The role of taxes in forced CEO turnover

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ABSTRACT

Our study examines whether low and high levels of tax avoidance lead to forced CEO turnover. While prior research argues that firms often do not engage in tax avoidance due to reputational concerns, the empirical evidence suggesting the existence of reputational costs is scarce. Using a sample of forced CEO changes from Fee et al. (2013), we find no relation between the payment of low taxes and forced turnover. We do, however, find that forced CEO turnover is more likely when the firm pays a high tax rate. Our results are consistent with the existence of individual reputational costs of not engaging in tax avoidance.

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I. INTRODUCTION

Our study examines whether tax low or high levels of tax avoidance lead to CEO turnover. A common view in the tax-accounting literature has been that firm and CEO reputational costs are a limiting factor in the extent to which CEOs are willing to minimize their effective tax rates. (Desai and Dharmapala, 2006; Chen, Huang, Li, and Stanfield, 2012; Graham, Hanlon, Shevlin, and Shroff, 2013; Armstrong, Blouin, Jagolinzer, and Larker, 2015; among others). However, the empirical evidence supporting CEO reputational effects has been scarce. The only study examining the issue to date (Gallemore, Maydew and Thornock, 2014) finds no evidence of reputational costs following the revelation of aggressive tax policy choices aimed at lowering effective tax rates. In response to the lack of empirical evidence, Law and Mills (2015) conclude that executives appear to face virtually no reputational risk due to aggressive tax behavior.

Our study examines two possibilities regarding the role of taxes with respect to individual reputational costs. First, we examine the possibility that CEOs are fired for paying too little tax. Our analysis follows the spirit of Gallemore et al. (2014), who find no difference in CEO turnover rates following 118 news events of firms engaging in aggressive tax shelters. Gallemore et al. (2014) are careful to note that the lack of an association between news of tax shelters and CEO turnover could be due to low power due to using a small sample. While Gallemore et al. (2014) examine whether CEO turnover follows 118 news of aggressive tax shelter activity, we examine whether forced turnover for 1,587 CEOs is associated with the low payment of taxes. Second, we examine the possibility that CEOs are fired for paying too much tax. Given that taxes represent a wealth transfer from shareholders, it is possible that CEO are held responsible for perceived decreases in shareholder wealth.

To the extent either more or less tax avoidance is a determinant of CEO turnover, our study can respond to Hanlon, Maydew, and Saavedra (2014) who suggest that the we know very little about the consequences of tax avoidance. At the same time, we can weigh in on the so-called "under-sheltering puzzle" that suggests many firms engage in less tax avoidance than might be expected (Hanlon and Heitzman, 2010). If were are able to document evidence that CEOs' probability of getting forced out increases when they avoid too much tax, the under-sheltering puzzle can be partly explained. If we find that CEOs' probability of getting forced out increases when they avoid too little tax, then the under-sheltering puzzle will remain.

For our empirical tests, we collect a sample of firm-years around forced CEO turnover events. We regress a time period forced CEO turnover year indicator on time varying firm characteristics. We include indicator variables separately capturing CEOs evidencing the lowest and highest tax avoidance (i.e. bottom and top effective tax rate quintiles) and controls for other known determinants of forced CEO turnover that include measures of performance. Because our tests include firm and year fixed-effects and a panel of firm-years leading up to and after the turnover event, our variables of interest compare firms' effective tax rates immediately preceding the turnover event relative to firms' average effective tax rates over the sample period. With this design we can gain some insight into whether CEOs evidencing relatively high or low effective tax rates precipitated or contributed to a forced turnover. Thus, we can examine whether a CEOs probability of being fired increases or decreases when paying too much or too little tax.

Confirming the limited research to date (Gallemore et al., 2014), we find that the probability of forced turnover does not increase or decrease for CEOs of firms that pay less tax (i.e., CEOs avoid more taxes). Consistent with the view that boards are more likely to replace

CEOs that pay too much tax we find that CEOs of firms paying high effective tax rates (i.e., CEOs not avoiding taxes) have a higher probability of being fired.

Our primary results are robust to a variety of additional empirical specifications and sample selection criteria including eliminating loss firms, using continuous instead of dichotomous effective tax rate variables, different regression distributional assumptions, and alternative effective tax rate assessment windows. We also repeat our tests using a sample of exogenous CEO turnover events from Fee et al. (2013). Exogenous turnover provides us with a strong counter-factual test because these events are less likely to result from board intervention. If the positive relation between higher effective tax rates and forced turnover within our endogenous sample were spurious, we should find similar result in the sample of exogenous turnover events. In the sample of exogenous or "unforced" CEO turnovers we find no consistent or statistically significant association between turnover and effective tax rates. This provides further support for the inferences documented in our primary tests that high effective tax rates are a statistically significant determinant of forced CEO turnover.

Our empirical findings provide evidence that the common view of reputational effects from tax avoidance are indeed contrariwise. CEOs are more likely to be forced out because of paying too much instead of too little tax. In addition, in our setting that considers a more general set of possible tax strategies than Gallemore et al. (2014) we are also unable to offer any solution to the under-sheltering puzzle. Because we only find reputational penalties from seemingly too little tax avoidance, our results underscore the conclusion in Gallemore et al. (2014) the "under-sheltering puzzle" is more of a puzzle than ever.

In addition to the research mentioned above, our paper also adds to the literature that examines determinants of CEO turnover. In particular the literature that examines the relation

between firm performance and CEO turnover (see for example; Coughlan and Schmidt, 1985; Warner, Watts, and Wruck, 1990; Engel, Hayes, and Wang, 2003; Farrell and Whidbee, 2003). Controlling for other aspects of firm performance, effective tax rates can be an incremental performance metric that has not been considered in prior work. The marginal effect of paying too much tax that we document appears economically significant both in isolation and relative to the prior literature in this area. We find that the probability of being forced out increases by 21% - 29% for CEOs that pay too much tax.[1] Brickley (2003) also suggests that much of the prior literature studying relations between firm performance and CEO turnover suffers from correlated omitted variables and endogeneity. While we cannot completely rule out these effects on our results, using a within-firm specification and samples of endogenous and exogenous CEO departures allows for strong identification and counter-factual testing.

Finally, we add to the literature that examines the role of CEOs on corporate tax outcomes (Chyz, Gaertner, Kausar, and Watson, 2015; Olsen and Stekelberg, 2015; Chyz, 2013; Dyreng, Hanlon, and Maydew, 2010). A criticism with this line of the literature is that CEOs are almost never tax experts and are unlikely to understand the details of common tax strategies, thus calling into question their role in corporate taxes (Dyreng et al., 2010). Our results documenting a relation between forced turnover and tax avoidance suggests that even if this criticism is true, boards appear to hold CEOs accountable for firms' corporate tax outcomes.

We structure the remainder of this paper as follows. In Section 2, we place our study in the context of the existing literature and develop hypotheses. In Section 3, we describe the data,

[1] There is a forced turnover in 14.8% of our firm-years. Paying too much tax increases the probability of being forced out from 3.1% - 4.3%. This represents a 21% - 29% increase in the base probability of being forced out. See Section 4 for more detail.

our variables of interest and the empirical design. In Section 4, we discuss our main results. We summarize our findings and conclude in Section 5.

II. INSTITUTIONAL BACKGROUND, RELATED LITERATURE AND HYPOTHESIS DEVELOPMENT

Corporate effective tax rates

Recent studies present evidence of substantial variation in effective tax rates (Dyreng et al., 2008; Blouin, 2014). For example, Dyreng et al. (2008) document some firms apparently sustaining low effective tax rates and other firms exhibiting consistently high effective tax rates that meet or exceed the statutory rate. Consistent with the Scholes and Wolfson all-taxes paradigm (Scholes, Wolfson, Erickson, Hanlon, Maydew and Shevlin, 2013) the maintained view in much of the empirical tax research is that cross-sectional variation in non-tax costs partially explain this observed variation in effective tax rates.[2] Among other things, this framework suggests that while avoiding taxes generates tax savings, doing so is not costless and managers must trade-off non-tax costs with expected benefits. Reputational costs are frequently posited as an important non-tax cost that could limit the extent to which CEOs could avoid taxes (Desai and Dharmapala, 2006; Hanlon and Slemrod, 2009; Chen, et al., 2012; Graham et al., 2013; Armstrong, et al,, 2015).

Prior studies vary in whether they view reputational costs as impacting executives individually or the firm as a whole. In all cases, the assumption is that reputational penalties follow too much tax avoidance. For example, Desai and Dharmapala (2006) suggest that possible

[2] See Hanlon and Heitzman (2010), Maydew (2001), and Shackelford and Shevlin (2001) for comprehensive summaries on the related literature.

sanctions imposed upon managers that increase the costs of tax avoidance include criminal, civil, or reputational sanctions. Austin and Wilson (2015) cite both firms' reputation with customers, and managers' individual reputations as limiting tax avoidance. Finally, underscoring the role of executive reputation, Crocker and Slemrod (2005) suggest that tax enforcement sanctions are typically optimal when levied against firms' management.

To date, empirical evidence supporting significant reputational effects at both the firm and executive level is scant. Some limited exceptions include Hanlon and Slemrod, (2009) and Graham et al., (2013). Both studies document evidence supporting reputational costs for tax avoidance. Hanlon and Slemrod (2009) find that stock prices are negatively impacted upon the news of accusations that firms participated in tax shelter transactions. Graham et al. (2013) survey results suggest that 69% of executives cite "potential harm to firm reputation" as a reason for not adopting a particular tax avoidance strategy. Reputational concerns is second only to concerns of getting caught as the most cited reason for not getting involved in a shelter. Unlike our study, the evidence in Hanlon and Slemrod (2009) measures changes in total firm value and thus cannot isolate reputational costs. In addition, it is unclear whether the survey evidence in Graham et al. (2013) captures broader firm-level reputational costs or executive specific reputational costs.

In the study most closely related to ours, Gallemore et al. (2014) specifically test for CEO reputational effects following what is typically thought of as particularly aggressive tax avoidance transactions (i.e. tax sheltering). Among other tests aimed at quantifying both firm and executive level reputational effects, the authors examine the likelihood of CEO turnover following revelation of tax shelter involvement. Gallemore et al. (2014) find that the likelihood of CEO turnover subsequent to tax shelter participation revelation is not any higher than it is for

their control firms. This result suggests that CEOs do not bear substantial reputational effects from aggressive tax policy choices. Unlike Gallemore et al. (2014) we do not focus on the revelation of any particular tax strategy. Rather, we let firms' effective tax rate realizations capture what boards could consider potentially too much or too little tax avoidance. In addition, our study distinguishes between forced and unforced CEO turnover. Fee et al. (2012) suggest that this distinction is important when examining the role of CEOs in firm outcomes. For example, failing to distinguish between forced and unforced turnover in treatment and control groups could threaten inferences. This leads to our first hypotheses stated in alternate form.

Hypothesis 1: *The probability of a forced turnover increases when effective tax rates are low.*

As is evident from the discussion above, the prior research has not visited, at least empirically, the possibility that CEOs bear reputational penalties for paying too much instead of too little taxes. Tax planning is typically viewed as beneficial to shareholders since it results in higher cash flows and net income (Blouin, 2014). Blouin (2014) concludes that firms have a responsibility to structures its transactions in a tax efficient manner. Thus, risk-neutral shareholders likely expect mangers to pursue opportunities to reduce tax liabilities (Hanlon and Heitzman, 2010). High effective tax rates could signal managers' unwillingness or inability to pursue such opportunities. Given that taxes represent a wealth transfer from shareholders to taxing authorities, it is possible that CEO are held responsible for perceived decreases in shareholder wealth. As a result, as effective tax rates increase, boards and shareholders could reasonably question CEOs' stewardship of firm resources. This leads to our second hypotheses stated in alternate form.

Hypothesis 2: *The probability of a forced turnover increases when effective tax rates are high.*

Focusing on CEOs as we do and and not line-level managers is consistent with Dyreng et al. (2010) and Rego and Wilson (2012), who suggest CEOs have a significant impact on corporate policies and decision-making, including tax planning (even if they are not directly involved in the tax-planning process). This approach is consistent with the "upper echelons" perspective introduced by Hambrick and Mason (1984). An alternative view is that CEOs are rarely if ever tax experts and may not be involved in the selection and implementation of tax strategies (Dyreng et al., 2010). If this alternative view were descriptive and boards do not hold CEOs accountable for the tax outcomes of the firm then we should not find support for either of our hypotheses. However, if we find support for either of our hypotheses it would at least suggest that boards believe CEOs can impact tax outcomes and tend to hold them accountable for the tax performance of their firms.

III. DATA, MEASURES, AND RESEARCH DESIGN

Data

As discussed above, we begin with a sample of firms experiencing endogenous or "forced" CEO departures from Fee et al. (2013). Fee et al. (2013) note that in many settings, CEO departure is endogenously related to organizational crisis that drives board action to deliberately change its leader and/or firm strategy. Fee et al. (2013) attempt to circumvent the endogeneity of CEO departure by following the approaches of Johnson et al. (1985), Denis and Denis (1995), and Weisbach (1995). Specifically, using Compustat Research Insight CDs and

Factiva searches, Fee et al. (2013) identify 824 firms experiencing CEO turnover events related to health, death, and natural retirements from 1990-2007; which they classify as exogenous CEO turnover.[3] For endogenous turnover, Fee et al. (2013) perform a similar search for articles surrounding a turnover event looking for key words that would indicate a forced departure such as "fired", "ousted", "under pressure", etc. Fee et al. (2013) identify 533 forced turnover events this way. The authors also assign the set of turnover events that are not identified as exogenous and that relate to a departing CEO that is (1) under the age of 60 at the start of his/her last year in office, and (2) does not immediately resurface as a CEO of another firm to the forced departure group. This method adds an additional 4,087 turnover events. Fee et al. (2013) perform validity testing which provides additional support that both approaches to identify forced turnover are accurate.

Table 1, Panel A provides detail on our sample selection criteria. The Fee et al. (2013) sample excludes financial firms (SIC codes 6000-6999), utilities (SIC codes 4900-4949), non-US firms, and firms with less than $10 million in book assets. We merge this sample to Compustat's XpressFeed files to obtain financial data. We require each sample firm to have at least one forced turnover event.[4] Consistent with extant tax-accounting research we also delete observations prior to the enactment of ASC740. Finally, we delete observations without sufficient data to compute our regression variables. This yields a final sample of 10,704 firm-years from 1993 to 2007 for

[3] Natural retirements are coded as taking place when the CEO is between 63 and 71 at the start of the year. Because some older managers may in fact be forced to depart, Fee et al. (2013) also require that the firm's most recent level of accounting performance exceed the sample annual median. The authors also exclude from this group any departures that are later discovered to be overtly forced. In counter-factual testing summarized in Table 6 we examine the impact of tax avoidance on exogenous turnover.

[4] For any exogenous turnover event in our panel of firm-years, we code the variable Forced CEO turnover as zero. For example, if Firm A experiences an endogenous turnover event in 1996, Forced CEO turnover = 1 for that year. If the same firm experiences an exogenous turnover event in 2001 Forced CEO turnover = 0 for that year and all other years except 1996.

our full multivariate model (see Table 5).[5] Within these 10,704 firm-years there are 1,587 forced turnover events. Table 1, Panel B summarizes the annual distribution of forced turnover events. The frequency of forced turnover is highest in 1999 with 159 events and lowest in 1993 with 84 events. The mean annual turnover over our sample period is approximately 106.

Measures

Effective tax rates

We are interested in examining the role of tax avoidance and effective tax rates on forced CEO turnover. Consistent with Dyreng et al. (2010) we use two broad and easy to understand measures; the GAAP effective tax rate (*ETR*) and the cash effective tax rate (*CETR*).[6] Both measures capture the amount of tax firms pay relative to their pretax accounting income. To reduce the volatility present in annual realizations (Hanlon and Heitzman, 2010) we use three year effective tax rate measures.

We select effective tax rates instead of other measures thought to capture "tax avoidance" for a number of reasons. First, many common tax avoidance measures, including book-tax-differences, are closely related to effective tax rates (Guenther, 2014). Second, in part because of their simple interpretation, visibility in the financial statements, and ease of calculation we expect effective tax rates to be relatively more visible and useful for boards in their decision making. Work by Phillips (2003) and Gaertner (2014) linking executive incentive pay to effective tax rates suggests as much. Third, anecdotal evidence suggests that tax watch dog groups like Citizens for Tax Justice focus on effective tax rates.[7] To the extent that boards hold

[5] To reduce the impact of outliers, we winsorize all continuous variables at the 1st and 99th percentiles.
[6] Unless stated otherwise, all data references correspond to Compustat XpressFeed data items.
[7] News and Analysis – Economic Analysis. February 13, 2012.

CEOs accountable for damage done to the firms' reputation because of attention from tax watch dog groups, effective tax rates are the most appropriate measure. Fourth, the link between effective tax rates and firm performance is relatively clear, thus simplifying interpretations when we control for firm performance.

ETR is estimated as the three-year sum of total tax expense (#TXT) divided by the three-year sum of pretax income (#PI). Research has shown that public companies are primarily concerned with their GAAP effective tax rate (Blouin, 2014). We set *ETR* equal to zero in cases where the numerator is negative and the denominator is positive. We set *ETR* equal to one when *ETR* is greater than one. Lastly, we set *ETR* to missing when the denominator is smaller than or equal to zero. *CETR* is the three-year sum of total cash paid for taxes divided by the three-year sum of pretax income. Similar to *ETR* we set *CETR* equal to zero in cases where the numerator is negative and the denominator is positive. We also set *CETR* equal to one when *CETR* is greater than one. Lastly, we set *CETR* to missing when the denominator is smaller than or equal to zero.

Because the *ETR* is reported on the financial statements and commonly referred to in the financial press, it is potentially more visible than the *CETR*. That being said, the *CETR* could reflect the firms' tax burdens more truly as it takes into account tax benefits associated with employee stock options, and it is not affected by changes in firms' tax contingency (tax cushion) (Dyreng, Hanlon, and Maydew, 2008).

Both effective tax rates only capture non-conforming tax rate avoidance. Effective tax rate variants are also unable to distinguish between real activities that are tax favored, activities specifically targeted to reduce taxes, and targeted tax benefits from lobbying activities (Hanlon and Heitzman, 2010). If our measures of tax avoidance are understated, then we would expect our empirical results to be understated as well.

Research design

We examine whether effective tax rate avoidance impacts the probability of a forced turnover event using the following linear probability model:[8]

$$\begin{aligned} \textit{Forced CEO turnover}_{it+1} = {} & \beta_0 + \beta_1 \textit{Low tax indicator}_{it} + \beta_2 \textit{High tax indicator}_{it} \\ & + \beta_4 \textit{Abnormal stock returns}_{i,t} + \beta_5 \textit{Return on assets}_{i,t} + \beta_6 \textit{Leverage}_{i,t} \\ & + \beta_i F_i + \beta_t T_t + \varepsilon_{it} \end{aligned} \quad (1)$$

where, *Forced CEO turnover* is an indicator variable capturing forced CEO turnover events and is equal to one for firm-years where Fee et al. (2013) code the turnover event as an overt firing or a suspected force out, and 0 otherwise; *Low tax indicator* is an indicator variable equal to 1 for observations in the lowest annual quintile of *ETR* or *CETR*, and 0 otherwise; *High tax indicator* is an indicator equal 1 for observations in the highest annual quintile of *ETR* or *CETR*, and 0 otherwise, *F* is a vector of *i* firm fixed effects, *T* is a vector of year fixed effects, and ε is a disturbance term with mean zero. Because we include firm fixed effects, our variables of interest compare firms' effective tax rates immediately preceding the turnover event relative to firms' average effective tax rates over the sample period. Our model effectively tests whether the probability a CEO is fired increases when his or her firm is paying its highest (*High tax indicator*) or lowest (*Low tax indicator*) effective tax rate. With this design we can gain some insight into whether CEOs evidencing high or low tax avoidance precipitated or contributed to a forced turnover.

[8] Subscript *i* denotes firm, *t* denotes year, and *k* denotes control variable. Unless stated otherwise, all input data for control variables are calculated as of time *t*. We use a linear probability model to ease interpretation of coefficients. Linear probability models have been shown to perform as well on categorical variables as specifications that do not assume linearity (Shi, 2003). As noted in Section 4, in untabulated analyses we find that our inferences are unchanged using a logit specification.

Hypothesis 1 predicts that the probability of a forced turnover increases for firms with low effective tax rates. In Equation (1) this would be supported by a positive and significant β_1 coefficient. Hypothesis 2 predicts that the probability of a forced turnover increases for firms with high effective tax rates. In Equation (1) this would be supported by a positive and significant β_2 coefficient.

Because Equation (1) is a linear probability model we can interpret coefficients on β_1 and β_2 as the change in probability that there is a forced turnover for a one unit change (i.e., 0 to 1) in the *Low tax indicator* and *High tax indicator* respectively. The inclusion of firm fixed effects forces the analysis to be conducted only using within-firm variation; therefore the firm acts as its own control. For example, if a firm always experiences lower tax rates because it operates in a lower-taxed industry or jurisdiction, then this effect will be captured in the firm fixed effect. Our inclusion of year fixed effects removes the effects of macroeconomic conditions that might be associated with forced CEO turnover.

We control for several determinants of CEO turnover from prior literature (e.g., Engel et al., 2003; Gilson, 1989; Hennes et al., 2008; Menon and Williams, 2008; Gallemore et al., 2014), including: size, abnormal stock returns, return on assets, and leverage. Size is the natural log of total assets (#AT). Abnormal stock returns is the annual stock return minus the value weighted return for the S&P 500. Return on assets is pretax income divided by total assets (#PI/#AT). Leverage is long term debt (including the current portion) divided by total assets (#DLC+#DLTT) / #AT.[9]

[9] While our effective tax rates are averaged over three years, our control variables are each computed over a single year. Applying the same averaging scheme to our control variables yields similar results.

IV. EMPIRICAL RESULTS

Descriptive statistics

Table 2, Panel A presents descriptive statistics for our final sample. The average firm in our sample has a three-year GAAP effective tax rate of 35.9% (i.e., mean *ETR* = 0.359) and a three-year cash effective tax rate of 32.0% (i.e. mean *CETR* = 0.320). The average firm in our sample has a positive return on assets of close to 10% (mean *Return on Assets* = 0.098), generates positive abnormal returns (mean *Abnormal stock returns* = 0.062) and has significant debt (mean *Leverage*= 0.210).

We partition our sample into firm-years without (Panel B) and with (Panel C) forced CEO turnover events. Because we measure the turnover event as of time t+1 and other variables as of time t, we can interpret partitioned descriptive data in Panel C as capturing firm characteristics immediately preceding the forced CEO departure. Some patterns emerge in this partitioning that are consistent with prior research (Gilson, 1990; Engel et al., 2003; Farrell and Whidbee, 2003). We find that average abnormal stock returns and return on assets in the year leading up to the forced turnover are lower on average than other years. Leverage tends to be higher leading up to forced turnover. With respect to effective tax rates, we find that both GAAP and cash effective tax rates are higher leading up to forced turnover events. This provides evidence supporting Hypothesis 1 rather than Hypothesis 2. This univariate result should be interpreted with some caution because it does not control for stationary firm characteristics or other covariates.

Correlations

Table 3 presents correlation coefficients for the variables used in our study (Pearson above, Spearman below). Correlation coefficients are accompanied by p-values below each coefficient estimate. As expected, *ETR* and *CETR* are positively correlated but not perfectly correlated. Consistent with partitions in Panels B and C of Table 2 described above, both *ETR* and C*ETR* are positively and significantly correlated with forced CEO turnover for both Spearman coefficient estimates (*ETR* correlation = 0.0431, p-value < 0.001; *CETR* correlation = 0.0749, p-value < 0.001) and Pearson coefficient estimates (*ETR* correlation = 0.0311, p-value < 0.01; *CETR* correlation = 0.0488, p-value < 0.001).

Also consistent with partitions in Panels B and C of Table 2 described above, both return on assets and abnormal stock returns are negatively and significantly correlated with forced CEO turnover (in both Pearson and Spearman specifications) suggesting that turnover is more likely when performance is weak. Leverage is positively correlated with forced CEO turnover but this relation is not statistically significant in either Pearson or Spearman specifications.

Univariate statistics and tests

In Table 4 we summarize the likelihood of forced CEO turnover by tax quintiles. Specifically, we compute annual quintiles of *ETR* (Panel A) and *CETR* (Panel B) and calculate the mean for *Forced CEO turnover*. Because this is an indicator that equals one when a CEO is fired, the mean realizations capture the likelihood of experiencing a forced turnover by effective tax rate quintile. If Hypothesis 1 is descriptive we would expect the mean realizations of CEO turnover to be highest in Q1 (when effective tax rates are lowest). If Hypothesis 2 is descriptive we would expect means realization of CEO turnover to be highest in Q5 (when effective tax rates are highest). Our univariate results show a U-shape relation between tax rates and forced

turnover. Relative to the middle three quintiles, forced CEO turnover is highest in the lowest and highest quintiles of both *ETR* and *CETR*. In both cases, however, the highest instance of forced CEO turnover occurs in Q5 (i.e., when effective tax rates are highest). For *ETR* the difference between mean realizations of CEO turnover in Q5 and Q1 is 0.028, representing an increase of 16.67%. This difference is statistically significant at the two-tailed level (p-value = 0.0184). For *CETR* the difference between mean realizations of CEO turnover in Q5 and Q1 is 0.051, representing a 31.88% increase. This difference is also statistically significant at the two-tailed level (p-value = <0.001). Combined, the results offer some support for both H1 and H2, with the effect for H2 seemingly dominating the effect for H1.

Multivariate results

Table 5 reports regression estimates for Equation (1). In all cases, our multivariate specification includes both firm and year fixed effects and are performed on a set of firms experiencing endogenous, or forced, CEO departures from Fee et al. (2013). The variable *Low tax indicator* captures the group of CEOs at firms with low effective tax rates. If reputational costs are a concern when CEOs are running firms paying too little tax, then the coefficient on *Low tax indicator* would be positive and significant. If paying less tax actually reduces the probability of getting fired, then the coefficient on *Low tax indicato*r would be negative and significant. In the *ETR* regression we find that the coefficient on *Low tax indicator* is positive but not statistically significant. In the *CETR* regression, the coefficient on *Low tax indicator* is negative but not statistically significant. These results provide no support for Hypothesis 1 and suggest that CEOs do not bear significant reputational penalties from avoiding taxes. This

confirms the findings in the limited research to date investigating the tax impacts on CEO turnover (Gallemore et al., 2014) within a sample of endogenous turnover events.

The coefficient on the variable *High tax indicator* captures the group of CEOs at firms with high effective tax rates. If reputational costs are a concern when CEOs are running firms paying too much tax, then the coefficient on *High tax indicator* would be positive and significant. If paying more tax actually reduces the probability of getting fired, then the coefficient on *High tax indicator* would be negative and significant. In the *ETR* regression we find that the coefficient on *High tax indicator* is positive and statistically significant (coefficient = 0.031, *t-stat* = 2.82). In the *CETR* regression, the coefficient on *Low tax indicator* is also positive and statistically significant (coefficient = 0.043, *t-stat* = 3.91). Because our regression is a linear probability model and the variable *High tax indicator* is dichotomous, we can interpret the coefficient estimates as percentage increases in the probability that a CEO is forced out. Based on Table 1, our overall sample average probability of being forced out any given year is 14.8% (*Forced CEO turnover* = 0.148). The results in our *ETR* regressions suggest that paying too much tax increases the probability of being fired any given year by approximately 21% (0.031/0.148). Our *CETR* regression results suggest that paying too much tax increases the probability of being fired any given year by 29% (0.043/0.148).

Overall, our multivariate results provide support for Hypothesis 2 that is both economically and statistically significant. These empirical findings support our assertion that the common view of CEO reputational effects is contrariwise. Instead of CEOs bearing reputational costs when their firms pay too little tax as was the commonly held belief, we find that they bear reputational costs when their firms pay too much tax.

Additional analysis

Additional robustness

We perform a variety of additional tests to ensure the robustness of our results. These results are not tabulated but available from the authors by request.

First, the sample in our primary regressions results includes loss firms. Excluding loss firms does not alter our inferences.

Second, we arrive at similar inferences if we use a continuous measure of effective tax rates. Specifically, we replace the low and high tax indicator variables with the 3-year cash and GAAP effective tax rates, we find that the coefficient loading is positive and statistically significant. This suggests that the probably of a forced CEO turnover increases with effective tax rates, consistent with our main results.

Third, although Shi (2003) suggest linear probability models perform as well on categorical variables as specifications that do not assume linearity, concerns about susceptibility to heteroscedasticity are potentially valid. Accordingly, we re-specify Equation (1) as a logit model and continue to document similar results.

Counter-factual tests

To gain additional comfort that the results from our primary analyses are not spurious or are the result of correlated omitted variables, we conduct a counter-factual test. Specifically, we run our regression Equation (1) in a sample of exogenous CEO departures. Exogenous departures are unlikely to be the result of organizational stress or crisis that drives board action to deliberately change its leader or firm strategy (Fee et al., 2013). If the positive relation between higher effective tax rates and forced turnover within our endogenous sample were spurious, we

would be more likely to find the same result in the sample of exogenous turnover events. Table 6 summarizes the results of these tests. Because the number of exogenous turnover events identified by Fee et al. (2013) is smaller, these regressions contain a fewer number of firm-years (6,007 vs. 10,704).

In Table 6 we see that the only tax indicator variable with a statistically significant coefficient estimate is that on *Low tax indicator* within the *CETR* regression. Recall that paying lower taxes was not associated with forced turnover. The coefficient on *High tax indicator* is negative but insignificant in the *ETR* regression (coefficient = -0.014, *t-stat* = 1.07) and essentially zero in the *CETR* regression (coefficient = 0.000, *t-stat* = 0.03). The lack of reliable associations between effective tax rates and the probability of an exogenous turnover provide additional comfort that the results documented in Table 5 are not spurious.

Unlike our endogenous sample regression results in Table 5, return on assets does not appear to be associated with turnover probability while size is associated with turnover probability. These differences in control variable results between Tables 5 and 6 are additional reassurances that endogenous and exogenous turnover is fundamentally different and that our counter-factual test is valid.

V. SUMMARY AND CONCLUSIONS

Our study contributes to the tax literature by examining the role of corporate taxes in forced CEO turnover. We model the probability of a turnover event as a function of effective tax rates and a set of firm covariates from prior literature thought to predict forced CEO turnover using a sample of "exogenous" and "endogenous" CEO changes from Fee et al. (2013). This allows us to separately identify forced CEO (i.e., endogenous) turnover for our main tests and

turnover resulting from natural CEO retirement, health reasons and CEO death (i.e. exogenous) for our counter-factual tests. We control for stationary firm characteristics in an unbalanced panel of firm-years that contains periods leading up to and after the CEO turnover event.

We find that the common view in much of the tax literature that CEOs bear substantial reputational penalties for avoiding too much tax does not appear to be valid. Instead, our results suggest that CEOs who do not avoid enough tax are the ones bearing significant reputational costs. Because the probability of being forced out increases in firms' effective tax rates, much like Gallemore et al. (2014) we are forced to conclude that the under-sheltering puzzle is more of a puzzle than ever.

Our study is the first to document evidence consistent with significant reputational consequences from what could be interpreted as CEOs exercising poor tax policy management. We note that it is unclear whether the CEO reputational effect that we document arises from an under-investment in tax avoidance, or a tendency for investments in tax avoidance to fail or be over-turned by the IRS. These are questions for future research. In either case, our study provides evidence that boards hold CEOs accountable for tax outcomes.

REFERENCES

Armstrong, C. S., Blouin, J. L., Jagolinzer, A. D., and Larcker, D. F. 2015. Corporate governance, incentives, and tax avoidance. *Journal of Accounting and Economics* forthcoming.

Austin, C. and Wilson, R. 2015. Are reputational costs a determinant of tax avoidance?. Working Paper: University of South Carolina and University of Oregon.

Blouin, J. 2014. Defining and Measuring Tax Planning Agressiveness. The National Tax Journal. 67 (4): 875-900.

Brickley, J.A. 2003. Empirical research on CEO turnover and firm-performance: a discussion. *Journal of Accounting and Economics* 26 (2003): 227-233.

Chen, S., Chen, X., Cheng, Q., and Shevlin, T. 2010. Are family firms more tax aggressive than non-family firms? *Journal of Financial Economics* 95 (1): 41-61.

Chyz, J. A. 2013. Personally tax aggressive executives and corporate tax sheltering. *Journal of Accounting and Economics* 56 (2/3): 311-328.

Chyz, J. A., Leung, W. S.C., Li, O.Z., and Rui, O.M. 2013. Labor unions and tax aggressiveness. *Journal of Financial Economics* 108 (3): 675-698.

Chyz, J., Gaertner, F., Kausar, A., and Watson, L. 2015. Overconfidence and corporate tax policy. Working Paper. University of Tennessee, Univerity of Wisconsin, Nanyang Technical University, University of Florida.

Coughlin, A.T., and Schmidt, R.M. 1985. Executive compensation, management turnover, and firm performance: an empirical investigation. *Journal of Accounting and Economics* 7: 43-66.

Crocker, K. J., and J. Slemrod, 2005, Corporate tax evasion with agency costs. Journal of Public Economics, 89: 1593-1610.

Denis, D. J., and D. K. Denis. 1995. Performance changes following top management dismissals. *Journal of Finance* 50: 1029-1057.

Desai, M., and D. Dharmapala, 2006, Corporate tax avoidance and high-powered incentives, *Journal of Financial Economics*, 79: 145-179.

Dyreng, S. D., Hanlon, M., and Maydew, E. L. 2008. Long-Run Corporate Tax Avoidance. *The Accounting Review* 83 (1): 61-82.

Dyreng, S. D., Hanlon, M., and Maydew, E. L. 2010. The Effects of Executives on Corporate Tax Avoidance. *The Accounting Review* 85 (4): 1163-1189.

Engel, E., Hayes, R. M., and Wang, X. 2003. CEO turnover and properties of accounting information. *Journal of Accounting and Economics* 36(2003): 197-226.

Farrell, K. A. and Whidbee, D. A. 2003. Impact of firm performance expectations on CEO turnover and replacement decisions. *Journal of Accounting and Economics* 36(2003): 165-196.

Fee, C. E., Hadlock, C. J. and Pierce, J. R. 2013. Managers with and without style: Evidence using exogenous variation. *Review of Financial Studies* 26 (3): 567-601.

Gaertner, F. B. 2014. CEO After-Tax Incentives and Corporate Tax Avoidance. *Contemporary Accounting Research* 31 (4): 1077-1102.

Gallemore, J., Maydew, E. L., and Thornock, J. 2014. The reputational costs of tax avoidance. *Contemporary Accounting Research* 31 (4): 1103-1133.

Gilson, S.C. 1989. Management turnover and financial distress. *Journal of Financial Economics* 25 (1989): 241-262.

Graham, J. R., Hanlon, M., Shevlin, T., and Shroff, N. 2013. Incentives for Tax Planning and Tax Avoidance: Evidence from the Field. *The Accounting Review* 89(3): 991-1023.
Guenther, D. 2014. Measuring corporate tax avoidance: Effective tax rates and book-tax differences. Working Paper. University of Oregon.
Hambrick, D., Mason, P., 1984. Upper echelons: The organization as a reflection of its top managers. Academy of Management Review 9, 193-206.
Hanlon, M., Maydew, E., and Saavedra, D. 2014. The taxman cometh: Does tax uncertainty affect corporate cash holdings? Working Paper. Massachusetts Institute of Technology and University of North Carolina.
Hanlon, M., and Heitzman, S. 2010. A review of tax research. *Journal of Accounting and Economics* 50 (2/3): 127-178.
Hanlon, M., and J. Slemrod, 2009, What does tax aggressiveness signal? Evidence from stock price reactions to news about tax aggressiveness, Journal of Public Economics, 93 (1-2): 126-141.
Hennes, K., Leone, A. and Miller, B. 2008. The importance of distinguishing errors from irregularties in restatment research: The cast oe restatements and CEO/CFO turnover. *The Accounting Review* 83 (6): 1487-1519.
Law, K., and Mills, L. M. 2015. Taxes and financial constraints: Evidence from linguistic cues. Working Paper: Tilburg University and University of Texas at Austin.
Menon, K., and Williams, D. 2008. Management turnover following auditor resignations. *Contemporary Accounting Resarch* 25 (2): 567-604.
Olsen, K. J., and J. Stekelberg. 2015. CEO narcissism and corporate tax policies. Working Paper: University of Southern California and University of Arizona.
Phillips, J. D. 2003. Corporate Tax-Planning Effectiveness: The Role of Compensation-Based Incentives. *The Accounting Review*, 78 (3): 847-874.
Rego, S. O., and Wilson, R. 2012. Equity Risk Incentives and Corporate Tax Aggressiveness. *Journal of Accounting Research* 50 (3): 775-810.
Scholes, M.,Wolfson, M., Erickson, M., Hanlon, M., Maydew, E., and Shevlin, T. 2013. *Taxes and business strategy: A planning approach*. Engelwood Cliffs, NJ: Prentice-Hall.
Shi, C. 2003. On the trade-off between the future benefits and riskiness of R&D: a bondholder's perspective. *Journal of Accounting and Economics* 35(2003): 227-254.
Shackelford, D., and T. Shevlin, 2001, Empirical tax research in accounting, *Journal of Accounting and Economics*, 31: 321-387.
Shevlin, T. 2002. Commentary: Corporate tax shelters and book-tax differences. *Tax Law Review, New York University School of Law* 55 (3): 427-443.
Warner, J.B., Watts, R.L., and Wruck, K.H. 1998. 1998. Stock prices and top management changes. *Journal of Financial Economics* 20: 461-492.
Weisbach, M. S. 1995. CEO turnover and the firm's investment decision. *Journal of Financial Economics* 37: 159-188.
Wilson, R. 2009. An examination of corporate tax shelter participants. *The Accounting Review* 84 (3): 969-999.

Table 1
Sample selection

Panel A: Sample selection

All Compustat firm-year observations from 1993-2007			157,812
Less:	Foreign firms	14,089	
	Financials and utilities	21,308	
	Firms with less than $10 in total assets	37,473	
	Firms not experiencing a forced CEO turnover event	56,007	
	Firms missing ETR	17,165	
	Firms missing Cash ETR	1,011	
	Firms missing Size	0	
	Firms missing Abnormal stock returns	3	
	Firms missing Return on assets	0	
	Firms missing Leverage	52	147,108
Total firm-year observations			10,704

Panel B: Number of Forced CEO turnover events by year

Year	Forced CEO turnovers
1993	84
1994	90
1995	104
1996	115
1997	130
1998	127
1999	159
2000	130
2001	96
2002	87
2003	101
2004	88
2005	95
2006	91
2007	90

This table reports sample selection criteria for the study. Forced CEO turnover is 1 in cases where Fee et al. (2013) code the turnover event as an overt firing or a suspected force out, and 0 otherwise. ETR is the three-year sum of total tax expense divided by the three-year sum of pretax income; and is set to 0 in cases where the numerator is negative and the denominator is positive, set to 1 when ETR is greater than 1, and set to missing when the denominator is smaller than or equal to 0. CETR is the three-year sum of total cash paid for taxes divided by the three-year sum of pretax income; and is set to 0 in cases where the numerator is negative and the denominator is positive, set to 1 when CETR is greater than 1, and set to missing when the denominator is smaller than or equal to 0. Size is the natural log of total assets. Abnormal stock returns is the annual stock return minus the value weighted return for the S&P 500. Return on assets is pretax income divided by total assets. Leverage is long term debt (including the current portion) divided by total assets. Forced CEO turnover is measured as of t+1, while all other variables as measured at t.

Table 2
Descriptive Statistics

Panel A: Descriptive statistics (full sample)

Variable	N	Mean	Std Dev	P10	P25	P50	P75	P90
Forced CEO turnover	10,704	0.148	0.355	0.000	0.000	0.000	0.000	1.000
ETR	10,704	0.359	0.170	0.000	0.309	0.368	0.400	1.000
CETR	10,704	0.320	0.222	0.000	0.182	0.301	0.394	1.000
Size	10,704	6.246	1.837	1.973	4.878	6.133	7.486	11.050
Abnormal stock returns	10,704	0.062	0.587	-1.010	-0.277	-0.029	0.259	4.788
Return on assets	10,704	0.098	0.092	-0.214	0.040	0.087	0.145	0.541
Leverage	10,704	0.210	0.188	0.000	0.036	0.185	0.322	0.928

Panel B: Descriptive statistics (Forced CEO turnover = 0)

Forced CEO turnover	9,117	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ETR	9,117	0.356	0.162	0.177	0.309	0.368	0.399	0.454
CETR	9,117	0.313	0.212	0.060	0.183	0.299	0.386	0.535
Size	9,117	6.290	1.845	3.916	4.922	6.201	7.544	8.835
Abnormal stock returns	9,117	0.081	0.580	-0.471	-0.252	-0.011	0.269	0.660
Return on assets	9,117	0.103	0.089	0.009	0.046	0.091	0.149	0.216
Leverage	9,117	0.209	0.186	0.000	0.038	0.186	0.320	0.461

Panel C: Descriptive statistics (Forced CEO turnover = 1)

Variable	N	Mean	Std Dev	P10	P25	P50	P75	P90
Forced CEO turnover	1,587	1.000	0.000	1.000	1.000	1.000	1.000	1.000
ETR	1,587	0.377	0.209	0.120	0.303	0.372	0.418	0.584
CETR	1,587	0.360	0.267	0.049	0.173	0.316	0.445	0.814
Size	1,587	5.991	1.773	3.804	4.607	5.831	7.164	8.414
Abnormal stock returns	1,587	-0.044	0.612	-0.647	-0.420	-0.150	0.172	0.612
Return on assets	1,587	0.070	0.100	-0.044	0.011	0.059	0.119	0.197
Leverage	1,587	0.214	0.200	0.000	0.026	0.178	0.334	0.494

This table reports descriptive statistics for the full sample as well as for samples conditional on CEO turnover. Forced CEO turnover is 1 in cases where Fee et al. (2013) code the turnover event as an overt firing or a suspected force out, and 0 otherwise. ETR is the three-year sum of total tax expense divided by the three-year sum of pretax income; and is set to 0 in cases where the numerator is negative and the denominator is positive, set to 1 when ETR is greater than 1, and set to missing when the denominator is smaller than or equal to 0. CETR is the three-year sum of total cash paid for taxes divided by the three-year sum of pretax income; and is set to 0 in cases where the numerator is negative and the denominator is positive, set to 1 when CETR is greater than 1, and set to missing when the denominator is smaller than or equal to 0. Size is the natural log of total assets. Abnormal stock returns is the annual stock return minus the value weighted return for the S&P 500. Return on assets is pretax income divided by total assets. Leverage is long term debt (including the current portion) divided by total assets. Forced CEO turnover is measured as of t+1, while all other variables as measured at t.

Table 3
Correlations

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	Forced CEO turnover		0.0431	0.0749	-0.0579	-0.0756	-0.1306	0.0101
			<.0001	<.0001	<.0001	<.0001	<.0001	0.2978
(2)	ETR	0.0311		0.4586	0.0255	-0.0154	-0.1286	0.0550
		0.0013		<.0001	0.0084	0.1107	<.0001	<.0001
(3)	CETR	0.0488	0.4249		-0.0386	-0.0850	-0.2354	0.0005
		<.0001	<.0001		<.0001	<.0001	<.0001	0.9596
(4)	Size	-0.0603	-0.0011	-0.0357		-0.0372	-0.0344	0.2228
		<.0001	0.9063	0.0002		0.0001	0.0004	<.0001
(5)	Abnormal stock returns	-0.1078	-0.0436	-0.1004	0.0416		0.2049	-0.0813
		<.0001	<.0001	<.0001	<.0001		<.0001	<.0001
(6)	Return on assets	-0.1403	-0.0852	-0.1209	-0.0294	0.2429		-0.2763
		<.0001	<.0001	<.0001	0.0024	<.0001		<.0001
(7)	Leverage	0.0006	0.0847	-0.0089	0.2918	-0.0693	-0.3290	
		0.9474	<.0001	0.3548	<.0001	<.0001	<.0001	

This table reports correlation coefficients (Pearson above, Spearman below) for the full sample, with p-values reported below each correlation. Forced CEO turnover is 1 in cases where Fee et al. (2013) code the turnover event as an overt firing or a suspected force out, and 0 otherwise. ETR is the three-year sum of total tax expense divided by the three-year sum of pretax income; and is set to 0 in cases where the numerator is negative and the denominator is positive, set to 1 when ETR is greater than 1, and set to missing when the denominator is smaller than or equal to 0. CETR is the three-year sum of total cash paid for taxes divided by the three-year sum of pretax income; and is set to 0 in cases where the numerator is negative and the denominator is positive, set to 1 when CETR is greater than 1, and set to missing when the denominator is smaller than or equal to 0. Size is the natural log of total assets. Abnormal stock returns is the annual stock return minus the value weighted return for the S&P 500. Return on assets is pretax income divided by total assets. Leverage is long term debt (including the current portion) divided by total assets. Forced CEO turnover is measured as of t+1, while all other variables as measured at t.

Table 4
Likelihood of Forced CEO turnover by tax quintiles

Panel A: Mean forced CEO turnover by ETR Quintiles

	(Lower) Q1	Q2	Q3	Q4	(Higher) Q5	Q5 - Q1	p-value
Mean Forced CEO turnover	0.168	0.118	0.131	0.127	0.196	0.028	0.0184

Panel B: Mean forced CEO turnover by CETR Quintiles

	(Lower) Q1	Q2	Q3	Q4	(Higher) Q5	Q5 - Q1	p-value
Mean Forced CEO turnover	0.160	0.119	0.113	0.138	0.211	0.051	<0001

This table reports mean Forced CEO turnover by ETR and CETR quintiles, where quintiles are increasing in both tax rates and are computed yearly. Forced CEO turnover is 1 in cases where Fee et al. (2013) code the turnover event as an overt firing or a suspected force out, and 0 otherwise. ETR is the three-year sum of total tax expense divided by the three-year sum of pretax income; and is set to 0 in cases where the numerator is negative and the denominator is positive, set to 1 when ETR is greater than 1, and set to missing when the denominator is smaller than or equal to 0. CETR is the three-year sum of total cash paid for taxes divided by the three-year sum of pretax income; and is set to 0 in cases where the numerator is negative and the denominator is positive, set to 1 when CETR is greater than 1, and set to missing when the denominator is smaller than or equal to 0. Forced CEO turnover is measured as of t+1, while all other variables as measured at t. P-values represent the p-value for a test of differences in means in Forced CEO turnover between Q5 and Q1 of ETR and CETR.

Table 5
Taxes and Forced CEO turnover

$$\text{CEO turnover}_{i,t+1} = \beta_1\text{High tax indicator}_{i,t} + \beta_2\text{High tax indicator}_{i,t} + \beta_4\text{Abnormal stock returns}_{i,t} + \beta_5\text{Return on assets}_{i,t} + \beta_6\text{Leverage}_{i,t} + F_i + T_t + \varepsilon_{i,t} \quad (1)$$

	Forced CEO turnover	
	Tax indicators based on ETR	Tax indicators based on CETR
Low tax indicator	0.004	-0.006
	(0.012)	(0.012)
High tax indicator	0.031 ***	0.043 ***
	(0.011)	(0.011)
Size	-0.009	-0.007
	(0.009)	(0.009)
Abnormal stock returns	-0.027 ***	-0.027 ***
	(0.007)	(0.007)
Return on assets	-0.480 ***	-0.438 ***
	(0.055)	(0.056)
Leverage	-0.056	-0.051
	(0.037)	(0.037)
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
R-square	0.113	0.114
N	10,704	10,704

This table reports estimates for equation (1). Regression coefficients are reported above, while standard errors are reported below. *, **, and *** denote two-tailed significance at the 10%, 5%, and 1% levels respectively. Forced CEO turnover is 1 in cases where Fee et al. (2013) code the turnover event as an overt firing or a suspected force out, and 0 otherwise. Low tax indicator is 1 for observations in the lowest quintile of ETR or CETR, and 0 otherwise. High tax indicator is 1 for observations in the highest quintile of ETR or CETR, and 0 otherwise. Quintiles are computed on a yearly basis. ETR is the three-year sum of total tax expense divided by the three-year sum of pretax income; and is set to 0 in cases where the numerator is negative and the denominator is positive, set to 1 when ETR is greater than 1, and set to missing when the denominator is smaller than or equal to 0. CETR is the three-year sum of total cash paid for taxes divided by the three-year sum of pretax income; and is set to 0 in cases where the numerator is negative and the denominator is positive, set to 1 when CETR is greater than 1, and set to missing when the denominator is smaller than or equal to 0. Size is the natural log of total assets. Abnormal stock returns is the annual stock return minus the value weighted return for the S&P 500. Return on assets is pretax income divided by total assets. Leverage is long term debt (including the current portion) divided by total assets. Forced CEO turnover is measured as of t+1, while all other variables as measured at t.

Table 6
Taxes and Exogenous CEO turnover

$$\text{CEO turnover}_{i,t+1} = \beta_1\text{High tax indicator}_{i,t} + \beta_2\text{High tax indicator}_{i,t} + \beta_4\text{Abnormal stock returns}_{i,t} + \beta_5\text{Return on assets}_{i,t} + \beta_6\text{Leverage}_{i,t} + F_i + T_t + \varepsilon_{i,t} \quad (1)$$

	Exogenous CEO turnover	
	Tax indicators based on ETR	Tax indicators based on CETR
Low tax indicator	-0.015	-0.029 **
	(0.015)	(0.014)
High tax indicator	-0.014	0.000
	(0.013)	(0.012)
Size	0.021 *	0.021 *
	(0.011)	(0.011)
Abnormal stock returns	-0.025 **	-0.025 **
	(0.010)	(0.010)
Return on assets	0.011	0.029
	(0.075)	(0.077)
Leverage	-0.004	-0.002
	(0.045)	(0.045)
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
R-square	0.050	0.051
N	6,007	6,007

This table reports estimates for equation (2). Regression coefficients are reported above, while standard errors are reported below. *, **, and *** denote two-tailed significance at the 10%, 5%, and 1% levels respectively. Exogenous CEO turnover is 1 in cases where Fee et al. (2013) code the turnover event as being due to death, health issues, or natural retirement, and 0 otherwise. Low tax indicator is 1 for observations in the lowest quintile of ETR or CETR, and 0 otherwise. High tax indicator is 1 for observations in the highest quintile of ETR or CETR, and 0 otherwise. Quintiles are computed on a yearly basis. ETR is the three-year sum of total tax expense divided by the three-year sum of pretax income; and is set to 0 in cases where the numerator is negative and the denominator is positive, set to 1 when ETR is greater than 1, and set to missing when the denominator is smaller than or equal to 0. CETR is the three-year sum of total cash paid for taxes divided by the three-year sum of pretax income; and is set to 0 in cases where the numerator is negative and the denominator is positive, set to 1 when CETR is greater than 1, and set to missing when the denominator is smaller than or equal to 0. Size is the natural log of total assets. Abnormal stock returns is the annual stock return minus the value weighted return for the S&P 500. Return on assets is pretax income divided by total assets. Leverage is long term debt (including the current portion) divided by total assets. Forced CEO turnover is measured as of t+1, while all other variables as measured at t.