managerial flexibility and, therefore, how it changed the relation

between tax uncertainty and takeover premiums. To examine the effect of FIN 48, I re-estimate all equations on the subset of deals completed after 2006.[10]

2.4 Hypothesis development

Prior literature demonstrates that uncertainty indirectly leads to higher takeover premiums by creating divergence of opinion among target shareholders. However, the effect of *tax* uncertainty on corporate takeovers is not well documented. Concurrent working papers explore the link between tax risk or aggressive tax avoidance and premiums (Chow, 2013; Mescall, 2012, Martin et al., 2012) but, to my knowledge, no other study investigates how target tax uncertainty influences takeover premiums.

2.4.1 Heterogeneous expectations

Income taxes are a substantial cash outflow and expense for US corporations and thus can materially affect estimates of firm value. Although managers have strong incentives to minimize tax outflows, the outcome of tax avoidance strategies is often uncertain ex ante. The final resolution of tax positions involves a negotiation between the taxpayer and tax authority, and depends on each party's interpretation of the relevant law, facts and circumstances, and their willingness to litigate. Additionally, firms often incur consulting fees to sustain tax positions that are challenged by tax authorities and face interest and penalties if a tax position is disallowed. Thus, given the same information about a firm's tax avoidance, shareholders can develop different expectations of the outcome and its implications for firm value.

[10] These post-2006 tests will also reflect changes in the relation between tax uncertainty and takeover premiums brought about by the adoption of SFAS 141R, which became effective December 15, 2008.

I begin my analysis by documenting a positive association between tax uncertainty and target shareholder divergence of opinion about taxes controlling for the target's information environment. Next, I examine how this opinion divergence influences premiums. My first hypothesis, stated formally below, predicts that this divergence of opinion is associated with increased takeover premiums.

H1: *There is a positive association between divergence of opinion among target shareholders about target taxes and takeover premiums.*

2.4.2 Reporting flexibility

The reporting flexibility theory suggests that managers incrementally value investments whose accounting treatment offers discretion in recognizing book income. Investments with tax uncertainty allow managers to exploit financial reporting rules governing accounting for income taxes to achieve favorable reporting outcomes. Thus, this theory predicts that tax uncertainty is directly associated with higher takeover premiums. I formally state the first part of my second hypothesis below.

H2a: *There is a positive association between target tax uncertainty and takeover premiums.*

Financial reporting concerns capture the extent to which managers face capital market pressures or otherwise emphasize meeting earnings targets. Managers with the greatest financial reporting concerns are likely to value the flexibility that tax uncertainty provides. For these managers, the potential to use target tax uncertainty to boost future earnings represents a form of "synergy" and increases their willingness to pay higher takeover premiums. Therefore, the reporting flexibility explanation predicts that

acquisition premiums will be more positively associated with tax uncertainty when acquirers have greater financial reporting concerns. My final hypothesis is formally stated below.

> ***H2b:*** *The positive association between target tax uncertainty and takeover premiums is increasing in the extent of acquirer financial reporting concerns.*

I also test all hypotheses separately using a subsample of deals completed after the effective date of FIN 48. Because studies provide conflicting evidence about the extent to which firms comply with FIN 48 and therefore how it affects financial reporting decisions or investor perceptions of uncertainty (e.g., De Simone et al., 2012; Robinson and Schmidt, 2013), I make no formal predictions about how relations change after FIN 48.

The two theories I test herein are not mutually exclusive. Rather, they offer predictions about how tax uncertainty impacts either target shareholders' or acquiring managers' perceptions of target value. The theory of heterogeneous expectations offers predictions about how tax uncertainty influences the price that acquirers must pay to satisfy target shareholders and complete the acquisition. The reporting flexibility theory highlights the potentially valuable discretion in financial reporting that investments with tax uncertainty provide and suggests that acquiring managers who more positively value this flexibility will pay a premium for it. Thus, my tests are not designed to rule out one theory in favor of the other or to determine if one theory dominates the relation between tax uncertainty and takeover premiums.

Chapter 3: Research Design – Heterogeneous Expectations

The theory of heterogeneous expectations predicts that tax uncertainty affects takeover premiums by increasing target shareholder divergence of opinion about target value. To test this hypothesis, I begin by demonstrating that target tax uncertainty is associated with increased opinion divergence among target shareholders and that this opinion divergence is, in turn, associated with higher takeover premiums.

3.1 Measures of tax uncertainty

I use three proxies to capture tax uncertainty. McGuire et al. (2012) explore the relation between tax avoidance and financial reporting outcomes and find that sustainable tax avoidance is positively associated with pre-tax earnings persistence. The authors develop a measure of tax sustainability, which they defined as the "dimension of a firm's tax strategy that is focused on achieving consistent tax avoidance outcomes over time." Based on this definition, I view uncertain tax avoidance to be less sustainable. Frequent changes in tax planning opportunities, audit settlements and fluid tax laws all contribute to volatile and less persistent cash ETRs. Therefore, similar to McGuire et al. (2012), I use the coefficient of variation of year-to-date cash ETRs *(CV_CETR)* as my first proxy for tax uncertainty.

I define *CV_CETR* as the standard deviation of target year-to-date cash ETR over the five years prior to acquisition, scaled by the average cash ETR over the same period. I use variation in year-to-date cash taxes paid because data on quarterly cash taxes paid are

not available in Compustat.[11] Before calculating the standard deviation or average, I reset all negative values of the cash ETR to zero and all values greater than one to one.

Similar to volatile cash ETRs, volatile year-to-date GAAP ETRs also reflect tax uncertainty by capturing management uncertainty about tax projections, changes in tax laws or uncertainty about audit outcomes. APB Opinion No. 28, *Accounting for Income Taxes*, requires firms to estimate the effective tax rate for the year and apply that forecasted rate to year-to-date earnings for interim reporting. FIN 18 further requires companies to adjust the year-to-date tax expense calculated in accordance with APB 28 to reflect any discrete tax adjustments attributable to the quarter. For example, in the year a tax benefit is enacted, firms recognize the entire benefit in the quarter of enactment. Companies also make discrete adjustments for audit settlements. Volatile quarterly GAAP ETRs could also capture the extent to which target firm managers exploit flexibility in manipulating tax expense to meet quarterly earnings benchmarks (Comprix et al., 2012). I calculate *CV_ETR*, my second proxy for tax uncertainty, in the same manner as *CV_CETR* but I replace taxes paid with tax expense.

Finally, to test the effects of FIN 48 on the relation between tax uncertainty and premiums, I use target reserves for uncertain tax positions calculated in accordance with FIN 48 as my final measure of tax uncertainty. FIN 48 permits firms to recognize only that portion of claimed tax benefits that is more likely than not to be sustained upon audit. Thus, firms must accrue a reserve for the difference between that amount and the total

[11] I use variation in year-to-date ETRs instead of annual ETRs to capture target managers own uncertainty about tax outcomes, which is more apparent in year-to-date (or quarterly) ETRs because of the accounting rules governing interim financial reporting.

benefit claimed. To illustrate, assume a company claims a $100 tax credit, $60 of which management concludes is more likely than not to be sustained upon audit, FIN 48 requires the company to accrue a $40 reserve.

Unlike *CV_ETR* and *CV_CETR*, FIN 48 reserves reflect only uncertainty related to tax positions the company has taken and that managers choose to disclose in accordance with the rule. It does not reflect general changes in tax laws or tax rates or any uncertainty that managers choose not to disclose. *T_UTB* is thus a more narrow measure of tax uncertainty than *CV_ETR* or *CV_CETR*. I calculate *T_UTB* as target FIN 48 reserves for the year ended prior to the acquisition announcement scaled by target market value of equity 28 trading days prior to the announcement. I winsorize all three measures of tax uncertainty at one and 99 percent.

3.2 Tax uncertainty and opinion divergence

I begin testing H1 by examining whether tax uncertainty increases target divergence of opinion about taxes. Consistent with Diether et al. (2002), who use dispersion in analysts' earnings forecasts as a proxy for divergence of opinion among investors, I use dispersion in analyst forecasts of targets' one-year-ahead GAAP ETR as my proxy for target shareholder divergence of opinion about taxes.[12] This approach is supported by Barron et al. (1998) who demonstrate analytically that analyst forecast dispersion is increasing in their uncertainty about the precision of forecasted values.

[12] Their results further suggest that analysts' dispersion is not a proxy for risk. To the extent dispersion in analysts' earnings forecasts is a proxy for risk, investors should demand higher returns when dispersion is high. Since Diether et al. (2002) document a significant negative relation between dispersion and stock returns, they reject the idea that dispersion is a proxy for risk.

Although other measures of divergence, such as breadth of ownership or idiosyncratic volatility have potential advantages over analyst forecast dispersion, I require a measure specifically related to divergence of opinion about taxes. Analyst dispersion of GAAP ETR provides this specific tax information whereas many other measures of opinion divergence do not. IBES generally provides both pre-tax (PRE) and after-tax (NET) income forecasts.[13] Therefore, I estimate forecasted GAAP ETR as the difference between forecasted pre-tax income and net income, scaled by forecasted pre-tax income ((PRE-NET)/PRE)). I reset all values less than to zero to zero and all values greater than one to one. I calculate *STD_IBES_ETR* as the standard deviation of forecasted GAAP ETR scaled by the absolute value of the average forecasted GAAP ETR for one-year-ahead earnings (Diether et al., 2002). I include all forecasts made within six months prior to the takeover announcement and winsorize *STD_IBES_ETR* at one and 99 percent.[14]

I begin by testing whether tax uncertainty is positively associated with target shareholder divergence of opinion, measured using *STD_IBES_ETR*, controlling for target size and profitability. I also include controls for analyst dispersion of pre-tax income estimates (*STD_IBES_PTI)* as well as volatility in pre-tax income (*STD_ROA)* to

[13] Although Value Line provides GAAP ETR forecasts for covered firms, they provide only a single forecast for each firm. Because I am interested in capturing variation in GAAP ETR forecasts among analysts, I use IBES data because they provide multiple analyst forecasts for each sample firm.

[14] I obtain IBES pre-tax income and net income forecasts for 903 deals, which is roughly 44 percent of my entire sample. Targets with sufficient information available to calculate *STD_IBES_ETR* are larger and have lower book-to-market ratios than those targets either not covered by IBES or for which IBES does not provide both pre-tax and net income forecasts. IBES targets receive significantly lower premiums and have significantly lower values of *CV_ETR*, *CV_CETR* and *T_UTB.*

better isolate the direct of effect of tax uncertainty incremental to uncertainty about general business operations. Specifically, I estimate the following OLS regression

$$STD\_IBES\_ETR = \beta_0 + \beta_1 * TAX\_UNCERTAIN + \beta_2 * STD\_IBES\_PTI + \beta_3 * STD\_ROA + \beta_3 * T\_MKTCAP + \beta_4 * T\_ROE + YearFE + \varepsilon \qquad (1)$$

Where *TAX_UNCERTAIN* is one of the three measures of tax uncertainty *(CV_CETR, CV_ETR or T_UTB)* described above. *STD_IBES_PTI* is the standard deviation of analysts' one-year-ahead pre-tax income forecast divided by the absolute value of the average one-year-ahead pre-tax income forecast. I expect analyst dispersion about pre-tax income to be positively associated with dispersion about effective tax rates.[15]

I capture volatility in pre-tax income with *STD_ROA*, the five-year standard deviation of target year-to-date pre-tax return on assets (ROA) from year *t-4* through year *t*, divided by the absolute value of the average year-to-date pre-tax return on assets from year *t-4* through year *t*. I expect actual volatility in pre-tax earnings to also be positively associated with analyst dispersion in ETR forecasts. Target size (*T_MKTCAP*) is a proxy for firms' overall information environment (Zhang 2006). Because larger firms generally

[15] Even though the corporate tax rate schedule in the US is progressive, firms reporting pre-tax income below $15M are subject to an average statutory tax rate of 34% and firms with pre-tax income above $18.3M are subject to an average statutory tax rate of 35%. Therefore minor deviations in forecasts of pre-tax income should not dramatically affect the expected average statutory tax rate to which the firm is subject. However, certain permanent book-tax differences, tax credits and special items are not earned in proportion to pre-tax income and will cause disagreements in pre-tax income forecasts to impact GAAP ETR forecasts. For example, assume two analysts each believe a company will claim a $50,000 R&D credit in year *t*. If Analyst A forecasts $1M of pre-tax income, he will forecast a GAAP ETR of 29% (assuming a 34% statutory tax rate). If Analyst B forecasts $1.2M of pre-tax income, he will forecast a GAAP ETR of 30%. Therefore, there will be disagreement in the GAAP ETR forecasts even though both analysts are forecasting the same amount of R&D tax credit benefits at the same statutory tax rate.

have better information environments, I expect a negative coefficient on *T_MKTCAP*. I also control for profitability (*T_ROE*) because pre-tax losses can make it more difficult to forecast GAAP ETRs. Financial accounting rules governing intra-period losses (FIN 18) and valuation allowances (SFAS 109) introduce potential complexity into calculating quarterly tax rates that is not necessarily related to uncertainty about tax outcomes but instead is an artifact of complicated accounting rules.

Next I estimate the effect of opinion divergence about taxes on takeover premiums by estimating the following OLS regression.

$$PREMIUM = \beta_0 + \beta_1 * STD\_IBES\_ETR + \beta_2 * STD\_IBES\_PTI + \beta_3 * TAXABLE + \beta_4 * COMPETE + \beta_5 * TENDER + \beta_6 * TOEHOLD + \beta_7 * STD\_ROA + \beta_8\ T\_LIQ + \beta_9 * T\_BTM + \beta_{10} * T\_ROE + \beta_{11} * T\_MKTCAP + \beta_{12} * T\_LEV + \beta_{13} * PENNY + YearFE + \varepsilon \qquad (2)$$

I remove influential observations from each sample using standard outlier analysis. Specifically, from each regression, I remove all observations with studentized residuals or DFFITS scores (Belsey et al. 1980) greater than two. I also restrict the samples to include only those deals with premium values between zero and two (e.g., Chatterjee et al., 2012; Officer, 2003). Following prior research, *PREMIUM* is the difference between the acquisition value and target market value 28 trading days prior to the announcement, deflated by target market value 28 trading days prior to the announcement (e.g., Ayers et al., 2000). Measuring the premium prior to the trading announcement is intended to capture the pre-announcement value of the stock not

affected by announcement of the merger itself.[16] H1 predicts β_1 is positive when estimating *PREMIUM* as a function of *STD_IBES_ETR.*

Prior literature identifies various deal characteristics that affect takeover premiums including tax status, competing bids and management attitude surrounding the deal. To control for higher premiums demanded by target shareholders in taxable acquisitions (Ayers et al., 2003; Hayn, 1989), I include *TAXABLE,* an indicator variable equal to one if less than 80 percent of the total consideration is stock. I also control for competing bids *(COMPETE)* and tender offers *(TENDER)* because prior studies have shown both deal characteristics to be positively associated with takeover premiums (e.g., Betton and Eckbo, 2000; Bradley et al., 1988). Finally, *TOEHOLD* is a continuous variable capturing the acquirer's equity interest in the target prior to acquisition. Betton and Eckbo (2000) find that larger acquirer toeholds reduce acquisition premiums. Because the frequency of hostile deals is so low in my sample, I omit controls for management hostility from all regressions.

To provide comfort that tax uncertainty results are not driven solely be uncertainty related to pre-tax operations, I control for volatility of the target's pre-tax income (*STD_ROA).* I also include controls for several target characteristics that have been analyzed in prior research (e.g., Comment and Schwert, 1995; Palepu, 1986; Schwert, 2000) including liquidity *(T_LIQ),* book-to-market ratio *(T_BTM),* return on equity *(T_ROE),* and leverage *(T_LEV).* These variables control for the efficiency of

[16] Schwert (1996) provides evidence of target cumulative abnormal returns (CAR) beginning 42 trading days prior to the bid announcement, with the largest increase in CAR occurring over the period from 21 trading days prior to the announcement to the day immediately before the announcement.

incumbent managers and the financial health of the target. I measure these variables using Compustat data for the fiscal year ending immediately prior to the takeover announcement and scale each variable by target market capitalization 28 trading days prior to the announcement. The inefficient management hypothesis predicts positive coefficients on *T_LIQ* and *T_BTM* and negative coefficients on *T_ROE* and *T_LEV*. However, Billett and Ryngaert (1997) predict that takeover premiums should be increasing in leverage because expected synergies should be independent of the target's internal financing, and decreasing in liquidity because non-financial assets are easier and more valuable to redeploy. Given the inconsistent theory and mixed findings in prior studies, I make no predictions as to the coefficients on *T_LEV* or *T_LIQ*.

Prior research also demonstrates that target size and share price can affect takeovers. Therefore, I include target market capitalization 28 trading days prior to the takeover announcement *(T_MKTCAP)* as a control for size. Because Betton et al. (2009) find that offer premiums are smaller for penny stocks, I include *PENNY*, an indicator variable equal to one if target stock price is less than one dollar 28 trading days prior to the takeover announcement. Finally, to control for takeover waves, I include year fixed effects based on the year of announcement. Because acquirers in my sample can be publicly traded or private, I omit controls for acquirer characteristics. This approach is consistent with many prior studies examining determinants of takeover premiums (e.g., Ayers et al., 2003; Chatterjee et al., 2012).

Chapter 4 – Research Design – Reporting Flexibility

4.1 Tax Uncertainty and Takeover Premiums

I test the direct effect of tax uncertainty on takeover premiums by re-estimating equation (2) after replacing *STD_IBES_ETR*, my measure of divergence of opinion, with the three measures of tax uncertainty outlined in Section 3.1. Specifically, I use the following OLS regression to estimate the effect of tax uncertainty on acquisition premiums:

$$PREMIUM = \beta_0 + \beta_1 * TAX\_UNCERTAIN + \beta_2 * TAXABLE + \beta_3 * COMPETE + \beta_4 * TENDER + \beta_5 * TOEHOLD + \beta_6 * STD\_ROA + \beta_7\ T\_LIQ + \beta_8 * T\_BTM + \beta_9 * T\_ROE + \beta_{10} * T\_MKTCAP + \beta_{11} * T\_LEV + \beta_{12} * PENNY + YearFE + \varepsilon \quad (3)$$

I estimate this regression for the full sample and the subsample of deals completed after the effective date of FIN 48.

4.2 Financial Reporting Concerns

I use two proxies to capture acquirers' financial reporting concerns. First, I set *PUBLIC* to one if the acquirer is publicly traded. Publicly traded firms face financial reporting pressures from capital markets and are therefore more concerned about financial performance than private firms.

I derive the second proxy, *FINRPT*, from the financial reporting concerns measure developed in Carter et al. (2007). The authors use principal component analysis to synthesize five observable variables into two principal components that captures manager concerns about reported earnings. The first captures financial reporting concerns arising

from participation in equity markets and the second captures concerns associated with plans to access debt and equity markets in the near future. To avoid confounds related to the acquisition itself, which likely involves plans to access debt and equity markets, I exclude the second component and rely exclusively on the first to capture the extent of acquirers' financial reporting concerns.

The first observable variable is the percentage of quarters that current earnings per share (EPS) is greater than or equal to EPS from the same quarter of the prior year because prior studies show that patterns of earnings increases are associated with higher stock prices (e.g., Barth et al., 1999; Burgstahler and Dichev 1997). Firms also benefit from meeting external earnings targets (e.g., Abarbanell and Lehavy, 2003; Bartov et al., 2002; Burgstahler and Eames, 2006; Degeorge et al., 1999; Kasznik and McNichols, 2002). Therefore, the second variable is the percentage of quarters that the acquirer meets or beats the IBES consensus analyst EPS forecast. Leverage is the final variable and it captures concerns about debt covenant violations, which can also incentivize managers to emphasize reported financial earnings (e.g., DeFond and Jiambalvo, 1994; Dichev and Skinner, 2002; Sweeney, 1994; Watts and Zimmerman, 1990). As in Carter et al. (2007), leverage has a negative loading in my sample, which is consistent with these firms relying heavily on equity financing and focusing on meeting the earnings expectations of equity investors. Therefore, following Carter et al. (2007), I subtract leverage from one to capture the extent to which assets are equity financed.[17]

[17] I report factor loadings of 0.84, 0.87 and 0.20 on the proportion of quarters the firm reports an increase in earnings over the same quarter in the prior year, the proportion of quarters the firm meets or beats the IBES

After conducting principal component analysis to obtain a composite measure of financial reporting concerns, I set *FINRPT* equal to one if the acquirer is above the median value of the measure, and zero otherwise. Because the data required to calculate *FINRPT* are available only for public firms covered by IBES, tests using *FINRPT* include a subset of deals completed by public acquirers. In untabulated tests, I use IBES analyst following as an alternative measure of financial reporting concerns.

The reporting flexibility explanation predicts that the association between tax uncertainty and premiums is more positive when the acquirer has greater financial reporting concerns. Therefore, to test H2b, I estimate equation (2) separately for acquirers with high and low financial reporting concerns. I also estimate equation (2) with an interaction term to quantify the differential effect of tax uncertainty based on acquirer financial reporting concerns. H2b predicts β_3 will be positive in both equations (4) and (5).

$$PREMIUM = \beta_0 + \beta_1 * TAX\_UNCERTAIN + \beta_2 * PUBLIC + \beta_3 * PUBLIC * TAX\_UNCERTAIN + \beta_j X_j + \beta_k X_{k*} PUBLIC + YearFE \quad (4)$$

$$PREMIUM = \beta_0 + \beta_1 * TAX\_UNCERTAIN + \beta_2 * FINRPT + \beta_3 * FINRPT * TAX\_UNCERTAIN + \beta_j X_j + \beta_k X_{k*} FINPRT + YearFE \quad (5)$$

In each equation $\beta_j X_j$ is the vector of control variables included in equation (2). Because the controls for deal and target characteristics might differentially affect *PREMIUM* depending on whether the acquirer is public, I include interactions between

consensus forecast and leverage, respectively. Carter et al. (2007) report factor loadings of 0.80, 0.81 and 0.51, respectively, for the same observable variables.

PUBLIC and all control variables in the model. I do the same with *FINRPT* for consistency in estimation.

Chapter 5: Sample Selection and Descriptive Statistics

5.1 Sample selection

All data used in this study are publicly available. I begin with 3,405 deals from SDC announced between January 1, 2002 and December 31, 2011. I retain only those business combinations where the deal status in SDC is listed as "Completed".[18] I further require the target to be public whereas the acquirer can be either publicly traded or private. I begin the sample in 2002 to ensure consistent accounting for business combinations after SFAS 141 and 142. Prior to June 30, 2001, acquiring firms could choose either the purchase or pooling method to account for business combinations. Ayers et al. (2002) provide evidence that firms paid higher prices to qualify business combinations for the more favorable pooling method of accounting. This sample selection criterion therefore reduces the potential for the choice of accounting method to confound results.

For a deal to be included in the sample, the acquirer cannot own more than 50 percent of the target before the acquisition and must own at least 80 percent of the target after the acquisition. Although consolidation is required for US GAAP purposes at greater than 50 percent ownership, consolidated tax filings are permitted only when the parent owns at least 80 percent of the affiliate. Therefore, this latter ownership requirement is intended to capture situations where the target's tax positions are more salient to the acquirer because they meet the 80 percent ownership level required for federal tax consolidation.

[18] Because my sample includes only completed deals, endogeneity limits the generalizability of my results. However, this sample selection approach is consistent with the main results presented in Chatterjee et al. (2012) and Martin et al. (2012). See Section 8.1 for further details and additional tests to address endogeneity.

I match deals from SDC with data from Compustat based on the six-digit CUSIP of the target. I also match deals to IBES and CRSP. After eliminating deals with missing data required to calculate variables, the final sample consists of 1,908 deals. The number of observations in each regression varies based on the relevant data requirements. See Panel A of Table 1 for detailed sample selection criteria.

Panels B presents the distribution of target firms across one-digit SIC code. I retain targets from all industries and no single industry accounts for more than 22 percent of the sample. Most targets are from the Rubber, Metals and Machines classification (3000), followed by Hotel and Other Services (7000) and Financial Services (6000). Panel C provides the frequency of deals with competing bids, hostile management attitudes and tender offers.

5.2 Descriptive Statistics

Panel A of Table 2 provides descriptive statistics for sample deals and target firms. The median deal value is $338M and the median takeover premium is 41 percent. The majority of deals in my sample are taxable. Further, acquirers do not hold a substantial interest in targets prior to acquisition as demonstrated by an average pre-acquisition toehold of zero percent. Panel B presents descriptive statistics based on whether the acquirer is publicly traded or private. The mean and median deal value is significantly greater for public acquirers. The median takeover premium is also larger for public (43 percent) versus private (37 percent) acquirers. These statistics are similar to Bargeron et al. (2008), who find an average premium of 46.5 percent for public acquirer, 40.9 percent for private operating company acquirers and 28.5 percent for private equity firms. Also

consistent with Bargeron et al. (2008) targets in my sample that are acquired by public firms have significantly lower book-to-market ratios, higher market capitalization and lower leverage than those acquired by private firms. I attempt to control for these differences in all regressions that compare takeovers between public and private acquirers.

Panel C reports descriptive statistics based on the extent of the acquirers' financial reporting concerns. There are few significant differences between these two groups. At the mean and median, targets acquired by acquirers with greater financial reporting concerns have significantly smaller book-to-market ratios and lower levels of liquidity and leverage than targets acquired by firms with lesser financial reporting concerns. Bidders with greater financial reporting concerns are also more likely to make tender offers. No other target or deal characteristics are significantly different between the two groups at both the mean and median.

Chapter 6: Results – Heterogeneous Expectations

6.1 Univariate Analysis

Table 3 shows Pearson and Spearman (rank) correlations for regression variables. Focusing on Pearson correlations, both measures of opinion divergence are positively correlated with premiums. This univariate analysis is consistent with predictions stemming from the theory of heterogeneous expectations. Additionally, *STD_IBES_ETR* is positively correlated with all three measures of tax uncertainty *(CV_ETR, CV_CETR* and *T_UTB)*, which indicates that tax uncertainty is associated with increased opinion divergence among target shareholders.

Other univariate correlations are largely in line with predictions following from prior research. Takeover premiums are higher for taxable deals and lower when the acquirer has a significant toehold. *PREMIUM* is negatively correlated with target profitability (*T_ROE*) and size (*T_MKTCAP*) but positively correlated with *T_BTM* and *PENNY*. Consistent with the inefficient management hypothesis, the correlation between *PREMIUM* and *T_LIQ* is positive. The positive correlation between *PREMIUM* and *T_LEV*, however, is inconsistent with the inefficient management hypothesis but consistent with Billett and Ryngaert (1997).

6.2 Multivariate Analysis

I begin by estimating *STD_IBES_ETR* as a function of each measure of tax uncertainty, controlling for volatility of pre-tax income as well as target size and profitability. Panel A of Table 4 presents the results of this multivariate analysis for the entire sample. Column (1) provides a baseline without including any tax uncertainty

measures and shows that *STD_IBES_ETR* is increasing in analyst forecast dispersion of pre-tax income (*STD_IBES_PTI*) as well as to volatility in reported pre-tax earnings (*STD_ROA*). Consistent with predictions, analyst dispersion of GAAP ETR forecasts is decreasing in both target size and profitability.

In Columns (2) and (3), I include *CV_ETR* and *CV_CETR* in turn to estimate their effects on *STD_IBES_ETR* and in Column (4) I include both measures. Across all specifications, both *CV_ETR* and *CV_CETR* are positively associated with divergence of opinion about target taxes. Focusing on Column (4), a one standard deviation increase in *CV_ETR* is associated with an approximate 14 percent increase in *STD_IBES_ETR*, holding controls constant. This represents a 48 percent increase over the average value of *STD_IBES_ETR.* Similarly, a one standard deviation increase in *CV_CETR* is associated with a 4.9 percent increase in *STD_IBES_ETR*, which is a 29 percent increase relative to the average.

Panel B replicates this analysis for the subset of deals completed after FIN 48 with similar results. *STD_IBES_ETR* is increasing in *CV_ETR*, *CV_CETR* and *T_UTB.* The results in Column (2) suggest a one standard deviation increase in *T_UTB* corresponds with an estimated 11 percent increase in *STD_IBES_ETR*, all else constant. This translates to a 39 percent increase over the average forecast dispersion. However, when I include *T_UTB* in the regression along with another measure of uncertainty in Columns (3) and (4), I find no significant association between *T_UTB* and *STD_IBES_ETR*, suggesting that the information in *T_UTB* about uncertainty is subsumed by the other measures. Both *CV_ETR* and *CV_CETR* remain positively

associated with *STD_IBES_ETR* in this smaller sample of post-FIN 48 deals. In Column (4) a one standard deviation increase in *CV_ETR* (*CV_CETR*) is associated with an estimated 12 (six) percent increase in *STD_IBES_ETR*, all else equal. The results presented in Table 4 collectively suggest that uncertainty about target taxes is sufficiently relevant to create divergent opinions among target shareholders.

In Table 5, I present results of testing H1. Specifically, I estimate *PREMIUM* as a function of *STD_IBES_ETR*, controlling for deal characteristics and target characteristics, including all of the control variables from Equation (1). I find results consistent with H1 in Column (1) and estimate that the coefficient on *STD_IBES_ETR* is positive and significant (0.0364, one tailed p-value < 0.10). A one standard deviation increase in *STD_IBES_ETR* represents an estimated 1.9 percent increase in takeover premiums, which is a 4.5 percent of the average takeover premium. The magnitude of these results is relatively consistent with those documented in Chatterjee et al. (2012). The authors document a 5.6 percent increase in takeover premiums given a one standard deviation increase in analyst dispersion of EPS forecasts. I fail to find a significant association between *STD_IBES_PTI* and *PREMIUM* in this sample.

In Column (2), I follow prior research (e.g., Chatterjee et al., 2012; Officer, 2003) and restrict the sample to include only those deals where the takeover premium lies between zero and two.[19] The association between *STD_IBES_ETR* and *PREMIUM* is positive and significant in this sample as well. In fact, the coefficient on *STD_IBES_ETR* increases to 0.0494 (one-tailed p-value < 0.05), which corresponds to an estimated 2.6

[19] Value-based premiums can be highly skewed for small firms. Restricting the sample to observations where the premium lies between zero and two is an alternative method for dealing with outliers.

percent increase in *PREMIUM*, which is 6.2 percent increase over the average takeover premium. Additionally, *STD_IBES_PTI* is positively associated with *PREMIUM* in this sample. A one standard deviation increase in *STD_IBES_ETR* is associated with an estimated 5.1 percent increase in the average takeover premium.

In both columns, control variables are largely in line with predictions. Taxable deals are associated with higher premiums and premiums are decreasing in the extent of the acquirer's toehold. Premiums are also increasing in target book-to-market and decreasing in liquidity. The results in Table 4 are consistent with the theory of heterogeneous expectations. Target tax uncertainty is positively associated with target shareholder divergence of opinion about taxes, which in turn is associated with increased takeover premiums.

Chapter 7: Results – Reporting Flexibility

7.1 Univariate Analysis

Table 3 shows that all three measures of tax avoidance are positively correlated with each other using either Pearson or Spearman correlations. Focusing on Pearson correlations, the largest correlation is between *CV_ETR* and *CV_CETR* (ρ=0.625, p-value < 0.001) suggesting that the measures are similar but not identical. Consistent with the financial reporting flexibility hypothesis, *PREMIUM* is positively correlated with both *CV_ETR* (ρ=0.067, p-value < 0.001) and CV_CETR (ρ=0.127, p-value < 0.001). Target FIN 48 reserve balances (T_UTB) are positively correlated with *PREMIUM* measured using Pearson correlations (ρ=0.169, p-value < 0.01) but only marginally correlated using Spearman correlations (ρ=0.067 p-value = 0.11).

Uncertainty about pre-tax earnings, measured with *STD_ROA* is also positively correlated with both tax uncertainty and takeover premiums. These univariate results highlight the importance of controlling for pre-tax earnings volatility in all multivariate analysis to accurately estimate the incremental effect of tax uncertainty on takeover premiums.

7.2 Multivariate Analysis

7.2.1 Tests of H2a

Table 6 presents results of testing H2 by estimating *PREMIUM* as a function of tax uncertainty. Columns (1) and (2) present results of measuring uncertainty with *CV_ETR*. In Column (1), I include the full sample and remove outliers using the methodology outlined in Belsey et al. (1980). In Column (2), I follow prior research and

restrict the sample to observations where *PREMIUM* falls within [0, 2]. Tax uncertainty is positively associated with takeover premiums in both columns. Focusing on Column (1) (coefficient = 0.0292, p-value < 0.01), one standard deviation increase in *CV_ETR* is associated with a 2.6 percent estimated increase in *PREMIUM*, all else equal.

I repeat the analysis in Columns (3) and (4) using *CV_CETR* as the measure of tax uncertainty and continue to find results consistent with H2. Focusing on the full-sample results presented in Column (3), a one standard deviation increase in *CV_CETR* corresponds to an estimated 1.9 percent increase in takeover premiums, all else equal. Both sets of results support H2a.

7.2.2 Tests of H2b

To more directly test the conjecture that acquirers value the financial reporting flexibility that tax uncertainty provides, I split the full sample into two subsamples based on acquirer financial reporting concerns. Table 7 presents results. In the first set of tests, reported in Panel A, I use acquirer status as a publicly traded firm as a proxy for greater financial reporting concerns. In Columns (1) through (3), I measure tax uncertainty with *CV_ETR.* In Column (1), which includes only deals with private acquirers, I fail to find a significant association between *CV_ETR* and *PREMIUM* (coefficient = -0.135, p-value = 0.47). In contrast, I find a positive and significant association between *CV_ETR* and *PREMIUM* in Column (2), which includes only deals with public acquirers (coefficient = 0.472, p-value < 0.01). Results in Column (3) demonstrate a significant difference in the relation between *PREMIUM* and *CV_ETR* depending on whether the acquirer is publicly traded. The coefficient on *PUBLIC*TAX_UNCERTAIN* is 0.0607 (p-value < 0.01), which

suggests that for the median value of *CV_ETR*, public acquirers pay premiums that are approximately 2.7 percent higher than non-public acquirers, all else equal.

Results in Columns (4) through (6), which measure tax uncertainty with *CV_CETR*, are similar. I find a positive association between *CV_CETR* and *PREMIUM* only among the subsample of deals with public acquirers (coefficient = 0.0479, p-value < 0.01). The difference in this association between public and private acquirers is significant. Holding all else equal, a target firm with the median value of *CV_CETR* receives a premium that is approximately 4.7 percent higher when acquired by a public firm. All regressions in Table 7 include interactions between *PUBLIC* and all control variables to account for the possibility that target characteristics differentially affect premiums for public firms. Results are robust to excluding these controls, however.

In Panel B, I further split the sample of deals with public acquirers into two subsamples based on the acquirer having either high or low financial reporting concerns. In line with H2b, *CV_ETR* is positively associated with *PREMIUM* only among the subsample of acquirers with high financial reporting concerns (i.e., where *FINRPT* equals one*)*. Additionally, the interaction between high financial reporting concerns and uncertainty, measured with *CV_ETR*, is also positive and significant (coefficient = 0.0731, p-value < 0.05). At the median level of *CV_ETR* for targets acquired by public firms, premiums are approximately 3.2 percent larger when acquirers have high financial reporting concerns. However, I fail to find any evidence of a different relation between *CV_CETR* and *PREMIUM* based on financial reporting concerns in Columns (4) through (6). This insignificant relation could reflect the fact that bidders with greater financial

reporting concerns are more focused on managing expenses rather than cash flows. Taken together, the results presented in Table 7 are generally consistent with the reporting flexibility explanation and suggest that managers value real investments with tax uncertainty because they provide discretion in opportunistically recognizing book income.

7.2.3 Post FIN 48 tests

To test the effects of FIN 48 on the relation between target tax uncertainty, divergence of opinions and premiums, I re-estimate equation (2) including only those deals announced after the effective date of FIN 48. Results are presented in Table 8. Panel A estimates premiums as a function of opinion divergence. Column (1) includes the entire samples with outliers removed using the methodology outlined by Belsey et al. (1980) and Column (2) restricts the sample to observations where *PREMIUM* is between zero and 2, inclusive. Results are consistent with the full-sample results presented in Table 5. I find that *STD_IBES_ETR* is positively associated with *PREMIUM* (coefficient = 0.077, p-value < 0.01) and that a one standard deviation increase in opinion divergence is associated with an estimated 4.0 percent increase in takeover premiums, all else equal. Results in Column (2) are of similar statistical and economic significance.

In untabulated results, I estimate equation (2) separately on deals announced before and after the effective date of FIN 48 and find a positive association between *STD_IBES_ETR* and *PREMIUM* in both subsamples. Further, I estimate a pooled regression including an indicator variable, *POST*, set equal to one for all deals announced after the effective date of FIN 48 and find no statistical difference in opinion divergence

across the two periods. I therefore conclude that the passage of FIN 48 did not significantly change the relation between target shareholder opinion divergence and takeover premiums.

I re-estimate equation (3) in Panel B. Results are consistent with the full-sample results reported in Table 6. I estimate that *PREMIUM* is positively associated with both CV*_ETR* and *CV_CETR* for the subsample of deals completed after the effective date of FIN 48. In this later period, a one standard deviation increase in *CV_ETR* (*CV_CETR*) corresponds to an estimated 5.9 (6.1) percent increase in premiums, all else equal. In untabulated analysis, I find no statistically significant difference in these relations across the two periods.

In Panel C, I more directly test the effects of FIN 48 by estimating premiums as a function of target FIN 48 balances. The coefficient of 0.6153 in Column (1) represents an approximate 5.1 percent increase in *PREMIUM* given a one standard deviation increase in *T_UTB.* Because FIN 48 balances arise most frequently from transfer pricing, research and development (R&D) tax credits, and general business expenses (Coder 2011), all of which could directly affect premiums, I re-estimate equation (2) after including controls for foreign income, R&D and SG&A expenses. Results presented in Column (2) include these additional controls measured in the year preceding the takeover announcement. In Column (3), I measure these additional controls over the five years prior to the announcement. These results in Columns (2) and (3) demonstrate that *T_UTB* remains positively associated with premiums even after controlling for the underlying economic factors that frequently give rise to FIN 48 balances.

I re-estimate equation (4) in Column (4) and find that *T_UTB* is more positively associated with *PREMIUM* when the acquirer is public. For the average FIN 48 reserve balance, being taken over by a public acquirer corresponds to an estimated 3.1 percent increase in takeover premium. However, at the median, the increase is only 0.52 percent. Results in Table 8 collectively suggest that the recognition and disclosure requirements of FIN 48 do not deter managers from acquiring targets with tax uncertainty.

Chapter 8: Additional Tests for Robustness

8.1 Endogeneity

I estimate all regressions using only completed deals. Therefore, endogeneity limits the generalizability of my results. In additional analysis, I attempt to address this concern by using the Heckman procedure to control for sample selection bias. Specifically, I estimate the probability that a firm becomes a target in a successful takeover using the following probability model adapted from Cremers et al. (2009) and Palepu (1986):

$$Prob\ (TARGET=1) = \beta_0 + \beta_1 * ROA + \beta_2 * PPE + \beta_3 * CASH + \beta_4 * MTB + \beta_5 * LEVERAGE + \beta_6 * LOGMKTCAP + \beta_7 * INDUSTRY \quad (6)$$

Where *TAREGET* is an indicator variable equal to one if a firm is taken over in year *t* and all other variables are defined in Appendix A. I retain the inverse Mills ratio generated by this estimation and use it as a control variable when estimating equations (2) and (3). Results of the first stage selection model are presented in Panel A of Table 9. Results of re-estimating equations (2) and (3) with controls for selection are presented in Panel B. Target shareholder opinion divergence and tax uncertainty remain positively associated with takeover premiums in this analysis.

8.2 Isolating tax uncertainty

Because tax uncertainty is closely related to general business uncertainty, it is possible that my measures of tax uncertainty are simply a proxy for uncertainty related to pre-tax operations. To address this concern, I include controls for pre-tax volatility in all regressions. I provide additional evidence that the effect of tax uncertainty is incremental

to general business uncertainty by developing an alternative measure of tax uncertainty that attempts to purge volatility related to business operations. Specifically, I adapt the GAAP ETR prediction model from Armstrong et al. (2012) and estimate the following regression by two-digit industry year:

$$ETR = \beta_0 + \beta_1 * PT\_ROA + \beta_2 * STD\_PT\_ROA + \beta_3 * LOGMKTCAP + \beta_4 * LEVERAGE + \beta_5 * CHG\_GDWLL + \beta_6 * NEW\_INVESTMENT + \beta_7\ COMPLEXITY + \varepsilon \qquad (7)$$

Results from estimating this regression are presented in Panel A of Table 10. I include pre-tax return on assets (*PT_ROA*) to control for underlying economic activity and *STD_ROA* to control for volatility in pre-tax operations, which can contribute to overall uncertainty. To control for size, I include *LOGMKTCAP*. The firm's debt-to-asset ratio (*LEVERAGE),* changes in goodwill (*CHG_GDWLL),* investments in R&D and capital expenditures (*NEW_INVESTMENT),* and geographic complexity (*COMPLEXITY)* capture various business activities that can enhance business uncertainty. All variables are defined in detail in Appendix A.

I retain the residual from equation (7), which captures the unexplained deviation in the GAAP ETR, and calculate the standard deviation of the residual over the five-years prior to the acquisition announcement. In Panel B, I use this alternative measure, *STD_ERROR*, to estimate the effect of tax uncertainty on premiums. Column (1) includes the full sample with outliers removed and Column (2) includes the subsample of deals with premiums between zero and two. In both columns, I estimate a positive and significant association between *STD_ERROR* and *PREMIUM.* This analysis provides

additional support that the results in earlier tables do not exclusively reflect general business uncertainty.

8.3 Level of tax avoidance

I address the possibility that the level and not the volatility of target ETRs drives my results. In my sample, *CV_ETR (CV_CETR)* is negatively correlated with target five-year GAAP (cash) ETRs. It is therefore possible that acquirers pay higher premiums for targets with low ETRs because they signal greater opportunities for tax avoidance that could reduce the ETRs of the newly combined entity. To address this alternative explanation, I re-estimate equations (2) and (3) controlling for the level of target five-year GAAP and cash ETRs. Although I find a negative relation between both the five-year GAAP and cash ETRs and *PREMIUM*, suggesting that premiums are increasing in target tax avoidance, I continue to find a significant positive association between tax uncertainty and premiums. Therefore, the effect of target tax uncertainty is incremental to the level of target tax avoidance.

8.4 Target financial reporting quality

I develop my primary measures of tax uncertainty from McGuire et al. (2012) who provide evidence that sustainable tax planning (tax uncertainty) is positively (negatively) associated with earnings persistence. Because persistence is an element of earnings quality (Dechow et al. 2010) it is possible that volatile ETRs are a proxy for lower overall earnings quality. Concurrent work examining the effect of target financial reporting quality on takeover premiums (e.g. McNichols and Stubben, 2012; Raman et al., 2012 and Skaife and Wangerin 2012) finds that lower target financial reporting

quality is associated with higher takeover premiums. It is therefore possible that my results reflect poor target financial reporting quality and not uncertainty about tax outcomes.

One explanation for the negative association between target earnings quality and takeover premiums is that low financial reporting quality firms trade at a discount because investors require a higher cost of capital. However, to my knowledge there is no evidence in the literature documenting a negative association between tax uncertainty and stock price. In fact, Koester (2011) finds a positive association between FIN 48 tax reserves and stock price, consistent with these reserves increasing investor uncertainty and not serving as a proxy for operational or information risk.

8.5 Changes in specification

Results reported herein are largely robust to several changes in specification. Results presented in Tables 5 through 8 are estimated on either the full sample using Belsey et al. (1980) to identify and eliminate outliers or on a subsample of observations where *PREMIUM* is in [0,2] (Chatterjee et al., 2012; Officer, 2003). However, inferences from these tables remain largely unchanged if I do not remove outliers. Results are also robust to excluding financial firms (SIC 6000-6999) and utilities (SIC 4500-4599) or to excluding penny stocks.

Inferences also remain qualitatively unchanged if I require the acquirer to own 100 percent of the target's stock subsequent to the completion of the takeover. Measuring tax uncertainty using volatility in annual rather than quarterly ETRs also does not materially change results reported herein. Finally, in untabulated results, I use analyst

coverage as an alternative measure of acquirer financial reporting concerns and find results similar to those presented in Table 7; the relation between target tax uncertainty and premiums is more positive among acquirers in the highest quartile of analyst following.

Chapter 9: Conclusion

This study uses M&A to investigate the association between target tax uncertainty and takeover premiums. I predict that tax uncertainty indirectly leads to higher takeover premiums by creating divergent opinions among target shareholders (Chatterjee et al., 2012; Miller, 1977). I begin by documenting that tax uncertainty is associated with increased target shareholder opinion divergence and that this opinion divergence is positively associated with takeover premiums. Using public company takeovers completed between 2002 and 2011, I estimate a one standard deviation increase in opinion divergence is associated with a greater than two percent increase in premiums, all else equal.

I also test whether target tax uncertainty directly affects takeover premiums. Shackelford et al. (2011) illustrate how tax uncertainty interacts with accounting rules to provide managers with valuable financial reporting flexibility. Consistent with this theory, I find a positive association between target tax uncertainty and takeover premiums. Further, using cross-sectional variation in acquirer financial reporting concerns, I find that the association is more positive when acquirer financial reporting concerns are greater. Public acquirers pay premiums that are approximately three percent higher for the same level of target tax uncertainty.

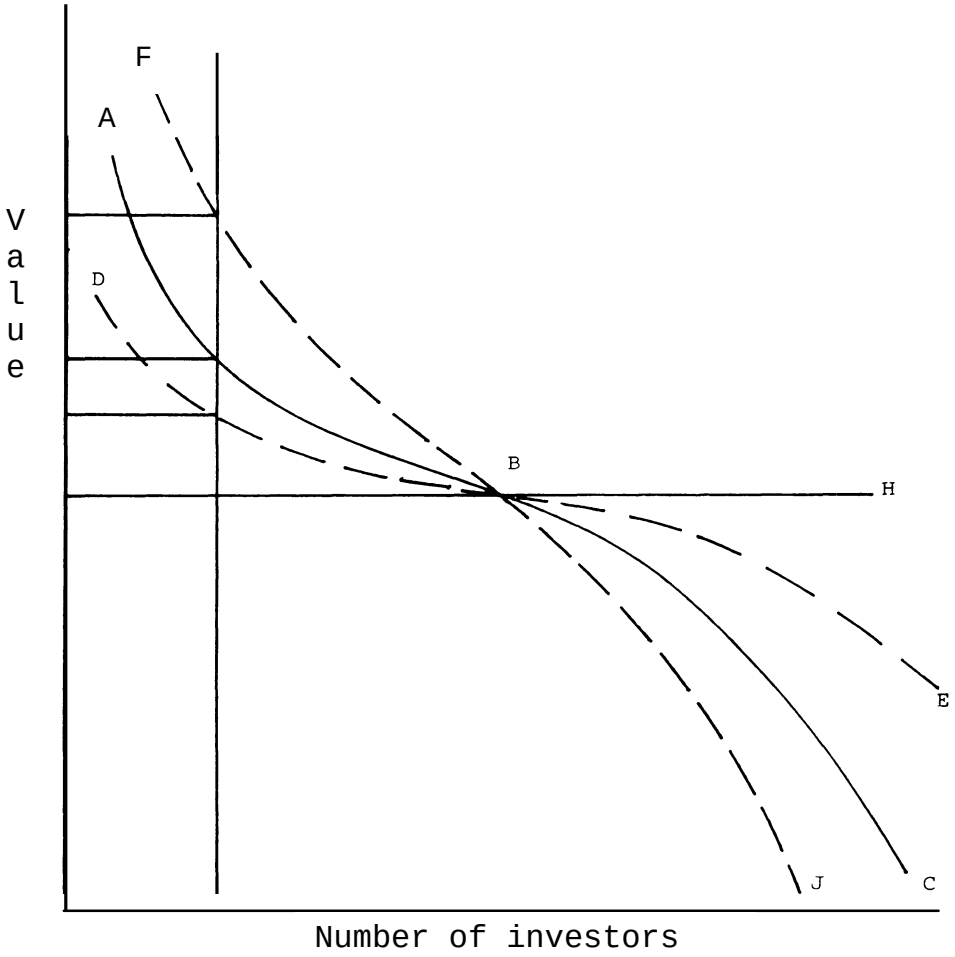
I also analyze whether newly required measurement and disclosure of uncertain tax positions, required by FIN 48, alter the relation between tax uncertainty and takeover premiums. Using a subsample of deals completed after the effective date of FIN 48, I find results consistent with the entire sample period. Thus it appears that the rule's recognition

and disclosure requirements do not reduce shareholder opinion divergence or deter managers from acquiring targets with tax uncertainty.

This study offers new insights into the effects of tax uncertainty on M&A, which should be of interest to shareholders when identifying factors that influence takeover premiums. My results also provide some of the first empirical evidence in support of the reporting flexibility theory developed in Shackelford et al. (2011) by documenting how financial reporting considerations influence managers' investment decisions around tax uncertainty. Finally, my study exploits M&A as a powerful setting to examine how tax uncertainty impacts firm value. My findings should be useful in enhancing stakeholders' understanding of how both shareholders and managers perceive tax uncertainty and its implications for firm value.

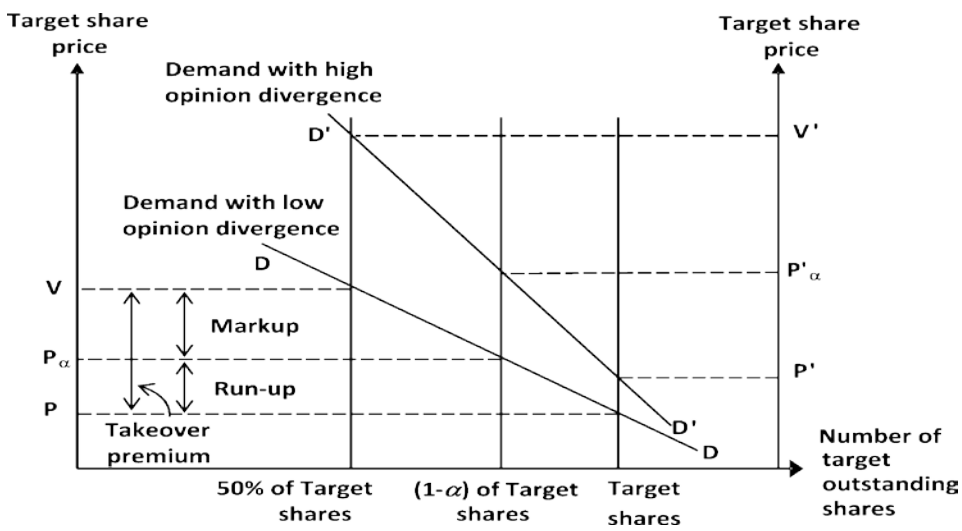
Figures

Figure 1: The effect of divergence of opinion on market clearing prices



This figure is extracted from Miller (1977). Estimates of firm value are on the vertical axis and the number of potential investors is on the horizontal axis. Curve ABC is the baseline demand curve for the security. The supply curve is the vertical line representing the number of shares available. The price is the intersection of these two lines. Curve FBJ depicts the demand for the security given an increase in divergence of opinion whereas Curve DBE represents demand given a decrease in divergence of opinion relative to ABC. When all potential investors agree about future cash flows, horizontal line H represents demand.

Figure 2: The effect of divergence of opinion of takeover premiums



This figure is extracted from Chatterjee et al. (2012). It depicts the takeover premium required for an acquirer to purchase a target firm given different levels of opinion divergence among target shareholders about the target's value. The vertical axis represents the target's share price and the horizontal axis is the number of target shares outstanding. The bidder's toehold is represented by α. Line D represents the demand curve for target shares when divergence of opinion is low. V is the takeover price and V-P is the takeover premium. Line D' is a steeper demand curve for target shares when divergence of opinion among target shareholders is higher relative to D. V' is the takeover price and V'-P' is the takeover premium. Premiums are increasing in divergence of opinion (V'-P'>V-P).

Tables

Table 1: Sample composition
Panel A: Sample selection

Mergers from SDC	3,405
Less:	
Observations with no target match in Compustat	(808)
Observations with no target match in CRSP	(496)
Observations with data missing to calculate required variables	(193)
Final Sample	**1,908**

The sample starts with mergers and acquisitions of public US targets by US public and non-public acquirers announced and completed between January 1, 2002 and December 31, 2011. All deals have non-missing acquisition values. All acquirers own less than 50 percent of the target prior to acquisition and greater than 80 percent of the target upon deal completion.

Panel B: Distribution of target firms by industry

SIC	Number	Percent
SIC 0000 Agriculture, forestry, fishing	4	0.2%
SIC 1000 Metal and mining	76	4.0%
SIC 2000 Food, textile, and chemicals	218	11.4%
SIC 3000 Rubber, metal, and machines	407	21.3%
SIC 4000 Transportation and utilities	121	6.3%
SIC 5000 Wholesale and retail trade	139	7.3%
SIC 6000 Financial services	351	18.4%
SIC 7000 Hotel and other services	363	19.0%
SIC 8000 Health and engineering services	82	4.3%
OTHER	147	7.7%
Total	**1,908**	**100%**

Panel C: Frequency of selected deal characteristics

Characteristic	Number	Percent
Competing Bid	95	5.0%
Hostile Attitude	9	0.5%
Tender Offer	334	17.5%

Table 2: Descriptive statistics
Panel A: Full sample

		MEAN	STD	P25	P50	P75
Divergence Measures						
STD_IBES_PTI	903	0.3760	0.8750	0.0508	0.1136	0.3050
STD_IBES_ETR	903	0.2885	0.5158	0.0198	0.0654	0.3099
Uncertainty Measures						
STD_ROA	1,906	0.0800	0.1170	0.0196	0.0439	0.0899
CV_ETR	1,816	0.7680	0.9038	0.1053	0.4432	1.0718
CV_CETR	1,512	1.2032	0.7455	0.6644	1.0271	1.5681
T_UTB	564	0.0258	0.0833	0.0000	0.0034	0.0149
Deal Characteristics *(N=1,908)*						
VALUE		1,729.3	5,290.6	103.290	338	1,271.2
PREMIUM		0.6145	0.8213	0.2240	0.4139	0.6986
TAXABLE		0.8370	0.3695	1.0000	1.0000	1.0000
COMPETE		0.0498	0.2176	0.0000	0.0000	0.0000
TENDER		0.1751	0.3801	0.0000	0.0000	0.0000
TOEHOLD		0.0100	0.0560	0.0000	0.0000	0.0000
Target Characteristics *(N=1,908)*						
T_LIQ		2.2431	4.9715	0.3001	0.5900	1.7988
T_BTM		0.7470	0.7956	0.3453	0.5457	0.8634
T_ROE		-0.1737	0.8625	-0.0315	0.0351	0.0636
T_MKTCAP		5.4713	1.8219	4.1758	5.4111	6.7442
T_LEV		0.6198	1.4320	0.0001	0.1377	0.6080
PENNY		0.0498	0.2176	0.0000	0.0000	0.0000

STD_IBES_PTI is the standard deviation of IBES analysts' one-year-ahead pre-tax income forecasts scaled by the absolute value of the average one-year-ahead pre-tax income forecast. *STD_IBES_ETR* is the standard deviation of IBES analysts' one-year-ahead GAAP ETR forecasts scaled by the absolute value of the average one-year-ahead GAAP ETR forecast. The GAAP ETR forecast is the difference between forecasted pre-tax income and forecasted net income, scaled by forecasted pre-tax income. *STD_ROA* is the five-year standard deviation of year-to-date return on assets from year *t-4* through year *t*, divided by the average year-to-date return on assets. *CV_ETR* is the five-year standard deviation of the year-to-date GAAP ETR from year *t-4* through year *t*, scaled by the absolute value of the average year-to-date GAAP ETR. If year-to-date GAAP ETR is less than zero (greater than one), I reset it to zero (one). *CV_CETR* is calculated in the same manner as *CV_ETR* but I replace year-to-date GAAP ETR with cash ETR. *T_UTB* is the target FIN 48 tax reserve as of the fiscal year ending immediately prior to the announcement, scaled by target market value 28 trading days prior to the merger announcement. *VALUE* is total deal value ($M). *PREMIUM* is the difference between *VALUE* and the target's market value 28 trading days prior to the takeover announcement, scaled by the targets' market value 28 days prior to announcement. *TAXABLE* is an indicator variable equal to one if less than 80 percent of total consideration is paid in stock and zero otherwise. *COMPETE* is an indicator variable equal to one if there was a competing bid for the target and zero otherwise. *TENDER* is an indicator variable equal to one if the takeover was initiated with a tender offer and zero otherwise. *TOEHOLD* is a continuous variable representing the percentage ownership of the bidder in the target prior to the takeover announcement. All of the following controls for target characteristics are scaled by target market value 28 trading days prior to announcement: *T_LIQ* is target liquidity as of the fiscal year ending immediately prior to announcement (*T_MKTCAP): T_BTM* is target book value of equity 28 trading days prior to announcement; *T_ROE* is target income for the fiscal year ending immediately prior to the announcement; *T_LEV* is target total long-term debt as of the end of the fiscal year immediately prior to announcement. *PENNY* is an indicator variable equal to one if target stock price is less than one dollar 28 days prior to the announcement.

Table 2 (cont'd): Descriptive statistics
Panel B: By acquirer status

	Public (N=1,480)		Non-Public (N=490)		Difference	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**
Divergence Measures						
STD_IBES_PTI	0.3749	0.1140	0.3806	0.1112	-0.0057	0.0028
STD_IBES_ETR	0.4201	0.1325	0.4028	0.1253	0.0172	0.0071
Uncertainty Measures						
STD_ROA	0.0834	0.0448	0.0702	0.0421	0.0132 **	0.0027
CV_ETR	0.7770	0.4328	0.7427	0.4758	0.0343	-0.0429
CV_CETR	1.1713	0.9778	1.2832	1.1257	-0.1120 ***	-0.1479 ***
T_UTB	0.0210	0.0035	0.0381	0.0032	-0.0171 *	0.0003
Deal Characteristics						
VALUE	1,965.1	418.56	1,046.8	175.52	918.30 ***	243.04 ***
PREMIUM	0.5904	0.4278	0.6842	0.3697	-0.0939 *	0.0581 ***
TAXABLE	0.7821	1.0000	0.9959	1.0000	-0.2138 ***	0.0000 ***
COMPETE	0.0346	0.0000	0.0939	0.0000	-0.0593 ***	0.0000 ***
TENDER	0.1869	0.0000	0.1408	0.0000	0.0461 **	0.0000 **
TOEHOLD	0.0056	0.0000	0.0226	0.0000	-0.0170 ***	0.0000 ***
Target Characteristics						
T_LIQ	2.1170	0.5682	2.6081	0.6439	-0.4911	-0.0757
T_BTM	0.6631	0.5133	0.9901	0.6882	-0.3271 ***	-0.1749 ***
T_ROE	-0.0943	0.0352	-0.4037	0.0349	0.3094 ***	0.0002
T_MKTCAP	5.6909	5.6288	4.8359	4.7385	0.8551 ***	0.8904 ***
T_LEV	0.5037	0.1299	0.9558	0.1568	-0.4521 ***	-0.0269 *

PUBLIC is an indicator variable equal to one if the acquirer is publicly traded. *STD_IBES_PTI* is the standard deviation of IBES analysts' one-year-ahead pre-tax income forecasts scaled by the absolute value of the average one-year-ahead pre-tax income forecast. *STD_IBES_ETR* is the standard deviation of IBES analysts' one-year-ahead GAAP ETR forecasts scaled by the absolute value of the average one-year-ahead GAAP ETR forecast. The GAAP ETR forecast is the difference between forecasted pre-tax income and forecasted net income, scaled by forecasted pre-tax income. *STD_ROA* is the five-year standard deviation of year-to-date return on assets from year *t-4* through year *t*, divided by the average year-to-date return on assets. *CV_ETR* is the five-year standard deviation of the year-to-date GAAP ETR from year *t-4* through year *t*, scaled by the absolute value of the average year-to-date GAAP ETR. If year-to-date GAAP ETR is less than zero (greater than one), I reset it to zero (one). *CV_CETR* is calculated in the same manner as *CV_ETR* but I replace year-to-date GAAP ETR with cash ETR. *T_UTB* is the target FIN 48 tax reserve as of the fiscal year ending immediately prior to the announcement, scaled by target market value 28 trading days prior to the merger announcement. *VALUE* is total deal value ($M). *PREMIUM* is the difference between *VALUE* and the target's market value 28 trading days prior to the takeover announcement, scaled by the targets' market value 28 days prior to announcement. *TAXABLE* is an indicator variable equal to one if less than 80 percent of total consideration is paid in stock and zero otherwise. *COMPETE* is an indicator variable equal to one if there was a competing bid for the target and zero otherwise. *TENDER* is an indicator variable equal to one if the takeover was initiated with a tender offer and zero otherwise. *TOEHOLD* is a continuous variable representing the percentage ownership of the bidder in the target prior to the takeover announcement. All of the following controls for target characteristics are scaled by target market value 28 trading days prior to announcement (*T_MKTCAP)*: *T_LIQ* is target liquidity as of the fiscal year ending immediately prior to announcement; *T_BTM* is target book value of equity 28 trading days prior to announcement; *T_ROE* is target income for the fiscal year ending immediately prior to the announcement; *T_LEV* is target total long-term debt as of the end of the fiscal year immediately prior to announcement. *, ** and *** represent one-tailed significance at the 10 percent, 5 percent or 1 percent, respectively.

Table 2 (cont'd): Descriptive statistics
Panel C: By acquirer financial reporting concerns

	FINRPT=1 (N=295)		FINRPT=0 (N=294)		Difference	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**
Divergence Measures						
STD_IBES_PTI	0.4215	0.1262	0.3800	0.1316	0.0415	-0.0054
STD_IBES_ETR	0.4201	0.1325	0.4028	0.1253	0.0172	0.0071
Uncertainty Measures						
STD_ROA	0.0922	0.0478	0.0721	0.0453	0.0201 *	0.0025
CV_ETR	0.8335	0.5208	0.7114	0.4188	0.1221 *	0.1021
CV_CETR	1.2039	1.0084	1.1778	1.0114	0.0261	-0.0030
T_UTB	0.0163	0.0050	0.0182	0.0023	-0.0019	0.0027 **
Deal Characteristics						
VALUE	1,743.7	461.59	1,630.7	427.06	113.03	34.530
PREMIUM	0.5917	0.4240	0.7776	0.4894	-0.1860 **	-0.0654
TAXABLE	0.8203	1.0000	0.7823	1.0000	0.0380	0.0000
COMPETE	0.0576	0.0000	0.0340	0.0000	0.0236	0.0000
TENDER	0.2136	0.0000	0.1531	0.0000	0.0605 *	0.0000 *
TOEHOLD	0.0030	0.0000	0.0022	0.0000	0.0008	0.0000
Target Characteristics						
T_LIQ	1.2651	0.4570	2.4646	0.5194	-1.1995 ***	-0.0624 **
T_BTM	0.5505	0.4287	0.7688	0.5421	-0.2183 ***	-0.1134 ***
T_ROE	-0.1047	0.0323	-0.1132	0.0361	0.0085	-0.0038
T_MKTCAP	5.7645	5.7482	5.5727	5.6207	0.1917	0.1275
T_LEV	0.3261	0.0603	0.7072	0.2105	-0.3810 ***	-0.1502 ***

FINRPT is an indicator variable equal to one if the acquirer has above-median financial reporting concerns measured using principal component analysis from Carter et al. (2007) to synthesize observable variables that capture equity market reporting pressures. *STD_IBES_PTI* is the standard deviation of IBES analysts' one-year-ahead pre-tax income forecasts scaled by the absolute value of the average one-year-ahead pre-tax income forecast. *STD_IBES_ETR* is the standard deviation of IBES analysts' one-year-ahead GAAP ETR forecasts scaled by the absolute value of the average one-year-ahead GAAP ETR forecast. The GAAP ETR forecast is the difference between forecasted pre-tax income and forecasted net income, scaled by forecasted pre-tax income. *STD_ROA* is the five-year standard deviation of year-to-date return on assets from year *t-4* through year *t*, divided by the average year-to-date return on assets. *CV_ETR* is the five-year standard deviation of the year-to-date GAAP ETR from year *t-4* through year *t*, scaled by the absolute value of the average year-to-date GAAP ETR. If year-to-date GAAP ETR is less than zero (greater than one), I reset it to zero (one). *CV_CETR* is calculated in the same manner as *CV_ETR* but I replace year-to-date GAAP ETR with cash ETR. *T_UTB* is the target FIN 48 tax reserve as of the fiscal year ending immediately prior to the announcement, scaled by target market value 28 trading days prior to the merger announcement. *VALUE* is total deal value ($M). *PREMIUM* is the difference between *VALUE* and the target's market value 28 trading days prior to the takeover announcement, scaled by the targets' market value 28 days prior to announcement. *TAXABLE* is an indicator variable equal to one if less than 80 percent of total consideration is paid in stock and zero otherwise. *COMPETE* is an indicator variable equal to one if there was a competing bid for the target and zero otherwise. *TENDER* is an indicator variable equal to one if the takeover was initiated with a tender offer and zero otherwise. *TOEHOLD* is a continuous variable representing the percentage ownership of the bidder in the target prior to the takeover announcement. All of the following controls for target characteristics are scaled by target market value 28 trading days prior to announcement (*T_MKTCAP)*: *T_LIQ* is target liquidity as of the fiscal year ending immediately prior to announcement; *T_BTM* is target book value of equity 28 trading days prior to announcement; *T_ROE* is target income for the fiscal year ending immediately prior to the announcement; *T_LEV* is target total long-term debt as of the end of the fiscal year immediately prior to announcement. *, ** and *** represent one-tailed significance at the 10 percent, 5 percent or 1 percent, respectively.

Table 3: Variable correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) PREMIUM	1	**0.133**	**0.108**	0.057	**0.067**	**0.127**	**0.169**	**0.102**	0.007	0.022	**-0.102**	**0.236**	**0.324**	**-0.338**	**-0.243**	**0.337**	**0.239**
(2) STD_IBES_PTI	**0.142**	1	**0.229**	0.042	**0.227**	**0.200**	**0.091**	-0.037	0.025	-0.003	-0.001	**0.099**	**0.120**	**-0.076**	**-0.193**	**0.122**	0.037
(3) STD_IBES_ETR	**0.127**	**0.631**	1	**0.307**	**0.581**	**0.416**	**0.233**	-0.013	-0.010	**0.066**	0.045	0.035	0.039	**-0.237**	**-0.203**	0.022	**0.113**
(4) STD_ROA	**0.108**	**0.244**	**0.317**	1	**0.426**	**0.266**	**0.112**	-0.016	0.028	**0.131**	0.019	**-0.143**	**-0.053**	**-0.224**	**-0.135**	**-0.141**	0.186
(5) CV_ETR	**0.142**	**0.410**	**0.518**	**0.479**	1	**0.625**	**0.117**	0.021	0.013	**0.123**	**0.068**	**-0.113**	-0.004	**-0.122**	**-0.166**	**-0.052**	**0.182**
(6) CV_CETR	**0.127**	**0.405**	**0.349**	**0.371**	**0.648**	1	**0.109**	0.018	**0.044**	**0.060**	**0.078**	**-0.046**	**0.077**	**-0.172**	**-0.220**	**0.072**	**0.188**
(7) T_UTB	0.067	**0.024**	0.072	0.046	**0.089**	**0.101**	1	-0.004	0.032	**-0.086**	-0.025	0.041	0.008	**-0.235**	**-0.124**	**0.129**	**0.128**
(8) TAXABLE	**0.149**	0.016	-0.027	**0.106**	0.033	0.024	**0.075**	1	**0.055**	**0.170**	0.028	**-0.111**	-0.030	-0.027	-0.047	-0.005	0.016
(9) COMPETE	-0.020	0.049	0.014	0.026	0.034	**0.047**	0.015	**0.055**	1	**0.040**	0.033	**-0.053**	0.008	0.015	0.031	-0.019	-0.019
(10) TENDER	**0.078**	0.045	**0.070**	**0.215**	**0.136**	**0.067**	0.023	**0.170**	**0.040**	1	**0.047**	**-0.118**	-0.044	-0.009	-0.027	**-0.082**	0.034
(11) TOEHOLD	**-0.119**	0.036	0.015	**0.038**	**0.056**	**0.071**	-0.021	**0.047**	**0.061**	**0.065**	1	0.015	0.100	-0.063	-0.062	0.099	0.062
(12) T_LIQ	**0.085**	**0.162**	0.016	**-0.374**	**-0.143**	-0.019	0.034	**-0.144**	**-0.047**	**-0.114**	0.017	1	**0.497**	**-0.433**	**-0.308**	**0.644**	**0.253**
(13) T_BTM	**0.102**	**0.160**	-0.004	**-0.236**	**-0.060**	0.041	**-0.092**	**-0.044**	-0.009	**-0.071**	**0.089**	**0.565**	1	**-0.404**	**-0.446**	**0.397**	**0.376**
(14) T_ROE	**-0.111**	**-0.428**	**-0.449**	**-0.343**	**-0.414**	**-0.405**	**0.080**	-0.010	-0.026	**-0.086**	-0.014	0.008	-0.033	1	**0.372**	**-0.397**	**-0.598**
(15) T_MKTCAP	**-0.163**	**-0.322**	**-0.193**	**-0.085**	**-0.179**	**-0.240**	**0.219**	-0.024	0.028	-0.020	**-0.071**	**-0.500**	**-0.437**	**0.276**	1	**-0.181**	**-0.385**
(16) T_LEV	**0.090**	**-0.063**	**-0.111**	**-0.482**	**-0.167**	**-0.065**	-0.004	**-0.102**	-0.025	**-0.153**	0.034	**0.315**	**0.193**	**0.131**	0.011	1	**0.225**
(17) PENNY	**0.111**	**0.070**	**0.065**	**0.199**	**0.195**	**0.189**	-0.053	0.016	-0.019	0.034	**0.051**	**0.214**	**0.168**	**-0.291**	**-0.337**	**0.042**	1

Pearson (Spearman) correlations above (below) the diagonal. Correlations with a two-tailed p-value of less than or equal to 10 percent are bold. *PREMIUM* is the difference between deal value and the target's market value 28 trading days prior to announcement, scaled by the target's market value 28 days prior to announcement. *STD_IBES_PTI* is the standard deviation of IBES analysts' one-year-ahead pre-tax income forecasts scaled by the absolute value of the average one-year-ahead pre-tax income forecast. *STD_IBES_ETR* is the standard deviation of IBES analysts' one-year-ahead GAAP ETR forecasts scaled by the absolute value of the average one-year-ahead GAAP ETR forecast. The GAAP ETR forecast is the difference between forecasted pre-tax income and forecasted net income, scaled by forecasted pre-tax income. *STD_ROA* is the five-year standard deviation of year-to-date return on assets from year *t-4* through year *t*, divided by the average year-to-date return on assets. *CV_ETR* is the five-year standard deviation of the year-to-date GAAP ETR from year *t-4* through year *t*, scaled by the absolute value of the average year-to-date GAAP ETR. If year-to-date GAAP ETR is less than zero (greater than one), I reset it to zero (one). *CV_CETR* is calculated in the same manner as *CV_ETR* but I replace year-to-date GAAP ETR with cash ETR. *T_UTB* is the target FIN 48 tax reserve as of the fiscal year ending immediately prior to the announcement, scaled by target market value 28 trading days prior to the merger announcement. *VALUE* is total deal value ($M). *PREMIUM* is the difference between *VALUE* and the target's market value 28 trading days prior to the takeover announcement, scaled by the targets' market value 28 days prior to announcement. *TAXABLE* is an indicator variable equal to one if less than 80 percent of total consideration is paid in stock and zero otherwise. *COMPETE* is an indicator variable equal to one if there was a competing bid for the target and zero otherwise. *TENDER* is an indicator variable equal to one if the takeover was initiated with a tender offer and zero otherwise. *TOEHOLD* is a continuous variable representing the percentage ownership of the bidder in the target prior to the takeover announcement. All of the following controls for target characteristics are scaled by target market value 28 trading days prior to announcement (*T_MKTCAP)*: *T_LIQ* is target liquidity as of the fiscal year ending immediately prior to announcement; *T_BTM* is target book value of equity 28 trading days prior to announcement; *T_ROE* is target income for the fiscal year ending immediately prior to the announcement; *T_LEV* is target total long-term debt as of the end of the fiscal year immediately prior to announcement. *PENNY* is an indicator variable equal to one if target stock price is less than one dollar 28 days prior to the announcement.

Table 4: Uncertainty and divergence of opinion
Panel A: Full sample

$$STD\_IBES\_ETR = \beta_0 + \beta_1 * TAX\_UNCERTAIN + \beta_2 * STD\_IBES\_PTI + \beta_3 STD\_ROA + \beta_4 * T\_MKTCAP + \beta_5 * T\_ROE + YearFE$$

VARIABLES		(1)	(2)	(3)	(4)
CV_ETR	+		0.2574 ***		0.1595 ***
			(0.014)		(0.017)
CV_CETR	+			0.1571 ***	0.0655 ***
				(0.015)	(0.017)
STD_IBES_PTI	+	0.1099 ***	0.0781 ***	0.0911 ***	0.0816 ***
		(0.018)	(0.013)	(0.011)	(0.011)
STD_ROA	+	1.1745 ***	-0.1674 ***	0.2561 ***	-0.1003 ***
		(0.140)	(0.125)	(0.113)	(0.113)
T_MKTCAP	-	-0.0267 **	-0.0012	0.0014	0.0039
		(0.011)	(0.008)	(0.007)	(0.007)
T_ROE	-	-0.2690 ***	-0.2626 ***	-0.2518 ***	-0.2596 ***
		(0.048)	(0.032)	(0.028)	(0.027)
Observations		903	855	765	762
Adj. R^2		17.9%	41.9%	33.3%	41.0%

STD_IBES_ETR is the standard deviation of IBES analysts' one-year-ahead GAAP ETR forecasts scaled by the absolute value of the average one-year-ahead GAAP ETR forecast. The GAAP ETR forecast is the difference between forecasted pre-tax income and forecasted net income, scaled by forecasted pre-tax income. *STD_ROA* is the five-year standard deviation of year-to-date return on assets from year *t-4* through year *t*, divided by the average year-to-date return on assets. *CV_ETR* is the five-year standard deviation of the year-to-date GAAP ETR from year *t-4* through year *t*, scaled by the absolute value of the average year-to-date GAAP ETR. If year-to-date GAAP ETR is less than zero (greater than one), I reset it to zero (one). *CV_CETR* is calculated in the same manner as *CV_ETR* but I replace year-to-date GAAP ETR with cash ETR. All other variables are defined in Appendix A. Coefficients on the intercepts are omitted for parsimony *, ** and *** denote two-tailed significance at 10 percent, 5 percent and 1 percent respectively.

Table 4 (cont'd): Uncertainty and divergence of opinion
Panel B: Post FIN 48 sample

$$STD\_IBES\_ETR = \beta_0 + \beta_1 * TAX\_UNCERTAIN + \beta_2 * STD\_IBES\_PTI + \beta_3 STD\_ROA + \beta_4 * T\_MKTCAP + \beta_5 * T\_ROE + YearFE$$

VARIABLES		(1)		(2)		(3)		(4)	
CV_ETR	+							0.1326	***
								(0.028)	
CV_CETR	+					0.1616	***	0.0746	**
						(0.024)		(0.030)	
T_UTB	+			1.366	***	0.2923		0.2996	
				(0.502)		(0.409)		(0.393)	
STD_IBES_PTI	+	0.1031	***	0.0918	***	0.0904	***	0.0868	***
		(0.028)		(0.028)		(0.016)		(0.016)	
STD_ROA	+	0.9488	***	0.9133	***	0.1278		-0.1603	
		(0.342)		(0.341)		(0.225)	***	(0.224)	***
T_MKTCAP	-	-0.0473	**	-0.0449	**	-0.0034		-0.0022	
		(0.019)		(0.019)		(0.011)		(0.011)	
T_ROE	-	-0.1905	***	-0.1607	***	-0.2306	***	-0.2368	***
		(0.054)		(0.055)		(0.031)		(0.030)	
Observations		318		318		278		278	
Adj. R^2		15.4%		16.1%		39.1%		43.7%	

STD_IBES_ETR is the standard deviation of IBES analysts' one-year-ahead GAAP ETR forecasts scaled by the absolute value of the average one-year-ahead GAAP ETR forecast. The GAAP ETR forecast is the difference between forecasted pre-tax income and forecasted net income, scaled by forecasted pre-tax income. *STD_ROA* is the five-year standard deviation of year-to-date return on assets from year *t-4* through year *t*, divided by the average year-to-date return on assets. *CV_ETR* is the five-year standard deviation of the year-to-date GAAP ETR from year *t-4* through year *t*, scaled by the absolute value of the average year-to-date GAAP ETR. If year-to-date GAAP ETR is less than zero (greater than one), I reset it to zero (one). *CV_CETR* is calculated in the same manner as *CV_ETR* but I replace year-to-date GAAP ETR with cash ETR. *T_UTB* is the target FIN 48 tax reserve as of the fiscal year ending immediately prior to the announcement, scaled by target market value 28 trading days prior to the merger announcement. All other variables are defined in Appendix A. Coefficients on the intercepts are omitted for parsimony *, ** and *** denote two-tailed significance at 10 percent, 5 percent and 1 percent respectively.

Table 5: Takeover premiums as a function of opinion divergence

$$PREMIUM = \beta_0 + \beta_1 * DIVERGENCE + Controls + YearFE + \varepsilon$$

		(1)		(2)	
Variables of Interest					
STD_IBES_ETR	+	0.0364	*	0.0494	**
		(0.023)		(0.025)	
STD_IBES_PTI	+	0.0136		0.0409	***
		(0.013)		(0.015)	
Deal Characteristics					
TAXABLE	+	0.0773	***	0.0518	*
		(0.030)		(0.033)	
COMPETE	+	0.0194		0.0101	
		(0.051)		(0.053)	
TENDER	+	0.0692	***	0.0235	
		(0.028)		(0.029)	
TOEHOLD	-	-1.6928	***	-0.7679	**
		(0.220)		(0.337)	
Target Characteristics					
STD_ROA	?	0.1919	**	0.1827	**
		(0.102)		(0.108)	
T_LIQ	?	-0.0275	***	-0.0081	*
		(0.006)		(0.006)	
T_BTM	+	0.1373	***	0.0639	**
		(0.028)		(0.028)	
T_ROE	-	-0.3641	***	-0.0535	
		(0.060)		(0.067)	
T_MKTCAP	-	-0.0039		-0.0137	*
		(0.008)		(0.009)	
T_LEV	?	0.0396	**	0.0172	
		(0.018)		(0.015)	
PENNY	-	-0.0339		-0.1163	
		(0.161)		(0.168)	
Observations		862		837	
R-squared		18.2%		7.2%	

Table 5 presents results from estimating takeover premiums as a function of target shareholder divergence of opinion. *PREMIUM* is the difference between deal value and the target's market value 28 trading days prior to announcement, scaled by the target's market value 28 days prior to announcement. *STD_IBES_ETR* is the standard deviation of IBES analysts' one-year-ahead GAAP ETR forecasts scaled by the absolute value of the average one-year-ahead GAAP ETR forecast. The GAAP ETR forecast is the difference between forecasted pre-tax income and forecasted net income, scaled by forecasted pre-tax income. *STD_IBES_PTI* is the standard deviation of IBES analysts' one-year-ahead pre-tax income forecasts scaled by the absolute value of the average one-year-ahead pre-tax income forecast.. All control variables are defined in Appendix A. Outliers were removed from Column (1) based on studentized residuals. Column (2) includes deals where *PREMIUM* is in [0, 2]. Coefficients on the intercept and year fixed effects are omitted for parsimony. Standard errors are in parenthesis. *, **, and *** denote significance at 10 percent, 5 percent and 1 percent, respectively, using a two-tailed test where no sign is predicted.

Table 6: Takeover premiums as a function of tax uncertainty

$$PREMIUM = \beta_0 + \beta_1 * TAX\_UNCERTAIN + Controls + YearFE + \varepsilon$$

TAX_UNCERTAIN=		CV_ETR				CV_CETR			
		(1)		(2)		(3)		(4)	
Variables of Interest									
TAX_UNCERTAIN	+	0.0292	***	0.0412	***	0.0254	**	0.0284	**
		(0.011)		(0.011)		(0.014)		(0.014)	
Deal Characteristics									
TAXABLE	+	0.1328	***	0.0741	***	0.1257	***	0.0923	***
		(0.024)		(0.025)		(0.028)		(0.028)	
COMPETE	+	-0.0273		-0.0215		-0.0395		-0.0319	
		(0.040)		(0.040)		(0.041)		(0.041)	
TENDER	+	0.0291		-0.0014		-0.0130		-0.0400	*
		(0.024)		(0.024)		(0.026)		(0.025)	
TOEHOLD	-	-1.3802	***	-0.5195	**	-1.3894	***	-0.5506	***
		(0.162)		(0.228)		(0.170)		(0.234)	
Target Characteristics									
STD_ROA	?	-0.0561		0.1814	**	0.0795		0.2375	**
		(0.102)		(0.107)		(0.111)		(0.115)	
T_LIQ	?	-0.0136	***	-0.0030		-0.0146	***	-0.0027	
		(0.003)		(0.003)		(0.003)		(0.003)	
T_BTM	+	0.0906	***	0.0759	***	0.0662	***	0.0543	***
		(0.017)		(0.017)		(0.019)		(0.019)	
T_ROE	-	-0.1232	***	-0.0571	***	-0.1161	***	-0.0521	***
		(0.018)		(0.018)		(0.019)		(0.019)	
T_MKTCAP	-	-0.0128	**	-0.0148	***	-0.0176	***	-0.0184	***
		(0.006)		(0.006)		(0.006)		(0.006)	
T_LEV	?	0.0354	***	0.0107		0.0469	***	0.0164	*
		(0.010)		(0.010)		(0.011)		(0.011)	
PENNY	-	-0.1014	*	-0.1181	**	-0.0275		-0.0892	
		(0.064)		(0.067)		(0.073)		(0.074)	
Observations		1,709		1,625		1,426		1,364	
R-squared		13.6%		8.7%		15.7%		9.9%	

Table 6 presents results from estimating takeover premiums as a function of target tax uncertainty. *PREMIUM* is the difference between deal value and the target's market value 28 trading days prior to announcement, scaled by the target's market value 28 days prior to announcement. *CV_ETR* is the five-year standard deviation of the year-to-date GAAP ETR from year *t-4* through year *t*, scaled by the absolute value of the average year-to-date GAAP ETR. If year-to-date GAAP ETR is less than zero (greater than one), I reset it to zero (one). *CV_CETR* is calculated in the same manner as *CV_ETR* but I replace year-to-date GAAP ETR with cash ETR. All control variables are defined in Appendix A. Columns (1) and (3) include the full sample. Columns (2) and (4) include the subset of deals where the *PREMIUM* is in [0, 2]. Coefficients on the intercept and year fixed effects are omitted for parsimony. Standard errors are in parenthesis. *, **, and *** denote significance at 10 percent, 5 percent and 1 percent, respectively, using a two-tailed test where no sign is predicted.

Table 7: Acquirer financial reporting concerns
Panel A: Public versus private acquirers

$$PREMIUM = \beta_0 + \beta_1 * TAX\_UNCERTAIN + \beta_2 * PUBLIC + \beta_3 * PUBLIC * TAX\_UNCERTAIN + Controls + YearFE + \varepsilon$$

TAX_UNCERTAIN =		CV_ETR				CV_CETR			
		PUBLIC=0	PUBLIC=1		All	PUBLIC=0	PUBLIC=1		All
		(1)	(2)		(3)	(4)	(5)		(6)
Variables of interest									
TAX_UNCERTAIN	+	-0.0135	0.0472	***	-0.0135	0.0022	0.0479	***	0.0022
		(0.019)	(0.010)		(0.019)	(0.022)	(0.014)		(0.023)
PUBLIC	+				0.1078				0.2693
					(0.248)				(0.339)
PUBLIC*TAX_UNCERTAIN	+				0.0607				0.0458	**
					(0.022)				(0.027)
Observations		408	1,236		1,644	379	992		1,371
R-squared		31.3%	16.8%		21.3%	25.9%	15.5%		19.5%

PUBLIC is an indicator variable equal to one if the acquirer is publicly traded. *PUBLIC* is interacted with all control variables to account for potential differences in the way target characteristics influence takeover premiums for publicly traded firms. *PREMIUM* is the difference between deal value and the target's market value 28 trading days prior to announcement, scaled by the target's market value 28 days prior to announcement. *CV_ETR* is the five-year standard deviation of the year-to-date GAAP ETR from year *t-4* through year *t*, scaled by the absolute value of the average year-to-date GAAP ETR. If year-to-date GAAP ETR is less than zero (greater than one), I reset it to zero (one). *CV_CETR* is calculated in the same manner as *CV_ETR* but I replace year-to-date GAAP ETR with cash ETR. Outliers were removed from each sample based on studentized residuals. Coefficients on the intercept, control variables (from Table 5) and year fixed effects are omitted for parsimony. Standard errors are in parenthesis. *, **, and *** denote significance at 10 percent, 5 percent and 1 percent, respectively, using a two-tailed test where no sign is predicted.

Table 7 (cont'd): Acquirer financial reporting concerns
Panel B: Financial reporting concerns factor

$PREMIUM = \beta_0 + \beta_1 * TAX\_UNCERTAIN + \beta_2 * FINRPT + \beta_3 * FINRPT * TAX\_UNCERTAIN + Controls + YearFE + \varepsilon$

TAX_UNCERTAIN =		CV_ETR			CV_CETR		
		FINRPT=0	FINRPT=1	All	FINRPT=0	FINRPT=1	All
		(1)	(2)	(3)	(4)	(5)	(6)
Variables of interest							
TAX_UNCERTAIN	+	-0.0247	0.0483 **	-0.0247	-0.0160	-0.0041	-0.0160
		(0.026)	(0.023)	(0.026)	(0.030)	(0.029)	(0.029)
FINRPT	?			-0.1287			-0.1856
				(0.187)			(0.204)
FINRPT*TAX_UNCERTAIN	+			0.0731 **			0.0119
				(0.035)			(0.042)
Observations		230	244	474	198	204	402
R-squared		30.9%	25.3%	28.2%	39.1%	30.8%	35.9%

FINRPT is an indicator variable equal to one if the acquirer has above-median financial reporting concerns measured using principal component analysis from Carter et al. (2007) to synthesize observable variables that capture equity market reporting pressures. *FINRPT* is interacted with all control variables to account for potential differences in the way target characteristics influence takeover premiums based on acquirer financial reporting concerns. *PREMIUM* is the difference between deal value and the target's market value 28 trading days prior to announcement, scaled by the target's market value 28 days prior to announcement. *CV_ETR* is the five-year standard deviation of the year-to-date GAAP ETR from year *t-4* through year *t*, scaled by the absolute value of the average year-to-date GAAP ETR. If year-to-date GAAP ETR is less than zero (greater than one), I reset it to zero (one). *CV_CETR* is calculated in the same manner as *CV_ETR* but I replace year-to-date GAAP ETR with cash ETR. Outliers were removed from each sample based on studentized residuals. Coefficients on the intercept, control variables (from Table 5) and year fixed effects are omitted for parsimony. Standard errors are in parenthesis. *, **, and *** denote significance at 10 percent, 5 percent and 1 percent, respectively, using a two-tailed test where no sign is predicted.

Table 8: Tax uncertainty and premiums after FIN 48
Panel A: Divergence of opinion and premiums

$$PREMIUM = \beta_0 + \beta_1 * DIVERGENCE + Controls + YearFE + \varepsilon$$

		(1)		(2)	
Variables of Interest					
STD_IBES_ETR	+	0.0770	***	0.0767	**
		(0.031)		(0.033)	
STD_IBES_PTI	+	-0.0169		0.0340	**
		(0.018)		(0.020)	
Deal Characteristics					
TAXABLE	+	0.1261	***	0.0617	
		(0.049)		(0.053)	
COMPETE	+	0.0535		0.0100	
		(0.068)		(0.071)	
TENDER	+	0.0588	**	0.0223	
		(0.034)		(0.037)	
TOEHOLD	-	-2.1744	***	-0.6513	
		(0.347)		(0.523)	
Target Characteristics					
STD_ROA	+	0.4050	*	0.3675	
		(0.262)		(0.289)	
T_LIQ	?	-0.0140	**	0.0043	
		(0.007)		(0.007)	
T_BTM	+	0.1101	***	0.0085	
		(0.036)		(0.035)	
T_ROE	-	-0.3608	***	0.0182	
		(0.063)		(0.070)	
T_MKTCAP	-	-0.0076		-0.0299	**
		(0.015)		(0.015)	
T_LEV	?	0.1386	***	0.0039	
		(0.023)		(0.016)	
PENNY	-	0.2692		-0.2647	
		(0.231)		(0.233)	
Observations		489		480	
R-squared		25.3%		9.6%	

Panel A of Table 8 presents results of estimating *PREMIUM* as a function of divergence of opinion for the subset of deals announced after the effective date of FIN 48. *PREMIUM* is the difference between deal value and the target's market value 28 trading days prior to announcement, scaled by the target's market value 28 days prior to announcement. *STD_IBES_ETR* is the standard deviation of IBES analysts' one-year-ahead GAAP ETR forecasts scaled by the absolute value of the average one-year-ahead GAAP ETR forecast. The GAAP ETR forecast is the difference between forecasted pre-tax income and forecasted net income, scaled by forecasted pre-tax income. *STD_IBES_PTI* is the standard deviation of IBES analysts' one-year-ahead pre-tax income forecasts scaled by the absolute value of the average one-year-ahead pre-tax income forecast. All other variables are defined in Appendix A. Outliers were removed from Column (1) based on studentized residuals. Column (2) includes deals where *PREMIUM* is in [0, 2]. Coefficients on the intercept and year fixed effects are omitted for parsimony. Standard errors are in parenthesis. *, **, and *** denote significance at 10 percent, 5 percent and 1 percent, respectively, using a two-tailed test where no sign is predicted.

Table 8 (cont'd):
Panel B: Tax uncertainty and premiums

PREMIUM = $\beta_0 + \beta_1$*TAX_UNCERTAIN + Controls + YearFE + ε

TAX_UNCERTAIN=		CV_ETR				CV_CETR			
		(1)		(2)		(3)		(4)	
Variables of Interest									
TAX_UNCERTAIN	+	0.0650	***	0.0511	***	0.0368	*	0.0169	
		(0.020)		(0.016)		(0.025)		(0.019)	
Deal Characteristics									
TAXABLE	+	0.2965	***	0.0621	*	0.2737	***	0.0719	**
		(0.054)		(0.042)		(0.054)		(0.043)	
COMPETE	+	-0.0322		-0.0548		-0.0449		-0.0395	
		(0.071)		(0.054)		(0.072)		(0.057)	
TENDER	+	0.0192		-0.0217		0.0115		-0.0314	
		(0.042)		(0.032)		(0.042)		(0.033)	
TOEHOLD	-	-1.7545	***	-0.3299		-1.5956	***	-0.4130	
		(0.392)		(0.344)		(0.397)		(0.368)	
Target Characteristics									
STD_ROA	+	0.5648	**	0.4086	*	0.4826	*	0.4247	**
		(0.338)		(0.259)		(0.338)		(0.256)	
T_LIQ	?	0.0199	***	0.0060	**	0.0181	***	0.0046	*
		(0.004)		(0.003)		(0.005)		(0.003)	
T_BTM	+	0.0273	**	-0.0161	**	-0.0648	**	-0.0171	***
		(0.012)		(0.007)		(0.030)		(0.007)	
T_ROE	-	-0.0422	*	-0.0269		-0.0057		-0.0272	*
		(0.028)		(0.021)		(0.028)		(0.021)	
T_MKTCAP	-	-0.0012		-0.0349	***	-0.0197	*	-0.0423	***
		(0.013)		(0.010)		(0.014)		(0.010)	
T_LEV	?	0.0807	***	-0.0115	*	0.1273	***	-0.0100	*
		(0.019)		(0.007)		(0.023)		(0.007)	
PENNY	-	0.1398		-0.0252		0.4343	***	-0.0111	
		(0.114)		(0.089)		(0.134)		(0.099)	
Observations		805		754		731		693	
R-squared		21.3%		9.1%		23.9%		8.8%	

Panel B of Table 8 presents results of estimating *PREMIUM* as a function of tax uncertainty for the subset of deals announced after the effective date of FIN 48. *PREMIUM* is the difference between deal value and the target's market value 28 trading days prior to announcement, scaled by the target's market value 28 days prior to announcement. *CV_ETR* is the five-year standard deviation of the year-to-date GAAP ETR from year *t-4* through year *t*, scaled by the absolute value of the average year-to-date GAAP ETR. If year-to-date GAAP ETR is less than zero (greater than one), I reset it to zero (one). *CV_CETR* is calculated in the same manner as *CV_ETR* but I replace year-to-date GAAP ETR with cash ETR. All control variables are defined in Appendix A. Columns (1) and (3) include the full sample. Columns (2) and (4) include the subset of deals where the *PREMIUM* is in [0, 2]. Coefficients on the intercept and year fixed effects are omitted for parsimony. Standard errors are in parenthesis. *, **, and *** denote significance at 10 percent, 5 percent and 1 percent, respectively, using a two-tailed test where no sign is predicted.

Table 8 (cont'd)
Panel C: FIN 48 reserves and premiums

$PREMIUM = \beta_0 + \beta_1 * T\_UTB + Controls + YearFE + \varepsilon$

		(1)		(2)		(3)		(4)	
Variables of Interest									
T_UTB	+	0.6153	**	0.5914	**	0.5446	**	0.1817	
		(0.315)		(0.317)		(0.319)		(0.359)	
PUBLIC								0.182	
								(0.308)	
PUBLIC*T_UTB								1.294	***
								(0.491)	
Other Controls									
R&D	+			0.0216		0.2921	**		
				(0.035)		(0.162)			
SG&A	+			-0.0288		-0.0267	*		
				(0.027)		(0.020)			
FOREIGN	+			-0.0098		0.0247			
				(0.013)		(0.095)			
Observations		537		528		530		450	
R-squared		42.5%		42.6%		44.7%		24.8%	

Panel C of Table 8 presents results of estimating *PREMIUM* as a function of tax uncertainty using target FIN 48 reserve balances as a measure of tax uncertainty. *PREMIUM* is the difference between deal value and the target's market value 28 trading days prior to announcement, scaled by the target's market value 28 days prior to announcement. *T_UTB* is target year-end FIN 48 reserve balance, scaled by target market value 28 trading days prior to announcement. Column (1) includes all control variables from Equation (3). Columns (2) and (3) also include controls for characteristics associated with FIN 48 reserve balances that can affect premiums: *R&D* is total research and development expenses scaled by sales, *SG&A* is selling, general and administrative expenses scaled by sales, and *FOREIGN* is foreign pre-tax income scaled by total pre-tax income. In Column (2) these controls are measured in the year prior to the acquisition announcement. In Column (3) these controls are measured over the five years prior to the acquisition announcement. In Column (4), *PUBLIC* is an indicator variable equal to one if the acquirer is publicly traded. Control variables (from Table 5) are defined in Appendix A. Outliers were removed from each sample based on studentized residuals. Coefficients on the intercept, control variables and year fixed effects are omitted for parsimony. Standard errors are in parenthesis. *, **, and *** denote significance at 10 percent, 5 percent and 1 percent, respectively, using a two-tailed test where no sign is predicted.

Table 9: Endogeneity
Panel A: Likelihood of acquisition

$$Prob(TARGET=1) = \beta_0 + \beta_1*ROA + \beta_2*PPE + \beta_3*CASH + \beta_4*MTB + \beta_5*LEVETAGE + \beta_6*LOGMKTCAP + \beta_7*INDUSTRY$$

		(1)	
Variables			
ROA	+	-0.0151	***
		(0.004)	
PPE	-	0.0384	**
		(0.020)	
CASH	?	-0.0474	**
		(0.023)	
MTB	-	-0.0015	***
		(0.001)	
LEVERAGE	?	0.0327	***
		(0.007)	
LOGMKTCAP	-	-0.0392	***
		(0.002)	
INDUSTRY	-	0.0601	
		(0.067)	
Observations		92,190	
Likelihood Ratio		586.59	

Panel A presents results of estimating the likelihood of takeover following Palepu (1986) and Cremers et al. (2009). *TARGET* is an indicator variable set equal to one if a firm is acquired in year *t*. *ROA* is net income scaled by assets. *PPE* is net property, plant and equipment scaled by assets. *CASH* is cash and cash equivalents scaled by assets. *MTB* is the market-to-book ratio calculated as the sum of total liabilities and market value of equity scaled by assets. *LEVERAGE* is the total debt to asset ratio. *LOGMKTCAP* is the natural log of market capitalization measured as the fiscal year-end stock price times common shares outstanding. *INDUSTRY* is an indicator variable set equal to one if there was a takeover in the firm's industry in the current year.

Table 9 (cont'd): Endogeneity
Panel B: Premiums as a function of opinion divergence and tax uncertainty

PREMIUM = $\beta_0 + \beta_1$*TAX_UNCERTAIN (DIVERGENCE) + Controls + YearFE + ε

Variable of Interest		STD_IBES_ETR (1)		CV_ETR (2)		CV_CETR (3)	
Variables of Interest							
DIVERGENCE	+	0.0474	**				
		(0.024)					
UNCERTAINTY				0.0397	***	0.0343	***
				(0.012)		(0.015)	
Deal Characteristics							
TAXABLE	+	0.0422		0.0711	***	0.0998	***
		(0.065)		(0.025)		(0.029)	
COMPETE	+	-0.0063		-0.0144		-0.0254	
		(0.053)		(0.040)		(0.041)	
TENDER	+	0.0262		-0.0085		-0.0494	**
		(0.029)		(0.049)		(0.026)	
TOEHOLD	-	-0.6912	**	-0.4341	**	-0.5050	**
		(0.337)		(0.229)		(0.238)	
Target Characteristics							
STD_ROA	+	0.1740	*	0.1694	*	0.2002	**
		(0.108)		(0.109)		(0.118)	
T_LIQ	?	-0.0072	*	0.0023		0.0031	
		(0.005)		(0.002)		(0.002)	
T_BTM	+	0.0615	**	-0.0016		-0.0050	
		(0.028)		(0.005)		(0.005)	
T_ROE	-	-0.0721		-0.0132	**	-0.0104	*
		(0.060)		(0.007)		(0.007)	
T_MKTCAP	-	-0.0316	*	-0.0267	**	-0.0237	
		(0.021)		(0.016)		(0.034)	
T_LEV	?	0.0122		0.0037		0.0029	
		(0.013)		(0.003)		(0.003)	
PENNY	-	-0.1457		0.019		0.012	
		(0.164)		(0.059)		(0.067)	
Inverse_Mills		0.4983		0.0409		-0.0298	
		(0.618)		(0.467)		(0.509)	
Observations		816		754		731	
R-squared		8.2%		9.1%		23.9%	

Panel B presents results of estimating *PREMIUM* as a function of divergence of opinion or tax uncertainty after controlling for the likelihood of becoming a target. *PREMIUM* is the difference between deal value and the target's market value 28 trading days prior to announcement, scaled by the target's market value 28 days prior to announcement. *STD_IBES_ETR* is the standard deviation of IBES analysts' one-year-ahead GAAP ETR forecasts scaled by the absolute value of the average one-year-ahead GAAP ETR forecast. The GAAP ETR forecast is the difference between forecasted pre-tax income and forecasted net income, scaled by forecasted pre-tax income. *STD_ROA* is the five-year standard deviation of year-to-date return on assets from year *t-4* through year *t*, divided by the average year-to-date return on assets. *CV_ETR* is the five-year standard deviation of the year-to-date GAAP ETR from year *t-4* through year *t*, scaled by the absolute value of the average year-to-date GAAP ETR. If year-to-date GAAP ETR is less than zero (greater than one), I reset it to zero (one). *CV_CETR* is calculated in the same manner as *CV_ETR* but I replace year-to-date GAAP ETR with cash ETR. *Inverse_Mills* is the inverse Mills ratio from estimating equation (6). All control variables are defined in Appendix A. Results reported are for the subset of deals where *PREMIUM* is in [0, 2]. Coefficients on the intercept, control variables (from Table 5) and year fixed effects are omitted for parsimony. Standard errors are in parenthesis. *, **, and *** denote significance at 10 percent, 5 percent and 1 percent, respectively, using a two-tailed test where no sign is predicted.

Table 10: Alternative measure of tax uncertainty

Panel A: Estimation of GAAP ETR following Armstrong et al. (2012)

$ETR=\beta_0+\beta_1*ROA+\beta_2*STD\_ROA+\beta_3*LOGMKTCAP+\beta_4*LEVERAGE+\beta_5*CHG\_GDWLL+\beta_6*NEW\_INVESTMENT+\beta_7\ COMPLEXITY + \varepsilon$

DEPENDENT VARIABLE		**ETR** (1)	
Variables			
ROA	+	0.0574	***
		(0.002)	
STD_ROA	-	-0.0111	***
		(0.001)	
LOGMKTCAP	?	0.0172	***
		(0.000)	
LEVERAGE	-	0.0051	***
		(0.002)	
CHG_GOODWILL	?	0.1536	***
		(0.010)	
NEWINVESTMENT	-	-0.0584	***
		(0.005)	
COMPLEXITY	-	-0.0231	***
		(0.002)	
Observations		76,966	
R-squared		19.6%	

PT_ROA is pre-tax return on assets. *STD_PT_ROA* is the standard deviation of *PT_ROA* from year *t-5* through year *t-1*. *LOGMKTCAP* is the natural log of market capitalization. *LEVERAGE* is total debt scaled by average assets. *CHG_GDWLL* is the change in goodwill from year *t-1* to *t*. *NEW_INVESTMENT* is the sum of R&D expenditures, capital expenditures and acquisition-related expenses, less depreciation expense and gains or losses from sales of PP&E, all scaled by average assets. *COMPLEXITY* is the sum of the squares of each geographic segment's sales as a percentage of total sales.

Table 10 (cont'd): Alternative measure of tax uncertainty
Panel B: Premiums as a function of tax uncertainty

$$PREMIUM = \beta_0 + \beta_1 * STD\_ERROR + Controls + YearFE + \varepsilon$$

		(1)		(2)	
Variables of Interest					
STD_ERROR	+	0.2193	***	0.2630	**
		(0.094)		(0.133)	
Deal Characteristics					
TAXABLE	+	0.1657	***	0.1438	**
		(0.028)		(0.083)	
COMPETE	+	-0.0111		0.0057	
		(0.044)		(0.062)	
TENDER	+	0.0650	***	0.0195	
		(0.027)		(0.039)	
TOEHOLD	-	-1.6305	***	-1.6849	***
		(0.178)		(0.361)	
Target Characteristics					
T_LIQ	?	-0.0078	**	-0.0162	***
		(0.003)		(0.005)	
T_BTM	+	0.0963	***	0.0384	*
		(0.020)		(0.025)	
T_ROE	-	-0.1666	***	-0.1293	***
		(0.020)		(0.024)	
T_MKTCAP	-	-0.0047		-0.0347	***
		(0.007)		(0.009)	
T_LEV	?	0.0745	***	0.1205	***
		(0.012)		(0.015)	
PENNY	-	0.1103	**	0.2169	***
		(0.062)		(0.086)	
Observations		1,650		1,609	
R-squared		19.4%		18.2%	

Panel B estimates premiums as a function of an alternative measure of tax uncertainty. *STD_ERROR* is the five-year standard deviation of the residual from the following regression estimated by industry (2-digit SIC) year:

$$ETR = \beta_0 + \beta_1 * PT\_ROA + \beta_2 * STD\_PT\_ROA + \beta_3 * LOGMKTCAP + \beta_4 * LEVERAGE + \beta_5 * CHG\_GDWLL + \beta_6 * NEW\_INVESTMENT + \beta_7\ COMPLEXITY + \varepsilon$$

Control variables are defined in Appendix A. In Column (1), outliers were removed from each sample based on studentized residuals. Column (2) includes the subsample of deals where *PREMIUM* is within [0, 2]. Coefficients on the intercept, control variables (from Table 5) and year fixed effects are omitted for parsimony. Standard errors are in parenthesis. *, **, and *** denote significance at 10 percent, 5 percent and 1 percent, respectively, using a two-tailed test where no sign is predicted.

Appendix A: Variable Definitions

Divergence Measures

STD_IBES_PTI	Standard deviation of IBES analysts' one-year-ahead pre-tax income forecasts scaled by the absolute value of the average one-year-ahead pre-tax income forecast.
STD_IBES_ETR	Standard deviation of IBES analysts' one-year-ahead GAAP ETR forecasts scaled by the absolute value of the average one-year-ahead GAAP ETR forecast. The GAAP ETR forecast is the difference between forecasted pre-tax income and forecasted net income, scaled by forecasted pre-tax income.

Tax Uncertainty Measures

CV_ETR	Five-year standard deviation of the year-to-date GAAP ETR from year *t-4* through year *t*, scaled by the absolute value of the average year-to-date GAAP ETR. If year-to-date GAAP ETR is less than zero (greater than one), I reset it to zero (one).
CV_CETR	Five-year standard deviation of year-to-date cash ETR from year *t-4* through year *t*, scaled by the absolute value of the average year-to-date cash ETR. If year-to-date cash ETR is less than zero (greater than one), I reset it to zero (one).
T_UTB	Target FIN 48 tax reserve as of the fiscal year ending immediately prior to the announcement, scaled by target market value 28 trading days prior to the merger announcement.

Deal Characteristics

VALUE	Total deal value ($M).
PREMIUM	The difference between the acquisition value and the target's market value 28 days prior to the takeover announcement, scaled by the target's market value 28 days prior to the takeover announcement.
TAXABLE	Indicator variable equal to one if less than 80% of total consideration is paid in stock and zero otherwise.
COMPETE	Indicator variable equal to one if there was a competing bidder for the target and zero otherwise.
TENDER	Indicator variable equal to one if the takeover was initiated with a tender offer and zero otherwise.
TOEHOLD	Continuous variable representing the percentage ownership of the bidder in the target prior to the takeover announcement.

HOSTILE Indicator variable equal to one if target management opposed the takeover and zero otherwise.

Target Characteristics

STD_ROA Five-year standard deviation of year-to-date pre-tax income from year *t-4* through year *t*, divided by the absolute value of the average year-to-date pre-tax income.

T_LIQ Ratio of target current assets as of the fiscal year ending immediately before the takeover to target market value 28 trading days prior to the takeover announcement. If current assets are missing, the numerator is the sum of cash and short-term investments, receivables and inventory.

T_BTM Ratio of target book value of equity as of the fiscal year ending immediately before the takeover to target market value 28 trading days prior to the takeover announcement.

T_ROE Ratio of target income for the fiscal year ending immediately before the takeover to target market value 28 trading days prior to the takeover announcement.

T_MKTCAP The natural log of target market value 28 trading days prior to the takeover announcement.

T_LEV Ratio of target long-term debt as of the fiscal year ending immediately before the takeover to target market value 28 trading days prior to the takeover announcement.

PENNY Indicator variable equal to one if target stock price is less than one dollar 28 trading days prior to the takeover announcement.

Financial Reporting Concerns Variables

PUBLIC An indicator variable set equal to one if the acquirer is publicly traded and zero otherwise.

FINRPT An indicator variable equal to one if the acquirer has above-median financial reporting concerns measured using principal component analysis following Carter et al. (2007) to synthesize observable variables that capture equity market reporting pressures, and zero otherwise. See Section 4.2 for further details.

Takeover Prediction Variables

TARGET	An indicator variable set equal to one if a firm is an acquisition target in year *t* and zero otherwise.
ROA	Return on assets in year *t-1*.
PPE	Net property, plant and equipment in year *t-1*, scaled by total assets at the end of year *t-1*.
CASH	Cash and cash equivalents at the end of year *t-1*, scaled by total assets at the end of year *t-1*.
MTB	The market value of equity plus the book value of total liabilities at the end of year *t-1*, scaled by total assets at the end of year *t-1*.
LEVERAGE	The sum of short-term and long-term debt at the end of year *t-1*, scaled by total assets at the end of year *t-1*.
LOGMKTCAP	The natural log of the market value of equity at the end of year *t-1*.
INDUSTRY	An indicator variable set equal to one if a firm in a particular industry was acquired in year *t-1* and zero otherwise. Industries are defined using the Fama-French 48 industry classification.

Alternative Measure of Tax Uncertainty

STD_ERROR	The five-year standard deviation of the residual from the following regression estimated by industry (2-digit SIC) year: $ETR = \beta_0 + \beta_1 * PT\_ROA + \beta_2 * STD\_PT\_ROA + \beta_3 * LOGMKTCAP + \beta_4 * LEVERAGE + \beta_5 * CHG\_GDWLL + \beta_6 * NEW\_INVESTMENT + \beta_7 COMPLEXITY + \varepsilon$
PT_ROA	Pre-tax return on average assets.
STD_PT_ROA	Standard deviation of ROA from year *t-5* through *t-1*.
LOGMKTCAP	Natural log of market capitalization.
LEVERAGE	Total debt scaled by average assets.

CHG_GDWLL	The change in goodwill from year *t-1* to *t*, scaled by average assets.
NEW_ INVESTMENT	The sum of R&D expenditures, capital expenditures and acquisition-related expenditures, less depreciation expense and gains or losses from sales of PP&E, all scaled by average assets.
COMPLEXITY	Sum of the squares of each geographic segment's sales as a percentage of total sales.

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