

Examining the Immediate Effects of Recent Tax Law Changes on the Structure of Executive Compensation

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Abstract: We exploit a December 22, 2017 law change to examine the relation between corporate taxes and executive compensation. The so-called “Tax Cuts and Jobs Act” (TCJA) repealed a long-standing exception that allowed publicly-traded companies to deduct executives’ qualified performance-based compensation (e.g., stock options) in excess of \$1 million. The new regime is effective for tax years beginning after December 31, 2017 and limits total deductible compensation to \$1 million for each covered executive. Using a difference-in-differences design to examine executive compensation paid in fiscal years 2017 and 2018, we find no evidence that firms impacted by the TCJA in their 2018 fiscal years changed total compensation, compensation mix, or pay-performance sensitivity relative to control firms that are not subject to the new regime until their 2019 fiscal years. We also execute a battery of tests to rule out alternative explanations for our results including: (1) firms not having enough time to respond in our sample window and (2) firms delaying any response while uncertainty around a grandfathering provision was resolved. Collectively, the preponderance of evidence from our analyses suggests the tax benefits of deductible executive compensation decisions do not outweigh non-tax considerations – such as incentive alignment – and cash and financial reporting considerations when structuring pay.

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1. Introduction

The so-called “Tax Cuts and Jobs Act” (TCJA or “the Act”) significantly reduced the tax benefits of executive compensation. Prior to the Act, all qualified performance compensation paid to top executives was deductible. After the Act, only \$1 million of *total* compensation paid to each top executive is deductible. The effect of this change is expected to be substantial, with the Joint Committee on Taxation estimating the modification would raise \$9.2 billion of tax revenue over ten years. In articulating the rationale for the change, the House Ways and Means Committee reasoned that existing tax benefits for stock-based compensation and other types of performance-based pay have “led to perverse consequences resulting from [executives’ focus] on quarterly results, rather than the long-term success of the company and its rank-and-file employees”.¹ Congress believed reducing firms’ economic incentives to award performance-based compensation would lead to a reduction in stock options and other performance pay. Our study examines how companies immediately responded to this tax law change.

Congress last changed the tax law governing executive compensation in 1994, when it limited the amount of deductible “fixed” compensation (i.e., salaries and discretionary bonuses) to \$1 million per top executive. The limit did not apply to performance-based pay. The rule changed in response to a widely-held view that executive compensation was not adequately tied to company performance, thereby allowing executives wide latitude to control their pay (Balsam, Evans, and Yurko 2018a). Since then, the percentage of executive compensation awarded that is

¹ See <https://www.congress.gov/115/crpt/hrpt409/CRPT-115hrpt409.pdf> for further detail.

performance-based has grown substantially. For example, stock compensation, which is often awarded based on performance metrics, averages almost 75 percent of total compensation for CEOs of large firms in 2017 (Mishel and Wolfe 2019).² Thus, the increase in performance pay since 1994 – particularly stock-based pay – could suggest Congress achieved its initial objective of better tying executive pay to company performance.

So why would Congress want to weaken the link between executive pay and company performance by increasing the after-tax cost of performance-based pay? Although several academic studies support the notion that performance pay such as stock-based compensation better aligns executives with shareholder incentives (Jensen and Murphy 1990; Bebchuk and Fried 2010) and does not increase instances of accounting fraud (Erickson, Hanlon, and Maydew 2006), others find evidence that even stock-based compensation, which is supposed to focus managers on long-term shareholder value, can induce myopia (Bizjak, Brickley, and Coles 1993; Cadman, Rusticus, and Sunder 2013) and earnings management (Burns and Kedia 2006; Cheng and Warfield 2005). Empirical evidence on the extent to which companies award performance pay in ways that align executives' and shareholders' long-term incentives are therefore mixed. Whether and how firms will immediately respond to the increased after-tax cost of executive compensation brought about by the TCJA is unclear.

If the increased tax costs of performance pay matter to firms, we expect several changes in compensation consistent with Congress' stated intentions. First, we predict performance pay will decrease following the TCJA's elimination of the exception for performance pay from the \$1 million limit on the deductibility of executive compensation. This prediction follows because after the TCJA, performance pay is relatively more expensive than it was before. Second, we

² This study by the Economic Policy Institute examines the 350 largest firms for which Execucomp provides compensation data.

expect salaries to increase because risk-averse executives prefer fixed compensation and the TCJA eliminates the tax penalty on fixed pay relative to performance pay – now only a total of \$1 million is deductible regardless of its form. Third, we predict total compensation to decrease, consistent with our first two predictions. A shift from performance-pay to fixed pay allows boards to compensate risk averse managers with smaller total pay packages.

However, we might find no evidence of an immediate change in executive compensation for several reasons. First, if the pre-TCJA tax benefits of performance pay were not a primary determinant of their usage, we might not observe an immediate reduction in their usage as Congress intended.³ In other words, the non-tax benefits of performance pay such as incentive-alignment, and cash flow and financial reporting considerations (Aboody, Barth and Kasznik 2006; Barth, Gow, and Taylor 2012; Bartov, Monhanram, and Nissim 2007; Bratten, Jennings, and Schwab 2015; Choudhary 2011; Francis 2019; Hodder, Mayew, McAnally, and Weaver 2006; Johnston 2006), might dominate tax considerations. ISS, a leading proxy statement advisor, notes that investors fear the TCJA’s modifications to the tax treatment of executive compensation could incentivize companies to offer contracts that are *less* transparent, *less* objective, and *less* performance-based than what they currently offer. David Kokell, head of U.S. compensation research at ISS, went so far as to say that any board that reduces performance-based pay in favor of fixed or discretionary pay is “going to face investor backlash”. Others similarly caution that companies make any changes carefully to avoid the appearance that executives can once again control their compensation (Balsam et al. 2018a).

³ This is consistent with a quotation from David Kokell of ISS, “While the tax deduction for performance pay afforded under [the pre-TCJA] rules provided an added benefit, it was seldom a primary reason behind investors’ expectation for performance-based grants.” This view is consistent with academic evidence that firms forwent an estimated \$22 billion of tax benefits from 1994-2016 by paying executive compensation that was nondeductible under the pre-TCJA rules (Balsam and Yin 2005).

Second, the TCJA reduced the corporate tax rate from a maximum rate of 35 percent to a flat rate of 21 percent. Therefore, the value of CEO talent (and therefore the level of CEO pay) could *increase* because now a larger portion of each dollar of pre-tax earnings accrues to shareholders. Third, firms may not have had time to immediately respond to the TCJA. Further, the TCJA included a “grandfathering” provision under which compensation contracts in place as of November 2, 2017 would be deductible under the “old” rules. The Senate introduced this provision in December of 2017, and substantial uncertainty existed until August 2018 as to the implementation of the provision. As such, the likelihood of firms being able to change contracts proactively to qualify them for the grandfathering provision was small. If firms believed, on average, that there was a sufficiently large probability that existing contracts would be exempt from the new rules, we expect to observe no immediate change in executive compensation.

We test our predictions empirically using a difference-in-difference design. The law change is effective for *tax years* beginning on or after January 1, 2018. This staggered time-series implementation of the rule across different fiscal years allows us to compare changes in executive compensation paid for fiscal years 2017 and 2018 between treatment and control firms. Our treatment group includes all firms with fiscal years that begin between January and June, and our control group consists of all firms with fiscal years that begin between July and December.⁴ The tax rate change is effective immediately for all treatment firms; control firms gradually reduce their tax rate from 35 percent to 21 percent and use a weighted-average rate for their 2018 fiscal year. Thus, not only are treatment firms subject to the repeal of the performance pay exception in their 2018 fiscal year, they also realize entire effect of the reduced tax rate.

⁴ All firms will eventually be subject to the new 162(m) regime starting with their tax years beginning on or after January 1, 2018. We exploit the staggered time-series effective date of the rule to compare 2017 and 2018 executive compensation for firms that are subject to the new rules in 2018 and a control sample of firms that will not be subject to the rules until their 2019 fiscal years. See Figure 1 for more detail.

We obtain the sample for our primary tests from CalcBench, a data compilation service that provides real-time, searchable access to SEC filings for a broad range of firms. We limit the sample to executives who receive total compensation above the \$1 million threshold. We separately examine fixed pay, performance pay, and total compensation for CEOs as well as all named executive officers. We test the level of compensation as well as the pay-performance sensitivity and pay mix.

We find no difference in total CEO compensation, salaries, or performance pay immediately following TCJA for treatment firms relative to control firms. Results are robust to including firm fixed effects and to entropy balancing. We also observe no difference in total compensation, salary, or performance pay for treated firms relative to a control sample when using a sample of firms in the S&P 1,500 from Execucomp. We find similar results when we examine pay-performance sensitivity and pay mix. Results are unchanged if we examine only the CEOs in our sample or all named executive officers. To rule out that control firms simultaneously changed their contracts to align them with “peer” treatment firms, thus contaminating the control sample and masking differences in contracts between the two groups, we re-estimate our analysis using only treatment firms and continue to find no changes in CEO compensation immediately after the TCJA.

Overall, we find no evidence of an immediate change in executive compensation following the TCJA. As noted above, these (non) results are consistent with the following (not mutually exclusive) explanations: (1) firms did not have time to respond to the TCJA when setting compensation contracts for fiscal year 2018, (2) firms hesitated to change compensation while uncertainty existed around implementation of the grandfathering rules, and/or (3) taxes are

not an essential determinant of executive compensation. We next attempt to distinguish between these explanations.

First, we examine a sample of healthcare insurers for which Congress repealed the performance pay exception in 2013. This analysis allows us to examine a longer time-series after the repeal than what can we observe in our primary sample; healthcare companies have had adequate time to react to the repeal if they wanted to. We find no difference in total CEO compensation, salary, or bonus for healthcare insurers after the repeal relative to a control group of non-healthcare insurers. We interpret this evidence as suggesting that the lack of response to TCJA in our main tests is not attributable to firms having insufficient time to respond to the TJCA. Because this healthcare law change did not include a grandfathering provision, we believe these tests help rule out uncertainty over grandfathering as the explanation for our lack of results.

Second, we test for differences in the pay mix for new CEOs hired in 2018. New CEOs' compensation was *not* eligible for grandfathering, so this test offers a clean setting to test the effects of the new rules. We focus on pay mix to avoid any changes in the level of pay for new CEOs. We find no difference in pay mix for these new CEOs relative to their predecessors. We interpret this evidence as suggesting that the lack of results in our main tests are not attributable to uncertainty over the grandfathering provision. Finally, we examine subsamples of firms with CEO salaries close to \$1M and firms that are financially constrained. We might expect to find results among this sample of firms because the tax benefits of executive compensation are presumably more important or salient to them (Perry and Zenner 2001). However, as in our main analysis, we find no evidence of a change in salary, performance pay, or total pay for these firms independently or relative to a control sample. This finding provides additional evidence that the after-tax cost of executive compensation to the firm has limited impact on the structure of

executive compensation or its pay-performance sensitivity. More broadly, firms' tax considerations appear to have limited effects on executive pay.

Our study exploits a powerful setting to provide new evidence on how much corporate taxes influence the executive pay-setting process. Whereas much prior literature examines how changes to the deductibility of *fixed* pay impact CEO compensation, the TCJA rule change has a much larger impact on the after-tax cost of compensation because it disallows a deduction for *all* compensation over \$1 million. Further, by studying immediate effects, we can utilize a control sample and a short window to better tease out the TCJA's effect; a longer window of analysis would trade off clean identification in favor of allowing firms more time to react. We also contribute to the policy debate on the efficacy of the TCJA by providing early evidence on the extent to which Congress achieved its stated objective of shifting executive compensation away from performance pay. Further, our robust findings complement concurrent work by Bornemann, Jacob, and Sailer (2019), who find no change in executive compensation following a 2014 tax law change in Austria that limited the deductibility of total executive compensation.⁵ Although we acknowledge only a short time has passed since the TCJA's enactment, the totality of our evidence suggests that taxes have limited effects on the structure of executive pay.

2. Institutional Background and Related Literature

Executive compensation

Executive pay in the U.S. is almost universally composed of a fixed component and an incentive-based component linked to firm performance. Over the last several decades, the majority of executive compensation has been awarded in the form of stock. In theory, performance pay such as stock options is attractive from a contracting perspective because it ties

⁵ In a concurrent working paper, Luna, Schuchard, and Stanley (2019) find firms that paid less than \$1 million in CEO salary pre-TCJA increased CEO salary compensation but exhibit no change in total compensation following TCJA, relative to a control sample of firms that paid more than \$1 million in salary pre-TCJA.

executives' incentives to shareholders', thereby mitigating agency conflicts, addressing the horizon problem (e.g., Dechow and Sloan 1991; Murphy and Zimmerman 1993; Smith and Watts 1982), and inducing managerial risk-taking (e.g., Coles, Daniel, and Naveen 2006).

Beyond its contracting benefits, stock-based compensation provides cash flow and financial reporting benefits to firms. First, because stock-based compensation is “cashless,” it allows companies to compensate executives without depleting liquidity (Yermack 1995). Because employees often exercise options when corporate profitability (and therefore taxable income) is high, stock options provide a dynamic tax shield that reduces tax cash flows in years with higher marginal tax rates (Babenko and Tserlukevich 2009). Additionally, evidence suggests firms consider financial reporting consequences when determining the level and structure of executive pay (Carter, Lynch, and Tuna 2007; Hayes, Lemmon, and Qiu 2012), and several papers find evidence that firms act to minimize the financial reporting impact of stock-based compensation by excluding these expenses from pro-forma earnings (e.g., Barth et al. 2012; Bentley, Christensen, Gee, and Whipple 2018), understating the expense (Aboody et al. 2006; Bartov et al. 2007; Bratten et al. 2015; Choudhary 2011; Francis 2019; Hodder et al. 2006; Johnston 2006), or both.

Academic research also posits reasons *executives* may prefer stock-based compensation as a form of performance pay. Executives are taxed only upon exercise of options and thus retain some flexibility to control the timing and amount of the associated tax liability.⁶ However, a common concern is that overly-powerful executives who have captured their companies' boards

⁶ Upon exercise, executives are taxed at ordinary tax rates only for the difference between the fair value of the option and the strike price. Further appreciation of the stock is taxed at capital gains rates. Restricted stock awards or units are taxable to the executive upon vesting. This feature allows tax deferral beyond the year of grant, although the timing of the tax consequences is not entirely within the employees' control. However, employees retain some flexibility as to the timing of income from restricted stock awards (Blouin and Carter 2010). As with options, further appreciation of stock obtained upon vesting of a unit or award is taxed at capital gains rates upon sale.

can unilaterally determine their compensation (e.g., Bebchuk, Cremers, and Peyer 2011; Core, Guay, and Larcker 1999; Core, Holthausen, and Larcker 1999; Murphy 1999). In response, several regulatory changes have attempted to address these concerns, including shareholder say-on-pay initiatives and requirements for independent compensation committees.

Congress has also taken steps to address concerns about rising and excessive executive compensation by altering companies' tax deductions. In 1993, Congress implemented Section 162(m) of the Internal Revenue Code (IRC) to limit the deduction for non-qualified performance-based pay to \$1 million for top executives.⁷ Despite this legislation being perhaps the most examined compensation tax change, evidence on the extent to which 162(m) altered executive compensation by increasing the after-tax cost of executive compensation is mixed and generally weak. Göx (2008) develops an analytical model where the tax-deductibility of salaries has an ambiguous effect on executives' incentive compensation while the model in Halperin, Kwon, and Rhoades-Catanach (2001) predicts a decline in fixed salary and an increase in total pay following the rule change. However, Harris and Livingstone (2002) find firms that previously paid their CEOs less than \$1 million *increased* CEO fixed pay after 162(m). The authors conclude the bright-line threshold set a benchmark for reasonable (expected) levels of CEO compensation. This interpretation suggests that it wasn't the change in tax consequences that prompted firms to modify salaries but rather the introduction of a baseline level of "acceptable" executive compensation. Rose and Wolfram (2000) find evidence that firms restrain salary increases following the enactment, but find no evidence of a decline in fixed pay.

However, Perry and Zenner (2001) find evidence that some firms did reduce salary below \$1

⁷ Prior to the TCJA, performance-based compensation paid to covered executives was deductible to the firm if it was paid under a written, objective performance standard, established by an independent compensation committee early in the fiscal year, and approved by shareholders. Private companies and foreign entities were not subject to the limitation.

million in response to the law change, which could suggest a firm-level response to changes in tax costs. In the most recent study, Balsam, Evans, and Yurko (2018b) investigate how an unexpected change that exempted the CFO from the \$1 million dollar limit, and find an increase in nonperformance pay. Their evidence is consistent with firm-level taxes affecting executive compensation.

The mixed evidence surrounding the implementation of and subsequent modifications to 162(m) is consistent with work examining other tax law changes. Hite and Long (1982) find evidence that taxes are an important consideration in the form of option grants using changes under the Tax Reform Act of 1969 as a setting. In contrast, Balsam, Halperin, and Mozes (1997) document that some firms continued to issue incentive stock options (ISO) even after the Tax Reform Act of 1986 increased the joint tax cost of doing so. Similarly, Austin, Gaver, and Gaver (1998) document an overwhelming preference for ISOs over nonqualified stock options despite the corporate tax disadvantage of issuing ISOs. These mixed results perhaps reflect the fact that taxes might not be a first-order consideration, on average, for firms when setting executive compensation. Incentive, liquidity, and financial reporting considerations might dominate tax considerations. Thus, it remains an open empirical question of how much corporate taxes affect executive pay. The TCJA law change provides a powerful setting to address.

TCJA Law Change

The TCJA repeals the exception for the deductibility of performance-based compensation from the overall \$1 million limit outlined in IRC Section 162(m). This change limited firms' ability to deduct covered employees' performance-based pay; now a total of \$1 million is deductible for covered employees regardless of whether it is guaranteed (i.e., fixed salary) or

subject to performance requirements (e.g., stock options).⁸ As a result of the law change, any compensation paid to top executives has a higher after-tax cost for firms. Essentially, TCJA eliminated the tax preference associated with performance-based pay so that no type of pay is tax-favored.

The TCJA offers a powerful setting to examine the effects of firm-level taxes on CEO pay. For example, Tim Cook, the CEO of Apple, received approximately \$102 million in total compensation for the year ended in 2017. Under the pre-TCJA regime, we estimate this compensation provided Apple approximately \$35 million in U.S. tax benefits, resulting in an after-tax cost of \$67 million. That same compensation paid under the post-TCJA regime would provide Apple only \$210,000 of U.S. tax benefits, leaving the before-tax and after-tax compensation costs post-TCJA virtually identical. As a result of the TCJA's rate reduction and the repeal of the 162(m) performance-based exception, Apple – and many other large public companies – will lose almost 100 percent of the tax benefits of executives' compensation. To our knowledge, no other tax law change in recent history has had such a material and widespread effect on the after-tax cost of executive compensation. We therefore believe the TCJA provides an extraordinary opportunity to enhance our understanding of the extent to which corporate-level taxes influence executive compensation decisions.

Congress believed reducing firms' economic incentives to award performance-based compensation would lead to a reduction in stock options and other performance pay and better

⁸ Affected executives include the CEO, CFO, and the next top three highest paid employees. Additionally, once an employee is considered a covered employee, s/he is always subject to these rules. Thus, whereas prior law (from 2007-2017) limited the number of covered executives to four per year, there is no limit to the number of covered executives under the new law.

focus executives on long-term company success.⁹ We test these expectations as outlined in Section 3.

3. Research Design and Data

Research Design

We use a difference-in-differences design to test the effect of TCJA on executive compensation. The TCJA's changes to 162(m) apply to executive compensation for tax years beginning on or after January 1, 2018. Thus, we can exploit the staggered implementation of the TCJA to develop groups of treated and control firms. We compare a set of control firms whose executive compensation was not subject to the new rules for either their 2017 or 2018 fiscal to a set of treated firms whose executive compensation was not subject to the new rules for the 2017 fiscal year but was subject to the new rules for 2018.

We use three dependent variables: (i) total compensation, (ii) salary, and (iii) performance pay including non-equity incentive plan compensation, share awards, and option grants. All data on executive compensation come from the summary compensation table of firms' Compensation Discussion and Analysis section of proxy filings (SEC form DEF 14A): We estimate the following regression:

$$Pay_{it} = \beta_1 Treated_i + \beta_2 Post_t + \beta_3 Treated_i \times Post_t + \beta_4 Controls_{it} + \gamma_j + \epsilon_{it} \quad (1)$$

where Pay_{it} is total compensation, salary, or performance pay. $Treated_i$ is an indicator variable equal to one for treated firms classified based on fiscal year ends as described above and as detailed in Figure 1. $Post_t$ is an indicator variable equal to 1 for the 2018 fiscal year and zero for the 2017 fiscal year. We restrict our analysis to two years of compensation to hold economic

⁹ See <https://www.congress.gov/115/crpt/hrpt409/CRPT-115hrpt409.pdf> for further detail.

conditions relatively constant across the pre- and post-periods such that we are less likely to confound inferences with changes unrelated to the TCJA.

Our variable of interest is $Treated_i \times Post_t$. If firms respond to an increase in the after-tax cost of CEO compensation as expected, we should observe a *decrease* in total compensation post-TCJA for treatment firms relative to control firms ($\beta_3 < 0$), an *increase* in salary post-TCJA for treatment firms relative to control firms ($\beta_3 > 0$), and a *decrease* in performance pay for treatment firms relative to control firms ($\beta_3 < 0$).

We estimate equation 1 with and without controls for completeness. We include controls from Core, Holthausen, and Larcker (1999): total sales (*Sales*), the mean year-end market-to-book ratio for the previous five years to capture the firm's investment opportunities (*Investment Opps.*), operating income before depreciation scaled by lagged assets (*ROA*), the stock return over the year (*Return*), the standard deviation of ROA for the previous five years (σ_{ROA}), and the standard deviation of stock returns over the previous five years (σ_{Ret}). We measure all controls in year $t-1$. Finally, we include 2-digit SIC industry fixed effects to account for industry-specific differences in pay.

Data

We use compensation data for all SEC filers from CalcBench. We use CalcBench in place of more conventional compensation data sources (e.g., Execucomp) to include a broader sample of firms.¹⁰ To increase the likelihood that CEOs in our sample are affected by the change, we require sample CEOs to receive more than \$1 million in total compensation. We require the same CEO to be present in both years to reduce the likelihood that we observe a decline in CEO pay in 2018 because a new CEO worked only part of the year. Our final sample includes 1,470

¹⁰ Using CalcBench data instead of Execucomp allows us to examine more firms (1,470 versus 1,256). We confirm in untabulated tests that all inferences are unchanged if we restrict our analysis to Execucomp firms.

firms, of which are 1,247 (85 percent) are treated. The number of observations used in each regression varies based on data availability.

Table 1 reports summary statistics. Total compensation is \$6.61 million on average and \$2.77 million at the 25th percentile, indicating that the TCJA's 162(m) changes will increase the after-tax cost of compensation for nearly all sample CEOs. The median salary is \$800,000 and \$1 million at the 75th percentile. Performance pay is larger than salary – \$3.97 million on average and \$5.41 million at the 75th percentile. On average, 53.5 percent of the CEO's total compensation is derived from performance pay. Sample firms are generally large with average market cap over \$8.4 billion (untabulated) and average assets of almost \$3 billion (untabulated). Sample firms also exhibit positive performance with average *ROA* of five percent and average *Return* of 6.6 percent.

Table 2 reports the covariate balance between treated and control firms using CEO compensation data for fiscal year 2017. Columns 1 and 2 report means for each subsample and Column 3 reports differences. Mean *ROA* and *Sales* are larger for control firms, while the standard deviations of *ROA* and returns are smaller for control firms. Other mean differences are economically and statistically insignificant. Figure 2 plots the trends for treated and control firms. Across all four compensation variables, there are no significant differences between the treated and control observations in the pre-period. Therefore, any observed effects following TCJA are unlikely the result of other inherent differences between the two samples.¹¹

¹¹ The TCJA changed other features of the U.S. tax code. For example, it reduced the top marginal tax rate for individuals from 39 to 37 percent. We do not expect this change – or other changes to the corporate tax base – to differentially affect treatment and control firms. We note that treatment and control firms are subject to different corporate tax rates for the 2018 fiscal year. However, as we discuss in more detail in the Appendix, we expect the TCJA's repeal of the 162(m) performance-based compensation exception to the \$1 million cap to have a more significant effect on companies' compensation decisions than the change in tax rates because a greater portion of the increased after-tax cost is attributable to the repeal. We also conduct sensitivity analysis to further address the impact of the rate change. Thus, we believe we can attribute any observed differences to the TCJA's repeal of the 162(m) performance-based compensation exception to the \$1 million cap.

4. Results

Main Results

Table 3, Panel A, presents the results of estimating equation 1. Columns 1 and 2 report results when the dependent variable is total compensation. Regardless of whether we include controls related to the determinants of pay, the coefficient on *Treated* \times *Post* is insignificant. This finding suggests that total compensation of treated firms did not significantly change following TCJA relative to that of control firms. We repeat this analysis using salary (Columns 3 and 4) and performance pay (Columns 5 and 6) and estimate an insignificant coefficient on *Treated* \times *Post* throughout. Collectively, Panel A of Table 3 provides no evidence that CEO compensation changed for affected firms following TCJA relative to control firms.

In Panels B and C, we test the robustness of these results to alternative specifications. First, because firms in the same industries often have similar fiscal year-ends, classifying treated firms based on their fiscal year ends and including industry fixed effects may compare dissimilar firms. To address this concern, Panel B replaces industry fixed effects with firm fixed effects. We omit the *Treated* indicator from the regression because the firm fixed effects subsume it. Consistent with results reported in Panel A, the estimated coefficient on the variable of interest *Treated* \times *Post* is insignificant in all specifications. These results support our main inferences that there are not significant differences in pay following TCJA for treatment firms relative to control firms.

Although we report generally balanced covariates between treated and control firms in our main specification, our second alternative specification entropy balances the sample along the covariates in equation 1. We report these results in Panel C. We estimate an insignificant

coefficient on *Treated* × *Post* in all specifications. This finding is consistent with Panels A and B. We repeat some of these analyses in Table 4 using all named executive officers (NEOs) and find similar results.¹² Overall, Tables 3 and 4 show that executive compensation did not significantly change for treated firms following TCJA relative to control firms.

In untabulated analyses, we examine pay mix instead of levels. We conduct this analysis because the TCJA also changed the corporate tax rate from 35 percent to 21 percent, and all control firms are subject to a blended income tax rate in the post-period while all treatment firms are subject to the reduced rate of 21 percent. Although these differential tax rates could impact *levels* of CEO compensation, we do not expect them to impact the pay mix; only the deductibility of certain types of compensation should impact the pay mix. We estimate insignificant coefficients on *Treated* × *Post*, consistent with our previous inferences.

To rule out the possibility that our control sample is contaminated because control firms changed their 2018 compensation to align themselves with “peer” treatment firms, we re-estimate our analysis from Panel A of Table 3 using only treatment firms. In Table 5, we estimate a positive coefficient on *Post* in all three specifications without controls. However, this covariate becomes insignificant when we include control variables. Thus, these results do not point to a decrease in CEO performance pay or an increase in salary after the TCJA

Next, we test for changes in pay-performance sensitivity following De Franco, Hope, and Larocque (2013). We do this because one of Congress’ stated objectives in repealing the 162(m) performance-based exception was shifting executives’ focus away from short-term accounting-based goals in favor of long-term firm value. Thus, we should observe a decrease in the pay-performance sensitivity of executive compensation to ROA (an arguably myopic performance

¹² We report the entropy-balanced difference-in-differences for NEOs because of weak balance between treated and control observations. However, we find similar results without balancing (untabulated).

measure) and a commensurate increase in the pay-performance sensitivity to returns (a measure of long-term shareholder value).

Table 6, Panel A reports the results of these tests. Contrary to Congress' stated objectives, we find no decrease in the sensitivity of CEO pay to accounting performance metrics but we do find a decrease in the sensitivity of CEO pay to stock returns. This evidence suggests the immediate effects of the TCJA's performance-based exception repeal did nothing to increase CEOs focus on long-term shareholder value or to de-emphasize more myopic measures of performance. These findings are robust to removing industry fixed effects (Panel B) and using an entropy balanced sample (Panel C). Overall, the evidence in Table 6 generally suggests that pay-performance sensitivity does not change following the TCJA in ways that are consistent with Congress' explicitly stated intent.

Ruling out Alternative Explanations

Our main results are consistent with the following possible, non-mutually exclusive explanations. First, boards did not have enough time to respond to the tax law change. Second, boards waited to respond in the hopes that existing contracts would be grandfathered. Finally, it is possible firm-level tax costs are not a sufficiently important consideration for firms when designing CEO compensation packages. In other words, it is possible that the pre-TCJA tax benefits of performance-based compensation were not a primary determinant of their usage.

To attempt to distinguish between these competing explanations, we first exploit another setting where the tax rules regarding the deductibility of CEO compensation in the U.S. changed. In 2013, Congress repealed the 162(m) performance-based compensation exception for healthcare insurers, but not for other insurers or other public corporations. Because this rule changed in 2013, we have a longer post period to observe changes in CEO compensation, thus

eliminating the possibility firms did not have enough time to respond to the law change. We also exploit this setting because this rule change did not offer a grandfathering provision similar to the one in the TCJA. Finally, this setting allows us to evaluate the generalizability of our results. Although the sample of healthcare insurers is very small with a maximum of 17 firms in any year, we believe these tests are nonetheless informative.

We estimate a difference-in-differences regression among insurers defining the pre-period as 2010-2012 and the post-period as 2014-2016. Treated insurers are healthcare insurers (SIC 624), and control firms are all other insurers. Across univariate and multiple regression specifications that include a pooled regression and entropy balancing, we find no evidence consistent with the law change impacting executive compensation. These results support the interpretation of our main results that corporate-level taxes are not a sufficiently important consideration in designing CEO compensation to outweigh non-tax considerations. Findings from this alternative setting are similar to those from Bornemann, Jacob, and Sailer (2019) who analyze changes in executive compensation following a 2014 Austrian tax law change that limited the amount deductible and find no evidence of an effect of the Austrian law change on executive compensation.

We next estimate equation 1 using a sample of new CEOs hired in 2018, whose contracts were not eligible to be grandfathered and governed under the old deductibility rules. We focus on the pay mix as the dependent variable because these CEOs may not have worked the entire year, may have received higher levels of compensation than the previous CEO, or both. These differences could cause mechanical changes in the level of compensation unrelated to the TCJA. We find no significant change in pay mix for new CEOs relative to the outgoing CEO. These results suggest our non-results elsewhere are not an artifact of companies not having sufficient

time to respond to the law change or delaying modifications in the hopes of grandfathering. Instead, they suggest taxes may not be a first-order concern in CEO pay structure.

Finally, we examine subsamples where we expect the tax benefits of CEO compensation to be more salient. First, we examine whether firms with total CEO salaries near the \$1 million threshold adjust their pay differently than other firms in response to the TCJA. Firms that pay CEO salaries close to the pre-TCJA \$1 million salary deductibility cap may be more sensitive to the tax implications of compensation. Therefore, we re-estimate equation 1 including an additional interaction to indicate whether the CEO had a salary between \$750,000 and \$1.25 million in 2017. In untabulated results, we find no significant difference between these firms and those with CEO salaries outside of these bounds. This result is also insignificant if we include only treated firms. The result is also insignificant if we instead examine firms with NEO salaries near the \$1 million threshold. Second, we examine financially constrained firms, for which the additional tax payments stemming from the increased tax cost of CEO pay could be more salient. Again, we find no significant changes.

Across a battery of tests, we find no evidence that compensation changed after TCJA for treated firms. Even in samples where we most expect to find changes, we do not. The evidence overwhelmingly suggests the non-tax benefits of performance pay outweigh any tax considerations.

5. Conclusion

The TCJA substantially increased the after-tax cost of executive compensation by (i) repealing the 162(m) performance-pay exception to the \$1 million cap on deductible executive compensation and (ii) reducing the corporate tax rate (and therefore the benefit of compensation deductions) from 35 to 21 percent. This study examines the immediate impact of these changes

on the level and structure of executive compensation. Congress intended these changes to shift executives' compensation away from options and other performance pay.

We find no difference in total compensation, salary, performance pay, compensation mix or pay-performance sensitivity for treated firms after TCJA relative to control firms. These results are robust to entropy balancing, including firm fixed effects, and to restricting the sample to Execucomp firms. Additional tests help rule out alternative explanations for our results, such as contamination of the control sample with treatment firms' "peers", a lack of sufficient time for treatment firms to respond to the TJCA, and uncertainty over a grandfathering provision that could allow some existing contracts to qualify for the "old" deductibility rules. We therefore conclude an increased after-tax cost (to the firm) of executive compensation does not materially affect the structure of executive pay.

These results contribute to our understanding of the factors that influence the executive pay-setting process. Our study also has policy implications because it provides early evidence on the extent to which Congress achieved its stated objectives in repealing the 162(m) performance-based exception of shifting executives' compensation away from performance-based pay to create a focus on longer-term shareholder value.

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APPENDIX

In this Appendix, we provide examples to illustrate our identification of treatment and control firms. Specifically we consider Alphabet (parent of Google), which has a December 31 fiscal year end, and Apple, which has a September 30 fiscal year end.¹³

Because Alphabet has a December 31 fiscal year end, its fiscal year beginning January 1, 2018 is subject to the TCJA's repeal of the 162(m) exception for performance-based compensation. We therefore identify Alphabet as a treatment firm. We compare Alphabet's compensation during the fiscal year spanning January 1, 2017 to December 31, 2017 (i.e., pre-TCJA fiscal year 2017) to its compensation during the fiscal year spanning January 1, 2018 to December 31, 2018 (i.e., post-TCJA fiscal year 2018). Alphabet's maximum tax benefit per covered employee for fiscal year 2017 is 35 percent of all deductible compensation: fixed pay up to \$1 million plus any qualified performance-based compensation. Alphabet's maximum tax benefit per covered employee for fiscal year 2018 is only \$210,000 (= \$1 million cap on total compensation * 21% 2018 statutory tax rate). Because compensation committees meet after the fiscal year end, but before the proxy date, to discuss the following year's compensation, Alphabet's compensation committee likely met in January or February 2018 to set 2018 compensation parameters.

Because Apple has a September 30 fiscal year end, its fiscal year beginning October 1, 2017 is not subject to the TCJA's repeal of the 162(m) performance-based compensation exception. We therefore identify Apple as a control firm. We compare Apple's compensation during the fiscal year spanning October 1, 2016 to September 30, 2017 (i.e., pre-TCJA fiscal

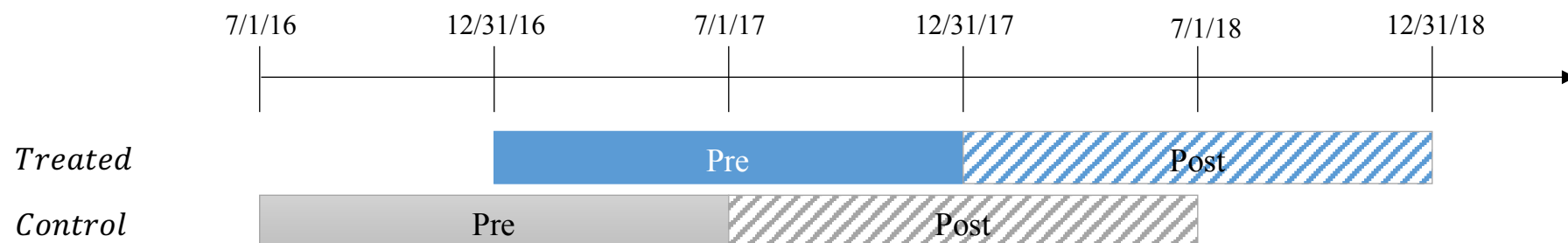
¹³ Apple's fiscal year end varies but generally lands at the end of September. For parsimony, in this example we assume Apple has a September 30 year end in both years. Further, throughout our study we assume firms' tax years are consistent with their fiscal year. We acknowledge tax years can deviate from fiscal years, however our understanding is that this is rare.

year 2017) to its compensation during the fiscal year spanning October 1, 2017 to September 30, 2018 (i.e., post-TCJA fiscal year 2018). Apple’s maximum tax benefit per covered employee in fiscal year 2017 is 35 percent of all deductible compensation: fixed pay up to \$1 million plus any qualified performance-based compensation. Apple can deduct the same amount of compensation per covered employee in fiscal year 2018 but the tax rate is reduced to 24.5% (= 35%*3/12 for October through December 2017 + 21%*9/12 for January through September 2018). Because compensation committees meet after the fiscal year end, but before the proxy date, to discuss the following year’s compensation, Apple’s compensation committee likely met in October or November 2017 to set fiscal year 2018 compensation.

To better quantify the impact of the 162(m) performance-based compensation exclusion repeal to the tax rate change from 35 percent to 21 percent, assume both the treatment firm (Alphabet) and the control firm (Apple) have \$100 million of deductible executive compensation for a covered employee pre-TCJA. Both firms have a tax benefit of \$35 million for fiscal year 2017 (= \$100M*35%). Because the TCJA limits the total deduction per covered employee to \$1 million, the treatment firm’s tax benefit in fiscal year 2018 is \$210,000, representing a tax benefit loss of 99.3% (= (\$35M-0.21M)/\$35M). Although the statutory tax rate reduction from 35% to 21% explains 40.2% of this loss (= \$100M*(35%-21%)/(\$35M-\$0.21M), 59.8% (= \$99M*21%/(\$35M-\$0.21M) of the loss is attributable to the 162(m) change. In contrast, the control firm loses 30% (= (\$35M-\$24.5M)/\$35M) of its tax benefit from executive compensation, entirely attributable to the rate change.

	2017 Tax Benefit	2018 Tax Benefit	% Tax Benefit Lost
Treatment (Alphabet)	\$100M*35% = \$35M	\$1 million*21% = \$210,000	99.3%
Control (Apple)	\$100M*35%= \$35M	\$100M*24.5%= \$24.5M	30%

FIGURE 1 – Timeline and Classification of Treatment and Control Firms by Fiscal Years

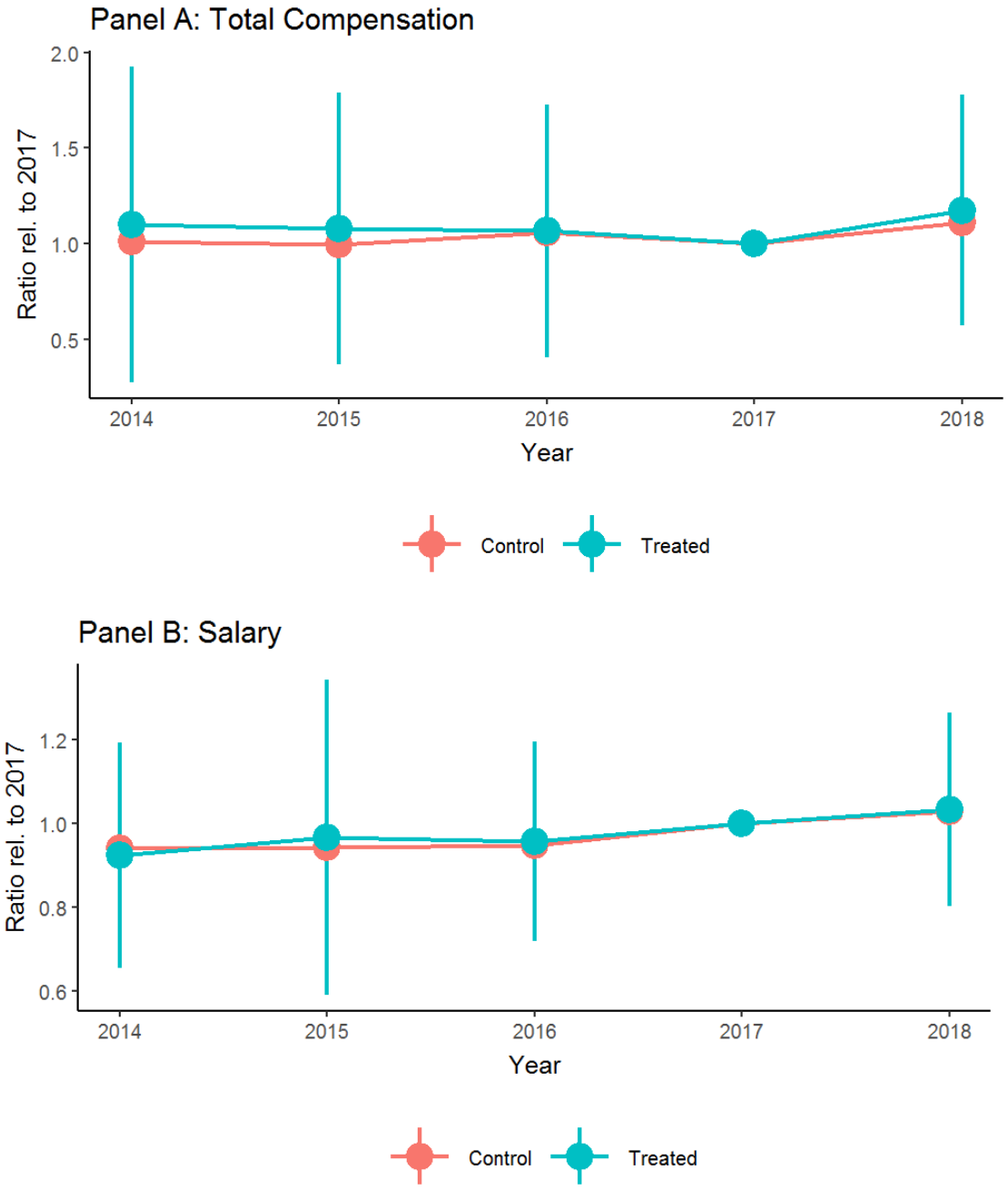


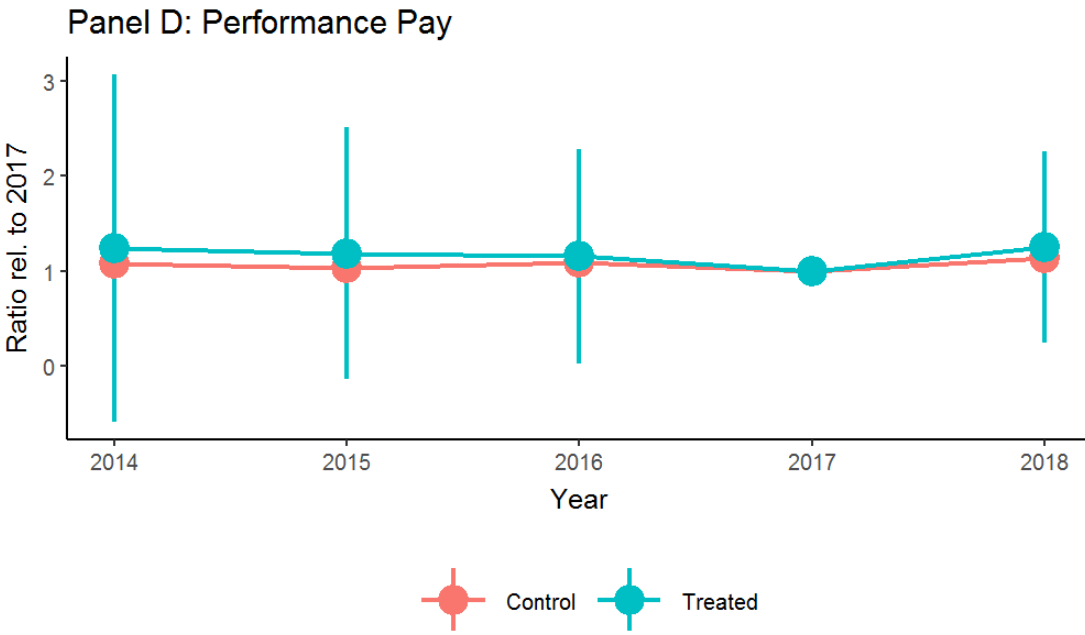
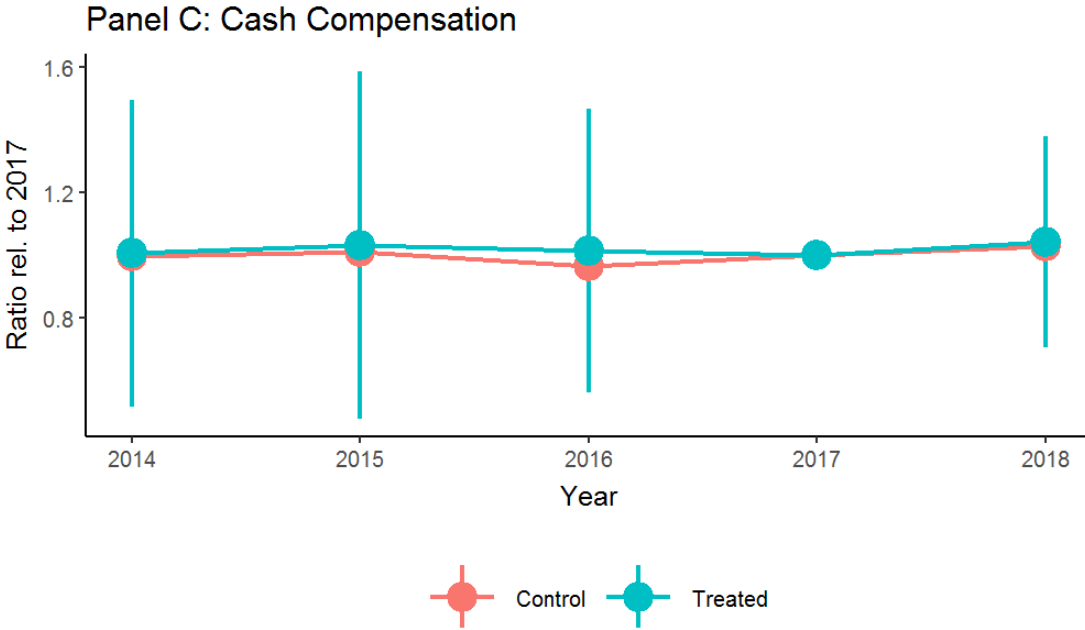
2017 Fiscal Year (Pre)		2018 Fiscal Year (Post)		
7/1/2016	6/30/2017	7/1/2017	6/30/2018	Control
8/1/2016	7/31/2017	8/1/2017	7/31/2018	
9/1/2016	8/31/2017	9/1/2017	8/31/2018	
10/1/2016	9/30/2017	10/1/2017	9/30/2018	
11/1/2016	10/31/2017	11/1/2017	10/31/2018	
12/1/2016	11/30/2017	12/1/2017	11/30/2018	
1/1/2017	12/31/2017	1/1/2018	12/31/2018	Treated
2/1/2017	1/31/2018	2/1/2018	1/31/2019	
3/1/2017	2/28/2018	3/1/2018	2/28/2019	
4/1/2017	3/31/2018	4/1/2018	3/31/2019	
5/1/2017	4/30/2018	5/1/2018	4/30/2019	
6/1/2017	5/31/2018	6/1/2018	5/31/2019	

This figure classifies all fiscal years in our sample as either “pre” or “post,” and treated or control. We use the staggered implementation of the TCJA to develop groups of treated and control firms. The TCJA is effective only for tax years beginning on or after January 1, 2018. We therefore conduct our analysis with a set of firms whose executive compensation was not subject to the new rules for either their 2017 or 2018 fiscal years and compare those control firms to a set of treated firms whose executive compensation was not subject to the new rules for the 2017 fiscal year but was subject to the new rules for 2018. Treated firms are those with fiscal years beginning between January 1 and June 1. For treated firms, “post” period observations relate to executive compensation paid for the 2018 fiscal

years that run from as early as January 1, 2018 – December 31, 2018 to as late as June 1, 2018 – May 31, 2019. Control firms are those with fiscal years beginning between July 1 and December 1. For control firms, “post” period observations relate to executive compensation paid for the 2018 fiscal years that run from as early as July 1, 2017 – June 30, 2018 to as late as December 1, 2017 – November 30, 2018.

FIGURE 2 – Treatment and Control Trends





This figure plots the pre-trends for treated and control firms. All amounts are relative to 2017. Panel A reports trends for total compensation. Panel B reports the trends for salary. Panel C reports the trends for cash compensation and Panel D reports the trends for performance pay. *Total Compensation* is total compensation and includes salary, cash bonuses, share grants, option grants, non-equity performance compensation, pensions, and all other compensation. *Salary* is the CEO's salary. *Performance Pay* is the sum of non-equity performance pay, share grants and option grants. *Cash Compensation* is the sum of salary and cash bonuses.

TABLE 1 – Summary Statistics

	N (1)	Mean (2)	SD (3)	Q1 (4)	Med (5)	Q3 (6)
Dependent Variables						
Total Compensation	2,940	6,470	5,739	2,511	4,673	8,457
Salary	2,920	813	348	570	767	1,000
Performance Pay	2,940	4,946	5,186	1,392	3,303	6,548
Cash Pay	2,920	958	593	623	850	1,089
Performance Proportion	2,940	0.682	0.240	0.587	0.760	0.851
Cash Proportion	2,920	0.231	0.179	0.111	0.174	0.291
Control Variables						
Sales	2,933	4,461	11,297	277	1,009	3,199
Investment Opps.	2,391	3.568	7.968	1.428	2.281	3.851
ROA	2,751	0.050	0.242	0.027	0.099	0.163
Return	2,902	0.066	0.440	0.211	0.004	0.251
σ_{ROA}	2,372	0.062	0.124	0.011	0.024	0.051
σ_{RET}	2,395	0.385	0.483	0.177	0.258	0.390

This table reports summary statistics for our sample that spans fiscal years 2017 and 2018. Panel A reports firm-level summary statistics measured as of the end of the prior year fiscal. All non-ratios are in \$USD millions. *Total Assets* is total assets. *Market Capitalization* is market capitalization as reported in Compustat. *Sales* is total revenue. *Investment Opps.* is investment opportunities available to the firm measured as the mean year-end market-to-book ratio over the previous five years. *ROA* is operating income before depreciation scaled by lagged total assets. *Return* is the raw stock return measured over the year. σ_{ROA} is the standard deviation of *ROA* for the previous five years. σ_{Ret} is the standard deviation of *Return* for the previous five years. Panel B reports summary statistics for CEO compensation. With the exception of *Proportion* variables, all amounts are in \$USD thousands. *Total Compensation* is total compensation and includes salary, cash bonuses, share grants, option grants, non-equity performance compensation, pensions, and all other compensation. *Salary* is the CEO's salary. *Performance Pay* is the sum of non-equity performance pay, share grants and option grants. *Cash Pay* is the sum of salary and cash bonuses. *Performance Proportion* is the ratio of *Performance Pay* to *Total Compensation*. *Cash Proportion* is the ratio of *Cash Pay* to *Total Compensation*. We winsorize all variables at 1% and 99%.

TABLE 2 – Covariate Balance

	Treated (1)	Control (2)	Difference (3)
<i>Total Compensation</i>	6,300	6,724	-424
<i>Salary</i>	804	815	-11
<i>Performance Pay</i>	4,764	5,340	-576
<i>Market Capitalization</i>	9,612	7,933	1,678
<i>Sales</i>	3,948	5,587	-1,639*
<i>Investment Opps.</i>	3.267	3.040	0.227
<i>ROA</i>	0.031	0.118	0.086***
<i>Return</i>	0.205	0.227	0.022
σ_{ROA}	0.064	0.046	0.019**
σ_{RET}	0.426	0.350	0.075*

This table compares the mean of key variables between treated and control observations using 2017 data. *Total Compensation* is total compensation and includes salary, cash bonuses, share grants, option grants, non-equity performance compensation, pensions, and all other compensation. *Salary* is the CEO's salary. *Performance Pay* is the sum of non-equity performance pay, share grants, and option grants. *Market Capitalization* is market capitalization as reported in Compustat. *Sales* is total revenue. *Investment Opps.* is investment opportunities available to the firm measured as the mean year-end market-to-book ratio over the previous five years. *ROA* is operating income before depreciation scaled by lagged total assets. *Return* is the raw stock return measured over the year. σ_{ROA} is the standard deviation of *ROA* for the previous five years. σ_{Ret} is the standard deviation of *Return* for the previous five years. Treated firms are those firms whose fiscal years begin January to May. Column 1 (2) reports the means for treated (control) observations. Column 3 reports the differences. In Column 3, ***, **, and * indicate significant differences at 1%, 5%, and 10%, respectively.

TABLE 3 – CEO Pay

Panel A: Pooled Difference-in-Differences

	Dependent Variable					
	Total Compensation		Salary		Performance Pay	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Treated</i>	-8.97 (422.86)	640.01* (381.85)	-6.45 (25.16)	40.35* (20.79)	-150.01 (384.50)	343.68 (351.19)
<i>Post</i>	265.60 (280.58)	452.79 (300.62)	13.63 (9.52)	0.84 (12.18)	187.83 (270.68)	370.10 (289.74)
<i>Treated x Post</i>	-57.58 (304.49)	-248.89 (330.80)	0.38 (10.79)	0.54 (14.57)	8.10 (294.28)	-96.04 (319.33)
<i>Sales</i>		0.30*** (0.02)		0.02*** (0.00)		0.25*** (0.02)
<i>Investment Opps.</i>		45.74* (23.91)		-1.01 (1.39)		43.12* (22.71)
<i>ROA</i>		3,910*** (1,088.00)		250.17*** (53.59)		3,725*** (931.44)
<i>Return</i>		763.71*** (291.23)		2.60 (13.66)		838.19*** (276.60)
σ_{ROA}		66.53 (1,268.00)		-178.98** (86.46)		167.43 (1,115.00)
σ_{RET}		-277.87 (261.81)		-41.78*** (15.17)		-233.44 (246.55)
Observations	Yes 2,940	Yes 2,228	Yes 2,920	Yes 2,212	Yes 2,940	Yes 2,228
Adjusted R ²	0.060	0.360	0.110	0.340	0.060	0.330

This table presents results from estimating the following difference-in-differences regression:

$$Pay_{it} = \beta_1 Treated_i + \beta_2 Post_t + \beta_3 Treated_i \times Post_t + \beta_4 Controls_{it} + \gamma_j + \epsilon_{it} \quad (1)$$

All specifications include industry fixed effects. Columns 1, 3, 5 do not include controls. Columns 2, 4, and 6 include controls. Pay_{it} is *Total Compensation* in Columns 1 and 2. In Columns 3 and 4 (5 and 6), Pay_{it} is *Salary* (*Performance Pay*). *Total Compensation* includes salary, cash bonuses, share grants, option grants, non-equity performance compensation, pensions, and all other compensation. *Salary* is the CEO's salary. *Performance Pay* is the sum of non-equity performance pay, share grants, and option grants. *Treated* is an indicator variable equal to one for firms with fiscal years starting in January to May, zero otherwise. *Post* is an indicator variable equal to one for 2018 fiscal years, and zero otherwise. *Sales* is total revenue. *Investment Opps.* is investment opportunities available to the firm measured as the mean year-end market-to-book ratio over the previous five years. *ROA* is operating income before depreciation scaled by lagged total assets. *Return* is the raw stock return measured over the year. σ_{ROA} is the standard deviation of *ROA* for the previous five years. σ_{Ret} is the standard deviation of *Return* for the previous five years. All compensation-related variables are in \$USD thousands and firm-level variables are in \$USD millions. Standard errors are in parentheses and are clustered by firm. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

TABLE 3 – CEO Pay

Panel B: Pooled Difference-in-Differences with Firm Fixed Effects

	Dependent Variable					
	Total Compensation		Salary		Performance Pay	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Post</i>	261.61 (392.62)	503.79 (434.08)	17.83 (12.12)	21.72** (10.25)	185.05 (378.72)	372.76 (419.98)
<i>Treated x Post</i>	-58.61 (425.88)	-472.23 (485.08)	-4.31 (14.04)	-13.57 (13.94)	5.14 (411.56)	-336.00 (466.55)
<i>Sales</i>		0.06 (0.26)		0.00 (0.01)		0.19 (0.27)
<i>Investment Opps.</i>		19.82 (34.10)		-2.56 (2.38)		-17.26 (22.52)
<i>ROA</i>		-1,298.00 (3,181.00)		26.60 (76.04)		-997.75 (2,917.00)
<i>Return</i>		-260.17 (423.63)		-3.21 (13.20)		-147.22 (416.70)
σ_{ROA}		-2,934.00 (3,701.00)		2.51 (77.27)		-2,900.00 (3,689.00)
σ_{RET}		236.33 (401.07)		10.56 (15.75)		118.23 (384.23)
Observations	2,940	2,228	2,920	2,212	2,940	2,228
Adjusted R ²	0.74	0.76	0.88	0.87	0.70	0.72

This table presents results from estimating the difference-in-differences regression:

$$Pay_{it} = \beta_1 Post_t + \beta_2 Treated_i \times Post_t + \beta_3 Controls_{it} + \gamma_i + \epsilon_{it} \quad (1)$$

All specifications include firm fixed effect. Columns 1, 3, 5 do not include any controls. Columns 2, 4, and 6 include controls. Pay_{it} is *Total Compensation* in Columns 1 and 2. In Columns 3 and 4 (5 and 6), Pay_{it} is *Salary* (*Performance Pay*). *Total Compensation* includes salary, cash bonuses, share grants, option grants, non-equity performance compensation, pensions, and all other compensation. *Salary* is the CEO's salary. *Performance Pay* is the sum of non-equity performance pay, share grants, and option grants. *Treated* is an indicator variable equal to one for firms with fiscal years starting in January to May, zero otherwise. *Post* is an indicator variable equal to one for 2018 fiscal years, and zero otherwise. *Sales* is total revenue. *Investment Opps.* is investment opportunities available to the firm measured as the mean year-end market-to-book ratio over the previous five years. *ROA* is operating income before depreciation scaled by lagged total assets. *Return* is the raw stock return measured over the year. σ_{ROA} is the standard deviation of *ROA* for the previous five years. σ_{Ret} is the standard deviation of *Return* for the previous five years. All measures of *Pay* are in \$USD thousands and firm-level variables are in \$USD millions. Standard errors are in parentheses and are clustered by firm. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

TABLE 3 – CEO Pay

Panel C: Entropy Balanced Difference-in-Differences

	Dependent Variable					
	Total Compensation		Salary		Performance Pay	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Treated</i>	1,181*** (415.52)	1,031*** (325.98)	62.81** (24.90)	49.84** (20.10)	852.29** (367.64)	719.42** (297.96)
<i>Post</i>	567.41** (252.01)	417.54 (271.78)	15.75** (7.92)	0.44 (10.23)	441.87* (249.05)	311.11 (266.84)
<i>Treated x Post</i>	-446.85 (288.90)	-198.96 (283.43)	-6.36 (10.21)	0.33 (12.91)	-302.49 (284.80)	-52.77 (278.30)
<i>Sales</i>		0.29*** (0.02)		0.01*** (0.00)		0.25*** (0.02)
<i>Investment Opps.</i>		42.78* (22.20)		0.58 (1.16)		38.69* (21.21)
<i>ROA</i>		4,403*** (1,021.00)		279.56*** (54.17)		4,346*** (890.27)
<i>Return</i>		909.75*** (348.79)		5.16 (13.81)		895.47*** (327.60)
σ_{ROA}		-178.19 (1,550.00)		-155.18* (83.19)		104.56 (1,380.00)
σ_{RET}		-804.68*** (230.07)		-59.19*** (16.47)		-608.17*** (196.06)
Observations	2,176	2,175	2,160	2,159	2,176	2,175
Adjusted R ²	0.080	0.390	0.100	0.380	0.080	0.370

This table presents results from estimating the following difference-in-differences regression using an entropy-balanced sample.

$$Pay_{it} = \beta_1 Treated_i + \beta_2 Post_t + \beta_3 Treated_i \times Post_t + \beta_4 Controls_{it} + \gamma_j + \epsilon_{it} \quad (1)$$

Columns 1, 3, 5 do not include controls. Columns 2, 4, and 6 include controls. Pay_{it} is *Total Compensation* in columns 1 and 2. In Columns 3 and 4 (5 and 6), Pay_{it} is *Salary* (*Performance Pay*). *Total Compensation* includes salary, cash bonuses, share grants, option grants, non-equity performance compensation, pensions, and all other compensation. *Salary* is the CEO's salary. *Performance Pay* is the sum of non-equity performance pay, share grants and option grants. *Treated* is an indicator variable equal to one for firms with fiscal years starting in January to May, zero otherwise. *Post* is an indicator variable equal to one for 2018 fiscal years, and zero otherwise. *Sales* is total revenue. *Investment Opps.* is investment opportunities available to the firm measured as the mean year-end market-to-book ratio over the previous five years. *ROA* is operating income before depreciation scaled by lagged total assets. *Return* is the raw stock return measured over the year. σ_{ROA} is the standard deviation of *ROA* for the previous five years. σ_{Ret} is the standard deviation of *Return* for the previous five years. All measures of *Pay* are in \$USD thousands and firm-level controls are in \$USD millions. Standard errors are in parentheses and are clustered by firm. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

TABLE 4 –Named Executive Officers (NEO)

Panel A: NEO Pay, Entropy Balanced Difference-in-Differences

	Dependent Variable					
	Total Compensation		Salary		Performance Pay	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Treated</i>	695.91*** (210.94)	673.97*** (171.43)	38.15*** (14.31)	35.10*** (12.12)	489.05*** (188.92)	466.69*** (158.89)
<i>Post</i>	264.71*** (99.57)	197.50* (110.77)	14.60*** (5.43)	8.56 (5.98)	176.91* (101.42)	121.49 (112.22)
<i>Treated x Post</i>	-212.11* (121.90)	-99.06 (122.90)	6.71 (6.22)	3.90 (7.10)	-113.66 (120.75)	11.37 (119.43)
<i>Sales</i>		0.14*** (0.01)		0.01*** (0.001)		0.12*** (0.01)
<i>Investment Opps.</i>		4.54 (9.96)		-0.50 (0.50)		3.77 (9.41)
<i>ROA</i>		2,219*** (534.38)		122.04*** (36.21)		2,197*** (483.95)
<i>Return</i>		486.74*** (167.92)		-10.15 (8.67)		514.56*** (160.12)
σ_{ROA}		471.85 (827.95)		-164.45** (68.03)		706.39 (735.25)
σ_{RET}		-424.19*** (128.41)		-16.81* (9.89)		-309.06*** (109.14)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,356	6,354	6,313	6,311	6,356	6,354
Adjusted R ²	0.04	0.21	0.08	0.19	0.04	0.21

This table presents results from estimating the following difference-in-differences regression using an entropy-balanced sample for all named executive officers (NEOs).

$$Pay_{it} = \beta_1 Treated_i + \beta_2 Post_t + \beta_3 Treated_i \times Post_t + \beta_4 Controls_{it} + \gamma_j + \epsilon_{it} \quad (1)$$

Pay_{it} is *Total Compensation* in Columns 1 and 2. In Columns 3 and 4 (5 and 6), Pay_{it} is *Salary* (*Performance Pay*). *Total Compensation* includes salary, cash bonuses, share grants, option grants, non-equity performance compensation, pensions, and all other compensation. *Salary* is the NEO's salary. *Performance Pay* is the sum of non-equity performance pay, share grants, and option grants. *Treated* is an indicator variable equal to one for firms with fiscal years starting in January to May, zero otherwise. *Post* is an indicator variable equal to one for 2018 fiscal years, and zero otherwise. *Sales* is total revenue. *Investment Opps.* is investment opportunities available to the firm measured as the mean year-end market-to-book ratio over the previous five years. *ROA* is operating income before depreciation scaled by lagged total assets. *Return* is the raw stock return measured over the year. σ_{ROA} is the standard deviation of *ROA* for the previous five years. σ_{Ret} is the standard deviation of *Return* for the previous five years. All measures of *Pay* are in \$USD thousands and firm-level controls are in \$USD millions. Standard errors are in parentheses and are clustered by firm. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

TABLE 5 – CEO Pay for Treatment Firms Only

	Dependent Variable					
	Total Compensation		Salary		Performance Pay	
	(1)	(2)	(3)	(4)	(5)	(6)
Post	207.63*	175.86	13.30***	0.88	195.60*	253.74
	(118.39)	(161.52)	(5.10)	(8.37)	(115.49)	(155.18)
Sales		0.31***		0.02***		0.26***
		(0.02)		(0.00)		(0.02)
Investment Opps.		40.34		-1.35		39.59
		(26.83)		(1.55)		(25.42)
ROA		3,558***		222.59***		3,319***
		(1,201.00)		(58.43)		(1,027.00)
Return		637.33**		3.84		740.88**
		(321.95)		(15.34)		(306.85)
σ_{ROA}		30.85		-201.76**		-41.08
		(1,366.00)		(94.97)		(1,202.00)
σ_{RET}		-107.14		-39.60**		-116.69
		(283.28)		(17.39)		(271.99)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,494	1,847	2,478	1,835	2,494	1,847
Adjusted R ²	0.070	0.360	0.130	0.340	0.060	0.310

This table presents results from estimating the following difference using only treatment observations.

$$Pay_{it} = \beta_1 Post_t + \beta_2 Controls_{it} + \gamma_j + \epsilon_{it} \quad (1)$$

Columns 1, 3, 5 do not include controls. Columns 2, 4, and 6 include controls. Pay_{it} is *Total Compensation* in columns 1 and 2. In Columns 3 and 4 (5 and 6), Pay_{it} is *Salary* (*Performance Pay*). *Total Compensation* includes salary, cash bonuses, share grants, option grants, non-equity performance compensation, pensions, and all other compensation. *Salary* is the CEO's salary. *Performance Pay* is the sum of non-equity performance pay, share grants and option grants. *Treated* is an indicator variable equal to one for firms with fiscal years starting in January to May, zero otherwise. *Post* is an indicator variable equal to one for 2018 fiscal years, and zero otherwise. *Sales* is total revenue. *Investment Opps.* is investment opportunities available to the firm measured as the mean year-end market-to-book ratio over the previous five years. *ROA* is operating income before depreciation scaled by lagged total assets. *Return* is the raw stock return measured over the year. σ_{ROA} is the standard deviation of *ROA* for the previous five years. σ_{Ret} is the standard deviation of *Return* for the previous five years. All measures of *Pay* are in \$USD thousands and firm-level controls are in \$USD millions. Standard errors are in parentheses and are clustered by firm. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

TABLE 6 – CEO Pay Performance Sensitivity

Panel A: Main Specification

	Dependent Variable: $\log(\Delta Total Compensation)$					
	(1)	(2)	(3)	(4)	(5)	(6)
ΔROA	0.09 (0.11)	0.33 (0.38)			0.10 (0.11)	0.30 (0.34)
$Adj. Return$			0.12*** (0.04)	0.29*** (0.09)	0.11*** (0.04)	0.26*** (0.08)
$Treated$		0.02 (0.03)		0.09 (0.09)		0.10 (0.09)
$Treated \times \Delta ROA$		0.47 (0.40)				0.43 (0.360)
$Treated \times Adj. Return$				0.19* (0.10)		0.17* (0.10)
Observations	1,357	1,357	1,454	1,454	1,357	1,357
Adjusted R ²	0.005	0.01	0.01	0.01	0.01	0.01

This table presents estimates for pay-performance sensitivity following TCJA and is based on the PPS regression in DeFranco, Hope, and Larocque (2013):

$$\begin{aligned} \log(\Delta Pay_{it}) = & \beta_1 \Delta ROA_{it} + \beta_2 Adj. Return_{it} + \beta_3 Treated_i & (2) \\ & + \beta_4 Treated_i \times \Delta ROA_{it} + \beta_5 Treated_i \times Adj. Return_{it} + \gamma_j \\ & + \epsilon_{it} \end{aligned}$$

The dependent variable is the change in the natural logarithm of *Total Compensation* from 2017 to 2018. *Total Compensation* includes salary, cash bonuses, share grants, option grants, non-equity performance compensation, pensions, and all other compensation. *Treated* is an indicator variable equal to one for firms with fiscal years starting in January to May, zero otherwise. ΔROA is the change in *ROA* from 2017 to 2018. *ROA* is operating income before depreciation scaled by lagged total assets. *Adj. Return* is the firm's stock return less the CRSP value-weighted return. *Treated* firms are those firms with fiscal years starting in January to May. All measures of *Pay* are in \$USD thousands and firm-level variables are in \$USD millions. Standard errors are in parentheses and are clustered by firm. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

TABLE 6 – CEO Pay Performance Sensitivity

Panel B: Excluding Industry Fixed Effects

	Dependent Variable: $\log(\Delta Total Compensation)$					
	(1)	(2)	(3)	(4)	(5)	(6)
ΔROA	0.10 (0.11)	0.33 (0.36)			0.09 (0.11)	0.30 (0.32)
$Adj. Return$			0.13*** (0.04)	0.27*** (0.09)	0.12*** (0.04)	0.26*** (0.08)
$Treated$		0.02 (0.03)		0.06 (0.09)		0.07 (0.08)
$Treated \times \Delta ROA$		0.46 (0.38)				0.43 (0.34)
$Treated \times Adj. Return$				0.15 (0.10)		0.14 (0.09)
Industry FE	No	No	No	No	No	No
Observations	1,031	1,031	1,113	1,113	1,031	1,031
Adjusted R ²	0.000	0.002	0.010	0.010	0.010	0.010

This table presents estimates for pay-performance sensitivity following TCJA and is based on the PPS regression in DeFranco, Hope, and Larocque (2013):

$$\begin{aligned} \log(\Delta Pay_{it}) = & \beta_1 \Delta ROA_{it} + \beta_2 Adj. Return_{it} + \beta_3 Treated_i & (2) \\ & + \beta_4 Treated_i \times \Delta ROA_{it} + \beta_5 Treated_i \times Adj. Return_{it} + \gamma_j \\ & + \epsilon_{it} \end{aligned}$$

The dependent variable is the change in the natural logarithm of *Total Compensation* from 2017 to 2018. *Total Compensation* includes salary, cash bonuses, share grants, option grants, non-equity performance compensation, pensions, and all other compensation. *Treated* is an indicator variable equal to one for firms with fiscal years starting in January to May, zero otherwise. ΔROA is the change in *ROA* from 2017 to 2018. *ROA* is operating income before depreciation scaled by lagged total assets. *Adj. Return* is the firm's stock return less the CRSP value-weighted return. All measures of *Pay* are in \$USD thousands and firm-level variables are in \$USD millions. Standard errors are in parentheses and are clustered by firm. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

TABLE 6 – CEO Pay Performance Sensitivity

Panel C: Entropy Balanced

	Dependent Variable: $\log(\Delta Total Compensation)$					
	(1)	(2)	(3)	(4)	(5)	(6)
ΔROA	0.20 (0.16)	0.63 (0.45)			0.18 (0.17)	0.57 (0.43)
<i>Adj. Return</i>			0.13*** (0.04)	0.24*** (0.09)	0.13*** (0.04)	0.23** (0.09)
<i>Treated</i>		0.002 (0.04)		0.08 (0.100)		0.07 (0.10)
<i>Treated x ΔROA</i>		0.97** (0.49)				0.89* (0.47)
<i>Treated x Adj. Return</i>				0.13 (0.11)		0.12 (0.11)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,072	1,072	1,073	1,073	1,072	1,072
Adjusted R ²	0.002	0.002	0.01	0.01	0.01	0.01

This table presents estimates for pay-performance sensitivity following TCJA and is based on the PPS regression in DeFranco, Hope, and Larocque (2013):

$$\begin{aligned} \log(\Delta Pay_{it}) = & \beta_1 \Delta ROA_{it} + \beta_2 Adj. Return_{it} + \beta_3 Treated_i & (2) \\ & + \beta_4 Treated_i \times \Delta ROA_{it} + \beta_5 Treated_i \times Adj. Return_{it} + \gamma_j \\ & + \epsilon_{it} \end{aligned}$$

The dependent variable is the change in the natural logarithm of *Total Compensation* from 2017 to 2018. *Total Compensation* includes salary, cash bonuses, share grants, option grants, non-equity performance compensation, pensions, and all other compensation. *Treated* is an indicator variable equal to one for firms with fiscal years starting in January to May, zero otherwise. ΔROA is the change in *ROA* from 2017 to 2018. *ROA* is operating income before depreciation scaled by lagged total assets. *Adj. Return* is the firm's stock return less the CRSP value-weighted return. All measures of *Pay* are in \$USD thousands and firm-level variables are in \$USD millions. Standard errors are in parentheses and are clustered by firm. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.