Does Sensationalism Affect Executive Compensation? Evidence from Pay Ratio Disclosure Reform

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Draft: January 2020

Abstract: Beginning in 2018, U.S. public firms were required to report the ratio of the chief executive officer's (CEO) compensation to their median employee's compensation in the annual proxy statement. We find that this pay ratio disclosure leads to a nominal decline in total compensation and a larger decline in pay-for-performance sensitivity for CEOs relative to chief financial officers. Our results are stronger for firms that are more sensitive to populist political pressure. Consistent with popular press coverage playing a role in influencing firm responses to the standard, firms disclosing higher pay ratios garner more compensation-related media coverage around the filing of their annual proxy statements and display negative abnormal returns around proxy filings in the presence of elevated media coverage.

Keywords: *CEO compensation; pay ratio; disclosure; corporate governance; pay-for-performance; media coverage*

JEL Classification: G34, G38, M12, M52

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We are grateful to Tharindra Ranasinghe (discussant) and workshop participants at the 2020 Hawai'i Accounting Research Conference, the University at Buffalo, University of California, Berkeley, and University of Rochester for helpful comments and suggestions. We acknowledge financial support from the University at Buffalo, SUNY and University of Rochester's Simon Business School.

1. Introduction

A rise in executive compensation over the past several decades has attracted intense criticism from the media and public. In response, regulators imposed a wide range of regulatory policies on executive compensation in recent decades, including changes in taxation, accounting rules, and disclosure requirements (Murphy and Jensen, 2018). As part of this effort, the U.S. Securities and Exchange Commission (SEC) on August 5, 2015 adopted a rule requiring publicly-traded firms to disclose the ratio of the total compensation of the chief executive officer (CEO) to the total compensation of the firm's median employee as part of executive compensation disclosures in their annual proxy statement.

In contrast to compensation disclosure settings examined in prior research, the Dodd-Frank pay ratio disclosure mandate provides no new information regarding an executive's compensation package with which to evaluate the executive's performance by providing only the pay level of the firm's median employee as a new piece of information. As evidenced by a two-year comment period that provided an unprecedented number of comment letters (SEC, 2015), the pay ratio rule triggered controversy as to whether government intervention into executive compensation is necessary while raising questions regarding the usefulness of this disclosure. In this paper, we empirically examine the effect of the pay ratio disclosure mandate on both the level and mix of CEO compensation packages.

We conjecture that there are two primary sources of potential costs imposed by the pay ratio disclosure mandate. First, we consider a cost imposed by criticism from external parties, such as the media, on the firm and/or board of directors regarding within-firm pay disparity (i.e., external pressure). Jensen and Murphy (1990) argue that such pressure will be associated with increases in the probability of litigation, demands for concessions from labor unions, and further

regulation. Similarly, Bebchuk and Fried (2003) argue that board members will experience reputational costs from external criticism, thereby harming their value in the director labor market. Existing literature provides some support for the presence of external pressure in response to CEO compensation. Core, Guay, and Larcker (2008) find that the media tends to write articles with negative tone for firms with more option exercises, which they infer is consistent with "sensationalism" regarding incentive compensation. Further, debate surrounding the pay ratio disclosure mandate focused centrally on the role of income inequality and populist concern over excess CEO pay, with efforts to introduce legislation constraining share repurchases at firms with excessive CEO pay ratios.[1] As a result, we expect firms to reduce or limit growth in the level of compensation provided to CEOs to avoid public scrutiny following the pay ratio disclosure reform.

While growth in the level of compensation is likely to be constrained in response to external pressure, we also expect a cost to be imposed on the CEO stemming from public aversion to income inequality. In a setting different from ours, Mas (2017) finds that in response to enhanced transparency regarding municipal manager compensation, cities nominally reduced top manager salaries following disclosure. However, consistent with a cost imposed on top managers stemming from public aversion to high compensation, the rate at which top municipal managers quit jumped by 75% following the disclosure mandate. To the extent that firms have difficulty in raising the level of CEO compensation (thereby worsening the pay ratio), firms can compensate the CEO by reducing the amount of compensation "at-risk" via reducing the extent of pay-for-performance.[2]

Second, we consider a cost imposed by the pay ratio disclosure stemming from additional

[1] Sen. Sanders and Rep. Khanna introduced legislation in November 2018 designed to prohibit stock repurchases at companies where the CEO pay ratio is above 150 times the median employee pay, entitled the "Stop WALMART" Act. Similarly, Sen. Warren called for greater employee representation in corporate decision making (Warren 2018).
[2] Relatedly, Jensen and Murphy (1990) argue that external pressure placed on boards will also reduce board members' willingness to provide innovative incentive contracts, thereby weakening the relation between CEO compensation and firm performance. This stems from the potential for incentive-based compensation to deliver large windfall rewards earned ex post by executives, which is highly "visible" to external parties such as the press.

scrutiny of pay disparity *within the firm* (i.e., internal pressure). Akerlof and Yellen (1990) predict that pay inequality will be associated with perceived unfairness in the pay process, thereby lowering morale and resulting employee effort and productivity. Consistent with this equity theory of compensation, several studies suggest that employee productivity responds negatively to unexplained compensation differences. For example, Green and Zhou (2019) find that within-firm base (total) pay inequality is associated with lower (higher) employee morale, consistent with employees viewing differences in base pay as unfair. Similarly, Breza et al. (2012) find that productivity declines in response to pay inequality are most prevalent when differential productivity across employees is not easily observable. With respect to pay ratios, Rouen (2019) finds that unexplained pay disparities (or lower pay fairness) between CEOs and employees are associated with lower future firm performance. Because the pay ratio reveals the gap between CEO and rank-and-file employee compensation, boards should face increasing pressure from employees to provide evidence that executive pay is not excessive and is closely linked to firm performance. Thus, we expect boards responding to internal pressure to reduce executive pay, increase alignment between executive compensation and performance, or both following the pay ratio reform.

The above discussion assumes that the information provided by the disclosure reform does not facilitate monitoring the CEO's performance. Hermalin and Weisbach (2012) argue that exogenously imposed increases in disclosure that increase the monitoring and scrutiny of firm executives will lead to increases in executive compensation. Existing empirical evidence supports this conjecture, showing that enhanced disclosures regarding CEO pay packages results in boards increasing the level of CEO pay to offset these monitoring costs (Park et al., 2001; Balsam et al., 2016; Lu and Shi, 2018; Gipper, 2016). In a letter to the SEC, Congressional proponents of the act argued that "pay ratio disclosure helps investors evaluate the relative value a CEO creates, which

facilitates better checks and balances against insiders paying themselves runaway compensation" (Menendez, 2017). To the extent that monitoring of CEO compensation increases as a result of the reform, we should observe increases (rather than decreases) in the level of CEO compensation and/or a reduction in pay-for-performance (as a compensating differential).

Empirically, it is difficult to assess the effect of mandated disclosure on CEO compensation because any such effect is likely to be confounded by contemporaneous changes in the real economy. Moreover, regulatory changes generally affect all firms in the economy simultaneously, making it challenging to identify treatment and control groups (Edmans, Gabaix, and Jenter, 2017). To overcome this empirical challenge, we exploit the fact that unlike previous regulatory changes that mandate more extensive disclosure regarding the features of executive compensation, the pay ratio rule requires the disclosure of only median employee pay as part of the CEO pay ratio. As a result, we employ a difference-in-differences design using chief financial officers (CFOs) as a natural control group for CEO compensation to mitigate concerns that existing economic conditions and competing regulatory changes confound our results. Our decision to use CFOs as a benchmark group stems from previous compensation and securities regulations that treat these executive positions similarly. For example, Section 304 of the Sarbanes-Oxley Act imposes a strict financial liability on CFOs and CEOs (but no other executives or officers) for restatements due to misconduct.[3] In additional analysis, we also exploit the timing of the disclosure mandate, which impacts December fiscal year-end firms first, to compare effects *across* (rather than within) firms.

For our primary tests, we collect a balanced sample of matched CEO-CFO pairs over the

[3] We do note that prior research identifies differences in the incentive effects of compensation provided to CEOs and CFOs on various decisions, such as cash holdings and earnings management (e.g., Jiang et al., 2010; Chava and Purnanandam, 2010). However, more importantly for our setting, this research also finds that both executive roles receive incentives that are substantial and that vary around prior regulations (e.g., stock option expensing examined by Chava and Purnanandam, 2010) consistent with common responses to compensation regulation.

2013-2018 period to examine the effect of the pay ratio disclosure mandate. Our sample begins in 2013 to avoid contamination from firm responses to say-on-pay implementation (e.g., Iliev and Vitanova, 2019) and ends in 2018 to avoid confounding effects from changes to the tax deductibility of compensation for CFOs stemming from the expanded definition of a "covered employee" under the Tax Cuts and Jobs Act of 2017 (which is in effect for the 2019 proxy season). Using this balanced panel, we regress total compensation and pay-for-performance sensitivity on a CEO indicator, a post-disclosure indicator, and its interaction. We also control for firm and executive characteristics known to influence compensation packages (e.g., investment opportunities, recent stock market performance, CEO age), year-fixed effects to mitigate the influence of compensation trends, and firm- or industry-fixed effects to mitigate the effects of unobservable and time-invariant differences across firms. As a result, our difference-in-differences test isolates the effect of the CEO pay ratio on the executives referenced in the mandated disclosure.

We begin our analysis of the consequences of pay ratio reform by examining the fundamental policy question of whether pay ratio disclosure curtails CEO compensation. We find that, relative to CFOs, CEOs experienced a modest decline in executive compensation following the pay ratio implementation. In terms of economic significance, CEO compensation declines by three percent relative to CFO compensation (approximately $200,000 for the average CEO) following pay ratio disclosure. To some extent, a nominal decline is consistent with advocates' expressed intentions for the pay ratio reform (in limiting CEO compensation and income inequality) and with effects of public disclosures of pay disparity in alternative settings (e.g., Mas, 2017).

We next explore whether pay ratio regulation differentially affects the pay-for-performance sensitivity of CEO and CFO compensation packages. To measure pay-for-performance sensitivity, we utilize option delta, which captures the sensitivity of an executive's wealth to a one percent

change in stock price (Core and Guay, 2002). To the extent that boards must compensate the CEO for enhanced scrutiny with respect to pay disparity and/or to the extent that boards seek to limit media coverage of high incentive compensation (due to ex post performance), we expect to observe a decrease in delta following the reform. In contrast, to the extent that boards seek to link pay more closely to performance to minimize employee perceptions of unfairness in compensation, we should find an increase in delta.

Inconsistent with enhanced incentive alignment following pay ratio disclosures, our second main finding is that pay-for-performance sensitivity declines by 6.8% for CEOs relative to CFOs following the pay ratio implementation, suggesting that boards are reducing the extent of incentive-based pay for CEOs post-reform. Because the pay ratio disclosure provides no new information on either CEO or CFO compensation, but rather discloses the median employee's total compensation as additional information, informational differences in compensation disclosure do not underlie the heterogeneous results we observe for CEOs and CFOs.

One plausible alternative explanation for our results is that there is a time trend over our sample period, where boards increasingly provide differential pay packages to CEOs and CFOs. In contrast to a time trend explaining our results, we find that the relative decline in CEO compensation and pay-for-performance appears isolated to the pay ratio implementation year. Additional tests confirm that the level and performance-sensitivity of CEO and CFO compensation exhibit parallel trends during the pre-disclosure period. Further, when we compare December fiscal year-end firms in the initial year of the pay ratio disclosure reform to firms with June – November year-ends issuing proxy statements that omit the pay ratio, results confirm a relatively modest decline in the level of CEO compensation combined with a substantial decline in delta.

Thus far, our results are most consistent with boards proactively altering compensation

contracts in response to pressure from external parties or to enhanced monitoring of the CEO. To further distinguish whether shifts in compensation surrounding the pay ratio reform are the result of external pressure (from sources such as the media) or internal pressure (from employees regarding pay inequity), we next conduct tests to determine whether specific components of compensation and/or subsets of executives are more sensitive to the pay ratio reform. Taking first the components of compensation, these tests follow from populist criticism that non-cash compensation (e.g., stock, options, perquisites) is typically unavailable to rank-and-file employees, generating enhanced pressure on boards to limit excess non-cash compensation for CEOs. Relatedly, Core, Guay, and Larcker (2008) find that press coverage of executive compensation tends to be more negative (or "sensational") for non-cash portions of executive compensation. In contrast, the pay disparity literature finds that employee morale is most sensitive to differential base pay, rather than total pay, inequality (e.g., Green and Zhou, 2019). Decomposing executive compensation into its cash and non-cash components, we find that the proportion of CEO compensation paid in cash relative to total compensation is larger following the implementation of pay ratio reform, consistent with a response to external rather than internal pressure.

Next, we examine whether our results are concentrated in firms that are more sensitive to populist political pressures following Murphy and Jensen's (2018) conjecture that the pay ratio disclosure was designed to incite populist pressure. We find that CEOs leading firms with more media coverage exhibit stronger declines in total compensation and pay-for-performance relative to CFOs following the pay ratio reform. We also examine whether firms that are likely subject to elevated internal pressure from employees (with relatively low levels of pay) display more pronounced shifts in CEO compensation. Using information from the pay ratio disclosures themselves, we find that our results are relatively similar across firms with above- and below-

median industry-adjusted median employee compensation. Given that our splits based on media coverage and industry-adjusted median employee compensation display relatively low correlation, these findings suggest a more prominent role for external rather than internal sources of pressure in CEO compensation contracts following the disclosure reform.

We also examine the consequences of disclosing an elevated CEO pay ratio in an effort to determine whether key stakeholders behave in ways suggesting that the pay ratio disclosure is useful. First, we examine whether higher CEO pay ratios lead to more attention from the popular press. We find that firms disclosing higher CEO pay ratios are more likely to garner compensation-related media articles in the two-week period surrounding the filing of their first annual proxy statement that includes the pay ratio disclosure. Further, we examine equity price responses to the initial disclosure of CEO pay ratios in annual proxy statements. We find that equity prices do not vary with the magnitude of the announced CEO pay ratio, on average. However, firms with higher media coverage (both leading up to and surrounding the proxy filing) earn significantly negative abnormal returns as the CEO pay ratio increases. Collectively, these tests further support our conjecture that pay ratio disclosure induces sensational press coverage, which influences compensation contracting and subsequent equity price responses to these contracts.

In our final set of tests, we explore whether firms disclosing elevated CEO pay ratios also experience higher employee turnover and lower labor productivity following the disclosure, consistent with costs stemming from internal pressure to limit pay disparity. While results of these tests provide some limited support for lower labor productivity at firms disclosing elevated pay ratios, we find no evidence of higher option forfeitures (as a proxy for employee turnover). These results lend some support to a concern over reduced employee morale and productivity in response to enhanced disclosure of information regarding within-firm pay disparity.

Our study contributes to research examining executive compensation in several ways. First, existing studies of the relation between disclosure and CEO compensation find that mandated disclosure is associated with increases in executive compensation (e.g., Murphy, 2012; Hermalin and Weisbach, 2012; Park et al., 2001; Lu and Shi, 2018; Gipper, 2016). These studies attribute rises in compensation to mandated disclosures that either make CEOs more aware of outside options and/or bind board members to paying out incentive compensation by publicly revealing their compensation strategy. Unique to the pay ratio disclosure reform, there is no new information available on an executive's compensation by which to evaluate an executive's performance; only the median employee compensation is a new disclosure. Consistent with the pay ratio disclosure primarily inciting sensationalism by the financial press rather than enhancing transparency regarding the CEO's pay package, pay ratio disclosures are associated with both a drop in the level of CEO compensation and a decline in pay-for-performance relative to CFOs.

Second, the pay ratio disclosure reform allows us to study the countervailing pressures of stakeholders internal and external to the firm, which is new to the executive compensation literature (see Murphy and Jensen, 2018 for a recent review). While our evidence is most consistent with boards proactively changing CEO compensation in response to populist pressure, we also find some evidence that employees are adversely affected by higher pay ratio disclosures, as evidenced by subsequent decreases in employee productivity. In this way, we add to the literature on the economic consequences of within-firm pay disparity (e.g., Rouen, 2019, Green and Zhou, 2019, Card et al., 2012, Breza et al., 2012; Boone et al., 2019).

Finally, our findings are policy-relevant because, along with Balsam and Liang (2019) and Boone et al. (2019), we provide the first evidence on the consequences to mandating pay ratio

disclosure for CEO compensation.[4] Our evidence suggests that pay ratio disclosure allows outside pressure from "uninvited guests" (Murphy and Jensen, 2018) to influence compensation contracts, with corresponding declines in both total compensation and pay-for-performance sensitivity. Although there is room for debate on whether a decline in total executive compensation is value-enhancing for shareholders, reduced pay-performance sensitivity suggests reduced incentives to enhance firm value post-reform. Thus, we urge policy-makers to carefully evaluate the economic effects of intervening into executive compensation by granting some validity to the U.S. Treasury Department's recent call to repeal pay ratio disclosure (Ackerman and Rubin, 2017).

2. Background, Literature, and Hypotheses

2.1. Pay ratio background and description

In response to populist criticisms by the media and general public of excessive levels of executive compensation relative to rank-and-file employees, Congress passed Section 953(b) of the Dodd-Frank Act (hereafter, the pay ratio disclosure mandate) on July 21, 2010 and directed the SEC to amend Item 402 of Regulation S-K, which details reporting requirements for executive compensation. Under the pay ratio disclosure reform, publicly-traded companies are required to disclose (1) the median annual compensation of all employees (excluding the CEO), (2) the annual total CEO compensation, and (3) the ratio between these two numbers (SEC, 2015).

The enactment of the pay ratio disclosure mandate was highly controversial, with the SEC receiving more than 287,400 comment letters over the rule (SEC, 2015). Proponents, mostly consisting of pension funds, unions, and shareholder activists, assert that the pay ratio disclosure

[4] Balsam and Liang (2019) document a decline in CEO compensation following pay ratio reform. Our paper differs in that we (1) examine pay-for-performance sensitivity, (2) provide analyses investigating the role of populist pressure and sensationalism, and (3) investigate the economic consequences (for equity prices and media coverage) of pay ratio reform. Boone et al. (2019) alternatively focus on firms' ability to manipulate the measure of median employee pay as part of the pay ratio disclosure.

will inform shareholder decisions (e.g., say-on-pay voting) on CEO pay, root out ineffective pay practices that led to the financial crisis, and eventually reduce income inequality in the U.S. In contrast, critics raise questions about the effectiveness of pay ratio disclosure. They contend that the disclosure will not be comparable across different companies, which substantially limits its informational value (Murphy, 2012). Other commenters point out that the pay ratio disclosure demands high computational costs, especially for multinational companies, in determining pay for the median employee (SEC, 2015).

After an extensive comment period, the SEC adopted the final version of the pay ratio disclosure mandate in August 2015. The final rule dictates that public companies should disclose all requirements described above for fiscal periods beginning on or after January 1, 2017.[5] To comply with the pay ratio disclosure mandate, firms must report the CEO's pay consistent with that disclosed in a summary compensation table in the annual proxy statement, which includes total salary, bonus, equity awards, pension changes, and perquisites. The denominator of the pay ratio reports the firm's median employee compensation. According to the rule, median employees can be determined using either the full population of employees or statistical sampling of employees using the same compensation calculations that apply to the CEO's compensation (SEC, 2015). The median employee must be identified once every three years. Appendix A provides an example pay ratio disclosure for Fleetcor Technologies, Inc. Fleetcor Technologies reports a pay ratio of 1,517:1 based on the total compensation of its CEO ($52,643,810) and median employee ($34,700). In contrast to previous compensation disclosure regulation, the CEO pay ratio does not provide any additional information on the CEO's pay. Instead, it merely provides a benchmark salary for a rank-and-file employee.

[5] The rule does not apply to smaller reporting companies, emerging growth companies, foreign private issuers, multi-jurisdictional disclosure system (MJDS) filers, or registered investment companies (SEC 2015-160).

2.2 Predictions and literature review

We conjecture that pay ratio disclosures will influence executive compensation contracts based on the extent of two primary costs likely to stem from the pay ratio disclosure. First, we consider a cost imposed on the firm and/or board of directors stemming from external pressures arising from public outrage to within-firm pay disparity. Jensen and Murphy (1990) raise a concern that criticism by external parties (such as the media) will be associated with elevated litigation risk, increased demands for concessions from labor unions, and the potential for increased regulation. Consistent with the potential for costly external pressure imposed on the firm in response to pay ratio reform, Sen. Sanders and Rep. Khanna introduced legislation in November 2018 designed to prohibit stock repurchases at companies where the CEO pay ratio is above 150 times the median employee pay.[6] Relatedly, Bebchuk and Fried (2003) argue that board members will respond to external pressures to protect their reputation and public image, which determines their value in the labor market. In line with pressure on board members, contemporaneous literature documents a significant relation between negative say-on-pay votes and the CEO pay ratio (Crawford, Nelson, and Rountree, 2018; Balsam and Liang, 2019). This discussion leads us to predict that increased pressure by external parties (such as the media) to justify compensation should drive boards to proactively alter CEO compensation in ways that limit public outrage. In particular, our costly external pressure hypothesis leads us to predict that boards will reduce the level (or constrain the growth) of CEO compensation following disclosure of the pay ratio.

With respect to pay-for-performance, we expect that two sources of external pressure will lead to declines in incentive-linked pay following the pay ratio reform. Jensen and Murphy (1990) argue that external pressure placed on boards from sources such as the popular press will reduce

[6] For details of the "Stop Welfare for Any Large Monopoly Amassing Revenue from Taxpayers Act of 2018" or the "Stop WALMART" Act, see Bernie Sanders' site: https://www.sanders.senate.gov/download/stop-walmart-act

board members' willingness to provide innovative incentive contracts, thereby weakening the relation between CEO compensation and firm performance. This stems from the potential for incentive-based compensation to deliver large windfall rewards earned ex post by executives, which is highly "visible" to external parties such as the press. Core, Guay, and Larcker (2008) find that the media tends to write articles with negative tone for firms with more option exercises, which they infer is consistent with "sensationalism" regarding incentive compensation. Alternatively, the board may contract upon the adverse effect of increased external pressure on the CEO following pay ratio reform. In this case, the disclosure cost is largely borne by the CEO personally, such that mandated disclosure will lead to a reduction in the extent of "at-risk" compensation as a compensating differential. With respect to public pressure that imposes costs on the CEO, Mas (2017) finds that in a municipal government setting, while the mandated disclosure of top manager salaries leads to a nominal seven percent relative salary decline, there is a sharp increase of 75% in the rate at which managers quit. Mas (2017) argues that these results are consistent with top managers responding to a cost imposed by public aversion to high manager compensation. In our setting of the pay ratio disclosure mandate, the implication of this discussion is that a desire by the board to limit the presence of high ex post payouts and/or the imposition of personal costs on the CEO will result in a decrease in the proportion of incentive compensation "at-risk" for the CEO.

CEO pay ratio disclosures are also likely to bring additional scrutiny of pay disparity *within the firm* (i.e., internal pressure). With respect to pay inequality, existing literature focuses on predictions from two competing theories. Tournament theory (Lazear and Rosen, 1981) argues that the motivating aspects of pay inequality will encourage effort and performance by employees who value the potential for promotions. In contrast, equity theory (Akerlof and Yellen, 1990) predicts that pay inequality will be associated with perceived unfairness in the pay process, thereby

lowering morale and resulting effort and productivity. More recent studies find that these competing predictions can be rationalized by the extent to which pay inequality is explained by underlying economic factors (e.g., differences in productivity across employees). In studies focusing on pay disparities among rank-and-file employees, Card et al. (2012) find that employees with below-median salaries report lower job satisfaction following disclosure of salary information. Similarly, Green and Zhou (2019) find that within-firm base (total) pay inequality is associated with lower (higher) employee morale, which the authors interpret as employees viewing base (but not total) pay through the lens of equity theory. In a randomized study, Breza et al. (2012) find that productivity declines in response to pay inequality are most prevalent when differential productivity is not easily observable.

More relevant to our setting is evidence on the role of pay disparity between lower-level employees and the highest paid employee (i.e., the CEO). Rouen (2019) finds that explained (unexplained) pay disparities between CEOs and employees are associated with better (worse) future firm performance, consistent with a role for both tournament and equity theories in explaining responses to CEO-employee pay disparity. Broadly, this stream of literature suggests that employee productivity responds most negatively to excess or unexplained compensation. Because the pay ratio reveals the gap between CEO and rank-and-file employee compensation, boards should face increasing pressure from employees to justify high CEO compensation and within-firm pay disparity. This leads to a prediction that boards concerned with negative workforce responses to CEO pay ratio disclosures should seek to minimize excess executive compensation and/or provide evidence that executive pay is strongly associated with firm performance to satisfy stakeholders (Park, Nelson, and Huson, 2001). Thus, our internal pressure hypothesis suggests that pay ratio disclosure will influence board contracting by reducing executive pay, by increasing

alignment between executive compensation and performance, or both.

In contrast to the above two sources of expected cost of the pay ratio reform, existing theory and empirical evidence on compensation disclosure emphasizes the role of enhanced monitoring of the executive's performance. These studies find that boards tend to increase the level of CEO pay to offset these monitoring costs (Hermalin and Weisbach, 2012; Park et al., 2001; Balsam et al., 2016; Lu and Shi, 2018; Gipper, 2016). For example, Iliev and Vitanova (2019) investigate the effect of say-on-pay votes on CEO compensation and document that the say-on-pay governance mandate is associated with a rise in CEO compensation. To the extent that the provision of the pay ratio provides new information to stakeholders regarding the relative value created by the CEO, we expect the presence of enhanced monitoring to be associated with increases in compensation following the reform (and/or a decrease in the proportion of incentive compensation "at-risk"). Last, since the pay ratio disclosure provides no new information on a CEO's compensation, we may also observe a null effect. For the pay ratio disclosure to have any impact, boards must expect investors or employees to respond to the newly required disclosure of median employee pay and/or must view the ratio as imposing costs on the CEO or board (that require adjustments to the compensation package). Comment letters submitted to the SEC ahead of the disclosure mandate argue that the pay ratio will provide little (or no) new information with which to evaluate the CEO's performance. As a result, if the pay ratio disclosure both provides limited new information and imposes relatively small costs on the CEO and the firm, we should observe a limited effect of the disclosure mandate on CEO compensation packages. This is ultimately an empirical question.

3. Data and Empirical Strategy

3.1. Data

We examine whether and how pay ratio disclosures affect executive compensation. To do

this, we examine executive compensation and pay-performance sensitivity for firms with fiscal year-ends between December 31, 2013 and November 30, 2018. We begin our sample in 2013 following previous studies that suggest that say-on-pay votes alter the level and composition of executive compensation (e.g., Iliev and Vitanova, 2019). Our sample ends in November 2018 for two reasons. First, this end-date allows us to observe one post-pay ratio disclosure for each firm in our sample (comprising firms with fiscal years ending between December 31, 2017 and November 30, 2018). Second, ending with fiscal 2018 periods avoids the confounding effects of changes to Revenue Code Section 162(m) of the Tax Cut and Jobs Act (TCJA), which is effective for fiscal year-ends beginning on or after January 2018. The TCJA limits the tax deductibility of the executive compensation of its CEO and CFO (along with the third highest-paid executive).[7] See Figure 1 for an illustration of our sample construction.

Our initial sample comprises 1,718 firms with data available on the *Execucomp* database and 16,342 executive-years (covering CEOs and CFOs) for the period 2013-2018. We exclude firms that lack executive compensation details and executives that serve a dual role. After matching remaining CEOs and CFOs within the same firm, the sample consists of 1,613 firms and 12,984 executive-years (6,492 matched pairs) over our sample period. We require each executive-year to have financial statement data from *Compustat* and stock return data from *CRSP*. We also exclude foreign private issuers, smaller reporting companies, emerging growth companies, and firms that do not disclose pay ratios following the mandate. This process yields 11,062 executive-years (5,531 matched pairs). Finally, we limit the sample to a balanced panel in which we observe each firm (matched pair) every year during the sample period to isolate the effects of the pay ratio disclosure from corresponding changes in the sample of firms and/or executives. Our final sample

[7] Prior to the TJCA, Section 162(m) excluded CFOs and tax deductibility limitations were only applicable to non-incentive compensation.

comprises of 560 firms and 5,600 executive years (2,800 matched pairs).

Table 1 presents summary statistics for all variables used in our main analysis. As expected, CEOs display higher mean levels of total compensation and delta than their CFO counterparts. The average CEO (CFO) earned total compensation of $6.7 million ($2.5 million). For a 1% increase in stock price, the average CEO (CFO) earned an additional $551,400 ($109,170) in compensation. Our sample of executives lead large firms, with average (median) total assets of $4.0 ($3.8) billion. These firms are profitable on average, with a 5% mean and median return on assets (*ROA*). The average executive in our sample is 54 years old and has been employed in his or her position for 8 years. Approximately half of our CEOs hold a joint position as chair of the board. Turning to our data that is hand-gathered from proxy statements, we find that the average (median) firm in our sample disclosed a *CEO Pay Ratio* of 168.04 (92), where the median employee pay disclosed in the denominator was approximately $62,000. The disclosed *CEO Pay Ratio* is also subject to substantial variation across firms, with a standard deviation of 234.38.

Table 2 reports Pearson correlations among CEO and CFO compensation variables. Notably, there is a strong positive correlation (0.853) between CEO and CFO total compensation, which is higher than the correlation (0.514) between CEO and director compensation documented by Brick et al. (2006). Similarly, CEO delta is also strongly correlated with CFO delta (0.590). The stronger correlation between CEO and CFO compensation variables than the correlations between the CEO and other executives/directors lends additional validity to our use of CEO-CFO matched pairs in our difference-in-differences design.

3.2 Empirical design

We estimate the following regression to test our hypotheses:

$$[Compensation\ Outcome]_{it} = \alpha_t + \beta_1 CEO_i + \beta_2 CEO_i \times Post_t + \sum \beta_i \textbf{Controls} + \gamma_i + \varepsilon_{it} \quad (1)$$

We use two measures of *Compensation Outcome* as dependent variables in Eq. (1) in our main analyses. To examine the effect of pay ratio disclosures on the level of CEO compensation, our first dependent variable is the natural logarithm of inflation-adjusted total executive *Compensation.* The pay ratio rule requires firms to compute median employee pay in the same manner used to compute total compensation for the CEO in the summary compensation table in the proxy statement. We use the TOTAL_ALT1 field from *Execucomp* to measure total executive compensation.[8] To examine the effect on pay-performance sensitivity, we define delta as the sensitivity of an executive's wealth to a one percent change in stock price (Core and Guay, 2002; Coles et al., 2006). We calculate delta using the Black-Scholes (1973) option-pricing model modified by Merton (1973).[9] Because prior literature shows that the compensation distribution is skewed (e.g., Frydman and Jenter, 2010), we take the natural logarithm of our compensation variables: *Ln(Compensation)* and *Ln(Delta)*.

To implement our difference-in-differences design, we define an indicator variable, *CEO*, set to one (zero) when the executive is a CEO (CFO). We utilize CFOs as our control group given that previous financial reporting and compensation disclosure regulations treat CEOs and CFOs in a similar manner. *Post* is an indicator variable set to one when a firm's fiscal year ends on or after December 31, 2017 to capture the first fiscal period in which pay ratio disclosures are required in proxy statements, and to zero otherwise. Our coefficient of interest is β_2, the interaction of *CEO* and *Post*. This interaction isolates the differential effect of pay ratio disclosure on CEOs relative to CFOs.[10]

[8] TOTAL_ALT1 uses the grant date fair value of equity-based compensation regardless of whether equity-based compensation vests, while TOTAL_SEC (total compensation as reported in SEC filings) includes the estimated fair value of only equity-based compensation that vests (Hopkins and Lazonick, 2016). We use TOTAL_ALT1 instead of TOTAL_SEC in order to isolate the compensation changes induced by the pay ratio disclosure.
[9] See Coles et al. (2006) and Coles et al. (2013) for additional details on the computation of delta.
[10] In terms of the main effects in Eq. (1), the coefficient for the *Post* indicator is subsumed by the inclusion of year-fixed effects (α_t) included to capture time-series variation in executive compensation packages over the full sample

Following previous studies on executive compensation, we also include a vector of controls for economic determinants of executive compensation, including firm size (*Size*), book-to-market (*BTM*), financial leverage (*Leverage*), return on assets (*ROA*), stock returns (*Stock return*), and stock return volatility (*Volatility*). We also control for executive characteristics including employment tenure (*Tenure),* executive age (*Age*), percentage of shares owned *(Ownership),* and firms where CEOs also serve as chair of the board (*CEO duality*), since these factors, along with other firm characteristics, affect firms' monitoring needs and directors' job difficulty (Brick et al., 2006).[11] Along with year-fixed effects, our empirical specifications alternate between industry- (Fama-French 48 industry) and firm-fixed effects (γ_i) to control for time-invariant unobservable factors across industries or across firms that may affect executive compensation. Finally, we winsorize all continuous variables at the top and bottom percentiles separately by year to limit the effects of potential outlying observations.

4. Main Results

4.1. Univariate evidence on executive compensation surrounding the pay ratio disclosure

As an initial step in investigating the effect of pay ratio disclosure on CEO compensation, we first examine the time-series of CEO and CFO compensation during the sample period. Figure 2, Panel A confirms the strong upward trend in the mean values of both CEO and CFO *Ln(Compensation)* during our sample period. The co-movement of CFO and CEO compensation levels in the pre-disclosure period provides descriptive evidence that CFOs serve as a reasonable control group in our study. Our identification strategy focuses on the trajectory of CEO compensation relative to that of CFO compensation following pay ratio reform. As compared to

period. The coefficient on the *CEO* indicator will reflect average compensation differences between CEOs and CFOs in the pre-pay ratio disclosure period.

[11] Refer to Appendix B for details of variable construction and data sources.

CFO compensation, the mean natural logarithm of CEO compensation exhibits a relatively smaller increase following pay ratio implementation. Figure 2, Panel B compares time trends of mean *Ln(Delta*) during our sample period. As is the case with total compensation, CEO and CFO delta move in similar directions during the pre-disclosure period, exhibiting parallel trends. However, following pay ratio reform, CEO delta declines whereas CFO delta increases. These results provide preliminary evidence for our hypotheses. Our subsequent empirical and cross-sectional analyses attempt to isolate the effect of the CEO pay ratio disclosure mandate on executive compensation.

4.2. Multiple regression tests of total compensation around the pay ratio disclosure

Table 3 reports results of estimating Eq. (1). The dependent variable is the natural log of inflation-adjusted executive compensation from *Execucomp, Ln(Compensation)*. Our independent variable of interest is the interaction of $CEO_i \times Post_{it}$, which takes the value of one for CEOs during the post-disclosure period and zero otherwise. All regressions include year-fixed and either industry- or firm-fixed effects. We cluster standard errors by firm and all p-values reported rely on two-tailed tests.

Consistent with the time-series pattern in Figure 2, Table 3 shows that the pay gap between CEOs and CFOs declines following pay ratio reform. Model (1) provides a difference-in-differences estimate without control variables. In model (1), the coefficient on $CEO_i \times Post_{it}$ is negative and statistically significant. Our results are virtually unchanged when we include firm and executive characteristics as controls in model (2). In models (3) and (4), we find similar statistical evidence of a relative decline in compensation for CEOs when we include firm-fixed effects. The coefficient of $CEO_i \times Post_{it}$ in model (4) of Table 3 is -0.029 and statistically significant (p-value < 0.10). In terms of economic significance, annual CEO compensation drops by a modest 2.9% ($e^{-0.029}$–1) relative to CFO compensation in model (4) when firms begin

providing pay ratio disclosures.

This evidence of a nominal decline in CEOs' relative compensation lies in contrast to the bulk of evidence in previous studies, which indicate that exogenously imposed disclosure requirements are often followed by unexpected increases in executive compensation (e.g., Hermalin and Weisbach, 2012; Murphy, 2012; Park, Nelson, and Huson, 2001; Balsam et al., 2016; Lu and Shi, 2018; Gipper, 2016). However, evidence of a nominal relative decline in CEO compensation in Table 3 is consistent with concerns in Murphy and Jensen (2018) that the pay ratio disclosure provides a mechanism through which "uninvited guests" will be induced to shame boards into lowering CEO pay via public aversion to high executive pay and with empirical evidence on the role of public disclosure of top municipal manager salaries (Mas, 2017).

4.3. Multiple regression tests of pay-performance sensitivity around the pay ratio disclosure

After observing a decline in total compensation, we next examine whether the pay ratio disclosure differentially impacts CEO pay-for-performance sensitivity. On the one hand, Jensen and Murphy (1990) argue that compensation disclosure is likely to incite media criticism, potential shareholder litigation, and enhanced regulation targeting firms with highly-compensated managers. These costs stemming from external pressure on board members should lead reputation-conscious and/or risk-averse directors to resist offering incentive-laden contracts or lead boards to compensate the CEO for costs imposed by public aversion to pay disparity. On the other hand, the new disclosure should induce boards to increase alignment between CEO compensation and performance to the extent they are responding to internal pressure from employees to justify within-firm pay disparity (e.g., Green and Zhou, 2019; Breza et al., 2012).

Table 4 reports the results of models for pay-for-performance sensitivity. Here our dependent variable is the natural logarithm of inflation-adjusted delta, *Ln(Delta)*. As is the case

with the level of compensation, Table 4's regression results corroborate the time-series patterns observed in Figure 2, Panel B. In model (1), we document a statistically significant 11.6% decrease ($e^{-0.123}$–1) in logged delta for CEOs relative to CFOs following the implementation of the pay ratio reform (p-value < 0.01). Results are consistent with this relative decline in CEO delta when we include firm and executive characteristics as controls in model (2) and firm-fixed effects in models (3) and (4), though these models display reduced statistical significance. Across the columns, our results suggest that CEO pay-performance sensitivity decreases by approximately 6.5% ($e^{-0.067}$–1) to 11.6% ($e^{-0.123}$–1) relative to CFOs in the pay ratio regime.

Our results in Table 4 show that the pay ratio disclosure is followed by a reduction in pay-performance sensitivity, consistent with reduced incentive alignment between boards and managers. Murphy and Jensen (2018) argue that the pay ratio disclosure does not provide useful information, and its sole purpose is to shame boards into lowering CEO compensation. Several comment letters received by the SEC similarly question the informational value of the pay ratio disclosure (SEC, 2015). If the pay ratio serves as a means to direct populist pressure towards executive compensation contracts, then the simultaneous declines in CEO compensation and pay-performance sensitivity are most consistent with our external pressure hypothesis. However, we conduct several additional tests to further explore whether internal pressures from the firm's workforce drive boards to modify executive compensation.

5. External Pressure on CEO Compensation

In this section, we further explore whether our results can be interpreted in light of Jensen and Murphy's (1990) political pressure argument. To do so, we first decompose total compensation into its cash and non-cash components, under the premise that non-cash components of compensation receive more negative populist criticism from the media and regulators. We then

attempt to partition our treatment sample into those boards that are more versus less sensitive to external and internal pressures to limit within-firm pay disparity.

5.1 Decomposing total compensation into cash and non-cash components

We split executive compensation into its cash (salary and bonus) and non-cash (e.g., options, equity, pension, and perquisites) components. This follows an argument that non-cash compensation receives more populist criticism than cash compensation via sensational reporting by the media following large *ex post* payouts in periods of rising equity values (i.e., Core, Guay, and Larcker, 2008). However, the pay inequality literature arrives at a different conclusion, where pay disparity is more acceptable to employees when it is justified by performance (e.g., Breza et al., 2012).

Table 5 examines the change in compensation composition, using the ratio of cash-based to total compensation, *Cash Compensation (%)*, as the dependent variable in a model estimated following Eq. (1). In model (1), we observe that the proportion of cash-based compensation increases for CEOs relative to CFOs following pay ratio reform. In economic terms, the proportion of cash-based compensation increases by 0.8% ($e^{0.008}$–1) for CEOs relative to CFOs under the pay ratio regime. These findings are robust to the inclusion of controls in model (2) and firm-fixed effects in model (3).[12] While including both firm-fixed effects and controls in model (4) yields a similar coefficient estimate to models (1) – (3), the coefficient in model (4) is not statistically significant at conventional levels (t-statistic = 1.59). These results provide some evidence that compensation that is more sensitive to populist criticisms (e.g., options, perquisites) becomes a relatively smaller part of CEOs' pay packages following the pay ratio disclosure mandate. Further,

[12] In tests untabulated for brevity, we find that there is a relative decline in the levels of both cash and non-cash compensation for CEOs following pay ratio reform. Specifically, non-cash compensation declines by 5% to 6%, while cash compensation declines by a lower proportion, approximately 3% relative to CFO compensation.

this result contrasts with the pay disparity literature that finds that employee morale is most sensitive to differential base pay inequality (e.g., Green and Zhou, 2019). To the extent cash compensation proxies for disparities in base pay, results in Table 5 are more consistent with external pressure, rather than internal pressure from employees, explaining executive compensation responses to the pay ratio reform.

5.2 Executive compensation and cross-sectional variation in external vs. internal pressure

We next conduct several cross-sectional tests in an attempt to isolate firms that are more sensitive to populist pressure or to internal pressure from employees. To measure the extent of external pressure on the board, we follow previous studies suggesting that the media pursues sensational coverage when reporting on CEO compensation (e.g., Core, Guay, and Larcker, 2008). In Table 6, we partition our firms based on the extent of prior-year media coverage using data from *Ravenpack*. Data available via the *Ravenpack Analytics* database covers a wide array of traditional and new media sources, representing a broad measure of media attention for our sample firms. Models (1) and (3) of Table 6 isolate firms with above-median counts of full articles appearing on *Ravenpack* over the prior fiscal year, while models (2) and (4) report results for firms with below-median full article counts. We find that firms with relatively greater pressure from external (non-stakeholder) sources are more responsive to pay ratio reform. Results in Panel A of Table 6 show that the level of CEO compensation declines by 5.9% ($e^{-0.061}$–1) to 6.1% ($e^{-0.063}$–1) relative to CFOs at firms with greater media coverage. Similarly, Panel B shows a relative decline in CEO compensation delta of 13.3% ($e^{-0.143}$–1) to 13.4% ($e^{-0.144}$–1) at firms with greater media coverage. In contrast, we observe economically small and statistically insignificant coefficients on *CEO*×*Post* for our low media coverage firms in Panels A and B. Time-series analysis in Figure 3 confirms that the differential response to pay ratio reform for CEO and CFO pay packages appears

isolated to firms receiving higher media coverage. Panels A and B of Figure 3 show that CEOs at high media coverage firms experience decreases in total compensation and pay-performance sensitivity under the pay ratio regime, whereas CFOs actually experience increases.[13]

Next, we examine whether the board's response to pay ratio reform is differentially influenced by the level of rank-and-file employee pay within a firm, consistent with pressure to limit perceptions of unfair within-firm pay disparities. We posit that firms with lower-paid median employees (relative to the average for the firm's industry) should face elevated pressure to limit within-firm pay disparity. While firms could address this disparity by altering pay for the median employee, we conjecture that altering CEO pay is easier for a firm to accomplish than raising the pay of its median employee in the near-term.

We hand-collect the median employee wage from the denominator of the CEO pay ratio from each firm's first proxy statement filed following the pay ratio disclosure mandate. We then split our sample into those firms with above- and below-median industry-adjusted median employee pay, following evidence that industry membership is important for explaining variation in rank-and-file employee pay (e.g., Rouen, 2019). Table 7 presents results of estimating Eq. (1) separately for samples of above- and below-median industry-adjusted median employee pay.[14] If the push to change executive compensation is originating from concerns regarding employee morale, we expect those effects to be most salient for firms who pay their employees less than their industry peers. Across models (1) – (4) in Panel A of Table 7, we observe a similar insignificant

[13] As an alternative to sorting on media coverage, we use firm size as an empirical proxy for political pressure by splitting our sample based on total assets (Watts and Zimmerman, 1986; Jensen and Murphy, 1990). Results of these tests show similar results to a split based on media coverage, with large firms displaying coefficients on *CEO×Post* that are negative and statistically significant in models for *Ln(Compensation)* (coeff. = -0.058, p-value < 0.05) and *Ln(Delta)* (coeff. = -0.145, p-value < 0.05) in models that include firm-fixed effects. In contrast, we find no evidence that CEO compensation at small firms differentially changes relative to CFOs following pay ratio reform.

[14] The Spearman correlation between lagged media coverage and industry-adjusted median employee pay is 0.15, consistent with our sorts in Tables 6 and 7 capturing distinct groups of firms.

coefficient on the *CEO* × *Post* interaction term (ranging between -0.026 and -0.036), consistent with limited variation in CEO compensation responses across firms based on the extent of internal pressure to limit pay disparity. Examining pay-performance sensitivity in Panel B provides similar evidence of limited differences in CEO delta responses across models (1) – (4) (coefficients ranging from -0.049 to -0.088). We infer that our proxy for the extent of internal pressure to limit within-firm pay disparity is insignificantly associated with CEO compensation responses to pay ratio reform.

Overall, our results show that negative associations between the pay ratio disclosure and both total compensation and pay-for-performance sensitivity are concentrated in firms exposed to higher pressure from external sources, such as the media or politicians. Further, while a decline in CEO compensation may accomplish a particular objective of a subset of regulators in favor of the pay ratio disclosure mandate, a decline in pay-for-performance sensitivity suggests a deterioration in shareholder-manager alignment following the disclosure mandate.

6. Additional Analyses

6.1 Test for parallel trends

To effectively implement a difference-in-differences design, we verify that the parallel trends assumption is valid in order to ensure that we are not capturing a general time trend (Angrist and Pischke, 2008; Atanasov and Black, 2016). In our setting, CEO and CFO compensation should exhibit similar co-movements during the pre-disclosure period in order to ensure that changes in CEO compensation are in response to the pay ratio disclosure itself. We estimate the following regression for the pre-disclosure period (covering fiscal year-ends between December 1, 2013 and November 30, 2017) to test whether the parallel-trends assumption is satisfied:

$$[Compensation\ Outcome]_{it} = \beta_0 + \beta_1 CEO_i + \beta_2 (CEO_i \times Time_t) + \beta_3 Time_t + \boldsymbol{\beta Controls} + \gamma_i + \varepsilon_{it,} \quad (2)$$

where $Time_t$ is a count variable ranging from 1 to 4 corresponding to each year in the pre-disclosure period (e.g., time takes the value of 4 for the fiscal year-ends between December 31, 2016 and November 30, 2017). CEO_i is an indicator taking the value of one if executive *i* is a CEO and zero otherwise. If there are parallel trends during the pre-disclosure period, then the coefficient on *CEO* × *Time* should be insignificantly different from zero. Table 8 presents the results of estimating Eq. (2). In models (1) and (2) examining *Ln(Compensation),* coefficients on *CEO* × *Time* are insignificantly different from zero, which indicates that the total compensation of CEOs and CFOs does not display differing trends during the pre-disclosure period. We find similar evidence in models (3) and (4) for *Ln(Delta)*. As a result, we infer that our pre-disclosure periods satisfy the parallel trends assumption.

6.2 Cross-firm responses to the staggered adoption of the pay ratio disclosure mandate

One concern with our primary analysis is that CEO and CFO compensation may be subjected to similar pressures to adjust compensation to limit pay disparity following the pay ratio reform, such that CFOs do not serve as a plausible control sample. To shed light on this possibility, we searched Factiva for news articles mentioning "pay ratio" and/or "median employee" over the July 2017 - January 2020 period on U.S. sources. We exclude news wires to avoid capturing firm-initiated press releases. This search yields 1,488 (non-duplicate) articles. Of these articles, 1,235 (83.0%) mention the CEO explicitly (with the remaining articles largely reflecting general discussions of compensation regulation and trends). In contrast, only 130 (8.7%) of the articles mention the CFO. While these statistics suggests that CFO compensation is subject to substantially less media attention following the pay ratio reform relative to CEO compensation, it does appear that CFOs are subjected to some degree of media attention following the pay ratio reform.

Given the potential for scrutiny of CFO compensation post-pay ratio reform, as an

alternative to our main analysis, we exploit the timing of the pay ratio disclosure mandate, which takes effect for all fiscal periods beginning on or after January 1, 2017. This implementation means that firms with a December 31, 2017 fiscal year-end adopted the pay ratio disclosure up to 11 months before firms with fiscal years ending outside of December. Given this, we examine the level and pay-for-performance sensitivity at firms with a December fiscal year-end when compared to firms with fiscal years ending in June through November to isolate firms with a similar reporting period, but with differing exposure to the implementation of pay ratio reform. We restrict the sample to Execucomp firms with fiscal years ending in June through December each year with data available for CEO compensation over our 2013 to 2017 sample period. Relative to our main analysis that requires the same CEO-CFO pair over the 2013-2017 sample period, we do not require the same CEO to be present or that CFO compensation is available, resulting in an increase in the number of firms included in this test to 912 firms per year (of which, 764 have December fiscal year-ends). We then employ a difference-in-differences specification using CEO compensation, whereby firms with fiscal years ending on December 31 are assigned to the treatment sample (*Treat* = 1) while firms with fiscal years ending in June – November serve as the control sample (*Treat* = 0). We set an indicator variable, *Post*, to one for all observations in calendar year 2017 to reflect the implementation of the pay ratio reform for the initial set of firms with fiscal periods ending on December 31, 2017, and equal to zero otherwise. Our interest is in the *Treat* × *Post* interaction term, which will reflect the difference in CEO compensation for December fiscal year-end firms in the initial adoption period of the pay ratio reform.

Results reported in Table 9 provide some evidence that *Ln(Compensation)* declines for CEOs at December fiscal year-end firms in the calendar year of the adoption. Estimates in model (1) that omits firm-level controls and in model (2) that includes controls show average declines of

7.9% ($e^{-0.082}$-1) and 6.9% ($e^{-0.071}$-1), respectively, in CEO compensation at December fiscal year-end firms. However, the effect is not statistically significant at conventional levels when we include the full set of control variables in column (2) (p-value < 0.15). Turning to results for *Ln(Delta)* in models (3) and (4) shows that firms with December fiscal year-ends display significant declines in pay-performance in the adoption period for the pay ratio reform. The coefficient on *Treat* × *Post* in model (4) that includes firm-level controls shows a decline of 18.5% ($e^{-0.205}$-1) in delta at firms subject to the pay ratio disclosure mandate, representing a larger decline in economic terms relative to our primary analysis of CEO-CFO compensation differences. Broadly, results of our cross-firm tests complement our primary analysis by confirming a relatively modest decline in the level of CEO compensation combined with a substantial decline in delta.

6.3 Economic consequences of the pay ratio disclosure mandate

Next, we expand our analysis to investigate the capital market consequences to pay ratio reform beyond compensation contracts. Core, Guay, and Larcker (2008) find that excess annual pay for CEOs leads to more negative media coverage. We investigate whether the pay ratio disclosure attracts both media attention and is associated with negative market returns around the proxy filing date. To do so, we begin by estimating the following Logit model using the first proxy filings following the pay ratio disclosure mandate:

$$Pr(Proxy\ Media_i = 1) = \beta_0 + \beta_1 CEO\ Pay\ Ratio_i + \beta_2 Media\ Coverage_i + \boldsymbol{\beta Controls} + \varepsilon_{it} \quad (3)$$

Our dependent variable in Eq. (3) is *Proxy Media*$_i$, an indicator variable set to one in cases where a compensation-related article or news flash that is written about firm *i* (captured by a "relevance" score of 100) appears on *Ravenpack* (based on the article "type" classification) in the 11-trading day window centered on the proxy statement issuance, and equal to zero otherwise.[15] Summary

[15] For this test, we are forced to drop 83 firms that file their 2018 proxy statement on or after September 24, 2018 given the vintage of our instance of the *Ravenpack Analytics* database.

statistics in Table 1 show that 22% of our sample of firms with data available around the proxy filing obtain a compensation-related media article or news flash (*Proxy Media* = 1). *CEO Pay Ratio*$_i$ measures the disclosed value of the pay ratio in the first proxy filed following the disclosure mandate. We continue to control for the firm and executive characteristics included in Eq. (1), along with a control for the 12-month count of full media articles appearing on *Ravenpack* during the fiscal period preceding the proxy filing, *Media Coverage*. Including *Media Coverage* in the model isolates the role of the proxy filing on media coverage that focuses on the compensation-related aspects of this disclosure separate from more general media attention centered on the firm. We cluster standard errors in this model by Fama-French 48 industry.

In model (1) of Table 10, we find a positive and statistically significant relation between the likelihood a firm receives a compensation-related news article and the magnitude of the disclosed *CEO Pay Ratio*. This relation with *CEO Pay Ratio* is attenuated when we add a control for fiscal-period *Media Coverage* in model (2), but remains statistically significant (β_1 coeff. = 0.001, p-value < 0.05). This relation is further robust when we include our battery of firm- and executive-level controls in model (3) (β_1 coeff. = 0.001, p-value < 0.01). The β_1 coefficient estimate in model (3) suggests that for a one-standard deviation move in the *CEO Pay Ratio* of 234.38, we observe a predicted 26.5% increase in the odds of receiving a compensation-related media article in the weeks surrounding the proxy filing ($e^{0.001*234.38}$). This evidence in Table 10 suggests that the media are significantly more likely to write a compensation-related article for firms disclosing large pay ratios following the disclosure mandate. This evidence aligns with contemporaneous research by Boone et al. (2019) showing that firms disclosing higher pay ratios experience negative media coverage and shareholder voting dissent on compensation.

To determine whether results in Table 10 are consistent with our conjecture that pay ratio

disclosures generate negative "sensational" coverage by the media, our final empirical analysis examines whether shareholder response to the proxy statement varies with the disclosed pay ratio using the following model:

$$CAR_{[-5,+5]} = \beta_0 + \beta_1 CEO\_Pay\ Ratio_i + \beta_2 Media\ Coverage_i + \boldsymbol{\beta Controls} + \varepsilon_{it} \quad (4)$$

$CAR_{[-5,+5]}$ is the eleven-day cumulative abnormal return (estimated using the Fama-French three-factor model) centered on the proxy statement date. We expect to observe a significant market response to the pay ratio disclosure reflected in *CAR* if the following conditions hold: (1) shareholders are surprised relative to the expected pay ratio, and (2) shareholders believe that either the pay ratio itself is informative and/or that the magnitude of the pay ratio will invite external pressure that increases compensation contracting frictions. Because median employee pay is unobservable prior to the pay ratio disclosure, the expectation model for the disclosed pay ratio is unclear *ex ante*. Given this, we use the disclosed pay ratio (*CEO Pay Ratio*) to proxy for the pay ratio "news" released in the proxy statement.

Table 11 provides results of estimating Eq. (4). In model (1), we find an insignificant *average* market response to disclosed CEO pay ratios in the proxy statement using the 11-day return window that corresponds to our measurement of compensation-related media coverage in Table 10. In models (2) and (3), we split our sample based on pre-disclosure levels of media coverage measured by lagged 12-month full article counts available from *Ravenpack*, with above-(below-) median coverage firms appearing in model (2) ([3]). Model (2) of Table 11 shows that equity prices respond negatively to the pay ratio disclosure, but only for those firms with above-median press coverage. In particular, the β_1 coefficient estimate in model (2) suggests that a one-standard deviation increase in the *CEO Pay Ratio* leads to a 0.70% lower *CAR* in the eleven-day window surrounding the pay ratio disclosure (0.003 * 234.38). In contrast, shareholders do not

appear to respond to the pay ratio disclosure in the low media coverage subsample. We obtain similar results when we split our sample in models (4) and (5) based on the presence of a compensation-related media article received during the 11-trading day window surrounding the proxy filing (*Proxy Media*). For firms receiving a compensation-related article surrounding the proxy filing in model (4) (*Proxy Media* = 1), abnormal returns reflected in *CAR* are significantly lower for firms disclosing higher *CEO Pay Ratio* values, with a β_1 estimate that is in line with that estimated for model (3) (β_1 coeff. = –0.003, p-value < 0.10). More broadly, our evidence of elevated media coverage combined with adverse equity market reactions for firms disclosing higher CEO pay ratios complements our main analysis by confirming the presence of external populist pressure on these firms.

6.4 Employee responses to the pay ratio disclosure mandate

Our final set of tests examine whether employees respond to pay ratio disclosures that indicate high within-firm pay disparity by departing the firm and/or limiting their productivity in response to perceived unfairness in compensation. Table 12 presents results of cross-sectional tests using firms' initial reporting period following the pay ratio disclosure mandate. Models (1) and (2) examine option forfeitures (*EE Turnover*$_{t+1}$) as a proxy for employee turnover (see Carter and Lynch, 2004). Core and Guay (2001) find evidence that options are granted extensively to non-executive employees, consistent with option forfeitures reflecting turnover among non-executive roles. In contrast to elevated employee turnover in response to higher CEO pay ratios, evidence in model (1) shows that option forfeitures as a proportion of options outstanding at the beginning of the year are significantly *lower* for firms with higher pay ratios (coeff. = -0.004, p-value < 0.01). This relation is attenuated in model (2) that includes firm-level controls, but remains negative. While this evidence suggests limited turnover in response to pay disparity, we caveat that

employees with option grants may be more similar to top executives than to the median employee in terms of their responses to within-firm pay disparity. Turning to models (3) and (4) for *Labor Productivity*$_{t+1}$, measured by annual sales revenue scaled by beginning-of-year number of employees, shows that this measure of on average labor productivity is significantly lower for firms reporting higher CEO pay ratios. This estimate remains significant after including firm-level controls in model (4) (coeff. = -0.835, p-value < 0.01), providing evidence in favor of concerns over reduced labor productivity in response to pay disparities disclosed via the CEO pay ratio.

7. Conclusion

As growth in executive compensation outpaced that of rank-and-file employees over recent decades, media and regulatory scrutiny of executive pay packages intensified. This scrutiny culminated in the requirement that firms provide a comparison of their CEO's total compensation to the median employee's total compensation. Advocates for the pay ratio regulation opined that executives are earning "runaway" compensation relative to the average worker and that this ratio improves compensation transparency. Opponents of the requirement lamented that this disclosure generates sensational press coverage but does not enhance shareholders' information sets.

Our research setting is unique in that the pay ratio provides no new information on a CEO's compensation; rather it discloses the total compensation of the median employee as a comparison figure in a firm's annual proxy statement. Using CFO compensation packages as a benchmark, we find CEO total compensation is relatively lower following pay ratio reform. Further, we find evidence that pay-for-performance sensitivity also declines for CEOs relative to CFOs after the pay ratio reform, leading to a weaker link between stock performance and executive compensation. These shifts in CEO compensation packages are concentrated in firms with more extensive media coverage and are robust to exploiting cross-firm variation in response to the adoption timeline of

the disclosure reform. Further, we find that firms ultimately disclosing higher CEO pay ratios receive elevated media coverage that is associated with negative equity market reactions in the presence of this elevated media coverage, consistent with external populist pressure on these firms. We also document an association between the disclosure of higher CEO pay ratios and decreased labor productivity, consistent with the notion that pay disparity within the firm can contribute to lower employee morale. More broadly, our results provide some of the first evidence of the consequences of the pay ratio disclosure mandate, pointing to reduced incentive alignment and sensational media coverage of CEO pay following the reform.

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Appendix A
Example Pay Ratio Disclosure

This appendix provides an example of the mandatory pay ratio disclosure from Fleetcor Technologies, Inc. in its prospectus statement (DEF 14A) issued April 27, 2018. The quantitative portion of the pay ratio disclosure is bolded below for expositional purposes.

2017 CEO PAY RATIO

As required by item 402(u) of Regulation S-K, the compensation, nominating, and corporate governance committee reviewed a comparison of our CEO's annual total compensation in fiscal year 2017 to that of all other Company employees for the same period. We identified our median employee by annualizing December 2017 pay for all individuals, excluding our CEO, who were employed by us on December 31, 2017 whether on a full-time, part-time, or seasonal basis, and calculating total employee compensation using the same methodology we use for our named executive officers in the 2017 Summary Compensation Table above. We did not make any cost-of-living adjustments when identifying our median employee. We applied a foreign currency to U.S. dollar exchange rate to the compensation paid in foreign currency.

The annual total compensation for fiscal year 2017 for our CEO was $52,643,810 as noted in the table above, and for our median employee it was approximately $34,700. The resulting ratio of our CEO's pay to the pay of our median employee for fiscal year 2017 is 1,517 to 1. This pay ratio is a reasonable estimate calculated in good faith, in a manner consistent with Item 402(u) of Regulation S-K, based on our payroll and employment records and the methodology described above. The Securities and Exchange Commission ("SEC") rules for identifying the "median employee" and calculating the pay ratio based on that employee's annual total compensation allow companies to adopt a variety of methodologies, to apply certain exclusions, and to make reasonable estimates and assumptions that reflect their compensation practices. As such, the pay ratios reported by other companies may not be comparable to the pay ratio set forth above, as other companies may have different employment and compensation practices and may utilize different methodologies, exclusions, estimates and assumptions in calculating their own pay ratios.

Appendix B
Variable Definitions and Data Sources

Variable	Definition	Source
CEO	An indicator variable set to one (zero) when the executive is a CEO (CFO).	Execucomp
Post	An indicator variable equal to one when the firm fiscal year ends on or after December 31, 2017, and equal to zero otherwise.	
Ln(Compensation)	Natural logarithm of executive compensation (*Total_alt1*), where compensation is reported in constant (2012) dollars adjusted for inflation using the consumer price index (CPI).	Execucomp
Ln(Delta)	Natural logarithm of the dollar sensitivity of executive wealth to a one percent change in stock price (Core and Guay, 2002; Coles et al., 2006) measured in constant dollars adjusted for inflation.	Execucomp
Size	Natural logarithm of the book value of assets at the beginning of the fiscal year.	Compustat
BTM	Ratio of the book value of total assets to the market value of assets at the beginning of the fiscal year.	Compustat
Leverage	Ratio of the book value of total debt (short- and long-term) to the market value of assets at the beginning of the fiscal year.	Compustat
Stock Return	Annualized market-adjusted monthly stock returns from the prior year, computed as the difference between firm-level stock returns and value-weighted returns to the CRSP market index.	CRSP
ROA	Income before extraordinary items scaled by book value of assets from the prior year.	Compustat
Volatility	Standard deviation of five annual observations of annualized monthly stock returns ending with the prior year.	CRSP
CEO duality	Indicator variable set equal to one if the CEO serves as a board chairperson at the beginning of the year, and to zero otherwise.	Execucomp
Tenure	The number of years the executive has held the position as of the beginning of the fiscal year.	Execucomp
Age	Executive age as of the beginning of the fiscal year.	Execucomp
Ownership	Percentage of shares owned by the executive at the beginning of the fiscal year.	Execucomp
Time	A count variable ranging from 1 to 4 corresponding to each year in the pre-disclosure period for fiscal years ending December 31 through November 30 (e.g., *Time* takes the value of 5 for fiscal year ends between Dec 31, 2016 and Nov 30, 2017).	
Media Coverage	The count of full media articles appearing during the 12-month fiscal period across all sources tracked by *Ravenpack* in its Analytics Edition.	Ravenpack
Proxy Media	An indicator variable set to one for firms with a full article or news flash written specifically about the firm (captured by a "relevance" score of 100) appearing in the 11-trading day period beginning one week prior to the filing of the firm's annual proxy statement on any source tracked by *Ravenpack* in its Analytics Edition with a "type" classified as 'executive-compensation', 'executive-salary', 'executive-incentives', or 'workforce-salary', and to zero otherwise.	Ravenpack
Median Employee Pay	Denominator of the mandated pay ratio disclosure. CEO pay ratio data come from the Equilar database supplemented with hand-collected CEO pay ratio data from the firm's proxy statement for firms with missing data in Equilar.	Proxy statement, Equilar
Ind Adj Median Employee Pay	*Median Employee Pay* less the average median employee pay for the firm's Fama-French 48 industry.	Proxy statement, Equilar
Cash Compensation (%)	Ratio of inflation-adjusted cash compensation (the sum of salary and bonus) to total compensation.	Execucomp
CEO pay ratio	Ratio of the total CEO compensation to the median employee total compensation. CEO pay ratio data come from the Equilar database supplemented with hand-collected CEO pay ratio data from the firm's proxy statement for firms with missing data in Equilar.	Proxy statement, Equilar
$CAR_{[-5,+5]}$	Cumulative abnormal returns for the 11-trading day window centered on the filing of the annual proxy statement. Abnormal returns are estimated using the Fama-French (1993) three-factor model.	CRSP
$EE\ Turnover_{t+1}$	Number of stock options cancelled or terminated during the year, multiplied by 100, and scaled by the number of options outstanding at the beginning of the year (see Carter and Lynch, 2004).	Compustat
$Labor\ Productivity_{t+1}$	Revenues in millions of dollars scaled by the number of employees at the beginning of the year.	Compustat

Figure 1
Timeline for pre- and post-disclosure windows during our sample period

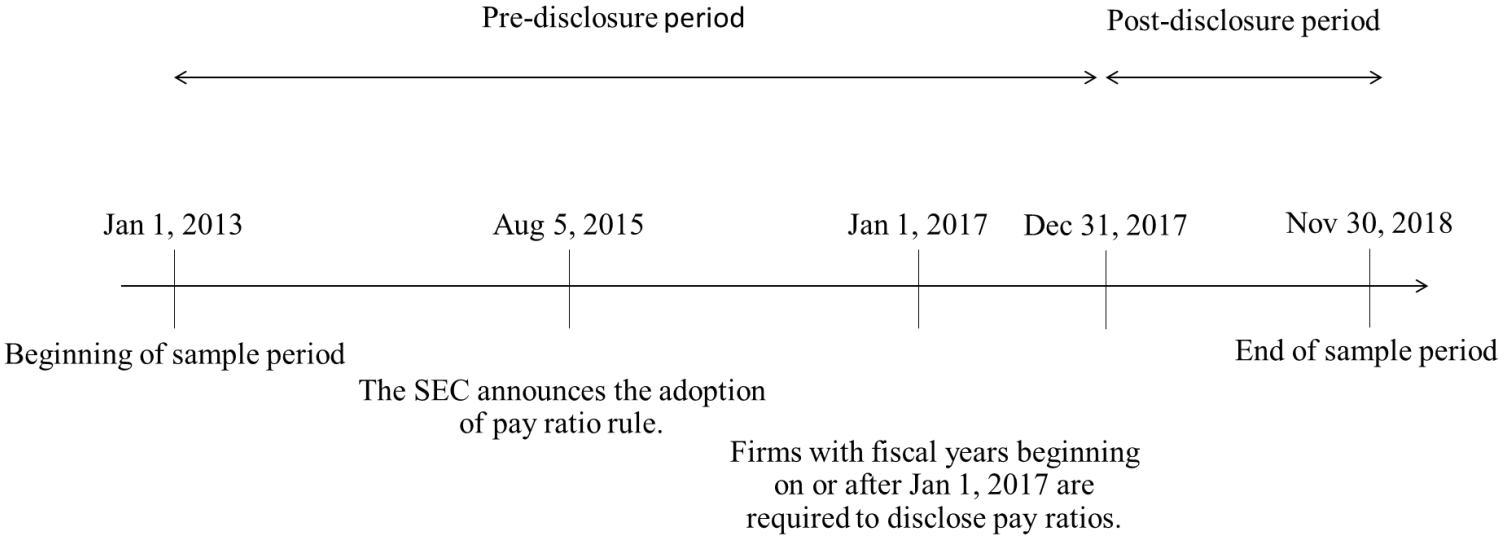
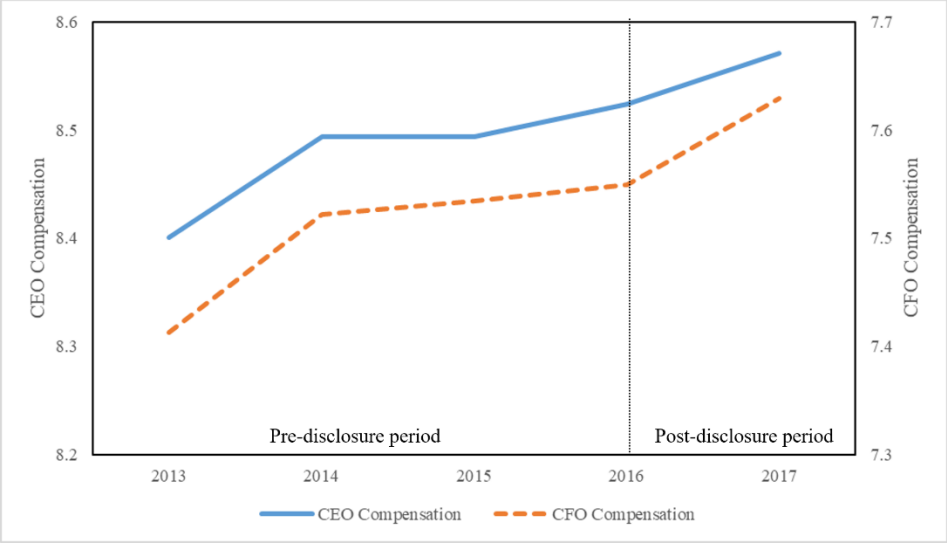


Figure 2
Time-Series Variation in Executive Compensation

This figure provides descriptive evidence on the yearly averages for the natural logarithm of CEO (solid line, left y-axis) and CFO (dashed line, right y-axis) compensation variables over our sample period. Panel A (Panel B) displays the yearly averages for the log of the inflation-adjusted compensation levels (delta). Each year on the x-axis reports the proxy statement calendar-year. The post-disclosure period captures 2018 proxy statements, which provide the mandated pay ratio disclosure for fiscal years beginning on or after January 1, 2017. Refer to Appendix B for variable definitions and data sources.

Panel A. *Ln(Compensation)*



Panel B. *Ln(Delta)*

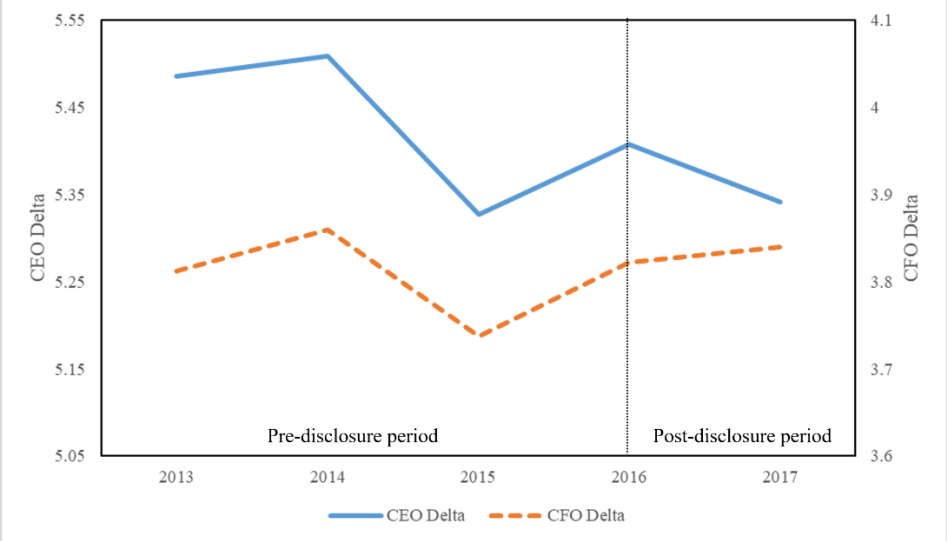
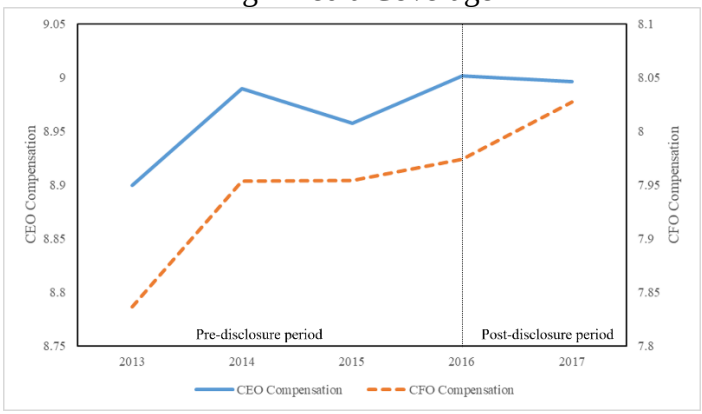


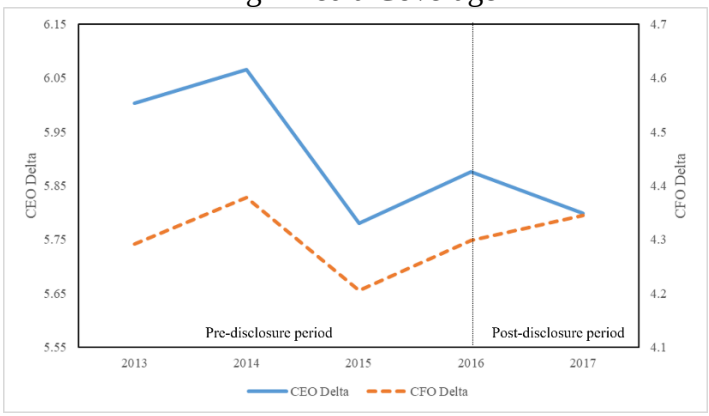
Figure 3
Cross-Sectional Variation in Executive Compensation by Media Coverage

This figure provides descriptive evidence on the yearly averages of the natural logarithm of CEO (solid line, left y-axis) and CFO (dashed line, right y-axis) compensation variables over our sample period. Panels A – D partition the sample based on median media coverage. Panels A and C plot time-series variation in inflation-adjusted total compensation levels, whereas Panels B and D plot compensation delta. Each year on the x-axes reports the proxy statement calendar-year. The post-disclosure period captures 2018 proxy statements, which provide the mandated pay-ratio disclosure for fiscal years beginning on or after January 1, 2017. Refer to Appendix B for variable definitions and data sources.

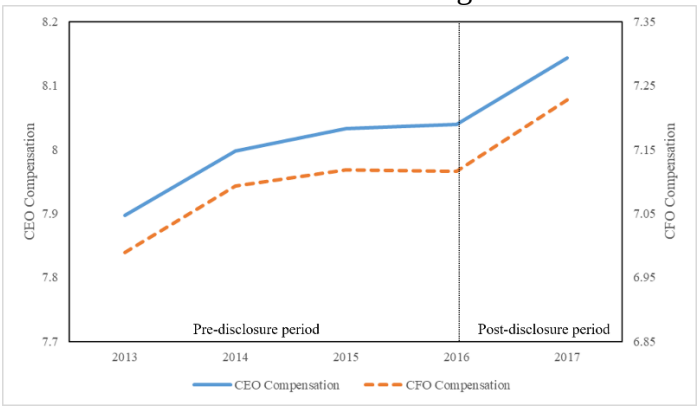
Panel A.
Ln(Compensation)
High Media Coverage



Panel B.
Ln(Delta)
High Media Coverage



Panel C.
Ln(Compensation)
Low Media Coverage



Panel D.
Ln(Delta)
Low Media Coverage

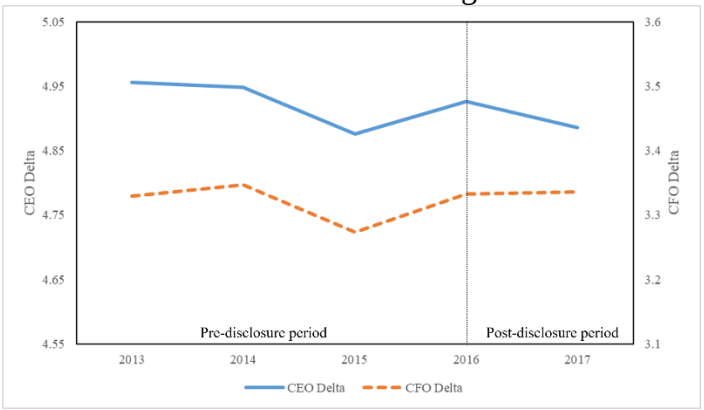


Table 1
Summary statistics

Table 1 reports the summary statistics of variables used in analysis. The sample comprises of 5,600 executive-year observations, with the exception of firm-year variables measured for the first proxy statement filed following the pay ratio disclosure mandate (*CEO Pay Ratio*, *Proxy Media*, $CAR_{[-5,+5]}$, *EE* $Turnover_{t+1}$, and *Labor* $Productivity_{t+1}$) for a subsample of firms with data available on returns from CRSP, compensation-related media coverage from *Ravenpack* during the 11-trading day window surrounding the proxy filing, option forfeiture data available from Compustat, or number of employees from Compustat (see Tables 10 – 12 for details). Total compensation and delta are reported in thousands of dollars. The cumulative abnormal return over the 11-trading day window surrounding the filing of the annual proxy statement, $CAR_{[-5,+5]}$, is multiplied by 100 to appear in percentage terms. Refer to Appendix B for details on variable measurement and data sources.

	Mean	Median	Std. Dev
CEO Total Compensation	6,669.72	5,149.65	5,230.92
CEO Ln(Total Compensation)	8.50	8.55	0.83
CEO Delta	551.40	218.37	944.20
CEO Ln(Delta)	5.41	5.39	1.39
CFO Total Compensation	2,487.30	1,808.30	2,296.37
CFO Ln(Total Compensation)	7.53	7.50	0.75
CFO Delta	109.17	45.35	345.52
CFO Ln(Delta)	3.81	3.84	1.29
Size	8.30	8.24	1.71
BTM	0.79	0.70	0.44
Leverage	0.27	0.20	0.27
ROA	0.05	0.05	0.07
Stock Return	0.05	0.03	0.27
Volatility	0.33	0.28	0.23
CEO duality	0.52	1.00	0.50
Tenure	8.00	7.00	5.15
Age	54.35	54.00	6.64
Ownership (%)	0.62	0.12	1.78
Media Coverage	208.99	161.00	186.86
Median Employee Pay	71,342.71	62,255.00	44,907.51
CEO Pay Ratio	168.04	92.00	234.38
Proxy Media	0.22	0	0.42
$CAR_{[-5,+5]}$ *(%)*	0.36	0.54	5.53
EE $Turnover_{t+1}$	5.50	2.08	10.11
Labor $Productivity_{t+1}$	898.741	384.797	1,739.890

Table 2
Pearson correlations

Table 2 provides Pearson correlations between CEO and CFO compensation variables. The sample consists of 5,600 executive-year observations over our 2013-2018 sample period. All correlations in the table are statistically significant at a 1% level (two-tailed p-values unreported for brevity). Refer to Appendix B for details on variable measurement and data sources.

	CEO Compensation	*CEO Delta*	*CFO Compensation*	*CFO Delta*
CEO Compensation	1.000			
CEO Delta	0.454	1.000		
CFO Compensation	0.853	0.431	1.000	
CFO Delta	0.501	0.590	0.603	1.000

Table 3
Total compensation

Table 3 reports the results of difference-in-differences models that estimate changes in the level of executive compensation around pay ratio disclosure reform. The dependent variable is the natural logarithm of inflation-adjusted executive compensation available from the *Execucomp* database, *Ln(Compensation*). *CEO* is an indicator variable set to one (zero) if the executive is a CEO (CFO). *Post* is an indicator variable equal to one when a firm's fiscal year ends on or after December 31, 2017, and equal to zero otherwise. Refer to Appendix B for details on remaining variable measurement and data sources. In models (1) and (2), we control for year- and Fama-French 48 industry-fixed effects. In models (3) and (4), we control for year- and firm-fixed effects. Standard errors are clustered at the firm level. t-statistics are in parentheses below each coefficient. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
CEO	0.973***	0.962***	0.973***	0.923***
	(66.02)	(53.31)	(62.88)	(55.08)
CEO × *Post*	-0.031*	-0.033**	-0.031*	-0.029*
	(-1.93)	(-2.06)	(-1.84)	(-1.72)
Size		0.375***		0.110**
		(32.89)		(2.12)
BTM		-0.121		-0.202***
		(-1.62)		(-3.65)
Leverage		-0.039		-0.059
		(-0.53)		(-1.45)
Tenure		0.007**		0.011***
		(2.48)		(4.88)
Age		0.001		0.003
		(0.45)		(1.45)
Ownership		-0.021*		-0.004
		(-1.83)		(-0.36)
ROA		0.500		0.018
		(1.63)		(0.10)
Stock Return		0.161***		0.118***
		(4.83)		(4.53)
Volatility		0.085		-0.047
		(1.33)		(-1.03)
CEO duality		0.006		-0.023
		(0.19)		(-0.95)
Constant	7.421***	4.308***	7.420***	6.513***
	(241.50)	(26.39)	(549.27)	(15.31)
Industry FEs	Yes	Yes	No	No
Firm FEs	No	No	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Adjusted R^2	0.358	0.717	0.855	0.860
Observations	5,600	5,600	5,600	5,600

Table 4
Pay-for-performance sensitivity

Table 4 reports the results of difference-in-differences models that estimate changes in pay-for-performance sensitivity around pay ratio disclosure reform. The dependent variable is the natural logarithm of inflation-adjusted pay-for-performance sensitivity, *Ln*(*Delta*). *CEO* is an indicator variable set to one (zero) if the executive is a CEO (CFO). *Post* is an indicator variable equal to one when a firm's fiscal year ends on or after December 31, 2017, and equal to zero otherwise. Refer to Appendix B for details on variable measurement and data sources. In models (1) and (2), we control for year- and Fama-French 48 industry-fixed effects. In models (3) and (4), we control for year- and firm-fixed effects. Standard errors are clustered at the firm level. t-statistics are in parentheses below each coefficient. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
CEO	1.625***	1.132***	1.625***	1.099***
	(36.80)	(28.64)	(35.04)	(28.99)
CEO × Post	-0.123***	-0.068*	-0.123***	-0.067*
	(-2.88)	(-1.82)	(-2.74)	(-1.75)
Size		0.458***		0.140*
		(22.78)		(1.93)
BTM		-0.543***		-0.397***
		(-3.78)		(-3.26)
Leverage		-0.212		-0.119
		(-1.57)		(-1.54)
Tenure		0.068***		0.076***
		(12.26)		(14.13)
Age		0.001		0.006
		(0.30)		(1.31)
Ownership		0.251***		0.236***
		(17.71)		(12.15)
ROA		1.986***		0.611**
		(3.61)		(2.00)
Stock Return		0.319***		0.225***
		(5.27)		(4.23)
Volatility		-0.088		-0.023
		(-0.76)		(-0.24)
CEO duality		0.099*		-0.025
		(1.78)		(-0.50)
Constant	3.837***	0.011	3.837***	2.315***
	(75.60)	(0.04)	(114.13)	(3.68)
Industry FEs	Yes	Yes	No	No
Firm FEs	No	No	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Adjusted R^2	0.319	0.633	0.725	0.803
Observations	5,600	5,600	5,600	5,600

Table 5
Cash vs. non-cash compensation

Table 5 reports the results of difference-in-differences models that estimate changes in compensation structure around pay ratio disclosure reform. The dependent variable is the ratio of inflation-adjusted cash compensation (the sum of salary and bonus) to total compensation (Total_Alt1) available from Execucomp. *CEO* is an indicator variable set to one (zero) if the executive is a CEO (CFO). *Post* is an indicator variable equal to one when a firm's fiscal year ends on or after December 31, 2017, and equal to zero otherwise. Refer to Appendix B for details on variable measurement and data sources. In models (1) and (2), we control for year- and Fama-French 48 industry-fixed effects. In models (3) and (4), we control for year- and firm-fixed effects. Standard errors are clustered at the firm level. t-statistics are in parentheses below each coefficient. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
CEO	-0.085***	-0.098***	-0.085***	-0.081***
	(-26.41)	(-16.95)	(-25.15)	(-21.32)
CEO × Post	0.008*	0.010**	0.008*	0.007
	(1.79)	(2.23)	(1.70)	(1.59)
Size		-0.053***		-0.018
		(-16.98)		(-1.41)
BTM		0.037*		0.034*
		(1.90)		(1.76)
Leverage		0.014		0.024*
		(0.61)		(1.75)
Tenure		-0.000		-0.001
		(-0.18)		(-1.34)
Age		0.001**		0.000
		(2.43)		(0.20)
Ownership		0.008**		-0.002
		(2.31)		(-0.90)
ROA		-0.073		-0.048
		(-0.96)		(-0.95)
Stock Return		-0.042***		-0.034***
		(-4.48)		(-3.78)
Volatility		0.012		0.005
		(0.60)		(0.36)
CEO duality		0.009		0.013
		(1.08)		(1.40)
Constant	0.329***	0.648***	0.329***	0.432***
	(42.91)	(14.92)	(75.18)	(4.27)
Industry FEs	Yes	Yes	No	No
Firm FEs	No	No	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Adjusted R^2	0.128	0.338	0.693	0.697
Observations	5,600	5,600	5,600	5,600

Table 6
Media coverage and CEO compensation

Table 6 reports results of models estimated separately for firms with above- and below-median media coverage based on articles appearing on any source covered by *Ravenpack*'s Analytics Edition. In odd- (even-) numbered models, the subsample comprises firms whose lagged 12-month full-article counts (*Media Coverage*) are above (below) the median value. In Panel A, the dependent variable is the natural logarithm of inflation-adjusted total compensation, *Ln(Compensation)*. In Panel B, the dependent variable is the natural logarithm of inflation-adjusted pay-for-performance sensitivity, *Ln(Delta)*. *CEO* is an indicator variable set to one (zero) if the executive is a CEO (CFO). *Post* is an indicator variable equal to one when a firm's fiscal year ends on or after December 31, 2017, and equal to zero otherwise. Refer to Appendix B for details on variable measurement and data sources. In models (1) and (2), we control for year- and Fama-French 48 industry-fixed effects. In models (3) and (4), we control for year- and firm-fixed effects. Coefficients for control variables consistent with those in Tables 3 – 5 and fixed effects are suppressed for ease of presentation. Standard errors are clustered at the firm level. t-statistics are in parentheses below each coefficient. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A. *Ln(Compensation)*

Subsample	(1) *High Media Coverage*	(2) *Low Media Coverage*	(3) *High Media Coverage*	(4) *Low Media Coverage*
CEO	0.998***	0.908***	0.986***	0.857***
	(41.50)	(36.16)	(42.65)	(37.60)
CEO × Post	-0.063**	-0.002	-0.061**	0.006
	(-2.36)	(-0.08)	(-2.17)	(0.27)
Controls	Yes	Yes	Yes	Yes
Industry FEs	Yes	Yes	No	No
Firm FEs	No	No	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Adjusted R^2	0.698	0.605	0.826	0.825
Observations	2,782	2,774	2,782	2,774

Panel B. *Ln(Delta)*

Subsample	(1) *High Media Coverage*	(2) *Low Media Coverage*	(3) *High Media Coverage*	(4) *Low Media Coverage*
CEO	1.145***	1.105***	1.142***	1.056***
	(19.77)	(23.15)	(20.07)	(21.82)
CEO × Post	-0.143**	0.014	-0.144**	0.015
	(-2.51)	(0.26)	(-2.39)	(0.25)
Controls	Yes	Yes	Yes	Yes
Industry FEs	Yes	Yes	No	No
Firm FEs	No	No	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Adjusted R^2	0.585	0.629	0.755	0.814
Observations	2,782	2,774	2,782	2,774

Table 7

Industry-adjusted median employee pay and CEO compensation

Table 7 reports results of models estimated separately for firms with above- and below-median industry-adjusted median employee pay (*Ind Adj Median Employee Pay*). *Ind Adj Median Employee Pay* is defined as a firm's *Median Employee Pay* less the equal-weighted average *Median Employee Pay* for the firm's Fama-French 48 industry. In odd- (even-) numbered models, the subsample comprises firms whose *Ind Adj Median Employee Pay* is above (below) the median value. In Panel A, the dependent variable is the natural logarithm of inflation-adjusted total compensation, *Ln(Compensation)*. In Panel B, the dependent variable is the natural logarithm of inflation-adjusted pay-for-performance sensitivity, *Ln*(*Delta*). *CEO* is an indicator variable set to one (zero) if the executive is a CEO (CFO). *Post* is an indicator variable equal to one when a firm's fiscal year ends on or after December 31, 2017, and equal to zero otherwise. Refer to Appendix B for details on variable measurement and data sources. In models (1) and (2), we control for year- and Fama-French 48 industry-fixed effects. In models (3) and (4), we control for year- and firm-fixed effects. Coefficients for control variables consistent with those in Tables 3 – 5 and fixed effects are suppressed for ease of presentation. Standard errors are clustered at the firm level. t-statistics are in parentheses below each coefficient. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A. *Ln(Compensation)*

Subsample	(1) *High Ind Adj Median Employee Pay*	(2) *Low Ind Adj Median Employee Pay*	(3) *High Ind Adj Median Employee Pay*	(4) *Low Ind Adj Median Employee Pay*
CEO	0.961***	0.949***	0.939***	0.910***
	(37.63)	(35.55)	(37.52)	(40.29)
CEO × Post	-0.036	-0.029	-0.033	-0.026
	(-1.46)	(-1.38)	(-1.28)	(-1.19)
Controls	Yes	Yes	Yes	Yes
Industry FEs	Yes	Yes	No	No
Firm FEs	No	No	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Adjusted R^2	0.736	0.728	0.846	0.873
Observations	2,800	2,800	2,800	2,800

Panel B. *Ln(Delta)*

Subsample	(1) *High Ind Adj Median Employee Pay*	(2) *Low Ind Adj Median Employee Pay*	(3) *High Ind Adj Median Employee Pay*	(4) *Low Ind Adj Median Employee Pay*
CEO	1.125***	1.125***	1.120***	1.080***
	(19.35)	(21.48)	(19.60)	(21.69)
CEO × Post	-0.049	-0.087	-0.049	-0.088
	(-1.02)	(-1.51)	(-1.00)	(-1.47)
Controls	Yes	Yes	Yes	Yes
Industry FEs	Yes	Yes	No	No
Firm FEs	No	No	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Adjusted R^2	0.632	0.657	0.793	0.812
Observations	2,800	2,800	2,800	2,800

Table 8
Parallel trends test

Table 8 reports the results of tests for parallel trends over the pre-pay ratio disclosure period. In models (1) and (2), the dependent variable is the natural logarithm of inflation-adjusted executive compensation, *Ln(Compensation*). In models (3) and (4), the dependent variable is the natural logarithm of inflation-adjusted pay-for-performance sensitivity, *Ln(Delta*). *CEO* is an indicator variable set to one (zero) if the executive is a CEO (CFO). *Time* is a count variable ranging from 1 to 4 corresponding to each year in the pre-disclosure period for firms with fiscal years ending December 31 through November 30 (e.g., *Time* takes a value of 4 for fiscal year-ends between December 31, 2016 and November 30, 2017). Refer to Appendix B for details on variable measurement and data sources. In models (1) and (2), we control for year- and Fama-French 48 industry-fixed effects. In models (3) and (4), we control for year- and firm-fixed effects. Standard errors are clustered at the firm level. t-statistics are in parentheses below each coefficient. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
Dep. Variable	*Ln(Compensation)*	*Ln(Compensation)*	*Ln(Delta)*	*Ln(Delta)*
CEO	0.977***	0.931***	1.199***	1.158***
	(41.01)	(40.74)	(21.83)	(20.80)
CEO × Time	-0.006	-0.005	-0.021	-0.021
	(-0.99)	(-0.79)	(-1.43)	(-1.34)
Time	0.015**	0.025***	-0.075***	-0.063***
	(2.12)	(2.79)	(-4.99)	(-3.70)
Size	0.379***	0.084	0.449***	0.162*
	(32.35)	(0.91)	(21.72)	(1.85)
BTM	-0.127	-0.227***	-0.494***	-0.275**
	(-1.62)	(-3.65)	(-3.41)	(-2.14)
Leverage	-0.015	-0.024	-0.134	-0.042
	(-0.18)	(-0.46)	(-0.89)	(-0.55)
Tenure	0.007**	0.012***	0.067***	0.074***
	(2.10)	(4.71)	(11.41)	(11.86)
Age	0.002	0.004	0.001	0.007
	(0.73)	(1.64)	(0.22)	(1.53)
Ownership	-0.021*	-0.004	0.239***	0.229***
	(-1.89)	(-0.40)	(17.13)	(11.55)
ROA	0.539*	0.149	1.904***	0.060
	(1.69)	(0.68)	(3.43)	(0.17)
Stock Return	0.174***	0.099***	0.366***	0.221***
	(4.54)	(3.23)	(5.15)	(4.19)
Volatility	0.055	-0.098**	-0.077	0.025
	(0.87)	(-1.99)	(-0.63)	(0.23)
CEO duality	0.002	-0.003	0.102*	-0.055
	(0.07)	(-0.09)	(1.76)	(-0.97)
Constant	4.243***	6.692***	0.076	2.030***
	(25.39)	(9.09)	(0.24)	(2.76)
Industry FEs	Yes	No	Yes	No
Firm FEs	No	Yes	No	Yes
Adjusted R^2	0.723	0.868	0.636	0.816
Observations	4,480	4,480	4,480	4,480

Table 9

Staggered implementation of the pay ratio reform across firms and CEO compensation

Table 9 reports the results of tests restricting the sample to firms with fiscal year-ends between June 30 and December 31. We employ a difference-in-differences specification whereby firms with fiscal years ending on December 31 are assigned to the treatment sample (*Treat* = 1) while firms with fiscal years ending in June – November serve as the control sample (*Treat* = 0). *Post* is an indicator variable set to one for all observations in calendar year 2017, and to zero otherwise. In this way, we use the staggered implementation of pay ratio reform to isolate the sample of December 31, 2017 fiscal year-end firms that are required to adopt the pay ratio reform first during the 2018 proxy season, measured by the *Treat* × *Post* interaction. The dependent variable in columns (1) and (2) is the natural logarithm of inflation-adjusted executive compensation available from the *Execucomp* database, *Ln(Compensation*). The dependent variable in columns (3) and (4) is the natural logarithm of inflation-adjusted pay-for-performance sensitivity, *Ln*(*Delta*). Refer to Appendix B for details on remaining variable measurement and data sources. We control for year- and Fama-French 48 industry-fixed effects. Standard errors are clustered at the firm level. t-statistics are in parentheses below each coefficient. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	Ln(Compensation)	*Ln(Compensation)*	*Ln(Delta)*	*Ln(Delta)*
Treat	0.004	0.017	0.004	0.085
	(0.06)	(0.38)	(0.04)	(1.08)
Treat × Post	-0.082*	-0.071	-0.161*	-0.205***
	(-1.69)	(-1.43)	(-1.76)	(-2.61)
Size		0.374***		0.424***
		(33.55)		(21.56)
BTM		-0.173***		-0.786***
		(-2.67)		(-6.05)
Leverage		0.012***		0.022***
		(5.57)		(6.00)
Tenure		0.002		0.069***
		(0.65)		(12.65)
Age		0.002		0.001
		(0.57)		(0.29)
Ownership		-0.028***		0.175***
		(-3.75)		(12.97)
ROA		0.286		1.618***
		(1.58)		(5.13)
Stock Return		0.141***		0.257***
		(4.33)		(4.91)
Volatility		0.035		-0.036
		(1.16)		(-0.86)
CEO duality		0.111***		0.189***
		(3.53)		(3.40)
Constant	8.394***	5.256***	5.453***	1.526***
	(124.03)	(25.01)	(51.73)	(5.07)
Year FEs	Yes	Yes	Yes	Yes
Industry FEs	Yes	Yes	Yes	Yes
Observations	4,560	4,560	4,560	4,560

Table 10
Proxy statement disclosure and firm-level media coverage

Table 10 reports the results of cross-sectional Logit models that estimate the effect of disclosed CEO pay ratios on the likelihood of receiving compensation-related media coverage during the 11-trading day window beginning one week prior to the filing of the first annual proxy statement that follows the pay ratio disclosure mandate. The dependent variable is an indicator, *Proxy Media*, set equal to one when a compensation-related article or news flash appears on *Ravenpack*'s Analytics database in the 11-trading day window centered on the proxy statement issuance based on articles with a "type" classified as 'executive-compensation', 'executive-salary', 'executive-incentives', or 'workforce-salary', and to zero otherwise. *CEO Pay Ratio* is the CEO pay ratio disclosed in the first proxy statement filed following the pay ratio reform. Models (2) and (3) include a control for lagged 12-month full-article counts available from *Ravenpack*'s Analytics Edition (*Media Coverage*). Refer to Appendix B for details on variable measurement and data sources for remaining controls. We present area under the receiver operating characteristic (ROC) curve as a measure of Logit model fit. t-statistics clustered by Fama-French 48 industry appear in parentheses below each coefficient. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)
Dependent Variable	*Proxy Media*	*Proxy Media*	*Proxy Media*
CEO Pay Ratio	0.002***	0.001**	0.001***
	(3.353)	(2.451)	(2.659)
Media Coverage		0.005***	0.001
		(6.074)	(1.553)
Size			0.587***
			(3.605)
BTM			-1.676**
			(-1.987)
Leverage			1.297
			(1.387)
Tenure			0.037
			(1.584)
Age			0.039
			(1.311)
Ownership			-0.360***
			(-3.195)
ROA			-0.249
			(-0.141)
Stock Return			-0.352
			(-0.536)
Volatility			-0.628
			(-0.760)
CEO duality			0.745**
			(2.365)
Constant	-1.560***	-2.778***	-8.818***
	(-9.113)	(-13.052)	(-4.062)
ROC	0.741	0.813	0.867
Observations	477	477	477

Table 11

Equity market reaction to mandatory pay ratio disclosures in the annual proxy statement

Table 11 reports the results of cross-sectional models that estimate the equity market reaction to CEO pay ratio disclosure. The dependent variable is the 11-day cumulative abnormal return, $CAR_{[-5,+5]}$, measured in percentage terms centered on the filing date for the first proxy statement filed following the pay ratio disclosure mandate. Abnormal returns are estimated as the residuals from the Fama-French three-factor model. Estimation in model (1) uses the full sample of 477 firm observations with data available to measure abnormal returns from CRSP and media coverage from Ravenpack during the 11-trading day window surrounding the proxy filing. Estimation in model (2) ([3]) uses a subsample comprising firms whose lagged 12-month full-article counts available from *Ravenpack*'s Analytics Edition (*Media Coverage*) are above (below) the median value. Estimation in model (4) ([5]) uses a subsample comprising firms with a compensation-related media article or news flash appearing on *Ravenpack*'s Analytics Edition during the 11-trading day window surrounding the proxy filing, *Proxy Media* = 1 (all remaining firms, *Proxy Media* = 0). *CEO Pay Ratio* is the pay ratio disclosed in the first proxy statement filed following the pay ratio disclosure mandate. Refer to Appendix B for details on variable measurement and data sources. t-statistics clustered by Fama-French 48 industry appear in parentheses below each coefficient. *, **, and *** indicate significance at the 10%, 5%, and 1% levels respectively.

	(1)	(2)	(3)	(4)	(5)
Subsample	*Full Sample*	*High Media Coverage*	*Low Media Coverage*	*Proxy Media = 1*	*Proxy Media = 0*
Dependent Variable	$CAR_{[-5,+5]}$	$CAR_{[-5,+5]}$	$CAR_{[-5,+5]}$	$CAR_{[-5,+5]}$	$CAR_{[-5,+5]}$
CEO Pay Ratio	-0.001	-0.003**	0.001	-0.003*	-0.001
	(-0.94)	(-2.45)	(0.59)	(-1.78)	(-0.46)
Media Coverage	0.000	0.001	-0.003	-0.000	0.002
	(0.08)	(0.92)	(-0.24)	(-0.13)	(0.43)
Size	0.016	-0.345	-0.023	-0.111	-0.099
	(0.05)	(-0.91)	(-0.06)	(-0.20)	(-0.24)
BTM	0.626	0.931	0.942	-0.016	0.908
	(0.43)	(1.09)	(0.48)	(-0.01)	(0.58)
Leverage	-0.960	-1.245	-1.129	-1.488	-0.869
	(-0.77)	(-0.92)	(-0.63)	(-0.81)	(-0.60)
Tenure	-0.048	-0.088	0.019	-0.047	-0.024
	(-0.96)	(-1.31)	(0.24)	(-0.71)	(-0.39)
Age	0.010	0.027	-0.018	-0.075	0.019
	(0.24)	(0.49)	(-0.31)	(-0.76)	(0.43)
Ownership	-0.410**	-0.545	-0.368*	0.379	-0.474**
	(-2.32)	(-1.54)	(-1.76)	(1.10)	(-2.47)
ROA	-5.844	-16.659	8.782	-16.251	-5.604
	(-0.54)	(-1.64)	(0.81)	(-1.68)	(-0.46)
Stock Return	-0.121	0.005	0.345	-4.900	0.567
	(-0.10)	(0.00)	(0.25)	(-1.60)	(0.45)
Volatility	1.683	-1.543	3.551	-4.934**	2.769
	(0.89)	(-0.80)	(1.49)	(-2.21)	(1.30)
CEO duality	0.171	-0.349	0.463	-0.036	0.270
	(0.28)	(-0.67)	(0.49)	(-0.04)	(0.33)
Constant	0.175	5.000	-0.382	9.901*	-0.738
	(0.06)	(1.16)	(-0.10)	(1.76)	(-0.19)
Adjusted R^2	0.014	0.100	-0.011	0.075	0.015
Observations	477	237	240	107	370

Table 12
Pay ratio disclosure and employee responses

Table 12 reports the economic consequences to pay ratio reform in the year following the pay ratio disclosure. The dependent variable in columns (1) and (2) is *EE Turnover*$_{t+1}$, which is defined as the number of stock options that are cancelled or terminated during the year scaled by the number of stock options outstanding at the beginning of the year, reported in percentage terms. The dependent variable in columns (3) and (4) is *Labor Productivity*$_{t+1}$, which is defined as revenues (in millions of dollars) scaled by the number of employees at the beginning of the year. *CEO Pay Ratio* is the ratio of the CEO's compensation to that of the median employee disclosed in the first proxy statement filed following the pay ratio reform. Refer to Appendix B for details on variable measurement and data sources for remaining controls. t-statistics clustered by Fama-French 48 industry appear in parentheses below each coefficient. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) *EE Turnover*$_{t+1}$	(2) *EE Turnover*$_{t+1}$	(3) *Labor Productivity*$_{t+1}$	(4) *Labor Productivity*$_{t+1}$
CEO Pay Ratio	-0.004***	-0.003	-1.100*	-0.835***
	(-2.87)	(-1.45)	(-1.92)	(-2.89)
Size		-0.365		93.773
		(-0.76)		(0.88)
BTM		6.072		1465.616*
		(0.79)		(1.78)
Leverage		15.987		-121.167
		(1.33)		(-0.20)
Tenure		-0.227		-1.787
		(-1.68)		(-0.26)
Age		0.083		-22.238
		(0.80)		(-1.35)
Ownership		0.513		46.520
		(0.90)		(1.07)
ROA		-14.331		703.661
		(-1.08)		(0.34)
Stock Return		-3.160		-110.599
		(-1.12)		(-0.38)
Volatility		-1.612		182.566
		(-0.38)		(0.44)
CEO duality		-0.550		-46.671
		(-0.28)		(-0.27)
Constant	7.396***	2.541	1159.873***	406.050
	(7.11)	(0.31)	(2.95)	(0.32)
Adjusted R^2	0.005	0.074	0.020	0.132
Observations	341	341	542	542