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CEO Tax Effects on Acquisition Structure and Value

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Abstract:

We hypothesize that prior evidence of target shareholder capital gains tax liabilities affecting acquisition features is driven by the tax liabilities of the target firm CEO. To test this, we estimate CEOs' capital gains tax liabilities for a large sample of acquisitions and examine the effects of such liabilities on acquisition outcomes. Results indicate that the previously documented positive relations between shareholder-level capital gains tax rates and 1) the likelihood of a nontaxable acquisition (Ayers, Lefanowicz, and Robinson 2004) and 2) acquisition premiums (Ayers, Lefanowicz, and Robinson 2003) are largely driven by CEO tax effects. We also find evidence consistent with 1) CEOs' tax incentives leading to potential agency conflicts under certain conditions and 2) acquisition structure or premium being adjusted in response to CEOs' taxes depending on the alternatives available to the acquirer. Our study contributes to our understanding of what and whose taxes affect acquisition structure and value.

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I. INTRODUCTION

This study investigates the effect of target firm CEOs' capital gains tax liabilities on acquisition structure and value. Our motivation comes from two separate streams of literature. First, whether target-shareholder-level taxes affect acquisition structure and premiums is a long-standing question in the literature. Although prior literature predicts target-shareholder tax effects, it was not until more recent studies that the effect of shareholder-level taxes in acquisitions was supported with empirical data.¹ Specifically, Ayers, Lefanowicz, and Robinson (2003) show that individual capital gains tax rates are positively associated with acquisition premiums whereas Ayers, Lefanowicz, and Robinson (2004) provide evidence that acquisition structure is more likely to be tax-free when individual capital gains tax rates are high.² In both of these papers, the tax effects are mitigated when institutional ownership is relatively high (i.e., when tax-exempt institutional investors are more likely to be the marginal investor). Together, the results in these studies document the importance of shareholder-level capital gains tax rates on acquisition structure and premiums when the marginal shareholder is more likely to be a taxable investor.³

Second, recent literature has attempted to open the “black box” of the firm and examine the effects of characteristics of the executives themselves on firm performance and activity. Bertrand and Schoar (2003) examine whether some executives have differential effects on

¹ Earlier studies conjecture shareholder tax effects but do not empirically document an effect (e.g., Mandelker 1974; Huang and Walkling 1987; Bradley, Desai, and Kim 1988; Brown and Ryngaert 1991). Landsman and Shackelford (1995) examine proprietary data for one company, RJR Nabisco, and find evidence of a lock-in tax effect. However, some debate over identification in their study exists because it is hard to distinguish the tax explanation from one of the differences in risk aversion or propensity to rebalance (Ayers et al. 2003). In addition to these studies on shareholder-level taxes, corporate level tax effects have also been examined (e.g., Erickson 1998 and Hanlon, Lester, and Verdi 2015).

² In addition, Ayers et al. (2007) investigate the lock-in effect of capital gains on aggregate corporate acquisition activity and find that the percentage of firms acquired in a calendar quarter is negatively associated with the individual capital gains tax rate applicable in that quarter.

³ See Shackelford and Shevlin (2001) and Hanlon and Heitzman (2010) for reviews of the literature.

corporate finance decisions (e.g., investment, leverage).⁴ Focusing on acquisitions, Jenter and Lewellen (2015) argue that CEOs are especially important actors in the takeover market and find a successful takeover bid more likely when the target CEO is nearing retirement age. Other studies examining CEO effects on transaction frequency and structure investigate whether the private benefits of the CEO (option grants, accelerated vesting, side payments, job retention, etc.) affect the premium on the deal.⁵ These results suggest that in acquisitions, the marginal (price-setting) shareholder is likely to be the CEO.

We hypothesize that the effects documented in Ayers et al. (2003, 2004) that shareholders' capital gains tax liabilities influence acquisition characteristics is due to CEOs' tax liabilities. This is because CEOs are in a better position to negotiate the acquisition terms and we expect CEOs to care about their own taxes when negotiating. Thus, while textbooks hypothesize and prior literature has made great strides in documenting that target shareholder taxes matter, we examine whether it is insiders', specifically in our tests the CEO's, taxes that matter.

Walt Disney Co.'s ("Disney") acquisition of 21st Century Fox's ("Fox") entertainment business provides an example of insiders' tax positions affecting acquisition structure and price. Fox was founded by Rupert Murdoch who was previously the CEO and at the time of the proposed deal was the Chairman of the Board. Rupert Murdoch's son, Lachlan Murdoch, was the CEO at the time of the proposed deal. In December 2017, Disney and Fox announced that they had agreed that Disney would acquire Fox in an *all-stock* deal valued at \$52.4 billion. In May of 2018, Comcast announced its intent to make, and in June made, an all-cash offer of \$65 billion to acquire

⁴ See also Dyreng, Hanlon, and Maydew (2010) who apply the Bertrand and Schoar (2003) methodology to show that certain corporate executives are able to reduce corporate tax burdens more than other executives.

⁵ Studies investigating the impact of CEO private benefits on merger outcomes include Hartzell, Ofek, and Yermack (2004) examining CEO job retention, Heitzman (2011) and Fich, Cai, and Tran (2011) on equity grants, Elkinawy and Offenberg (2013) regarding accelerated vesting provisions, and Broughman (2017) on CEO side payments.

Fox. After Comcast's announcement of the intent to bid, Christopher Hohn an activist investor in Fox, urged Rupert Murdoch to engage in talks with Comcast. Hohn wrote a letter to the Fox Board stating "We are aware that the Murdoch family has a potential conflict of interest because of capital gains tax, which could lead them to preferring a lower priced Disney stock offer to a higher priced offer from Comcast...However, the personal tax position of the Murdoch family must be an irrelevant consideration of the board, in order for the board to comply with their fiduciary duties."⁶ This anecdote is more extreme than what we study because the Murdoch family were the founders, large shareholders, Chairman, and CEO. Nonetheless, it illustrates the issues in our study. Whether the effects are important in other deals is an empirical question. We examine a broad sample of merger and acquisitions to investigate the extent to which a CEO's potential capital gains tax liability affects acquisition structure and premium.

We test our prediction by revisiting the evidence of the effect of shareholder-level taxes on acquisition structure and premium in the influential papers by Ayers et al. (2003, 2004). With respect to acquisition structure, Ayers et al. (2004) show that the acquisition is more likely to be structured as a nontaxable (tax-deferred), stock-for-stock deal when shareholder-level capital gains

⁶ On June 20, 2018, Disney raised its offer to \$38 per share (valuing Fox's equity at a total of \$71.3 billion) with a mixture of consideration approximately 50 percent cash and 50 percent stock. Among the reasons the Board ultimately listed for its recommendation to accept the Disney deal was that the stock portion of the consideration received by Fox shareholders would be tax-free, whereas the Comcast proposal would not provide the opportunity for Fox shareholders to achieve tax-deferral (Twenty-First Century Fox, SEC Schedule 14A). The Murdoch Family Trust was the single largest shareholder in 21st Century Fox, holding 320 million shares, or 39 percent of the company's outstanding shares. At the time of the merger rumors, several news outlets estimated a capital gains tax liability of \$3-4 billion to be owed by the Murdoch family in the event of a taxable sale of the shares. When rumors of a Comcast all-cash deal became public, Robert Willens, president of tax and consulting firm Robert Willens LLC, noted that the only way Comcast could woo Murdoch was by offering him a much higher pre-tax price for the deal compared to Disney. At the time, Willens was quoted as saying, "It is not advisable for a man of Murdoch's age to engage in a taxable sale of his property. If he passed away while still owning the property, his heirs would achieve a basis step-up for the property, thus eliminating, forever, any capital gains tax on the appreciation in the assets that accrued during the scions' lifetime" (Roumeliotis and Toonkel 2018). The DIS-FOX deal closed March 20, 2019 as a stock and cash deal (see The Willens Reports 5/9/18, 6/22/18, and 3/20/19).

tax rates are high and the marginal investor is likely to be taxable. In other words, the higher the potential tax liability to selling shareholders, the less likely the transaction is structured as a cash-for-stock (taxable) transaction. To the extent that CEOs are the marginal (price-setting) investors and they care about their own tax liabilities, our first hypothesis (H1) is that the effect of shareholder taxes on acquisition structure is driven by CEOs' tax liabilities.

With respect to acquisition premiums, Ayers et al. (2003) hypothesize that higher target shareholder-level taxes need to be compensated in a taxable acquisition, and this compensation is reflected in acquisition premiums. Consistent with this argument, they show that capital gains rates are positively related to acquisition premiums and that the effect is mitigated when institutional ownership is high (i.e., when the marginal shareholder is less likely to be taxable). We predict that to the extent that CEOs are the marginal investors and care about their own tax liabilities, our second hypothesis (H2) is that the acquisition premium is increasing in CEOs' tax liabilities.

There are several reasons why one may not expect CEO tax liabilities to influence acquisition features. For example, CEOs are heavily exposed to the firms they work for and are undiversified relative to outside shareholders. As a result, CEOs may prefer cash acquisitions despite incurring immediate taxes because by doing so they are able to diversify. Similarly, it is possible that managers are compensated for some of their taxes by the firm which would ease their preference for nontaxable deals or, in the event of taxable deals, substitute for increased acquisition premiums. We explore some of these counterforces in our cross-sectional analyses.

To examine our first hypothesis, we use a sample of acquisitions in the period 1996 – 2016. Consistent with the Ayers et al. (2004) results, we find that individual capital gains tax rates are positively associated with the likelihood of a nontaxable deal and that this relation is mitigated when tax-exempt institutions hold a large fraction of the firm. We then modify their empirical

design in several ways and sequentially test each modification to determine whether the target CEO's tax liability affects the inferences from Ayers et al. (2004). We start by testing whether CEO ownership (a rough proxy for both the CEO being the marginal shareholder and the CEO's taxable gain being relatively large) makes the relation between individual capital gains tax rates and acquisition structure stronger: we find that it does. In fact, acquisition structure is not affected by individual capital gains tax rates when the CEO owns a relatively small proportion of the firm's shares (i.e., when the CEO is less likely the marginal shareholder and is less likely to incur significant capital gains). Inferences are unchanged if we replace CEO ownership with a more direct measure of the CEO's tax liability – namely the CEO's federal tax burden. Together, our evidence suggests that the structure of corporate acquisitions is affected by the personal tax incentives of the target company's CEO, and that the effect of target shareholders' taxes on acquisition structure is entirely due to CEOs' tax effects.

We refine our tests of the CEO's taxes by replacing the federal tax burden with the state tax burden to improve identification. The key assumption behind our state-level tests is that the location of the corporate headquarters is more likely to be the state of residence of the CEO but less likely to reflect the state of residence for outside shareholders. We find that the likelihood of the acquisition being structured as a nontaxable deal gets stronger as the CEO's state tax liability increases. In economic terms, an interquartile increase in the CEO's state tax burden is associated with a 3.1 percentage point higher likelihood of a nontaxable acquisition. Given that the unconditional average probability of a nontaxable acquisition equals 47.4 percent, the effect we document equates to a 6.5 percent relative increase in the probability of a nontaxable deal. The state-level analysis reinforces our conclusion that the structure of corporate acquisitions is a function of the CEO's personal tax incentives.

We test our second hypothesis that CEOs' capital gains tax liabilities explain acquisition premiums using a sample of taxable acquisitions from 1996 – 2016. We first replicate the association between the capital gains rate and acquisition premiums documented in Ayers et al. (2003). We then add a measure of target CEO ownership interacted with shareholder-level capital gains rates and find that shareholder-level taxes are increasingly related to acquisition premiums as CEO ownership rises. We again find that the results are entirely concentrated in firms where CEO ownership is relatively high. In our alternative specification, we also find that the CEO's federal tax burden is associated with higher premiums in taxable deals. Furthermore, the effect of non-CEO target shareholders' taxes is not significant.

Using state-level taxes, we find that premiums rise as CEOs' state tax liabilities increase. Economically, an interquartile increase in the CEO's state tax burden is associated with a 2.2 percentage point higher premium in a taxable acquisition, which translates to a 5.0 percent relative increase in acquisition premiums (given the average premium of 43 percent in our sample). To put this number in perspective, for the average deal size, an interquartile increase in the total tax burden of the CEO amounts to an additional \$5.33 million in federal and state taxes owed by the CEO. In contrast, the additional premium received by the CEO is \$2.06 million, thereby offsetting just below 40 percent of the CEO's total tax liability, on average.

We conduct a number of additional analyses using the state tax burden measure (in untabulated analyses, we repeat these tests using the CEO's federal tax burden and find the same inferences). First, we examine whether side payments (such as the inclusion of golden parachutes or the presence of merger bonuses) made directly to target CEOs influence the relation between CEO personal tax incentives and acquisition outcomes. We find that side payments mitigate the tendency of high-tax CEOs to engage in nontaxable acquisitions and also that the presence of side

payments reduces the premiums required in taxable acquisitions.⁷ Second, we study whether influential shareholders (activist shareholders and outside blockholders) in the target firm apply pressure against acquisition decisions based on the CEO's personal tax considerations (as Mr. Hohn did in the Disney-Fox transaction discussed above).⁸ Our findings suggest that these influential shareholders reduce high-tax CEOs' tendency to engage in nontaxable acquisitions, but do not deter high-tax CEOs from obtaining higher acquisition premiums in taxable deals. Activist shareholders and blockholders seem to be more aligned with CEOs' preference for higher premiums (when incurring higher taxes) as they also benefit from it.

Third, we investigate whether acquirers retain a larger share of the overall merger gains. Our findings indicate that when target CEOs have higher tax liabilities, acquirers experience higher announcement returns and pocket a larger share of the overall merger gains, consistent with target CEOs sacrificing overall shareholder value in some cases to suit their own preferences.⁹ Fourth, we examine the trade-off between acquisition structure and premium for public versus private acquirers. Public acquirers can adjust the acquisition structure (cash versus stock deals) as well as the premium to accommodate the tax liabilities of the target CEOs. In contrast, private acquirers rarely engage in stock deals, meaning that they can only accommodate tax liabilities via premiums. Our results suggest that public acquirers are more likely to adjust the structure, but not the premium

⁷ Note that these all suggest some level of agency issue because even though shareholders all benefit if the premium is higher, the results are not consistent with non-CEO shareholder taxes mattering enough to yield higher premiums (i.e., the manager is not thinking about outside shareholder taxes) – there is only compensation for taxes when the CEO taxes are high and that effect is mitigated if the CEO is getting some other form of compensation.

⁸ It is unclear to us, ex ante, whether activist shareholders and blockholders will discourage CEOs from allowing personal tax considerations to influence merger outcomes. For instance, if outside shareholders and the CEO share similar tax concerns, then it might be in shareholders' interests to allow the deal to be tailored in the CEO's interests. On the other hand, if the CEO's interests diverge from those of outside shareholders, then the CEO's tax incentives may not necessarily imply value creating activities from the perspective of outside shareholders.

⁹ Note that these results for acquisition announcement returns only reflect public acquirers (for which we can measure announcement returns) and, as we explain below, public acquirers accommodate target tax liabilities via acquisition structure (and not premiums).

as a function of CEOs' tax liabilities. In contrast, private acquirers do the reverse – they do not adjust acquisition structure (presumably because this is not an option) but instead compensate CEOs for their tax liabilities by increasing the acquisition premium. Fifth, we study whether CEOs' tax liabilities affect the likelihood that firms are acquired. Like Ayers et al. (2007), we find that tax considerations reduce the unconditional likelihood that a firm is acquired (especially in taxable deals), but we provide evidence that this effect is driven primarily by CEOs' taxes. Finally, we perform multiple robustness tests.

We contribute to the literature in two ways. First, relative to Ayers et al. (2003, 2004), we document that shareholder-level capital gains taxes matter for acquisition structure and value because the CEO cares about her own tax liabilities. In fact, we show that when CEO tax liabilities (or CEO holdings) are small, shareholder-level taxes are generally unrelated to acquisition outcomes. As such, our evidence is important because of the principal-agent relationship the CEO has with shareholders. Whether CEOs act in their self-interest with respect to tax treatment in transactions is different than the 'target shareholder taxes affect deals' perspective that has been in the literature before. Thus, our findings speak to a long-standing question in corporate finance and accounting of whether managers consider shareholder taxes.

Our paper also helps answer the call for research in Hanlon and Heitzman (2010): "Research that addresses the role of tax preferences of the CEO or other controlling shareholders on acquisition structure and price would be interesting." (p. 158-159). Looking inside the black box to investigate the importance of executive-level capital gains taxes in acquisitions contributes to our understanding of what taxes and whose taxes matter. Indeed, our findings are also relevant to a broader literature on the effect of shareholder-level taxes, and insiders' taxes in particular, on corporate decisions (e.g., Hanlon and Hoopes 2014 and Yost 2018).

II. SAMPLE SELECTION AND VARIABLE MEASUREMENT

Sample Selection

Table 1, Panel A outlines our sample selection process. We start by obtaining data from SDC Platinum on all acquisitions of U.S. public firms with completion dates ranging from January 1, 1996 through December 31, 2016.¹⁰ We exclude acquisitions of assets.¹¹ To ensure there was a change in ownership, we limit the sample to deals in which the bidder acquires more than 50 percent of the target shares in the transaction. Further, we exclude acquisitions with deal values below \$10 million in order to exclude very small transactions. These initial restrictions yield a sample of 4,055 completed acquisitions. Since we require target ownership data, we also exclude deals in which the target firm is not a member of the S&P 1500 (and thus not covered in ExecuComp).¹² We additionally exclude deals with missing data required to construct control variables or the CEO's tax burden. Finally, we classify acquisitions as taxable cash-for-stock deals if more than 50 percent of the consideration paid was cash, as nontaxable stock-for-stock deals

¹⁰ We start in 1996 because similar to Jin and Kothari (2008), we use the previous five years' holdings and grant information to estimate the first observation of a CEO's tax burden. ExecuComp coverage begins in 1992, thus, our first year of observation for the tax burden is 1996.

¹¹ Including only sales of stock assures there is the potential for taxation at the shareholder level. An asset sale is taxable at the corporate level on the sale of assets, and only if the corporation distributes the proceeds (e.g., via dividend or liquidation) will there be potential tax at the shareholder level. Even if a Section 338 election were made to elect to tax the transaction as an asset sale, if the target company is a freestanding C corporation then the target shareholders pay tax on the sale of the stock (and the acquirer makes a unilateral Section 338 election). See Erickson, Hanlon, Maydew, and Shevlin (2020) for more details on the taxation of mergers and acquisitions.

¹² We re-estimate our main tests using a broader sample of deals that includes target firms not belonging to the S&P 1500 as well as S&P 1500 firms. We follow the same steps outlined in Table 1 Panel A to obtain our sample, except we do not require the target firm to be listed in ExecuComp. To acquire CEO holdings data for a broader sample of firms, we rely on the Thomson Financial Insiders Data Feed (TFN), which contains stock holdings data for insiders on dates when they trade in their companies' stock. We use the TFN database to construct proxies for CEO ownership and the CEO tax burden. Our sample selection process based on TFN data yields a total of 2,030 deals from 1996-2016, including 1,485 taxable and 545 nontaxable deals. Details on how we construct the CEO ownership and CEO state tax burden proxies using TFN data and our tables presenting the results of our tests using this larger sample can be found in our Online Appendix. The use of the TFN data allows tests of ownership using a larger sample of firms beyond those in ExecuComp and may be useful for researchers studying various research questions going forward. Overall, the results using TFN data suggest that our primary findings generalize to a larger sample of target firms, including those not belonging to the S&P 1500.

(which are nontaxable at the deal date, overall tax-deferred) if more than 90 percent of the consideration was stock, and we exclude the deal from the sample if neither criterion is met.¹³ Our final sample consists of 485 taxable deals and 220 nontaxable deals, for a total of 705 deals.

Table 1 Panel B provides a 2x2 chart summarizing the number of deals by acquisition structure and acquirer type.¹⁴ Specifically, our sample consists of these four different classifications: (i) taxable acquisitions by public acquirers; (ii) taxable acquisitions by private acquirers; (iii) nontaxable acquisitions by public acquirers; and (iv) nontaxable acquisitions by private acquirers. The panel reveals that public acquirers are almost equally likely to pursue a nontaxable deal as a taxable deal (221 cash deals versus 199 stock deals, or 53 percent versus 47 percent). However, private acquirers rarely pursue nontaxable deals (264 cash deals versus 21 stock deals, or 93 percent versus 7 percent). Private acquirers are unlikely to offer their own stock in a nontaxable bid due to the lack of a public share price and incentives to retain control (an issue we investigate further below). For this reason, in our tests investigating acquisition structure (nontaxable vs. taxable) we restrict the sample to deals in which the acquirer is publicly traded.¹⁵

Both public and private acquirers can freely adjust acquisition *premiums* in response to tax incentives. Thus in our analysis of acquisition premiums, we include deals in which the acquirers are publicly traded or privately held. However, we do not include nontaxable deals in our premium

¹³ For an acquisition to qualify as a nontaxable stock-for-stock transaction under Section 368(a)(1)(B), all of the consideration paid must be voting stock of the acquirer, with the exception of cash paid in lieu of fractional shares (p. 417 of Erickson et al. 2020). We use greater than 90 percent stock as the cutoff point to allow for the possibility that a small amount of cash was included in a nontaxable deal as payment for fractional shares. In untabulated analyses, we find similar results if we use a cutoff of 50 percent, 75 percent, and 100 percent, yielding the inference that if some portion is tax-free and the CEO can choose the tax-free option (as was available in the ultimate deal between Disney and Fox discussed in Section I) then our results hold. In addition, our inferences are unchanged when using a sample consisting exclusively of deals listed as 100 percent cash (taxable deals) or 100 percent stock (nontaxable deals).

¹⁴ SDC includes four different categories for the form of consideration used in each deal, corresponding to the percentage of the purchase price paid using cash, stock, 'other', and 'unknown'. Generally these four categories total to 100 percent. Our requirement that the payment consist of greater than 50 (90) percent cash (stock) excludes 79 deals from our sample, because those deals have significant consideration listed as either 'other' or 'unknown'.

¹⁵ Ayers et al. (2004) also restrict their sample to acquisitions made by public acquirers.

analyses because we primarily expect acquisition premiums to respond to shareholder-level tax incentives in *taxable* deals.¹⁶ In other words, the sellers demand a higher premium to compensate for additional tax on the taxable transaction. As a result, in our main tests regarding acquisition premiums, we restrict the sample to taxable deals. We then examine the nontaxable deals separately as a falsification test.

Variable Measurement

Federal Tax Rates: We measure the federal tax rate in our main tests as the maximum long-term capital gains rate, *Fed CG Rate*, on the effective date of the acquisition. There were four different federal tax regimes during our sample period, representing three major tax rate changes:

- 1) Taxpayer Relief Act of 1997, the top capital gains tax rate was reduced from 28 percent to 20 percent, effective May 7, 1997.
- 2) Jobs and Growth Tax Relief and Reconciliation Act of 2003, the top rate was further reduced from 20 percent to 15 percent, effective January 1, 2003.
- 3) American Taxpayer Relief Act of 2012, the top rate increased to 23.8 percent, effective January 1, 2013.¹⁷

To ease interpretation of our variables interacted with *Fed CG Rate* in the specifications to follow, we define *Fed CG Rate* as the maximum statutory long-term capital gains rate less 20

¹⁶ In untabulated robustness analysis, we perform our primary tests of acquisition premiums with a combined sample of taxable and nontaxable deals, including interaction terms with an indicator variable to designate whether the deal is taxable, similar to the approach in Ayers et al. (2003). We find that our inferences are unchanged using this alternative approach.

¹⁷ The American Taxpayer Relief Act raised the top tax rate from 15 percent to 20 percent but the net investment tax contained in the Affordable Care Act imposes a 3.8 percent surtax on income from investments. It applies to investment income of married couples with more than \$250,000 of adjusted gross income, and single filers with more than \$200,000 of adjusted gross income.

percentage points. Thus, rather than ranging from 15 percent to 28 percent, *Fed CG Rate* ranges from -5 percent to 8 percent and is centered around approximately zero.¹⁸

Tax-Insensitive Institutional Ownership: We construct the percentage of the firm owned by tax-insensitive institutional investors (*Target Inst Own*) following the classifications described in Blouin, Bushee, and Sikes (2017) (data are available on Bushee's website).¹⁹

CEO Ownership: We construct CEO ownership using data from ExecuComp, which contains detailed data on holdings for individual managers of firms belonging to the S&P 1500 index. We calculate CEO ownership as the total number of shares held by the CEO (vested and unvested), divided by the total number of outstanding shares.²⁰

CEO Federal and State Tax Burdens: To better capture the CEO's overall tax liabilities arising from the sale of her holdings in the firm, we employ two measures that incorporate the CEO's unrealized gain on those holdings. The first such measure is *CEO Fed Tax Burden*, which conceptually reflects the percentage of the CEO's proceeds that would be owed in federal taxes if the CEO sold all of her stock holdings in a taxable acquisition.²¹ Using ExecuComp data on CEOs' holdings of unrestricted stock at the end of each fiscal year, we operationalize our measure of the CEO's federal tax liability as follows:

¹⁸ Our inferences are unaffected if we use the unadjusted federal statutory tax rates for *Fed CG Rate*. The adjustment is done to ease interpretation of the coefficients.

¹⁹ When the Ayers et al. (2003, 2004) studies were written, they conducted the state-of-the-art tests at the time using total institutional ownership to proxy for tax-exempt shareholders. Recent studies (e.g., Moser 2007 and Blouin et al. 2017) have provided finer partitions of the institutional ownership data. We employ the more recent data partitions. We also estimate our tests using total institutional ownership and obtain inferences that are unchanged.

²⁰ In this measure, we include vested and unvested stock to be consistent with prior literature (e.g., Hanlon and Hoopes 2014) and because in our robustness tests using TFN data (available in our Online Appendix) the portion of vested stock is not distinguishable from unvested stock. In untabulated tests, we estimate the main tests of structure and premiums and find that the results are largely driven by vested ownership, as one would expect.

²¹ Similar to Jin and Kothari (2008) and Yost (2018), we focus specifically on the tax liability with respect to vested stock while excluding that on unvested stock. Our rationale is that CEOs do not have the ability to sell unvested stock, so there is no tax lock-in effect at work (the barrier to selling is not due to the tax). In addition, the CEO has relatively little control over whether to incur the tax on unvested stock, as restricted stock is typically taxed upon vesting.

$$CEO\ Fed\ Tax\ Burden_t = \frac{\sum_{n=1}^t (P_t - P_n) \times N_n \times Fed\ CG\ Rate_t}{CEO's\ Total\ Proceeds\ from\ Sale_t}$$

where P_t is the firm's stock price at the end of year t ; P_n is the firm's stock price at the end of year n (i.e., the price at which the CEO is assumed to have received the shares obtained in year n);²² N_n is the number of unrestricted shares held by the CEO at the end of year t that were obtained in year n ; $Fed\ CG\ Rate_t$ is the unadjusted maximum federal long-term capital gains tax rate for individuals in year t ; and $CEO's\ Total\ Proceeds\ from\ Sale_t$ is the total proceeds the CEO would receive from selling all shares held at the end of year t .

In addition to *CEO Fed Tax Burden*, we employ another measure – *CEO State Tax Burden* – that reflects the percentage of the CEO's proceeds that would be owed in state taxes if the CEO sold all of her stock in a taxable acquisition. We restrict our attention to state-level taxes only to mitigate concerns that our measure is picking up the tax liabilities of outside shareholders.²³ Our maintained assumption is that the location of the corporate headquarters is the state of residence of the CEO, but less likely to reflect the state of residence for outside shareholders. We operationalize our measure of the CEO's state tax liability as follows:

$$CEO\ State\ Tax\ Burden_t = \frac{\sum_{n=1}^t (P_t - P_n) \times N_n \times State\ CG\ Rate_t}{CEO's\ Total\ Proceeds\ from\ Sale_t}$$

where $State\ CG\ Rate_t$ is the unadjusted maximum state long-term capital gains tax rate applicable to individuals in the state in which the target firm is headquartered in year t .²⁴ To the extent that

²² Due to the lack of more detailed data on grant and vesting dates in ExecuComp, we follow Jin and Kothari (2008) and Yost (2018) in making the simplifying assumption that all vested shares during a year became vested at the fiscal year-end, with the fiscal year-end stock price as the new tax basis.

²³ Although we focus on the state portion of the CEO's tax burden to reduce the possibility that the measure reflects outside shareholder tax liabilities, in untabulated analysis we find similar results when we instead use the CEO's *total* tax burden (federal plus state).

²⁴ Compustat's location data (variable STATE) suffers from an error in that it reports the address of a firm's current principal executive office, not its historic headquarters location. Heider and Ljungqvist (2015) collect corrected firm headquarters data for the years 1989-2011, and Alexander Ljungqvist generously agreed to share the corrected data. Accordingly, our data reflect the corrected historical firm headquarters.

the location of the corporate headquarters is the state of residence of the CEO but less likely to reflect the state of residence for outside shareholders, it allows us to better isolate the effect of the CEO's tax liability. We obtain state tax rate data from the National Bureau of Economic Research.²⁵ Detailed descriptions of *CEO Fed Tax Burden* and *CEO State Tax Burden* are contained in Appendix B.

Control Variables: We follow Ayers et al. (2003, 2004) to control for characteristics of the target and bidder firms, as well as deal characteristics. Target firm characteristics include the target firm's book-to-market value of equity and ROA. We also control for deal characteristics such as whether the bid was hostile, whether there were multiple bidders, and the change in the S&P 500 index for the twelve months preceding the acquisition. In our tests of acquisition structure, we include bidder firm characteristics, including the book-to-market value of equity, the size of the bidder's net operating losses, bidder institutional ownership, bidder abnormal returns in the 12 months preceding the acquisition announcement, the value of cash holdings, the trichotomous tax rate variable from Graham (1996), and the relative size of the target and bidder firms.

We also control for several variables consistent with recent literature. Following Jenter and Lewellen (2015), we control for target firm size, the CEO's age and tenure with the firm, and whether the CEO serves as chairman of the board. Finally, in our tests of acquisition premiums, we control for the target firm's stock price 40 days prior to the acquisition announcement. Our rationale for including the target firm's stock price is that since premiums are calculated as a percentage change from the pre-announcement stock price, target firms with low stock prices are likely to mechanically receive higher premiums. Controlling for the target firm's pre-

²⁵ A listing of the tax rates by state and year that we use can be found in our Online Appendix.

announcement stock price helps to ameliorate the mechanical relation between pre-announcement stock price and premium. Details on variable construction are contained in Appendix A.

Descriptive Statistics

Table 2 Panel A presents descriptive statistics for the variables for H1, tests of acquisition structure. The data show that 47 percent of our sample deals are nontaxable, comparable to the 53 percent of deals found to be nontaxable in Ayers et al. (2004). The average target firm CEO holds 1.5 percent of the firm's outstanding shares. The last three columns show mean values for each variable separately for taxable and nontaxable deals, and the results of t-tests examining the differences in means. The mean value of *Fed CG Rate* is significantly lower for taxable versus nontaxable deals, suggesting that when tax rates are higher, nontaxable deals are more popular, consistent with Ayers et al. (2004). Further, the mean values of *CEO Fed Tax Burden* and *CEO State Tax Burden* are significantly lower for taxable compared to nontaxable deals, suggesting that CEOs prefer to engage in nontaxable deals when they have higher personal tax burdens.

Table 2 Panel B displays descriptive statistics for the variables for H2. The mean acquisition premium is 43 percent, which is lower than the mean premium in Ayers et al. (2003) of 55 percent, but comparable to other recent studies (e.g., Dhaliwal, Lamoreaux, Litov, and Neyland 2016, examining acquisitions from 1985 to 2010, report a mean premium of 46 percent).²⁶ The last three columns show the mean values for each variable separately for deals with public and private acquirers, and the results of t-tests examining the differences in means; public acquirers pay higher premiums (45 percent compared to 40 percent), consistent with the findings in Barger, Schlingemann, Stulz, and Zutter (2008).

²⁶ We note that Dhaliwal et al. (2016) computed the premium in the same manner but used a 28 day period rather than a 40 day period as in Ayers et al. (2003).

III. ACQUISITION STRUCTURE ANALYSIS

Research Design – Acquisition Structure (H1)

We use a series of tests to examine H1 regarding acquisition structure. We first replicate the primary results in Ayers et al. (2004) over the more recent sample period of 1996 through 2016. Using our sample of acquisitions made by public firms, we estimate the following regression:²⁷

$$\begin{aligned} \text{Nontaxable Deal} &= \beta_1 \text{Fed CG Rate} + \beta_2 \text{Fed CG Rate} \times \text{Target Inst Own} \\ &+ \beta_3 \text{Target Inst Own} + \beta_k \text{Controls} + \delta_{time} + \alpha_{ind} + \epsilon \end{aligned} \quad (1)$$

Nontaxable Deal is an indicator variable equal to one if the deal is a stock-for-stock transaction, and equal to zero otherwise. *Fed CG Rate* represents the maximum federal capital gains tax rate at the time of deal completion, *Target Inst Own* represents the percentage of the firm's outstanding shares owned by tax-insensitive institutional investors at the end of the fiscal year prior to the deal's completion, and *Controls* represents the vector of control variables described above. We also include fixed effects for time and industry; δ_{time} represents indicator variables for five-year intervals starting in 1996, and α_{ind} represents SIC 1-digit fixed effects.²⁸

Following Ayers et al. (2004), we predict that the coefficient on *Fed CG Rate*, β_1 , is positive because when capital gains tax rates are high, target firm shareholders prefer to be acquired in nontaxable deals. Also, following Ayers et al. (2004) we predict that the coefficient on

²⁷ We use a linear probability model (LPM) as opposed to a non-linear limited dependent variable (LDV) model for our acquisition structure tests to enable easy interpretation of the coefficients, especially with regards to the interacted coefficients (i.e., Ai and Norton 2003), and because we include fixed effects in our model (Angrist and Pischke 2009). The use of LPM does not impose potential bias or inconsistency on the coefficients and standard errors (Greene 2004). We use heteroskedasticity robust standard errors in our estimation of the LPM to adjust for the well-known problem of heteroskedasticity when using an LPM with a LDV. We have estimated our tests using LDV and the results are qualitatively unchanged.

²⁸ We use indicator variables for five-year intervals and SIC 1-digit industry fixed effects to ensure the same fixed effects structure as in Ayers et al. Dividing our sample period into five-year intervals results in four five-year periods (corresponding to years 1996-2000, 2001-2005, 2006-2010, and 2011-2015) and one one-year period (the year 2016).

the interaction term $Fed\ CG\ Rate \times Target\ Inst\ Own$, β_2 , is negative—a higher percentage of tax-exempt shareholders should mitigate the tax effect.²⁹

We then modify Equation 1 to introduce CEO ownership, $CEO\ Own$, and we estimate the following regression:

$$\begin{aligned}
 Nontaxable\ Deal &= \beta_1 Fed\ CG\ Rate + \beta_2 Fed\ CG\ Rate \times Target\ Inst\ Own + \beta_3 Fed\ CG\ Rate \\
 &\times CEO\ Own + \beta_4 Target\ Inst\ Own + \beta_5 CEO\ Own + \beta_k Controls + \delta_{time} \\
 &+ \alpha_{ind} + \epsilon
 \end{aligned} \tag{2}$$

$CEO\ Own$ represents the percentage of the firm’s outstanding shares owned by the CEO at the end of the fiscal year prior to the deal’s completion. It is intended to proxy for both whether the CEO is the marginal (price-setting) shareholder, analogous to the Ayers et al. (2003, 2004) method of testing the effect of institutional investors, and also whether the potential gain is relatively large for the CEO. H1 predicts a positive coefficient on the interaction term of $Fed\ CG\ Rate \times CEO\ Own$, β_3 . We do not have a prediction about the coefficients β_1 and β_2 . The coefficients may remain significant if the CEOs’ tax incentives provide an incremental effect. However, if the tax effects only become significant in the presence of CEO ownership, then the main effect on shareholder-level taxes as well as the mitigating effect of institutional investors may be zero. This specification allows for a parsimonious way to extend the analysis in Ayers et al. (2004) and to examine the effect of CEO ownership on the relation between taxes and acquisition structure.³⁰

²⁹ Note that although we center our tax rate variable, $Fed\ CG\ Rate$, around zero, we do not mean-center the institutional ownership variable, $Target\ Inst\ Own$, around zero, so we can interpret the main effect for $Fed\ CG\ Rate$ as the effect for a firm with zero percent institutional investors. This way, the main effect represents the tax effect for the situation in which the findings of Ayers et al. (2004) would be the strongest. In untabulated analysis, we repeat the specification with the $Target\ Inst\ Own$ mean centered around zero, and we find that the coefficient on $Fed\ CG\ Rate$ is insignificant, consistent with taxes being less important for an average firm with considerable institutional investors. Most importantly, our inferences that CEO tax liabilities are important continue to hold regardless of whether we use zero or average institutional ownership as our benchmark.

³⁰ In untabulated analysis, we replace CEO ownership with the aggregate holdings of the top five insiders with the largest holdings (including the CEO), and find that our results are qualitatively unchanged. When we separately

To more directly examine the impact of the CEO's taxable gain on acquisition structure, we modify Equation 2 by replacing our proxy for CEO ownership, *CEO Own*, and its interaction with the federal tax rate, *Fed CG Rate* \times *CEO Own*, with an estimate of the CEO's federal tax burden at the end of the fiscal year prior to the deal's completion, *CEO Fed Tax Burden*. An advantage of *CEO Fed Tax Burden* over *CEO Own* is that it better captures the CEO's unrealized gain on her holdings in the firm. Unrealized gains are more precisely estimable for insiders (relative to estimating gains for the entire shareholder set) because data are available regarding acquisition dates of insider stock holdings. We estimate the following regression:

$$\begin{aligned}
 \text{Nontaxable Deal} &= \beta_1 \text{Fed CG Rate} + \beta_2 \text{Fed CG Rate} \times \text{Target Inst Own} \\
 &+ \beta_3 \text{CEO Fed Tax Burden} + \beta_4 \text{Target Inst Own} + \beta_k \text{Controls} + \delta_{\text{time}} \\
 &+ \alpha_{\text{ind}} + \epsilon
 \end{aligned} \tag{3}$$

We predict a positive coefficient on the interaction term of *CEO Fed Tax Burden*, β_3 , — when CEOs with large unrealized federal tax liabilities, target firms show a stronger preference to be acquired in nontaxable deals.

Because federal tax rates affect all individual shareholders at the same time it is difficult to separate the tax effects of the CEO from outsiders. To deal with this challenge, we examine the effects of *state* tax rates on acquisition structure. There is substantially more variation in state tax rates during our sample period than in federal tax rates. Not only do most states have unique tax rates (rather than a uniform federal tax rate applying to all deals at a given point in time), there are also more *changes* in state tax rates. The staggered changes in state taxes over time allows for the inclusion of year fixed effects, which mitigates a concern that the findings could be affected by an omitted correlated variable affecting firms around the time of changes in the federal tax rates.

include CEO ownership and the aggregate holdings of the four other largest insiders, we find that although the other insiders seem to have some incremental explanatory power, our results are largely driven by the CEO.

The state tax setting also helps us address the concern that our tax rate variable reflects outside shareholders' incentives, because a given state's capital gains tax rates apply only to shareholders who reside in that state. Thus, while a state's taxes are likely to apply to employees of the firm, including the CEO, who presumably resides near the firm headquarters, they will not apply to investors who live in other states, allowing us to more confidently attribute acquisition outcome responses to the tax incentives of the CEO (who we assume lives in the state).³¹

We modify Equation 3 by dropping *Fed CG Rate* and replacing *CEO Fed Tax Burden* with *CEO State Tax Burden*, which measures the CEO's state tax burden at the end of the fiscal year prior to the deal's completion. In addition, we replace the indicator variables for five-year intervals with year fixed effects. Thus, we estimate the following regression:

$$\begin{aligned} \text{Nontaxable Deal} \\ = \beta_1 \text{CEO State Tax Burden} + \beta_2 \text{Target Inst Own} + \beta_k \text{Controls} + \delta_{\text{year}} \\ + \alpha_{\text{ind}} + \epsilon \end{aligned} \quad (4)$$

We predict a positive coefficient on *CEO State Tax Burden*, β_1 , — when target CEOs have high state tax burdens, target firms show a stronger preference to be acquired in nontaxable deals.

Main Results – Acquisition Structure (H1)

Table 3 presents the results from estimating Equations 1 through 4. The first column shows a successful replication of the main result from Ayers et al. (2004) in our more recent sample period. Namely, the positive coefficient on *Fed CG Rate* (coef.=0.025; t-stat=1.83) indicates that target firms are more likely to be acquired in nontaxable deals when tax rates are high. The negative coefficient on *Fed CG Rate* \times *Target Inst Own* (coef.=-0.029; t-stat=-1.87) is consistent with the

³¹ Of course, to the extent that investors are subject to local bias (investing in firms located in their state (e.g., Ivkovic and Weisbenner 2005), or insiders do not reside in the same state in which the company is headquartered, the state tax setting will not entirely rule out the concern that our tax rate variable reflects the incentives of other investors besides the CEO.

tax effect being mitigated when the firm's investor base is made up in large part by tax-insensitive investors (i.e., when the marginal shareholder is more likely to be tax-exempt).

Examining the control variables, the negative coefficients on *Target ROA* and *Competing Bid* indicate that better performing targets with multiple bidders are less likely to be purchased in a nontaxable stock deal, consistent with Ayers et al. (2004), (although the negative coefficient on *Competing Bid* is insignificant in their study). The positive coefficient on *Bidder Runup* indicates that better performing acquirers are more likely to use their own stock to purchase a target in a nontaxable deal, consistent with Ayers et al. (2004). We find positive coefficients on *Log(Target Size)* and *Relative Size*, indicating that targets are more likely to be purchased with stock when they are larger in an absolute sense, and when they are larger relative to the size of the acquirer. We also find a positive effect of *Bidder NOL* and *Bidder MTR* on nontaxable deal likelihood, although Ayers et al. (2004) found no relation. We find no statistically significant effects on nontaxable deal likelihood from *Target BTM*, *Hostile*, *S&P 500 Index Change*, *Bidder BTM*, *Bidder Inst Own*, and *Bidder Cash Value*. Although these coefficients do not meet the same levels of statistical significance, they are directionally consistent with the findings in Ayers et al. (2004). Finally, we find negative but insignificant effects from *Log(CEO Age)*, *Log(CEO Tenure)*, and *CEO Chair*, pointing to a possible preference of older, more experienced CEOs for cash payouts.³²

³² In untabulated analysis, we consider the possibility that older CEOs might be less sensitive to tax considerations and simply prefer cash deals for the purpose of diversifying their personal wealth. To test this conjecture we partition the sample of deals into quartiles based on CEO age, and designate the top quartile of CEO age (which corresponds approximately to CEOs over the age of 60) as *CEO High Age*. Our findings suggest that in the absence of large personal tax liabilities, older CEOs do indeed tend to prefer cash deals. However, when facing significant personal tax liabilities, older CEOs are actually *more* likely to engage in nontaxable deals, or receive higher premiums in taxable deals, as compared with younger CEOs. One possible explanation for this finding is that older CEOs have greater opportunities for tax planning in the near future. For example, older CEOs who reside in high tax states (e.g., California) might prefer to continue deferring the sale of shares and realization of tax until they retire and are able to move to a low or no tax state (e.g., Texas or Florida). Additionally, older CEOs may prefer to hold their shares until death to obtain the step-up in asset bases for their shares.

In the second column of Table 3, we introduce the *CEO Own* variable, reflecting the percentage of the firm held by the CEO at the time of the acquisition. The coefficient on *Fed CG Rate* \times *CEO Own* is positive and significant (coef.=0.342; t-stat=3.22) indicating that target firms are significantly more likely to be acquired in nontaxable deals relative to taxable deals when CEOs hold more shares in the firm. In addition to the effect of CEO ownership, we note that the coefficients on *Fed CG Rate* and on *Fed CG Rate* \times *Target Inst Own* are no longer significant when our variable for CEO holdings is included in the regression. This suggests that the effect of individual tax rates on acquisition structure is not statistically significant when CEO ownership is low and that the effect of institutional investors is subsumed by the effect of CEO ownership.

In the third column, we use *CEO Fed Tax Burden* variable, The coefficient is positive and significant (coef.=0.441; t-stat=2.92) indicating that target firms are more likely to be acquired in nontaxable deals when CEOs have higher federal tax burdens. Similar to the second column, the coefficients on *Fed CG Rate* and on *Fed CG Rate* \times *Target Inst Own* are not significant. Last, in the fourth column of Table 3, we replace the *CEO Fed Tax Burden* variable with *CEO State Tax Burden*. The coefficient on *CEO State Tax Burden* is positive and significant (coef.=1.162; t-stat=1.98) indicating that target firms are more likely to be acquired in nontaxable deals when target CEOs have higher state tax burdens.³³ Economically, an interquartile increase in *CEO State Tax Burden* is associated with a 3.1 percentage point higher likelihood of a nontaxable

³³ The implicit assumption in our state-level tests is that the location of the corporate headquarters is more likely to be the state of residence for the CEO but less likely to reflect the state of residence for outside shareholders. In untabulated analysis, we test this assumption by adding an interaction term *State CG Rate* \times *Target Inst Own* to the specification in the fourth column. Consistent with institutional investors being located in other states, we find that the coefficient on the interaction term *State CG Rate* \times *Target Inst Own* is insignificantly different from zero. We continue to find that the coefficient on *State CG Rate* \times *Target Inst Own* is insignificantly different from zero when we modify the specification in the fourth column by excluding the *CEO State Tax Burden* term. Our findings are similar with regard to acquisition premiums in Table 4.

acquisition.³⁴ Given that the unconditional average probability of a nontaxable acquisition equals 47.4 percent, this result implies a relative increase in the likelihood of a nontaxable acquisition of 6.5 percent due to CEO state tax effects.

Overall, we interpret the findings in Table 3 as indicating that the target-shareholder tax effect on acquisition structure documented in Ayers et al. (2004) is concentrated in companies where the target CEO is subject to a relatively high tax burden, consistent with H1. Indeed, the results suggest that if the CEO does not have a relatively high tax burden, shareholder-level taxes do not influence acquisition structure.

IV. ACQUISITION PREMIUM ANALYSIS

Research Design – Acquisition Premium (H2)

To test CEO tax effects on acquisition premiums, H2, we perform a similar series of tests as in our analysis of acquisition structure. In particular, we re-estimate Equations 1 through 4, but we replace the dependent variable with *Target Premium*, and we adjust the set of control variables to reflect determinants of premiums.

Main Results – Acquisition Premium (H2)

Table 4 Panel A presents the results of our initial tests of H2. The first column displays a replication of the main result from Ayers et al. (2003) in our more recent sample period. The positive coefficient on *Fed CG Rate* (coef.=0.019; t-stat=2.06) indicates higher premiums are paid in taxable deals when individual-level capital gains tax rates are high. The negative coefficient on *Fed CG Rate* \times *Target Inst Own* (coef.=-0.024; t-stat=-1.63) indicates that this effect is decreasing in the percentage of tax-insensitive investors, consistent with Ayers et al. (2003).

³⁴ Note that the 25th and 75th percentiles of *CEO State Tax Burden* in the structure sample are 0.000 and 0.027. Thus, the economic magnitude of an interquartile increase can be computed as $1.162 \times (0.027 - 0.000) = 0.031$.

Examining the control variables reveals positive coefficients on *Log(Target Size)*, *Target Leverage*, *Target Current Assets*, and *Tender*, indicating that among taxable deals, higher premiums are awarded to target firms that are larger, have more debt and more current assets, or are acquired in tender offers. Ayers et al. (2003) also find higher premiums for targets with greater leverage and those acquired in tender offers, although they find no relation between premiums and the target's current assets, and they do not control for the size of the target firm. We find negative coefficients on deals in which the acquirer previously had an ownership stake (*Toehold*) in the target, similar to Ayers et al. (2003). We find a negative relation between *Log(Target Price)* and *Target Premium*, consistent with lower-priced targets receiving mechanically higher percentage price increases in acquisitions. Also similar to Ayers et al. (2003), we find no significant relation between *Target Premium* and *Target BTM*. Unlike Ayers et al. (2003), who find positive coefficients on *Target ROA*, *Target NOL*, *Hostile*, and *Competing Bid*, we find no statistically significant effect from these characteristics. We also find no significant effect arising from *Log(CEO Age)* or *Log(CEO Tenure)*, consistent with Jenter and Lewellen (2015).³⁵

In the second column of Table 4 Panel A, we introduce the *CEO Own* variable, reflecting the percentage of the firm held by the CEO at the time of the acquisition. The coefficient on *Fed CG Rate* \times *CEO Own* is positive and significant (coef.=0.224; t-stat=2.27), consistent with H2. We interpret the evidence as being consistent with higher capital gains tax rates leading to higher acquisition premiums in taxable deals when CEOs hold more shares in the firm. Like Table 3, the coefficients on *Fed CG Rate* and *Fed CG Rate* \times *Target Inst Own* are smaller and no longer statistically significant when the variable for CEO holdings is included. In the third column, we

³⁵ While many of our controls are consistent with Ayers et al. (2003, 2004) the differences that are present may exist because of the different sample periods and/or because we include additional control variables in our study due to the progression of the literature and our workshop and review process.

employ *CEO Fed Tax Burden*; we find the coefficient is positive and significant (coef.=0.282; t-stat=2.02) indicating that target firms receive higher premiums in taxable deals when CEOs have larger federal tax burdens. Again, the coefficients on *Fed CG Rate* and on *Fed CG Rate* \times *Target Inst Own* are not significant.

In the fourth column of Table 4 Panel A, the coefficient on *CEO State Tax Burden* is positive and significant (coef.=0.981; t-stat=2.30) indicating that target firms receive higher premiums in taxable deals when target CEOs have higher state tax burdens. Economically, an interquartile increase in *CEO State Tax Burden* is associated with a 2.2 percentage point higher premium in a taxable acquisition.³⁶ Given that the unconditional average premium of a nontaxable acquisition equals 43 percent, this implies a relative increase in acquisition premium of 5.0 percent.

In untabulated analysis, we quantify the amount of the additional premium received by the CEO in response to an interquartile increase in the *total* tax burden (federal plus state tax liabilities). For the average deal size, an interquartile increase in the total tax burden amounts to an additional \$5.33 million in federal and state taxes owed by the CEO. The additional premium received by the CEO in response to the larger tax burden amounts to \$2.06 million, thereby offsetting just below 40 percent of the CEO's total tax liability.

Overall, we interpret the findings in Table 4 Panel A as indicating that the target-shareholder tax effect on premiums documented in Ayers et al. (2003) is concentrated in companies where the CEO is subject to a relatively high personal tax burden, consistent with H2. Again, similar to the structure tests above, the results suggest that if the CEO does not have a relatively high tax burden, shareholder-level taxes are not important to acquisition premiums (i.e., outsider shareholders' taxes are not important).

³⁶ Note that the 25th and 75th percentiles of *CEO State Tax Burden* in the premium sample are 0.000 and 0.022. Thus, the economic magnitude of an interquartile increase can be computed as $0.981 \times (0.022 - 0.000) = 0.022$.

Falsification Test – Acquisition Premium in Nontaxable Deals

In our analysis of premiums above, we examine only taxable deals (and exclude nontaxable deals) because we expect the sellers to demand a higher premium to compensate for the additional tax on a taxable transaction. In the absence of a tax liability imposed upon the sale of shares, we do not expect higher tax rates to cause shareholders to demand higher acquisition premiums. In Panel B of Table 4, we test this prediction in a sample of 220 nontaxable, stock-for-stock, mergers. Consistent with our expectation, we do not find a statistically significant positive relation between CEOs' tax liabilities and premiums for nontaxable deals.³⁷

V. ADDITIONAL ANALYSIS

We perform several additional analyses to further explore the nature of the relation between CEOs' tax incentives and deal outcomes.

CEO Side Payments

We examine whether direct payments to CEOs in the course of the merger mitigate the effect of CEOs' personal tax preferences on acquisition outcomes. We examine two forms of payments made to target CEOs: golden parachute payments and merger bonuses. Although both forms of payment benefit the target CEO upon completion of the merger, they have distinct features and play unique roles in the acquisition process. As described in Fich, Rice, and Tran (2016), one key difference is that golden parachutes are generally contained within the CEO's employment agreement before merger negotiations are underway (i.e., an *ex ante* tool to align CEOs' and shareholders' incentives), whereas merger bonuses generally occur in the course of merger negotiations (i.e., an *ex post* tool). Another difference is that while a merger bonus is

³⁷ Ayers et al. (2003) examined nontaxable deals as a type of falsification test, but found unexpected evidence of a tax effect for nontaxable deals in some cases. The authors conjectured that one reason might be that if shareholders plan to sell the shares obtained in the stock-for-stock deal they would still face a tax and perhaps demand to be compensated for this tax upon the acquisition transaction.

generally paid to the target CEO as long as the merger is completed, a golden parachute payment is typically awarded to the target CEO only if she is *not* retained by the merged firm. Despite the unique features of the two types of benefits, we predict that both are likely to reduce the CEO's sensitivity to any personal tax implications of the merger.

We test our prediction by modifying Equation 4 to include an indicator variable, *Gold Parachute*, equal to one if (i) the target firm guarantees a golden parachute payment to the CEO upon a change-in-control, and (ii) the target CEO is not retained by the merged firm. We then include an interaction between *Gold Parachute* and *CEO State Tax Burden*. We similarly test for the effect of merger bonuses on acquisition structure by replacing the *Gold Parachute* variable with *Merger Bonus*, an indicator variable equal to one if the target CEO was awarded a merger bonus in the course of the acquisition and an interaction term between *Merger Bonus* and *CEO State Tax Burden*. We predict that the estimated coefficients for the interaction terms will be negative, suggesting that the existence of a side payment attenuates the CEO's tax incentives.

The first results column of Table 5 Panel A estimates the influence of golden parachutes on the relation between CEO tax burdens and acquisition structure. The coefficient on *CEO State Tax Burden* is positive and significant (coef.= 2.537; t-stat=4.68), consistent with the findings in Table 3. The interaction term, *CEO State Tax Burden* \times *Gold Parachute* is negative and significant (coef.=-1.482; t-stat=-2.04); when target CEOs with high tax burdens receive golden parachute payments, they are more willing to engage in a taxable acquisition. The coefficients indicate that the presence of a golden parachute payment reduces the target CEO's tax preference for nontaxable deals by more than half. The second column displays the results for merger bonuses. The coefficient on *CEO State Tax Burden* \times *Merger Bonus* is negative and marginally significant (coef.=-1.861; t-stat=-1.43); when high-tax target CEOs receive bonuses as part of the merger,

they are more willing to sell the firm in a taxable acquisition.³⁸ An F-test examining the joint significance of the coefficients on *CEO State Tax Burden* and *CEO State Tax Burden* \times *Merger Bonus* ($\beta_1 + \beta_3$) reveal that the joint effect is insignificantly different from zero (p -value = 0.42), indicating that CEO state tax burdens do not significantly influence deal structure when a merger bonus is paid to the CEO.

Table 5 Panel B presents the results of tests examining the impact of side payments on the relation between CEO tax burdens and acquisition premiums. Both results columns display negative and significant coefficients on the interaction terms, *CEO State Tax Burden* \times *Gold Parachute* and *CEO State Tax Burden* \times *Merger Bonus*, indicating that side payments to CEOs with high tax burdens during the acquisition process lead to reduced premiums. Similar to the results on acquisition structure, the coefficient magnitudes suggest that the use of golden parachutes or merger bonuses largely offset CEOs' preferences for higher premiums in the presence of taxes. The results of F-tests examining the joint significance of the coefficients ($\beta_1 + \beta_2$) and ($\beta_1 + \beta_3$) reveal that in the presence of either golden parachutes or merger bonuses, CEO state tax burdens do not significantly influence acquisition premiums. Overall, the results in Table 5 are consistent with side payments to target CEOs weakening the link between CEOs' personal tax liabilities and acquisition outcomes.

Influential Shareholders

We investigate whether two groups of potentially influential shareholders in the target firm pressure the target CEO not to make acquisition decisions based on personal tax considerations. We examine activist shareholders and outside blockholders because these shareholder groups tend to be relatively powerful and likely to be able to challenge management decisions. Activist

³⁸ Note that we have fewer observations in our tests regarding merger bonuses because the merger bonus data from Fich et al. (2016) only covers years 1999 to 2009.

shareholders and outside blockholders are also likely to be less sensitive to taxes than are CEOs. Since we measure blockholders from large institutional investors (as explained below), the argument follows directly from Ayers et al. (2003, 2004). As for activist shareholders, prior literature suggests that activist shareholders are most often hedge funds, and those hedge funds are less likely to be subject to taxes (Blouin et al. 2017; Jiang, Li, and Mei 2018).³⁹ In addition, Brav, Jiang, Partnoy, and Thomas (2008) find that the median holding period for activist hedge funds is approximately one year. In contrast, the median CEO tenure in our sample of mergers is approximately seven years. This disparity in holding periods suggests that CEOs have a significantly longer horizon over which to accumulate unrealized gains and thus have a stronger incentive to avoid taxes upon sale.

Ex ante, it is unclear to us whether these two groups of potentially influential shareholders will seek to dissuade CEOs from allowing personal tax considerations to influence the merger terms. For instance, to the extent that the CEO's preference for nontaxable deals comes at the expense of a lower premium, then there would be a conflict of interest between a CEO with large tax burden and activists/blockholders. On the other hand, if the CEO preference translates into a taxable deal with higher premiums, then the incentives between the CEO and activists/blockholders will be aligned.

We obtain data on corporate activism campaigns from SharkWatch (FactSet), which offers a comprehensive database of activism events from the year 2000 onward. Following Boyson, Gantchev, and Shivdasani (2017), we create an ex ante measure of shareholder activism potential by identifying those firms that have recently experienced activist campaigns. In particular, we

³⁹ Jiang et al. (2018) show that out of a sample of 281 unique activist investors engaged in campaigns involving mergers, over 80 percent of them are hedge funds. Further, in evaluating the tax-sensitivity of institutional investors, Blouin et al. (2017) find that 71 percent of hedge funds are tax-insensitive.

create an indicator variable, *Activist*, equal to one if the target firm has experienced an activist campaign of any kind within the five-year window prior to the acquisition announcement. To test our prediction with respect to outside blockholders, we create an indicator variable, *Outside Block*, equal to one if the target firm has an institutional investor who owns more than five percent of the firm's outstanding shares at the end of the firm's fiscal year prior to the acquisition (Dechow, Sloan, and Sweeney 1996). We then examine the impact of activists and outside blockholders on the relation between CEO state tax burdens and acquisition outcomes by adding interaction terms containing *Activist* and *Outside Block* to our primary specifications.

Table 6 Panel A displays the results. The first column shows a negative but only marginally significant coefficient on *CEO State Tax Burden* \times *Activist* (coef.=-1.098; t-stat=-1.34), indicating that when activist shareholders are present, target CEOs with high tax burdens are less inclined to choose a nontaxable deal structure. The second column similarly shows a negative and significant coefficient on *CEO State Tax Burden* \times *Outside Block* (coef.=-1.398; t-stat=-2.08), suggesting that the presence of outside institutional blockholders also discourages high-tax burden CEOs from choosing a nontaxable deal structure.

Table 6 Panel B shows the effects of influential shareholders on the relation between target CEO taxes and premiums. The interaction terms *CEO State Tax Burden* \times *Activist* and *CEO State Tax Burden* \times *Outside Block* both have insignificant coefficients, indicating no effect of outside shareholders on the relation between CEOs with high tax burdens and premiums in taxable deals. Overall, the results are consistent with outside shareholders preferring a taxable deal (because they are less tax-sensitive than CEOs) and in those deals having aligned incentives with CEOs (i.e., both the CEO and the shareholders want a higher premium). These results plausibly suggest that outside shareholders perceive the CEO's preference for nontaxable deals as value-decreasing.

Share of Merger Gains to Acquirer

The previous result on shareholder activism suggests a potential agency conflict between CEOs and shareholders when CEOs' tax incentives translate into a higher probability of a nontaxable deal (and potentially a conflict when CEOs have a low tax liability if they fail to negotiate a higher premium as compensation for shareholder taxes). In this section, we extend this analysis by examining the value implications for the acquirer. In particular, we focus on whether target CEOs acting in their own personal interests allow acquirers to earn a larger share of the overall merger gains. As in our analysis of activist investors, the prediction here is unclear, *ex ante*. For instance, if the target CEO personally desires a nontaxable acquisition to the point where she accepts a deal at a low premium, the acquirer benefits by obtaining the target at a low price. However, if the target CEO bargains more aggressively to gain a higher premium and offset some personal tax liability, the acquirer suffers by having to pay more to complete the deal.

We test for the value implications to the acquirer in two ways, we examine the acquirer's: 1) cumulative abnormal returns around the acquisition announcement and 2) relative share of the total merger gains, following Ahern (2012). The variables are defined in Appendix A. Since we require market returns for the acquirer, we restrict our sample to those deals with public acquirers. We use the same specification as in Equation 4, but we add a control variable to indicate whether the deal is nontaxable, and we replace the dependent variable with our proxies for acquirer value.

Table 7 displays the results of our tests regarding the impact of target CEO tax liabilities on acquirer firm value. The dependent variable in the first column is the acquirer's 3-day cumulative abnormal return around the acquisition announcement, *Acquirer CAR*. The relation between *Acquirer CAR* and CEO taxes is positive and significant as indicated by the coefficient on *CEO State Tax Burden* (coef.=0.114; t-stat=2.58). The dependent variable in the second column

is the target's relative dollar share of the overall merger gains, *Target Relative Gain*, as used in Ahern (2012). The coefficient on *CEO State Tax Burden* in the second column is negative and significant (coef.=-0.104; t-stat=-2.28), indicating that target firms take home less of the overall merger gains when the CEO has a high personal tax liability.

Our interpretation of these findings is that target CEOs concerned about their own taxes fail to maximize the target's share of the overall merger gains. Thus, these findings are consistent with the evidence above that CEO preferences for nontaxable deals appear to be value-decreasing from the perspective of target shareholders.

Public and Private Bidder Analysis

In this section, we partition our sample into public and private acquirers and conduct our tests separately for these two groups. Our rationale for this analysis follows from the observation that public acquirers can respond to target firm CEO tax liabilities in two ways: structure the deal as a nontaxable acquisition by offering stock, or offer cash in a taxable deal but pay a higher premium. In contrast, private firm acquirers have less flexibility in this regard, because their stock is not publicly traded making it less useful as a form of currency (Celikyurt, Sevilir, and Shivdasani 2010). Thus we predict that private firm acquirers can only accommodate insider tax liabilities via acquisition premium.⁴⁰ For public acquirers, however, it is an empirical question whether they accommodate insider tax liabilities via structure or premium.

Table 8 displays the results of the acquisition structure and premium analysis for public and private acquirers separately. In Panel A of Table 8, the first column shows a positive, significant coefficient on *CEO State Tax Burden* (coef.=1.246; t-stat=2.61), indicating that public

⁴⁰ Consistent with this argument, Table 1 reports that among public acquirers 53 percent of the deals are taxable and 47 percent are nontaxable. In contrast, among private acquirers 93 percent of the deals are taxable whereas only 7 percent are nontaxable.

acquirers respond to target CEO tax incentives by offering stock in nontaxable deals. The second column, however, shows an insignificant coefficient on *CEO State Tax Burden* (coef.=0.003; t-stat=0.01), consistent with private firm bidders lacking the flexibility to respond to target tax incentives by offering stock in a nontaxable deal. Panel B of Table 8 presents the results for acquisition premiums in taxable deals with public and private acquirers and paints the opposite picture. Specifically, the first column shows an insignificant coefficient on *CEO State Tax Burden* (coef.=-0.683; t-stat=-0.66), indicating that public acquirers do not respond to target tax incentives by offering higher premiums. However, the second column shows a positive and significant coefficient on *CEO State Tax Burden* (coef.=1.872; t-stat=2.16), indicating that private acquirers respond to target tax incentives by offering substantially higher premiums in taxable deals.⁴¹

Overall, the results in Table 8 reveal that when faced with target CEO tax preferences, public bidders choose to placate those shareholders by offering stock in a tax-free deal. However, private bidders lack the option of using their own stock as currency in a tax-free deal, so they must respond to target CEO tax preferences with the only lever available to them – offering higher premiums in a taxable cash acquisition.

Acquisition Likelihood

Building on Ayers et al. (2007), who provide evidence that periods of higher capital gains tax rates are associated with fewer acquisitions, we examine whether this effect is driven by CEO taxes. We predict that high CEO taxes are more likely to reduce the likelihood of taxable acquisitions, because the acquirer is forced to pay a higher premium to induce the target CEO to

⁴¹ In order to test statistical significance, in untabulated analysis we perform a variation of the Table 8 tests in which we pool all of the deals in one regression, use an indicator variable to denote public acquirers, and include an interaction term to test for the differential impact of target insiders' tax liabilities on deal structure and premiums for public and private acquirers (i.e., *CEO State Tax Burden* × *Public Acquirer*). Using this alternative methodology, we find that the difference between the two groups is statistically significant in both tests.

accept the deal. However, since nontaxable acquisitions do not reflect a higher premium paid in response to CEO taxes, we do not expect to see higher CEO tax burdens associated with a reduced frequency of nontaxable deals.

To perform our analysis of acquisition likelihood, we retain all firm-years in Compustat during our sample period which contain the necessary data to construct CEO tax burdens as well as our control variables. This process yields 32,428 firm-years from 1996 through 2016, containing 705 completed acquisitions. We include a subset of the control variables used throughout our acquisition structure and premium tests. We also include one additional control variable, *Takeover Defense*, which is an indicator variable reflecting whether the firm requires a supermajority of shareholders to vote in favor of a merger for approval.⁴²

The first column of Table 9 displays the effect of CEO state tax burdens on the likelihood of a deal (taxable or nontaxable) occurring. The negative and significant coefficient on *CEO State Tax Burden* (coef.=-0.065; t-stat=-2.48) indicates that deals are less likely to occur when target CEOs face higher tax burdens. We interpret this result as being consistent with target CEO taxes at least partially driving the findings in Ayers et al. (2007).

The second and third columns of Table 9 show the effects of CEO taxes on acquisition likelihood for taxable and nontaxable deals. The coefficient on *CEO State Tax Burden* for taxable deals is significantly negative, suggesting that target CEO taxes present a real friction to taxable deals. However, the coefficient on *CEO State Tax Burden* for nontaxable deals is not significantly different from zero, indicating that target CEO taxes do not deter nontaxable acquisitions.

⁴² Bebchuk, Cohen, and Ferrell (2009) list the supermajority requirement to approve a merger as one of their six key metrics used to measure the entrenchment of a firm's managers. They typically require the approval of two-thirds, 75 percent, or 80 percent of the holders of the firm's outstanding shares, rather than a simple majority approval. We find that approximately 30 percent of our sample firm-years are subject to a supermajority requirement, similar to the figures shown in Bebchuk et al. (2009).

Economically, an interquartile increase in *CEO State Tax Burden* is associated with a relative decrease in unconditional acquisition likelihood of 7.8 percent, and a relative decrease in the likelihood of taxable deals of 10.4 percent. Overall, the results in Table 9 suggest that CEO taxes reduce the unconditional likelihood of an acquisition occurring, and that this effect is driven by a reduced likelihood of taxable (but not nontaxable) deals.⁴³

VI. CONCLUSION

This study investigates the effect of target firm CEOs' capital gains tax liabilities on acquisition structure and value. We build upon the important work by Ayers et al. (2003, 2004) who document that target shareholder taxes affect acquisition price and structure. The key innovation in our paper is that we expect the effect of shareholder taxes on acquisition structure and value to increase as CEOs' tax liabilities increase. The intuition behind our hypotheses is that CEOs are effectively the price-setting shareholders because they are negotiating the deals and that CEOs will care about shareholder-level taxes when they bear those taxes themselves.

We conduct multiple analyses, including tests employing state-level tax burdens, as well as tests investigating mechanisms to mitigate the influence of CEOs' tax incentives such as side payments and activist shareholders. Overall, we find results that support our hypotheses. In addition, we highlight situations in which CEOs' tax incentives may translate into acquisition features that are not value-enhancing from the perspective of the target's shareholders. We also

⁴³ The findings in Table 9 indicate that CEO tax liabilities influence the initial choice of whether to be involved in the M&A market at all, raising the concern that the sample of target firms in our acquisition structure and premium tests is not randomly selected. In untabulated analyses we address potential self-selection concerns with a Heckman (1979) two-stage selection model. In the first stage we estimate the likelihood that a firm is acquired using a probit model including the control variables used in Table 9. To identify the selection effect in the second stage, there must be at least one excluded variable that is used as an explanatory variable in the first stage. We use the *Takeover Defense* variable to help explain variation in the likelihood that a firm is acquired. We use the first stage results to estimate the inverse Mills ratio, which we include in second stage regressions estimating the impact of CEO state tax burdens on acquisition structure and premiums. After controlling for the potential self-selection of target firms being acquired, we continue to find that high CEO state tax burdens are associated with a higher likelihood of nontaxable deals and higher premiums among taxable deals.

provide evidence that public acquirers respond to target-shareholder taxes primarily by adjusting the deal structure, whereas private acquirers respond by adjusting the deal price.

Our study contributes to our understanding of what taxes and whose taxes affect acquisition structure and value. We find that the result that shareholder-level taxes influence acquisition outcomes is driven by the CEO's taxes. An overriding question in the literature is whether firm management considers shareholder-level taxes in decision-making. We find evidence that CEOs take their own taxes into account in decision-making but little evidence that they take outside shareholder-level taxes into account. The evidence suggests that shareholder-level taxes matter only when CEOs are relatively large shareholders and/or their tax liabilities are relatively high.

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APPENDIX A
Variable Definitions

This table provides a detailed description of the procedures used to compute each variable used in the analyses. The data are obtained through Compustat, CRSP, FactSet (SharkWatch), Institutional Shareholder Services (ISS), SDC Platinum, and Thomson Reuters. We use data from Brian Bushee's [website](#), to classify institutional investors as tax-sensitive (i.e., Blouin et al. 2017). State tax rate data are provided courtesy of [NBER TaxSim](#). The authors of Fich, Rice, and Tran (2016) have provided us with data regarding merger bonuses and CEO retention for the years 1999 to 2009. In addition, we use corrected Compustat historical headquarters location data provided by Alexander Ljungqvist. All continuous variables are winsorized at the 1st and 99th percentiles.

Dependent variables:

Variable	Definition
<i>Nontaxable Deal</i>	An indicator variable equal to one if the acquisition is a tax-free stock-for-stock acquisition, and zero if the acquisition is a taxable acquisition. Deals are classified as stock-for-stock acquisitions if greater than 90 percent of the purchase price is made using stock, according to SDC Platinum. Deals are classified as taxable acquisitions if greater than 50 percent of the purchase price is made using cash, according to SDC Platinum.
<i>Target Premium</i>	The acquisition price in SDC less the target's market value of equity (CRSP data SHROUT × PRC) 40 days prior to the first public announcement of a pending acquisition, deflated by the target's market value of equity 40 days prior to the acquisition announcement. If the target's price is missing on day $t=-40$ relative to the announcement date, then we use the target's price on either day $t=-39$ or day $t=-41$ relative to the announcement, to compute the target's market value.
<i>Target Relative Gain</i>	Constructed similar to Ahern (2012), the full calculation is as follows: $\frac{\text{Target CAR} \times \text{Target MVE} - \text{Acquirer CAR} \times \text{Acquirer MVE}}{\text{Target MVE} + \text{Acquirer MVE}}$ <p><i>Target CAR</i> and <i>Acquirer CAR</i> are the cumulative abnormal returns of the target and acquirer, respectively, over the three days surrounding the announcement adjusted by the equally weighted CRSP index. <i>Target MVE</i> and <i>Acquirer MVE</i> represent the market value of equity of the target and acquirer firms (CRSP data SHROUT × PRC) 40 trading days before the merger announcement.</p>
<i>Acquirer CAR</i>	The acquirer's cumulative abnormal returns (CRSP data RET) over three days surrounding the announcement date adjusted by the equally weighted CRSP index (CRSP data EWRETD).
<i>Acquisition Ind</i>	An indicator variable equal to one if the firm is acquired during the year, and zero otherwise.

APPENDIX A (continued)

Tax Rate and Ownership variables:

Variable	Definition
<i>Fed CG Rate</i>	The maximum statutory federal long-term capital gains tax rate for individual investors at the acquisition date. When used as an independent variable in our regressions, we subtract 20 percentage points so it is centered approximately around zero. Thus, rather than ranging from 15 percent to 28 percent, it ranges from -5 percent to 8 percent.
<i>Target Inst Own</i>	The percentage of common stock owned by tax-insensitive institutional investors of the acquired firm prior to the acquisition announcement. Tax-insensitive investors are identified using the investor classification data on Brian Bushee's website, http://acct.wharton.upenn.edu/faculty/bushee/IIclass.html , (Blouin et al. 2017).
<i>CEO Own</i>	The percentage of common stock owned by the CEO of the target firm prior to the acquisition announcement. Using data from ExecuComp, CEO ownership is computed as the number of vested and unvested shares held by the CEO (ExecuComp data SHROWN_EXCL_OPTS) divided by the number of common shares outstanding (data SHROUT). Throughout our analyses we use <i>CEO Own</i> measured as of the most recent fiscal year-end prior to the acquisition completion date.
<i>CEO Fed Tax Burden</i>	<p>The <i>CEO Fed Tax Burden</i> measure is computed as:</p> $CEO\ Fed\ Tax\ Burden_t = \frac{\sum_{n=1}^t (P_t - P_n) \times N_n \times Fed\ CG\ Rate_t}{CEO's\ Total\ Proceeds\ from\ Sale_t}$ <p>Where P_t is the firm's stock price at the end of year t; P_n is the firm's stock price at the end of year n (i.e., the price at which the CEO is assumed to have received the shares obtained in year n); N_n is the number of unrestricted shares held by the CEO in year t that were obtained in year n; $Fed\ CG\ Rate_t$ is the unadjusted maximum statutory federal long-term capital gains tax rate for individuals in year t; and <i>CEO's Total Proceeds from Sale_t</i> is the total proceeds the CEO would receive from selling all shares held at the end of year t. Throughout our analyses we use <i>CEO Fed Tax Burden</i> measured as of the most recent fiscal year-end prior to the acquisition completion date.</p>
<i>CEO State Tax Burden</i>	<p>The <i>CEO State Tax Burden</i> measure is computed as:</p> $CEO\ State\ Tax\ Burden_t = \frac{\sum_{n=1}^t (P_t - P_n) \times N_n \times State\ CG\ Rate_t}{CEO's\ Total\ Proceeds\ from\ Sale_t}$ <p>Where P_t is the firm's stock price at the end of year t; P_n is the firm's stock price at the end of year n (i.e., the price at which the CEO is assumed to have received the shares obtained in year n); N_n is the number of unrestricted shares held by the CEO in year t that were obtained in year n; $State\ CG\ Rate_t$ is the unadjusted maximum statutory state long-term capital gains tax rate for individuals in year t in the state where the firm is headquartered; and <i>CEO's Total Proceeds from Sale_t</i> is the total proceeds the CEO would receive from selling all shares held at the end of year t. Throughout our analyses we use <i>CEO State Tax Burden</i> measured as of the most recent fiscal year-end prior to the acquisition completion date.</p>

APPENDIX A (continued)

Control variables:

Variable	Definition
<i>Target BTM</i>	The ratio of the target's book value of common equity (data CEQ) to the target's market value of equity (data CSHO × PRCC_F) at the end of the prior fiscal year.
<i>Target ROA</i>	The ratio of target income before extraordinary items (data IB) to total assets (data AT) for the prior fiscal year.
<i>Target Size</i>	The target's market value of equity (data CSHO × PRCC_F) at the end of the prior fiscal year.
<i>Target Leverage</i>	The ratio of target long-term debt (data DLTT) to the target's market value of equity (data CSHO × PRCC_F) at the end of the prior fiscal year.
<i>Target Current Assets</i>	The ratio of target current assets (data ACT) to the target's market value of equity (data CSHO × PRCC_F) at the end of the prior fiscal year.
<i>Target NOL</i>	The product of the target's net operating loss (data TLCF) and the maximum federal corporate tax rate applicable at the acquisition effective date (35 percent throughout the sample period), deflated by the target's market value of equity (data CSHO × PRCC_F) at the end of the prior fiscal year.
<i>Hostile</i>	An indicator variable equal to one if the target's management opposed the acquisition (deal listed as 'Hostile' in SDC), and zero otherwise.
<i>Competing Bid</i>	An indicator variable equal to one if there was a competing bidder for the target (number of bidders listed in SDC is greater than one), and zero otherwise.
<i>Toehold</i>	A continuous variable representing the percentage ownership of the bidder in the target prior to the first public announcement of a pending acquisition (per SDC, the percentage of shares owned after the deal minus the percentage of shares acquired in the deal).
<i>Tender</i>	An indicator variable equal to one if the acquisition of the target was initiated with a tender offer (per SDC, if the deal provides a date on which a tender offer was made), and zero otherwise.
<i>S&P 500 Index Change</i>	The change in the Standard & Poor's 500 (S&P) index (CRSP data SPINDX) for the 12 months preceding the acquisition calculated as the natural log of the ratio of the S&P index for the month preceding the acquisition divided by the S&P index 13 months preceding the acquisition.
<i>CEO Age</i>	The CEO's age in years at the end of the prior fiscal year (ExecuComp data AGE).
<i>CEO Tenure</i>	The CEO's tenure in years at the end of the prior fiscal year (Compustat data DATADATE less ExecuComp data BECAMECEO).
<i>CEO Chair</i>	An indicator variable equal to one if the CEO is also the chairman of the board (ExecuComp data TITLEANN), and zero otherwise.
<i>Bidder BTM</i>	The ratio of the bidder's book value of common equity (data CEQ) to the bidder's market value of equity (data CSHO × PRCC_F) at the end of the prior fiscal year.
<i>Bidder NOL</i>	The bidder's net operating loss (data TLCF), deflated by the bidder's market value of equity (data CSHO × PRCC_F) at the end of the prior fiscal year.
<i>Bidder MTR</i>	Graham's (1996) trichotomous tax rate, which equals the maximum statutory corporate tax rate at the acquisition date (35 percent throughout the sample period) if during the prior fiscal year the bidder has positive taxable income (data NI) and no net operating losses (data TLCF), one-half the maximum corporate tax rate if the bidder has negative taxable income or net operating losses, and zero if the bidder has both negative taxable income and net operating losses.

<i>Bidder Inst Own</i>	The percentage of common stock owned by institutional investors of the acquiring firm at the end of the prior fiscal year.
<i>Bidder Runup</i>	Bidder abnormal returns cumulated over the period from 286 days through 41 days prior to the acquisition announcement. We estimate abnormal returns using the bidder's raw returns (CRSP data RET) adjusted for the value-weighted index (CRSP data VWRETD) over the same period.
<i>Bidder Cash Value</i>	The sum of the bidder's cash and short-term investments (data CHE) divided by the acquisition price provided in SDC.
<i>Relative Size</i>	The ratio of the target's market value of equity (data CSHO \times PRCC_F) to the sum of the target and bidder's market value of equity at the end of the prior fiscal year.
<i>Target Price</i>	The stock price of the target firm (CRSP data PRC) 40 days prior to the acquisition announcement.

Other variables:

Variable	Definition
<i>Gold Parachute</i>	<p>An indicator variable equal to one if the target firm contains a golden parachute agreement between the firm and the CEO, and if the CEO is not retained by the merged firm (i.e., the target CEO is terminated upon completion of the merger), and equal to zero otherwise.</p> <p>Data regarding the presence of a golden parachute contract for the target firm is obtained from Institutional Shareholder Services (ISS) in WRDS.</p> <p>Data regarding the retention of the target firm CEO is obtained from Fich, Rice, and Tran (2016) for acquisitions occurring during the 1999 to 2009 time window. Outside of those years, data regarding the retention of the target firm CEO is obtained by examining the Thomson Financial Insiders Data Feed. For each target firm CEO, we search the trading activity of the acquiring firm for five years following the acquisition completion date. If we observe activity by the target firm CEO, she is coded as being retained by the merged firm. If we do not observe activity by the target firm CEO, she is coded as not being retained by the merged firm.</p>
<i>Merger Bonus</i>	An indicator variable equal to one if the target firm CEO receives a merger bonus payment in the course of the acquisition, and equal to zero otherwise. Merger bonus data comes from Fich, Rice, and Tran (2016), and covers acquisitions completed from 1999 to 2009.
<i>Activist</i>	Following Boyson, Gantchev, and Shivdasani (2017), <i>Activist</i> is an indicator variable equal to one if the target firm has experienced an activism campaign within the five-year period preceding the acquisition announcement date, and equal to zero otherwise. We obtain data on corporate activism campaigns from SharkWatch (FactSet), which offers a comprehensive database of activism events from the year 2000 onward.
<i>Outside Block</i>	An indicator variable equal to one if the target firm has a Schedule 13D filer (i.e., an outside investor owning greater than five percent of the firm's outstanding shares), and equal to zero otherwise.
<i>Takeover Defense</i>	An indicator variable equal to one if the target firm has a requirement that requires more than a majority of shareholders to approve a merger.

APPENDIX B
Constructing the CEO Federal and State Tax Burdens – ExecuComp Data

Construction of CEO federal and state tax burdens using ExecuComp:

The federal and state tax burdens constructed using data from ExecuComp are based on the tax liability arising from the sale of the CEO's unrestricted (i.e., vested) stock holdings. The intuition behind the tax burden measures is that they represent the percentage of the CEO's total proceeds that would be owed in tax (federal or state) upon the sale of all unrestricted stock. Year 1 represents the first year in which the CEO receives vested stock in the firm.

The CEO's federal tax burden constructed using ExecuComp data is the following:

$$CEO\ Fed\ Tax\ Burden_t = \frac{\sum_{n=1}^t (P_t - P_n) \times N_n \times Fed\ CG\ Rate_t}{CEO's\ Total\ Proceeds\ from\ Sale_t}$$

Variable Definitions:

P_t = the stock price at the end of year t ;
 P_n = the stock price at the end of year n (i.e., the CEO's basis in the stock obtained in year n);
 N_n = the number of unrestricted shares held by the CEO in year t that were obtained in year n ;
 $Fed\ CG\ Rate_t$ = is the unadjusted maximum federal long-term capital gains tax rate for individuals in year t ; and
 $CEO's\ Total\ Proceeds\ from\ Sale_t$ = the total value of all of the CEO's unrestricted stock held in year t .

The construction of the CEO's state tax burden using ExecuComp data is identical to the construction of the CEO's federal tax burden described above, but with the maximum federal long-term capital gains tax rate replaced by the maximum state long-term capital gains tax rate for the state in which the firm is headquartered. Specifically, the CEO's state tax burden is computed as follows:

$$CEO\ State\ Tax\ Burden_t = \frac{\sum_{n=1}^t (P_t - P_n) \times N_n \times State\ CG\ Rate_t}{CEO's\ Total\ Proceeds\ from\ Sale_t}$$

Variable Definitions:

$State\ CG\ Rate_t$ = is the unadjusted maximum state long-term capital gains tax rate for individuals in year t in the state where the firm is headquartered; and

All other variables are as described above.

Tax Burden of Vested Stock

We assume that a restricted stock grant enters the tax calculation only when it becomes vested. The CEO owes ordinary income tax on the entire value of the restricted stock at the time of vesting. Any appreciation subsequent to the vesting date accrues capital gains tax. We collect ExecuComp data on CEOs' holdings of unrestricted stock at the end of each fiscal year from 1992 to 2016. From these, we estimate the tax basis, with the simplifying assumption that all vested shares during a year became vested at the fiscal year-end, with the fiscal year-end stock price as the new tax basis. If any vested stock is sold during a year, we assume CEOs sell first the shares with the highest tax basis, which minimizes realized capital gains or maximizes capital losses. We use the previous 5 years' holdings and grant information to estimate the first observation of tax burden measure for a CEO. Thus, given our data starts in 1992, our first year of observation for the tax burden is 1996. The unrestricted stock held by a CEO in the first year of data available on ExecuComp is assumed to have been granted 5 years earlier. For example, if the CEO first appears in ExecuComp in 1993, we assume reported unrestricted stock was granted in 1988. This approximation is necessary due to the lack of more detailed information in ExecuComp, and is consistent with the methods used in prior literature to calculate the tax burden (e.g., Jin and Kothari 2008, Yost 2018).

TABLE 1
Sample selection and summary

Panel A: Sample selection

	No. of Acquisitions Remaining
Acquisitions of U.S. public firm stock completed from Jan. 1, 1996 to Dec. 31, 2016	4,209
Eliminate acquisitions with a deal value less than \$10 million	4,055
Eliminate acquisitions in which the target firm is not listed in ExecuComp	1,086
Eliminate acquisitions with missing data required for control variables	1,043
Eliminate acquisitions with missing data required to compute the CEO tax burden	784
Eliminate acquisitions paid with less than 50 percent cash or 90 percent stock	705
Number of taxable acquisitions	485
Number of nontaxable acquisitions	220
Total number of taxable and nontaxable acquisitions	705
Number of acquisitions with a public acquirer	420
Number of acquisitions with a private acquirer	285
Total number of acquisitions with public or private acquirer	705

Panel B: Sample summary

	Public Acquirers	Private Acquirers	All Acquirers
Taxable Deals	221	264	485 ^b
Nontaxable Deals	199	21	220 ^c
Total Deals	420 ^a	285 ^d	705 ^e

The 420 taxable and nontaxable deals completed by public acquirers are used to test H1.

The 485 taxable deals completed by public and private acquirers are used to test H2.

^aTables 3, 5, 6, 7, and 8.

^bTables 4, 5, 6, 8, and 9.

^cTables 4 and 9.

^dTable 8.

^eTable 9.

TABLE 2
Descriptive statistics

Panel A (Panel B) presents the descriptive statistics for the variables of interest in the acquisition structure (premium) analysis. The sample in Panel A reflects all completed deals (taxable and nontaxable) of S&P 1500 target firms by public acquirers that contain the necessary data for the years 1996 to 2016. The sample in Panel B reflects all completed taxable deals of S&P 1500 target firms by public and private acquirers that contain the necessary data for the years 1996 to 2016. Details of variable construction are contained in Appendix A.

Panel A: Descriptive statistics for acquisition structure analysis (public acquirers; taxable + nontaxable deals)

Variables	N	Mean	SD	P25	P50	P75	Taxable	Nontaxable	Diff.
							Deals Mean	Deals Mean	
<u>Dependent variables:</u>									
<i>Nontaxable Deal</i>	420	0.47	0.50	0.00	0.00	1.00			
<i>Target Relative Gain</i>	420	0.045	0.069	-0.001	0.033	0.081	0.044	0.046	-0.002
<i>Acquirer CAR</i>	420	-0.012	0.069	-0.050	-0.009	0.024	-0.002	-0.024	0.022***
<u>Tax Rate and Ownership variables:</u>									
<i>Fed CG Rate †</i>	420	18.29	3.58	15.00	20.00	20.00	17.43	19.25	-1.82***
<i>Target Inst Own</i>	420	0.692	0.228	0.548	0.731	0.874	0.750	0.626	0.124***
<i>CEO Own</i>	420	0.015	0.045	0.001	0.005	0.017	0.017	0.014	0.003
<i>CEO Fed Tax Burden</i>	420	0.041	0.081	0.000	0.042	0.095	0.028	0.056	-0.028***
<i>CEO State Tax Burden</i>	420	0.011	0.027	0.000	0.005	0.027	0.008	0.014	-0.006**
<u>Control variables:</u>									
<i>Target BTM</i>	420	0.50	0.34	0.28	0.42	0.61	0.51	0.48	0.03
<i>Target ROA</i>	420	0.03	0.09	0.01	0.04	0.07	0.04	0.03	0.01
<i>Log(Target Size)</i>	420	7.37	1.47	6.35	7.29	8.34	6.99	7.79	-0.80***
<i>Hostile</i>	420	0.02	0.15	0.00	0.00	0.00	0.03	0.02	0.01
<i>Competing Bid</i>	420	0.05	0.22	0.00	0.00	0.00	0.07	0.03	0.04*
<i>S&P 500 Index Change</i>	420	-0.07	0.17	-0.18	-0.11	-0.05	-0.07	-0.07	0.00
<i>CEO Age</i>	420	55.81	5.85	52.50	55.42	59.00	56.09	55.50	0.59
<i>CEO Tenure</i>	420	7.10	5.62	3.38	6.92	8.13	7.35	6.82	0.53
<i>CEO Chair</i>	420	0.54	0.50	0.00	1.00	1.00	0.50	0.59	-0.09**
<i>Bidder BTM</i>	420	0.41	0.25	0.23	0.37	0.54	0.42	0.40	0.02
<i>Bidder NOL</i>	420	0.03	0.10	0.00	0.00	0.01	0.03	0.03	0.00
<i>Bidder MTR</i>	420	0.28	0.10	0.17	0.35	0.35	0.26	0.30	-0.04***
<i>Bidder Inst Own</i>	420	0.59	0.27	0.51	0.58	0.77	0.62	0.55	0.07***
<i>Bidder Runup</i>	420	0.11	0.40	-0.12	0.05	0.26	0.06	0.16	-0.10***
<i>Bidder Cash Value</i>	420	2.32	6.93	0.07	0.31	1.13	3.14	1.41	1.73**
<i>Relative Size</i>	420	0.23	0.19	0.06	0.18	0.37	0.18	0.28	-0.10***
<u>Other variables:</u>									
<i>Gold Parachute</i>	420	0.35	0.48	0.00	0.00	1.00	0.46	0.24	0.22***
<i>Merger Bonus</i>	203	0.26	0.44	0.00	0.00	1.00	0.22	0.32	-0.10
<i>Activist</i>	295	0.14	0.35	0.00	0.00	0.00	0.16	0.10	0.06
<i>Outside Block</i>	420	0.86	0.35	1.00	1.00	1.00	0.93	0.79	0.14***

† The *Fed CG Rate* variable is unadjusted in the table above, but when used as an independent variable in our regressions we subtract 20 percentage points so it is centered around approximately zero.

TABLE 2 (continued)

Panel B: Descriptive statistics for acquisition premium analysis (taxable deals; public + private acquirers)

Variables	N	Mean	SD	P25	P50	P75	Public	Private	Diff.
							Acq. Mean	Acq. Mean	
<u>Dependent variables:</u>									
<i>Target Premium</i>	485	0.43	0.31	0.23	0.37	0.55	0.45	0.40	0.05*
<u>Tax Rate and Ownership variables:</u>									
<i>Fed CG Rate</i> †	485	17.41	3.41	15.00	15.00	20.00	17.43	17.39	0.04
<i>Target Inst Own</i>	485	0.631	0.225	0.492	0.671	0.803	0.652	0.614	0.038*
<i>CEO Own</i>	485	0.015	0.027	0.002	0.006	0.014	0.013	0.017	-0.004*
<i>CEO Fed Tax Burden</i>	485	0.026	0.072	0.000	0.026	0.074	0.026	0.025	0.001
<i>CEO State Tax Burden</i>	485	0.012	0.018	0.000	0.001	0.022	0.014	0.012	0.002
<u>Control variables:</u>									
<i>Target BTM</i>	485	0.54	0.34	0.31	0.47	0.68	0.51	0.57	-0.06**
<i>Target ROA</i>	485	0.04	0.07	0.01	0.04	0.07	0.04	0.04	0.00
<i>Log(Target Size)</i>	485	6.92	1.37	6.06	6.86	7.82	6.99	6.85	0.14
<i>Target Leverage</i>	485	0.29	0.43	0.00	0.14	0.40	0.22	0.36	-0.14***
<i>Target Current Assets</i>	485	0.44	0.42	0.17	0.32	0.58	0.44	0.45	-0.01
<i>Target NOL</i>	485	0.03	0.07	0.00	0.00	0.01	0.03	0.03	0.00
<i>Hostile</i>	485	0.02	0.14	0.00	0.00	0.00	0.03	0.02	0.01
<i>Competing Bid</i>	485	0.08	0.28	0.00	0.00	0.00	0.07	0.10	-0.03
<i>Toehold</i>	485	0.01	0.03	0.00	0.00	0.00	0.00	0.01	0.00
<i>Tender</i>	485	0.31	0.46	0.00	0.00	1.00	0.34	0.29	0.05
<i>CEO Age</i>	485	55.40	6.83	51.00	55.46	59.00	56.10	54.81	1.29**
<i>CEO Tenure</i>	485	7.34	6.06	3.42	6.92	8.33	7.35	7.33	0.02
<i>CEO Chair</i>	485	0.47	0.50	0.00	0.00	1.00	0.50	0.45	0.05
<i>Target Price</i>	485	27.95	19.03	13.56	24.56	37.13	28.60	27.41	1.19
<u>Other variables:</u>									
<i>Gold Parachute</i>	485	0.43	0.50	0.00	0.00	1.00	0.46	0.41	0.05
<i>Merger Bonus</i>	244	0.21	0.41	0.00	0.00	0.00	0.22	0.21	0.01
<i>Activist</i>	374	0.17	0.38	0.00	0.00	0.00	0.18	0.17	0.01
<i>Outside Block</i>	485	0.85	0.35	1.00	1.00	1.00	0.93	0.79	0.14***

† The *Fed CG Rate* variable is unadjusted in the table above, but when used as an independent variable in our regressions we subtract 20 percentage points so it is centered around approximately zero.

TABLE 3
Target CEO capital gains taxes and acquisition structure

The OLS regressions below estimate the effects of target CEO capital gains taxes and other determinants on acquisition structure. The dependent variable equals one for nontaxable stock-for-stock acquisitions, and zero otherwise. Variables are defined in Appendix A. *,**,*** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, using a one-tailed *t*-test where we have a prediction, a two tailed *t*-test otherwise.

Dependent Variable:	Pr. Sign	<i>Nontaxable Deal</i>			
<i>Fed CG Rate</i>	+0	0.025** (1.83)	0.011 (0.66)	0.017 (1.11)	
<i>Fed CG Rate</i> × <i>Target Inst Own</i>	-0	-0.029** (-1.87)	-0.017 (-0.93)	-0.012 (-0.66)	
<i>Fed CG Rate</i> × <i>CEO Own</i>	+		0.342*** (3.22)		
<i>CEO Fed Tax Burden</i>	+			0.441*** (2.92)	
<i>CEO State Tax Burden</i>	+				1.162** (1.98)
<i>Target Inst Own</i>		-0.186* (-1.76)	-0.172 (-1.64)	-0.212** (-2.07)	-0.173 (-1.34)
<i>CEO Own</i>			0.902** (2.54)		
<i>Target BTM</i>		0.068 (1.25)	-0.030 (-0.38)	0.078 (0.77)	0.029 (0.16)
<i>Target ROA</i>		-0.466** (-2.54)	-0.867** (-2.07)	-0.548** (-2.21)	-0.651** (-2.05)
<i>Log(Target Size)</i>		0.085*** (4.56)	0.076*** (3.64)	0.038 (1.18)	0.038 (1.31)
<i>Hostile</i>		-0.073 (-0.60)	-0.076 (-0.59)	-0.084 (-0.76)	-0.096 (-0.82)
<i>Competing Bid</i>		-0.267*** (-2.91)	-0.252*** (-2.77)	-0.244*** (-2.78)	-0.235** (-2.00)
<i>S&P 500 Index Change</i>		0.020 (0.22)	0.003 (0.03)	0.005 (0.04)	-0.012 (-0.07)
<i>Log(CEO Age)</i>		-0.188 (-1.37)	-0.144 (-1.03)	-0.134 (-1.08)	-0.210** (-2.16)
<i>Log(CEO Tenure)</i>		-0.011 (-0.40)	-0.021 (-0.73)	-0.050 (-1.59)	-0.043 (-0.98)
<i>CEO Chair</i>		-0.021 (-0.48)	-0.020 (-0.52)	0.004 (0.08)	-0.013 (-0.18)
<i>Bidder BTM</i>		-0.117 (-1.14)	-0.151 (-1.31)	-0.215* (-1.65)	-0.249* (-1.67)
<i>Bidder NOL</i>		0.722*** (3.25)	0.967** (2.47)	0.846* (1.88)	0.970 (1.32)
<i>Bidder MTR</i>		0.622** (2.54)	0.575** (2.10)	0.332 (1.42)	0.293 (0.78)
<i>Bidder Inst Own</i>		0.069 (0.83)	0.049 (0.56)	0.132 (1.29)	0.127 (0.90)
<i>Bidder Runup</i>		0.168*** (3.92)	0.206*** (2.90)	0.159** (2.07)	0.144** (1.99)
<i>Bidder Cash Value</i>		-0.001 (-0.25)	-0.007 (-0.49)	-0.010 (-0.33)	-0.016 (-0.50)
<i>Relative Size</i>		0.500*** (3.29)	0.599*** (3.74)	0.731*** (4.20)	0.760*** (4.00)
Industry FE (SIC 1-digit)		Yes	Yes	Yes	Yes
Time FE (5-year intervals)		Yes	Yes	Yes	No
Year FE		No	No	No	Yes
S.E. clustered by:		Year	Year	Year	State & Year
No. of observations		420	420	420	420
Adj. R-Squared		35.7%	35.4%	35.9%	41.9%

TABLE 4
Target CEO capital gains taxes and acquisition premiums

This table presents the results from estimating the effects of target CEO capital gains taxes and other determinants on acquisition premiums. Panel A (Panel B) displays the results for the sample of taxable (nontaxable) acquisitions. Variables are defined in Appendix A. *,**,*** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, using a one-tailed *t*-test where we have a prediction and a two-tailed *t*-test otherwise.

Panel A: Taxable deals

Dependent Variable:	Pr. Sign	<i>Target Premium</i>			
<i>Fed CG Rate</i>	+,0	0.019** (2.06)	0.011 (0.77)	0.012 (0.87)	
<i>Fed CG Rate</i> × <i>Target Inst Own</i>	-,0	-0.024* (-1.63)	-0.016 (-0.81)	-0.011 (-0.56)	
<i>Fed CG Rate</i> × <i>CEO Own</i>	+		0.224** (2.27)		
<i>CEO Fed Tax Burden</i>	+			0.282** (2.02)	
<i>CEO State Tax Burden</i>	+				0.981** (2.30)
<i>Target Inst Own</i>		-0.053 (-0.63)	-0.042 (-0.58)	-0.018 (-0.23)	0.041 (0.53)
<i>CEO Own</i>			0.628 (0.68)		
<i>Target BTM</i>		-0.004 (-0.05)	0.002 (0.03)	-0.002 (-0.03)	-0.000 (-0.00)
<i>Target ROA</i>		-0.264 (-0.85)	-0.270 (-0.96)	-0.200 (-0.64)	-0.298 (-1.05)
<i>Log(Target Size)</i>		0.034** (2.01)	0.034** (2.06)	0.028 (1.39)	0.026 (1.63)
<i>Target Leverage</i>		0.052 (1.46)	0.056 (1.30)	0.073 (1.51)	0.054 (1.38)
<i>Target Current Assets</i>		0.114* (1.87)	0.098 (1.57)	0.114* (1.89)	0.084 (1.45)
<i>Target NOL</i>		0.167 (1.08)	0.248 (1.05)	0.201 (1.04)	0.190 (1.20)
<i>Hostile</i>		0.096 (1.22)	0.063 (0.68)	0.074 (1.10)	0.118** (2.24)
<i>Competing Bid</i>		-0.035 (-0.73)	-0.047 (-1.13)	-0.056 (-1.14)	-0.045 (-0.98)
<i>Toehold</i>		-0.970** (-2.14)	-1.013** (-2.21)	-0.980* (-1.76)	-0.970** (-1.96)
<i>Tender</i>		0.100*** (3.06)	0.100*** (2.82)	0.093*** (3.38)	0.060** (2.29)
<i>Log(CEO Age)</i>		-0.099 (-0.84)	-0.114 (-0.95)	-0.148 (-1.17)	-0.171 (-1.41)
<i>Log(CEO Tenure)</i>		0.002 (0.09)	0.005 (0.17)	-0.001 (-0.03)	0.006 (0.25)
<i>CEO Chair</i>		0.017 (0.66)	0.016 (0.49)	0.028 (1.24)	0.025 (1.02)
<i>Log(Target Price)</i>		-0.124*** (-3.76)	-0.122*** (-2.70)	-0.132*** (-4.24)	-0.123*** (-4.16)
Industry FE (SIC 1-digit)		Yes	Yes	Yes	Yes
Time FE (5-year intervals)		Yes	Yes	Yes	No
Year FE		No	No	No	Yes
S.E. clustered by:		Year	Year	Year	State & Year
No. of observations		485	485	485	485
Adj. R-Squared		20.0%	19.9%	19.8%	25.5%

TABLE 4 (continued)

Panel B: Nontaxable deals

Dependent Variable:	Pr. Sign	Target Premium			
<i>Fed CG Rate</i>	0	-0.009 (-0.72)	-0.008 (-0.71)	-0.009 (-0.66)	
<i>Fed CG Rate</i> × <i>Target Inst Own</i>	0	0.024 (1.13)	0.022 (1.11)	0.024 (1.18)	
<i>Fed CG Rate</i> × <i>CEO Own</i>	0		0.085 (0.32)		
<i>CEO Fed Tax Burden</i>	0			-0.173 (-0.33)	
<i>CEO State Tax Burden</i>	0				0.029 (0.02)
<i>Target Inst Own</i>		0.093 (0.76)	0.075 (0.65)	0.091 (0.72)	0.069 (0.57)
<i>CEO Own</i>			-2.281** (-2.15)		
<i>Target BTM</i>		-0.049 (-0.36)	-0.068 (-0.52)	-0.052 (-0.39)	0.069 (0.70)
<i>Target ROA</i>		-0.461 (-1.45)	-0.474 (-1.16)	-0.439 (-1.23)	-0.500 (-1.09)
<i>Log(Target Size)</i>		-0.003 (-0.25)	-0.010 (-0.74)	-0.003 (-0.21)	-0.010 (-0.33)
<i>Target Leverage</i>		-0.096 (-1.27)	-0.094 (-1.30)	-0.098 (-1.24)	-0.147*** (-3.51)
<i>Target Current Assets</i>		0.043 (0.46)	0.045 (0.34)	0.040 (0.42)	0.022 (0.22)
<i>Target NOL</i>		-0.772** (-2.20)	-0.759*** (-2.66)	-0.748* (-1.72)	-1.041*** (-3.18)
<i>Hostile</i>		0.091 (0.67)	0.105 (0.78)	0.088 (0.63)	0.179 (1.19)
<i>Competing Bid</i>		0.115 (1.56)	0.108 (1.38)	0.111 (1.31)	0.110* (1.68)
<i>Toehold</i>		-1.505 (-0.98)	-1.067 (-0.69)	-1.489 (-0.96)	-2.058 (-1.06)
<i>Tender</i>		0.188 (1.18)	0.167 (1.23)	0.187 (1.28)	0.172 (1.21)
<i>Log(CEO Age)</i>		-0.396* (-1.91)	-0.366* (-1.76)	-0.380* (-1.92)	-0.386 (-1.13)
<i>Log(CEO Tenure)</i>		0.094*** (3.04)	0.111*** (3.56)	0.096*** (3.50)	0.080 (1.19)
<i>CEO Chair</i>		0.034 (0.81)	0.038 (0.87)	0.033 (0.74)	0.017 (0.24)
<i>Log(Target Price)</i>		-0.156*** (-4.08)	-0.158*** (-4.43)	-0.151*** (-4.19)	-0.123** (-2.00)
Industry FE (SIC 1-digit)	Yes	Yes	Yes	Yes	Yes
Time FE (5-year intervals)	Yes	Yes	Yes	Yes	No
Year FE	No	No	No	No	Yes
S.E. clustered by:	Year	Year	Year	Year	State & Year
No. of observations	220	220	220	220	220
Adj. R-Squared	17.5%	18.4%	17.2%	18.4%	

TABLE 5

The effect of side payments on the relation between target CEO taxes and acquisition outcomes

This table presents the influence of side payment arrangements to the target CEO on the relation between CEO tax liabilities and acquisition outcomes. The sample used in the merger bonus tests is limited to acquisitions completed during 1999 to 2009, the years for which we have merger bonus data. Variables are defined in Appendix A. The *t*-statistics are reported below coefficient estimates in parentheses and are calculated based on standard errors clustered at the state and year level. ***,** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, using a one-tailed *t*-test where we have a prediction, and a two-tailed *t*-test otherwise.

Panel A: Acquisition structure

Dependent Variable: Side payment type:	Label	Pr. Sign	Nontaxable Deal	
			Gold Parachute	Merger Bonus
<i>CEO State Tax Burden</i>	β_1	+	2.537*** (4.68)	2.018** (2.39)
<i>CEO State Tax Burden</i> × <i>Gold Parachute</i>	β_2	-	-1.482** (-2.04)	
<i>CEO State Tax Burden</i> × <i>Merger Bonus</i>	β_3	-		-1.861* (-1.43)
<i>Gold Parachute</i>			-0.105 (-1.31)	
<i>Merger Bonus</i>				0.092 (1.11)
<i>p</i> -Value for joint significance:				
$\beta_1 + \beta_2 > 0$			0.05	
$\beta_1 + \beta_3 > 0$				0.42
Control variables from Table 3 included			Yes	Yes
Industry FE (SIC 1-digit)			Yes	Yes
Year FE			Yes	Yes
S.E. clustered by:			State & Year	State & Year
No. of observations			420	203
Adj. R-Squared			41.3%	34.4%

Panel B: Acquisition premium

Dependent Variable: Side payment type:	Label	Pr. Sign	Target Premium	
			Gold Parachute	Merger Bonus
<i>CEO State Tax Burden</i>	β_1	+	1.723** (1.96)	1.450*** (2.61)
<i>CEO State Tax Burden</i> × <i>Gold Parachute</i>	β_2	-	-2.255* (-1.60)	
<i>CEO State Tax Burden</i> × <i>Merger Bonus</i>	β_3	-		-1.537** (-2.09)
<i>Gold Parachute</i>			-0.030 (-0.88)	
<i>Merger Bonus</i>				-0.046 (-1.22)
<i>p</i> -Value for joint significance:				
$\beta_1 + \beta_2 > 0$			0.31	
$\beta_1 + \beta_3 > 0$				0.94
Control variables from Table 4 included			Yes	Yes
Industry FE (SIC 1-digit)			Yes	Yes
Year FE			Yes	Yes
S.E. clustered by:			State & Year	State & Year
No. of observations			485	244
Adj. R-Squared			26.4%	47.2%

TABLE 6
Influential shareholders on the relation between target CEO taxes and acquisition outcomes

This table presents the influence of activist shareholders and outside blockholders in the target firm on the relation between CEO taxes and acquisition outcomes. In the tests of activism, the sample is limited to acquisitions completed from 2000 to 2016, the years for which we have shareholder activism data. Variables are defined in Appendix A. The *t*-statistics are reported below coefficient estimates in parentheses and are calculated based on standard errors clustered at the state and year level. ***,** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, using a one-tailed *t*-test where we have a prediction, and a two-tailed *t*-test otherwise.

Panel A: Acquisition structure

Dependent Variable:	Label	Pr. Sign	<i>Nontaxable Deal</i>	
<i>CEO State Tax Burden</i>	β_1	+	2.446** (2.11)	2.537*** (3.39)
<i>CEO State Tax Burden</i> × <i>Activist</i>	β_2	-	-1.098* (-1.34)	
<i>CEO State Tax Burden</i> × <i>Outside Block</i>	β_3	-		-1.398** (-2.08)
<i>Activist</i>			0.014 (0.22)	
<i>Outside Block</i>				-0.017 (-0.19)
<i>p</i> -Value for joint significance:				
$\beta_1 + \beta_2 > 0$			0.16	
$\beta_1 + \beta_3 > 0$				0.02
Control variables from Table 3 included			Yes	Yes
Industry FE (SIC 1-digit)			Yes	Yes
Year FE			Yes	Yes
S.E. clustered by:			State & Year	State & Year
No. of observations			295	420
Adj. R-Squared			33.8%	41.6%

Panel B: Acquisition premium

Dependent Variable:	Label	Pr. Sign	<i>Target Premium</i>	
<i>CEO State Tax Burden</i>	β_1	+	0.612** (1.78)	2.417* (1.44)
<i>CEO State Tax Burden</i> × <i>Activist</i>	β_2	0	0.155 (0.12)	
<i>CEO State Tax Burden</i> × <i>Outside Block</i>	β_3	0		-1.748 (-0.88)
<i>Activist</i>			-0.037 (-0.75)	
<i>Outside Block</i>				0.041* (1.84)
<i>p</i> -Value for joint significance:				
$\beta_1 + \beta_2 > 0$			0.26	
$\beta_1 + \beta_3 > 0$				0.29
Control variables from Table 4 included			Yes	Yes
Industry FE (SIC 1-digit)			Yes	Yes
Year FE			Yes	Yes
S.E. clustered by:			State & Year	State & Year
No. of observations			374	485
Adj. R-Squared			29.8%	25.2%

TABLE 7
Target CEO taxes and the relative share of merger gains

This table presents the effects of target CEO taxes on acquirer announcement returns and the relative share of merger gains going to the target shareholders versus the acquirer. Variables are defined in Appendix A. The *t*-statistics are reported below coefficient estimates in parentheses and are calculated based on standard errors clustered at the state and year level. *,**,*** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, using a one-tailed *t*-test where we have a prediction and a two-tailed *t*-test otherwise.

Dependent Variable:	Pr. Sign	<i>Acquirer CAR</i>	<i>Target Relative Gain</i>
<i>CEO State Tax Burden</i>	+,-	0.114*** (2.58)	-0.104** (-2.28)
<i>Target Inst Own</i>		-0.013 (-0.59)	0.009 (0.77)
<i>Target BTM</i>		0.025* (1.70)	-0.016 (-1.38)
<i>Target ROA</i>		-0.032 (-1.02)	0.014 (0.37)
<i>Log(Target Size)</i>		-0.006 (-0.91)	0.008** (2.29)
<i>Hostile</i>		0.015 (0.48)	0.046 (1.19)
<i>Competing Bid</i>		-0.025* (-1.83)	-0.013 (-1.39)
<i>S&P 500 Index Change</i>		0.010 (0.52)	0.000 (0.01)
<i>Log(CEO Age)</i>		0.071** (2.44)	-0.044* (-1.79)
<i>Log(CEO Tenure)</i>		-0.005 (-0.61)	0.006 (0.73)
<i>CEO Chair</i>		-0.010 (-1.29)	0.009 (1.03)
<i>Bidder BTM</i>		-0.030 (-1.57)	0.038** (2.01)
<i>Bidder NOL</i>		-0.058 (-1.31)	0.057*** (3.28)
<i>Bidder MTR</i>		0.037 (1.31)	-0.049* (-1.95)
<i>Bidder Inst Own</i>		-0.022 (-1.26)	0.007 (0.41)
<i>Bidder Runup</i>		0.007 (0.55)	0.002 (0.19)
<i>Bidder Cash Value</i>		-0.000 (-0.15)	-0.001 (-0.78)
<i>Relative Size</i>		0.008 (0.28)	0.089*** (2.65)
<i>Nontaxable Deal</i>		-0.017** (-2.43)	-0.020* (-1.76)
Industry FE (SIC 1-digit)		Yes	Yes
Year FE		Yes	Yes
S.E. clustered by:		State & Year	State & Year
No. of observations		420	420
Adj. R-Squared		7.3%	16.0%

TABLE 8
Target CEO taxes and acquisition outcomes for public and private acquirers

This table presents the effects of target CEO taxes on acquisition structure and premiums, for public and private acquirers. Variables are defined in Appendix A. The *t*-statistics are reported below coefficient estimates in parentheses and are calculated based on standard errors clustered at the state and year level. ***,** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, using a one-tailed *t*-test where we have a prediction and a two-tailed *t*-test otherwise.

Panel A: Acquisition structure

Dependent Variable: Acquirer type:	Label	Pr. Sign	<i>Nontaxable Deal</i>	
			Public Acquirer	Private Acquirer
<i>CEO State Tax Burden</i>	β_1	+0	1.246*** (2.61)	0.003 (0.01)
<i>Target Inst Own</i>			-0.192 (-1.38)	-0.056 (-0.67)
<i>Target BTM</i>			0.039 (0.46)	0.022 (0.61)
<i>Target ROA</i>			-0.311 (-1.45)	-0.129 (-1.20)
<i>Log(Target Size)</i>			0.077*** (2.82)	0.011 (1.03)
<i>Hostile</i>			-0.142* (-1.69)	-0.072 (-0.55)
<i>Competing Bid</i>			-0.172** (-2.37)	-0.075 (-0.99)
<i>S&P 500 Index Change</i>			0.004 (0.03)	0.123 (1.01)
<i>Log(CEO Age)</i>			-0.230* (-1.75)	0.004 (0.06)
<i>Log(CEO Tenure)</i>			-0.046 (-1.03)	-0.067* (-1.78)
<i>CEO Chair</i>			-0.016 (-0.19)	0.042 (0.90)
<i>p</i> -Value for difference in β_1 coefficients			0.01	
Industry FE (SIC 1-digit)			Yes	Yes
Year FE			Yes	Yes
S.E. clustered by:			State & Year	State & Year
No. of observations			420	285
Adj. R-Squared			35.1%	13.6%

TABLE 8 (continued)

Panel B: Acquisition premium

Dependent Variable:			<i>Target Premium</i>	
Acquirer type:	Label	Pr. Sign	Public Acquirer	Private Acquirer
<i>CEO State Tax Burden</i>	β_1	0,+	-0.683 (-0.66)	1.872** (2.16)
<i>Target Inst Own</i>			0.238 (1.47)	-0.117 (-0.92)
<i>Target BTM</i>			-0.160 (-1.39)	0.061 (0.88)
<i>Target ROA</i>			-0.706 (-1.58)	-0.175 (-0.36)
<i>Log(Target Size)</i>			0.032 (0.96)	0.028 (1.30)
<i>Target Leverage</i>			0.040 (0.35)	0.122** (2.14)
<i>Target Current Assets</i>			0.159 (1.28)	0.050 (0.43)
<i>Target NOL</i>			0.477 (0.78)	0.217 (0.75)
<i>Hostile</i>			0.265* (1.75)	-0.031 (-0.29)
<i>Competing Bid</i>			-0.047 (-0.61)	-0.082 (-1.08)
<i>Toehold</i>			1.519 (1.49)	-1.983*** (-4.39)
<i>Tender</i>			0.068 (1.08)	0.070* (1.80)
<i>Log(CEO Age)</i>			-0.235 (-1.53)	-0.214 (-1.45)
<i>Log(CEO Tenure)</i>			0.064 (1.54)	-0.021 (-0.53)
<i>CEO Chair</i>			0.025 (0.48)	0.006 (0.13)
<i>Log(Target Price)</i>			-0.183*** (-2.60)	-0.106*** (-2.77)
<i>p</i> - Value for difference in β_1 coefficients			0.02	
Industry FE (SIC 1-digit)			Yes	Yes
Year FE			Yes	Yes
S.E. clustered by:			State & Year	State & Year
No. of observations			221	264
Adj. R-Squared			29.0%	29.3%

TABLE 9
Target CEO capital gains taxes and acquisition likelihood

This table contains the results of OLS regressions estimating the effects of target CEO capital gains taxes and other determinants on acquisition likelihood. In the first (second, third) column, the dependent variable equals one if the firm is acquired in a given year in any type of acquisition (taxable acquisition, nontaxable acquisition), and zero otherwise. Variables are defined in Appendix A. *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, using a one-tailed *t*-test where we have a prediction and a two-tailed *t*-test otherwise.

Dependent Variable: Deal type:	Pr. Sign	<i>Acquisition Ind</i>		
		All Deals	Taxable Deals	Nontaxable Deals
<i>CEO State Tax Burden</i>	-, -, 0	-0.065** (-2.48)	-0.060*** (-2.95)	-0.004 (-0.60)
<i>Target Inst Own</i>		0.030*** (6.19)	0.021*** (6.09)	0.009*** (3.22)
<i>Target BTM</i>		0.004** (2.29)	0.004*** (2.76)	0.001 (0.94)
<i>Target ROA</i>		-0.004 (-0.40)	0.009 (1.14)	-0.014** (-2.27)
<i>Log(Target Size)</i>		-0.005*** (-4.18)	-0.005*** (-5.26)	-0.000 (-0.20)
<i>Target Leverage</i>		-0.002 (-1.47)	-0.004*** (-3.13)	0.001 (1.11)
<i>Target Current Assets</i>		-0.002 (-0.63)	-0.000 (-0.21)	-0.002 (-0.88)
<i>Target NOL</i>		-0.000 (-0.06)	0.001 (0.09)	-0.001 (-0.86)
<i>Log(CEO Age)</i>		0.016** (2.23)	0.010* (1.80)	0.006* (1.82)
<i>Log(CEO Tenure)</i>		-0.001 (-0.90)	0.000 (0.04)	-0.001 (-1.19)
<i>CEO Chair</i>		-0.008*** (-3.57)	-0.005*** (-3.09)	-0.002** (-2.16)
<i>Log(Target Price)</i>		0.006** (2.38)	0.003** (2.09)	0.003** (1.81)
<i>Takeover Defense</i>		-0.005** (-2.34)	-0.003* (-1.69)	-0.002* (-1.65)
Industry FE (SIC 1-digit)		Yes	Yes	Yes
Year FE		Yes	Yes	Yes
S.E. clustered by:		Firm, State, Year	Firm, State, Year	Firm, State, Year
No. of observations		32,428	32,428	32,428
No. of acquisitions		705	485	220
Adj. R-Squared		1.4%	1.3%	1.1%