Spinning the CEO Pay Ratio Disclosure

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Abstract

The SEC recently mandated disclosure of the CEO pay ratio, which is the annual compensation of the CEO scaled by that of the median employee. We examine pay ratio disclosures to ascertain how managers use discretion afforded by the SEC to potentially shape the stakeholder reception. Firms with higher pay ratios overall or within an industry tend to use more exemptions that influence the reported employee pay. Their disclosures also contain lengthier pay ratio narratives and have a greater propensity to use corporate spin language in describing its construction. In turn, disclosing higher pay ratios attracts negative media attention, increases shareholder voting dissent on executive compensation, and diminishes labor productivity. The use of spin exacerbates these outcomes. Much of the stakeholder reaction stems from the unexpected portion of the pay ratio and its components. Our findings shed light on the real effects of disclosing information about the gap between executive and employee compensation. Managers attempt to assuage negative perceptions of reporting high vertical pay disparity, but these efforts are not successful.

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1. Introduction

A large and growing disparity exists between the remuneration of chief executive officers (CEOs) and rank-and-file workers. This differential has generated strong debate among politicians, regulators, and economists. The pay gap, some claim, is evidence that CEOs extracted greater rents, while employees experienced stagnating wages, despite a sustained period of economic expansion and high corporate earnings (Palladino, 2019). Others suggest that labor market differences between CEOs and non-executives limits comparability of their total compensation (Edmans, 2017). Yet, for most firms, the opacity of worker pay practices has constrained the ability of external parties to precisely assess within-firm vertical pay disparity and its effects.

Congress, as part of the 2010 Dodd-Frank Act, responded to the call for more information on firm-level pay practices and potential disparities by tasking the U.S. Securities and Exchange Commission (SEC) to promulgate regulation requiring firms to report the pay of the median employee and the ratio of the CEO's total compensation to this value (the "CEO pay ratio"). The regulation does not alter or constrain compensation at the firm, so its potential influence stems from enhancing transparency on median worker wages, while also providing a summary value that concisely quantifies vertical pay disparity.[1]

The CEO pay ratio provision of Dodd-Frank was quite contentious. While other rules, like Say-On-Pay (SOP), were quickly adopted, pay ratio disclosure did not become effective until 2018. Some critics contend that the ratio provides little, if any, substantive incremental information due to the flexibility of the disclosure rule and differences in organizational structure (Murphy and Jensen, 2018; Bank and Georgiev, 2019). Extensive lobbying efforts, however, imply that both advocates and detractors believe that the disclosure could be impactful.

Using a broad sample of Russell 3000 firms in the U.S. during the 2018 and 2019 proxy filing years, our paper sheds light on the consequences of the CEO pay ratio disclosure. We first estimate the

[1] For example, a Harvard Business School article discussing the CEO pay ratio notes, "We can expect a deluge of stories comparing the compensation ratios for various CEOs. Reporters won't even have to do the math behind the stories." See https://hbswk.hbs.edu/item/will-transparency-in-ceo-compensation-have-unintended-consequences.

economic determinants of the pay ratio and comparability within industries. Next, we examine managerial discretion in constructing and disclosing the newly reported metric and its underlying components, particularly, the median worker pay. We then conduct a textual analysis of the pay ratio narrative and examine the propensity to spin the disclosure in a positive manner. Finally, we explore consequences of pay ratio disclosure and the use of spin on the stakeholders of the firm by studying changes in media coverage, shareholder SOP voting, and labor productivity.

In the first reporting year, the mean (median) pay ratio is 150-to-1 (70-to-1) with the mean (median) ratio rising to 174-to-1 (78-to-1) in the second year. The underlying values of the ratio are a CEO compensation mean (median) of $6.7 ($4.6) million in reporting year one and $8.3 ($5.1) million in reporting year two, while the median employee earns a mean (median) salary of $80,300 ($63,000) in the first reporting year and $81,000 ($64,400) in the second. Thus, overall, compensation for CEOs increased by a greater percentage than it did for median workers in reporting year two.

We begin our analyses by modeling the pay ratio and its components – CEO and employee pay. We then calculate the marginal contribution to the goodness of fit for each explanatory variable to assess which factors better explain variation in the observed values. We find that firm size explains significant variation in CEO pay, followed by industry affiliation. In contrast, industry explains the greatest variation in median employee pay. These results support arguments that CEO pay depends more on large geographic labor markets (Edmans et al., 2017), while worker pay corresponds more to an industry labor market.

Importantly, over 75% of the explained component of the reported pay ratio is attributable to industry factors. This finding implies that there is at least some comparability of the ratio across firms within an industry. Our modeling of the pay ratio also allows us to decompose it into expected and unexpected components (Rouen, 2019), which we use to examine whether firms with higher than expected ratios exhibit differential disclosure and stakeholder outcomes.

We next examine the properties of pay ratio disclosure to ascertain the choices that managers make when computing the median employee pay. The SEC rule affords substantial discretion in the timing and methods of identifying the employee as well as particular adjustments to the compensation value. We

further analyze the length of the disclosures and the firm's use of spin to potentially influence the perception of the ratio. Prior work finds that firms take actions to alter the perceptions of other disclosures, such as earnings press releases (Huang et al., 2014). In the context of the pay ratio, Jung et al. (2018) show that some firms provide a supplemental pay ratio in their disclosures.

Generally, firms with higher pay ratios, which we define in several ways, take more exemptions, such as removing foreign workers when determining the median employee. These firms are also more likely to pick a date for identifying the median employee other than the fiscal year end. Such choices likely narrow the reported pay gap by increasing the reported employee pay. Firms with higher pay ratios are less likely to disclose the ratio in the Compensation Discussion & Analysis (CS&A) section of the proxy, which helps avoid the perception that the compensation committee considers the ratio when setting executive pay.

Using textual analysis of the pay ratio narrative, we find that firms with higher pay ratios have lengthier disclosures in the proxy statement and use more words that we flag as spin. For our purposes, spin includes the use of words that justify either higher CEO pay or lower median worker pay. Managers use more spin when they report a higher ratio than their industry peers and when the unexpected component of the pay ratio is higher. This finding suggests that managers are concerned with the negative perception that a high pay ratio might generate and attempt to moderate the stakeholder response by providing greater detail and positive language regarding compensation practices and human capital relations.

The lobbying efforts and extensive nature of the comment letters prior to implementation indicate that both firms and other constituents believe that the disclosure could influence perceptions of the firm and potentially impact interactions with key stakeholders.[2] Therefore, we examine changes in media coverage, shareholder voting on compensation proposals, and labor productivity around the pay ratio disclosure. We find that the media sentiment tends to be more negative for firms with higher pay ratios just after the initial disclosure. These findings complement prior work linking media coverage with firms' compensation levels

[2] See, for example, a comment letter by the Business Roundtable to the SEC: https://www.sec.gov/comments/pay-ratio-statement/cll3-1664780-148922.pdf. Appendix A summarizes all comment letters submitted to the SEC.

(e.g., Core et al., 2008; Kuhnen and Niessen, 2012). Importantly, we find the negative media response to high pay ratios is present even when controlling for CEO and employee compensation.

Advocates of the pay ratio disclosure rule claim it provides boards with additional information to help set executive compensation and assists investors in voting on compensation issues. We find that firms with higher pay ratios receive greater dissent on SOP proposals and have a higher likelihood of failing to receive majority support. These findings reinforce extant studies showing that SOP is a means for shareholders to express dissatisfaction with executive compensation practices (e.g., Cai and Walkling, 2011; Brunarski, 2015) and on vertical pay disparity at U.S. banks (Crawford et al., 2019).

Opponents of the rule contend that higher pay ratios or the revelation of higher worker pay at peer firms could reduce morale at firms with lower worker pay. Further, some express concerns that the pay ratio could generate unintended consequences that ultimately harms workers by encouraging managers to outsource low wage positions or reduce nonpecuniary benefits to increase the reported median wage and deflate the pay ratio (Edmans, 2017). Thus, we next explore changes in labor productivity, as prior work links employee pay disclosure to worker satisfaction and productivity (Card et al., 2012). We find that employee productivity gains are lower following the initial disclosure of a high pay ratio. These findings are consistent with the notion that larger pay differences between top managers and employees could reduce employee morale, leading to lower productivity (Rees, 1993; Green and Zhou, 2019).

We find that most of the negative stakeholder outcomes arise from reporting an unexpectedly high pay ratio and when the value is larger than the majority of its industry peers. We also present regression results that include the pay ratio and separate controls for CEO and median employee compensation. For most tests, we find the ratio has significant explanatory power beyond compensation levels, suggesting that it contains unique and informative content for stakeholders.

To explore whether the use of spin influences stakeholder perception of the ratio, we interact the spin measures with the pay ratio in regressions on media coverage, SOP voting, and employee productivity. Using the unexpected component of the ratio, we find evidence that greater spin is associated with more

negative media coverage, greater shareholder dissent, and lower productivity. Such results suggest that spin language in the disclosure actually attracts more attention to high ratios, rather than attenuating it.

For firms with available second-year disclosures, we find that those with higher pay ratios in the first year are more likely report a reduced ratio in the second year via lower CEO or higher median employee pay. Further, firms with higher second year pay ratios tend to provide longer disclosures but do not necessarily increase their use of spin more than the firms with lower pay ratios.

In additional tests, we find that the presence of additional compensation consultants is associated with less spin for firms with a higher pay ratio. These findings are consistent with consultants advising against providing extraneous information in the initial disclosure of the pay ratio to avoid drawing scrutiny.[3]

Our paper speaks to the notion of income inequality by examining the pay gap between CEOs and rank-and-file workers.[4] Some research seeks to explain the factors contributing to the rising income inequality (Song et al., 2018). Other work explores the relation between within-firm pay inequality and firm outcomes such as performance and valuation (Mueller et al., 2017) or employee productivity (Faleye et al., 2013). Our paper differs from prior literature by focusing explicitly on the mandatory disclosure of the CEO-to-median worker pay ratio by most publicly-listed U.S. firms. Though firms already reported the compensation of their top executives, enabling the study of pay differential between CEO and other executives (see, e.g., Kale et al., 2009; Bebchuk, et al., 2011), this new disclosure means that rank-and-file pay and the relation to the CEO pay are now explicitly disclosed and widely available. We also show that firms take actions to both mitigate the reported ratio through the use of exemptions and other choices, as well as the possible reception of external parties through the use of spin.

Though some critics predicted that few stakeholders would care about the pay ratio, we find that media coverage becomes more negative for firms reporting higher ratios. We also show that shareholders are more likely to oppose CEO compensation packages, and employee productivity declines after the initial

[3] Many consultants recommended a minimalist disclosure approach. See Barrall (2017), "10 Consensuses on CEO Pay Ratio Planning," at: https://corpgov.law.harvard.edu/2017/12/04/10-consensuses-on-ceo-pay-ratio-planning/.
[4] To address this gap, several states and some members of Congress propose linking corporate tax rates to pay ratios. See https://www.accountingtoday.com/news/sanders-lee-and-tlaib-introduce-legislation-to-tax-excessive-ceo-pay.

disclosure of a high ratio. These findings indicate that disclosing pay ratios can have real consequences for firms and is consistent with work showing pay transparency has a material impact on other outcomes like wages (Mas, 2019). Further, firms with higher ratios increase their disclosure length and use more spin words, potentially in an effort to alter the perception of vertical pay disparity. These efforts, however, are not fruitful in mitigating the negative consequences of reporting a high pay ratio.

2. Institutional details and research questions

2.1 Pay Ratio Disclosure Rule

Congress mandated that the SEC promulgate rules requiring CEO pay ratio disclosure in Section 953(b) of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. The Pay Ratio Disclosure rule requires SEC-reporting firms to disclose the annual total compensation of the CEO and median employee, as well as the ratio of these two figures. For example, if the CEO receives $5,000,000 in compensation during the fiscal year and the median employee earns $100,000, then the company must report a CEO pay ratio of 50-to-1. While SEC-reporting firms have long been required to disclose executive compensation to investors, the information on median employee pay—and its implications for vertical pay disparity—is new information for most investors and other stakeholders.

The SEC first proposed the Pay Ratio Disclosure rule in 2013.[5] After receiving 308,561 comment letters and holding 14 meetings with unions, academics, shareholder and director advocacy groups, and other market participants, the SEC finalized the rule in 2015 and provided interpretive guidance in 2017.[6] All SEC-reporting firms, except for those meeting the definition of (i) Emerging Growth Companies; (ii) Smaller Reporting Companies; (iii) Foreign-Private Issuers, or (iv) Canadian firms filing annual reports on Form 40-F, are required to disclose the pay ratio annually for fiscal years beginning on or after January 1,

[5] See Pay Ratio Disclosure, Proposed Rule (10/1/2013), https://www.sec.gov/rules/proposed/2013/33-9452.pdf.
[6] See Pay Ratio Disclosure, Final Rule (8/15/2015), https://www.sec.gov/rules/final/2015/33-9877.pdf; Commission Guidance on Pay Ratio Disclosure (9/21/2017), https://www.sec.gov/rules/interp/2017/33-10415.pdf; and Division of Corporation Finance Guidance on Calculation of Pay Ratio Disclosure (9/21/2017). https://www.sec.gov/corpfin/announcement/guidance-calculation-pay-ratio-disclosure.

2017. Thus, the first reporting year of the pay ratio disclosure rule occurs in calendar/proxy year 2018 and contains compensation information from fiscal year 2017.

The SEC rule requires firms to disclose the pay ratio, typically in the annual proxy statement (Form DEF 14A), but a few firms provide it in a registration statement (Form S-4 or S-4/A) or annual report (Form 10-K or 10-K/A). The rule does not prescribe a particular location or heading within the proxy statement and purposefully allows managers discretion to provide additional narrative or data that assists investors in understanding the context of the reported ratio.[7] For example, firms can disclose the ratio with or without a heading such as "Pay Ratio." The disclosure could be provided near or away from the Summary Compensation Table or in the Compensation Discussion & Analysis, although the latter gives the optics that the compensation committee considers the ratio in setting executive compensation (Barrall, 2017).

In its final rule, the SEC defined employees as any worldwide full-time, part-time, seasonal, and temporary workers of the company and its subsidiaries. Thus, contract workers (i.e., those whose compensation is determined by an unaffiliated third party) are excluded from the pool of workers. To reduce the cost of compliance, the SEC affords significant flexibility in identifying the median employee and their total annual compensation. One such option is that a firm can statistically sample its workforce using various sources, such as payroll records, or any other consistently applied compensation measures (CACM), as long as it discloses any material adjustments, estimates, assumptions, or exclusions used to identify the median employee's compensation. Another source of flexibility is that firms can use any date within three months prior to the last day of their fiscal year end to identify the median employee.

Without significant changes to the employee population or compensation arrangements, firms can retain the same median employee for up to three years and simply update the worker's reported pay each year. Firms can also substitute a similar employee in any year if they determine that the compensation of the original median employee becomes atypical. In subsequent years, firms must disclose any change in its methodologies or adjustments from the prior year along with the reason for making this change.

[7] See Pay Ratio Disclosure, Final Rule, p.223 at https://www.federalregister.gov/d/2015-19600/p-223.

The SEC's final rule permits firms to exclude foreign workers from their employee calculation based on two exemptions. First, the "data privacy exemption" allows companies to exclude foreign employees if their home country has data privacy laws that prevent the firm from gathering necessary information. Second, the "*de minimis* exemption," allows firms to exclude foreign employees from the pay ratio calculation if they account for 5% or less of the total workforce as long as the foreign workers excluded under the data privacy provision did not already total up to 5% of the workforce. Other nuances apply when using this exemption, but it potentially affords managers the flexibility to exclude low-wage foreign workers from the median employee calculation, thereby deflating the pay ratio.

The SEC allows firms to make cost-of-living adjustments for employees outside the CEO's jurisdiction, but firms need to disclose where the median employee resides and how they modified the compensation. If the firm makes this adjustment, it must also disclose an alternative pay ratio without the modification. Finally, firms can annualize compensation for full- and part-time employees that were not employed for the entire fiscal year but are not permitted to annualize compensation for seasonal or temporary employees.

2.2 Research questions

In this section, we formulate our research questions based on predicted outcomes of the rule by the SEC, commenters, and early legal scholarship. We also review the extant literature for each question.

RQ1. What are the economic determinants of the pay ratio disclosure?

The high degree of permitted flexibility in determining the median employee (and therefore the pay ratio), while intended to lessen compliance costs, could potentially reduce its informativeness (Bank and Georgiev, 2019). Moreover, Edmans (2017) portends that the pay ratio might not be useful in making comparisons across firms or industries due to differences in organizational structures. Consistent with this notion, many firms note in their disclosure that, due to the varying methodologies in selecting the median employee, the reported pay ratio by other firms might not be comparable to its own.

Rouen (2019) notes that the usefulness of the pay ratio depends on understanding the economic determinants of its components, CEO and employee pay. Using data on larger firms from the Bureau of Labor and Statistics (BLS), he obtains estimates of the mean employee compensation and models an estimated pay ratio. Rouen reports that the unexplained component of the estimated pay ratio has a greater ability to explain firm performance than the explained component. His work suggests that it is important to account for the economic factors, especially for employee pay, when interpreting and analyzing the effects of the actual pay ratio disclosure.

To ascertain whether the ratio provides useful context for firm-level pay and how the economic determinants interact with firm and stakeholder response to the disclosure, we model the pay ratio and its components and explore how industry factors, in particular, explain variation in the measure.

RQ2. Do managers use discretion afforded by the SEC to opportunistically reduce the reported ratio or diminish its potential impact?

Loh (2017) discusses the possibility that some firms might exploit the flexibility of the pay ratio rule by choosing the median employee wage that helps generate a desired ratio. In its final rule, the SEC also notes that some market participants expressed concern that the flexibility would "allow registrants to manipulate the ratio in their favor," which could reduce its usefulness. To explore how managers use discretion in constructing the ratio, we examine four key choices: (1) excluding certain foreign workers or those from recent M&A transactions; (2) including benefits in the compensation value for the median worker; (3) choosing a date other than the fiscal year end for identifying the median worker; or (4) reporting the pay ratio away from certain sections of the proxy statement.

First, the removal of certain foreign workers is permissible under the *de minimis* exemption. To the extent that foreign wages are lower than those of domestic employees, we expect this exclusion will deflate the pay ratio by increasing the median wage. Similarly, the M&A exemption could be used after acquisitions of firms with lower paid employees versus the existing workforce. Second, including benefits in the median worker's compensation, which must be done symmetrically for the CEO, tends to reduce the pay ratio because it constitutes a larger proportion of wages for employees than it does for executives. Third, firms

that select a date other than the fiscal year end for identifying the median employee might increase the reported employee wage as this choice could exclude some temporary workers, which tend to increase during the holiday season that coincides with the fourth quarter for most firms.[8]

Finally, managers have essentially three location choices for reporting the pay ratio narrative in the proxy statement. The first location is under the CD&A section. However, some compensation consultants warn that providing the disclosure in this section implies that the compensation committee takes the ratio into account when establishing CEO pay (Barrall, 2017). The second choice is to report the ratio just after the Summary Compensation Table (SCT), where firms report itemized compensation for named executive officers during the current and preceding two fiscal years. We conjecture that providing the disclosure close to the SCT could draw attention to other highly-paid executives. The third choice is to provide the disclosure in a location of the proxy statement outside of the CD&A and not directly after the SCT.

Based on these choices, we hypothesize that firms with higher pay ratios are more likely to use exemptions or exclusions, include benefits with employee wages, utilize a date other than the fiscal year end to identify the median employee, and provide the pay ratio disclosure in a location away from the CD&A and SCT sections of the proxy statement. Such choices could either deflate the reported pay ratio or potentially lessen the negative perception of reporting a higher pay ratio.

RQ3. Do firms with higher pay ratios spin the disclosure in an attempt to influence the perception of that ratio?

Our next research question centers on the disclosure narrative associated with the pay ratio. Because the SEC gave firms significant flexibility in the format and detail of the pay ratio discussion, managers could utilize such freedom to put a positive slant on the figure or its components. The SEC's final rule states that firms, "would be permitted, but not required, to supplement their disclosure with a narrative discussion…" Indeed, the contentious nature of the disclosure and the fact that firms lobbied for the greater

[8] During the period 2010 to 2018, non-seasonally adjusted temporary employment was 8.3% higher during the months October to December versus January through September. See FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/TEMPHELPN.

flexibility in the disclosure, suggests that managers could care about the optics of the reported ratio and might provide additional narrative or context for stakeholders.

As noted in Loughran and McDonald (2016), research links disclosure decisions to firm outcomes, which suggests firms could attempt to sway the reception of mandatory disclosures by providing additional information or using particular language. For example, Huang et al. (2014) find that the earnings press releases for firms that are financially constrained have an abnormally positive tone. Using more optimistic language, however, can generate potential costs to the firm. For example, Rogers et al. (2011) find that more optimistic disclosures have a higher probability of facing litigation.

In the context of pay ratio disclosure, compensation advisors generally recommend that firms avoid providing additional or unnecessary details in the narrative. For example, Barrall (2017) advocates for concise pay ratio disclosure unless managers expect the ratio will trigger adverse reactions by employees, unions, or customers. He warns that even these firms should not provide excess information to avoid being viewed as defensive, generating unintended consequences, or attracting adverse media attention. In a working paper, Jung et al. (2018) examine whether firms provide supplementary pay ratios and the directional nature of those ratios. They find that 14% of S&P1500 firms provide a supplemental pay ratio in the first year of reporting and that, for most firms, this figure is lower than the SEC's mandated ratio.

Based on this discussion, we hypothesize that firms with higher pay ratios are more likely to provide longer narrative disclosures and use spin language to presumably lessen the negative perception of the pay ratio by investors, employees, and the media.

RQ4. What is the stakeholder response to the disclosures?

As noted in Subsection 2.1, the length of time before the rule was finally implemented and extensive nature of the comment letters indicate that both firms and other constituents believe that the disclosure could influence perceptions of the firm and interactions with key stakeholders. Therefore, we examine changes in media coverage, shareholder voting on executive compensation, and labor productivity around

the pay ratio disclosure. Prior work shows that each of these mechanisms can influence both the long-term performance of the firm and CEO compensation.

First, high pay ratios might attract negative media coverage. Bank and Georgiev (2019) argue that the intuitive nature of pay ratios have the potential to resonate with the public more than other compensation-related disclosures and attract substantial media attention. Though work on compensation disclosure and media attention is limited, it highlights a potential interaction effect. Core et al. (2008) find the media is more likely to cover CEOs with high total compensation. They also show that media sentiment is more negative when CEOs receive excess compensation and large option grants. They interpret these results to imply that, while the media has some degree of sophistication in covering CEO compensation, it also tends to sensationalize the topic of executive pay. Kuhnen and Niessen (2012) confirm that media coverage is more negative for the stock option component of CEO pay and show that after such attention, firms tend to reduce future option grants, indicating that firms respond to negative media coverage.

Second, we investigate whether pay ratios influence shareholder voting on executive compensation. The SEC press release accompanying the pay ratio rule notes that one intended benefit is to enhance informational efficiency on executive compensation by providing data on internal pay disparity.[9] Therefore, shareholders could use pay ratios, jointly with other disclosures, to inform SOP advisory votes.

Cai and Walkling (2011) link abnormally high CEO compensation and market returns around the introduction of SOP bills to Congress prior to Dodd-Frank. They reason that SOP creates shareholder value by reining in high executive pay, especially for firms that are more susceptible to market pressure. Ertimur et al. (2011) find shareholder activists target firms with high CEO pay via SOP voting, but support for their campaigns is higher only at firms with excess CEO compensation. Along those lines, studies find SOP voting dissent is driven by excess CEO pay (Brunarski et al., 2015) and that shareholders value the option to vote on SOP proposals (Iliev and Vitanova, 2019).

[9] See "SEC Adopts Rule for Pay Ratio Disclosure: Rule Implements Dodd-Frank Mandate While Providing Companies with Flexibility to Calculate Ratio." Aug. 5, 2015. https://www.sec.gov/news/pressrelease/2015-160.html.

More recently, Crawford et al. (2019) examine the relation between pay ratios and say-on-pay voting for a panel of U.S. commercial banks, where employee compensation was disclosed prior to the SEC's pay ratio disclosure requirement for all firms. They find that voting dissent on SOP proposals is increasing in the level of the pay ratio, particularly for banks in the highest pay ratio decile.

Third, we explore how worker productivity and pay ratios are related. Academic literature has long debated whether disparate pay structures have an effect on worker productivity. One possibility is that greater differences in pay reduce morale, leading to lower effort thereby stifling productivity (Akerlof and Yellen, 1990; Loh, 2017). Moreover, by definition, half of the employees make less than the disclosed median wage, which could increase resentment for a substantial portion of the workforce and dampen productivity for firms with a high disclosed pay ratio (Loh, 2017). Compensation consultants also note that some of their clients are most concerned about employee perceptions of the ratio (Speidel and Ownbey, 2018). A different possibility is that pay inequality within a firm encourages employees to work harder to get promoted (i.e., tournament-based incentives), leading to higher productivity (Lazear and Rosen, 1981).[10]

Empirical work on pay disclosure and firm outcomes has produced mixed results. Card et al. (2012) find when university employee pay is disclosed, workers below the median report lower job satisfaction and are more likely to consider other jobs. Breza et al. (2018) show that observed pay inequality among workers can reduce worker output when productivity is difficult to observe. Consistent with these findings, a recent working paper by Green and Zhou (2019) examines pay inequality, job satisfaction, and firm performance using data from the website Glassdoor.com. They find that base pay inequality is negatively related to firm performance with no significant relation for total pay inequality. Using a sample period prior to the pay ratio disclosure rule, Rouen (2019) models the components of a CEO to employee pay ratio using census data. He reports a negative relation between unexplained pay disparity and future firm stock and accounting performance.

[10] The SEC notes that some of the comment letters on the rule contend that pay ratio disclosures would encourage companies to reduce vertical pay disparity, which could ultimately improve employee morale and productivity.

Other work finds a potentially positive relation between pay disparity and productivity. Faleye et al. (2013) examine the pay ratios prior to the SEC rule for firms that voluntarily disclose employee wages. They find that productivity can be higher in certain settings. Similarly, other work associates pay inequality with better firm performance (Cheng et al., 2017; Mueller et al., 2017).

Based on this prior work, we examine how higher pay ratios are associated with changes in media attention, shareholder voting on executive compensation, and labor productivity.

RQ5. Does spinning pay ratio disclosures attenuate negative media, employee, and shareholder outcomes?

We also examine the consequences of firms using spin language to describe the CEO pay ratio. To the extent that spin alters the perception of executive compensation, median employee compensation, or the disparity in these figures, then firms that spin their disclosures might see proportionally lower declines in media sentiment, shareholder voting dissent on executive compensation packages, and employee productivity. In contrast, some compensation consultants note that providing additional context or altering pay ratio disclosures can have the opposite effect of its intention and draw negative attention towards executives and the ratio (Harrall, 2017; Lifshey, 2018).

Prior work examines the relation between the properties of firm disclosure and corporate outcomes. Rogers et al. (2011), for instance, examine disclosure tone and shareholder litigation, finding that plaintiffs target more optimistic statements in their shareholder lawsuits. Firms with unusually optimistic earnings announcements also attract a greater portion of shareholder lawsuits.

Huang et al. (2014) examine firms with abnormally positive language in earnings announcements and find it predicts negative future earnings and cash flows. The use of such language is also positively associated with expectations management and future earnings restatements. The market initially responds positively to the release of the positive language at the earnings announcement, but firms with abnormally positive language experience a delayed negative reaction in the one and two quarters afterward.

The aforementioned literature provides mixed results regarding management's use of strategic language in disclosures and its effect on public perception. Therefore, it is an empirical topic we explore in the context of pay ratio disclosure.

3. Research Design and Data

3.1 Modeling the pay ratio

We start by modeling the pay ratio and its components, CEO and median employee pay, to address several goals. First, we want to explore whether variation in the pay ratio and its components can be explained by industry factors, which sheds light on whether pay ratios are comparable between peer firms across industries. Second, this analysis enables us to separate the ratio into the expected and unexpected components and relate this to the properties of disclosure and stakeholder outcomes. Our models of CEO and median employee pay closely follow Rouen (2019) and are based on the first year of reporting. We note that our estimation is at the firm, not establishment level, and includes foreign employees.

We first model CEO pay as follows:

$$Ln\left(CEO\ Pay_{i,t}\right) = \alpha + \Phi_{it} + Industry\ FE + \epsilon_{it} \quad (1)$$

Our controls, Φ_{it} include the following: natural log of total assets (*size*), industry adjusted return on assets (*adjusted ROA*), five-year standard deviation of adjusted ROA (*ROA variance*), natural log of the number of years the CEO has been in office (*CEO tenure*) and the CEO's age in years (*CEO age*), annual stock return in the fiscal year of reporting (*return* $_t$) and prior year (*return* $_{t-1}$), five-year standard deviation of stock returns (*return variance*), indicator that equals one if the firm reports a net income value less than zero (*loss*), book value of equity to market value of equity (*book-to-market*), and total debt as a percentage of total assets (*leverage*). For these tests we follow Rouen in using two-digit Standard Industrial Classification (SIC) codes for industry adjustments and industry fixed effects, but the results are similar using the Fama-French 49 industries.

We next model median employee pay as follows:

$$Ln(Median\ Employee\ Pay_{i,t}) = \alpha + \varphi_{it} + Industry\ FE + \epsilon_{it} \quad (2)$$

Our controls, φ_{it} include the following: natural log of total assets (*size*), industry adjusted return on net operating assets (*adjusted RNOA*), five-year standard deviation of adjusted RNOA (*RNOA variance*), percent of residents of Metropolitan Statistical Area (MSA) closest to the company headquarters that hold a college degree from the Census Bureau (*college graduate*), average industry-level compensation for the nearest MSA (*ind-region comp*), indicator equal to one if the headquarter state has a "Right to Work" law (*right to work*), annual stock return in the fiscal year of reporting (*return* $_t$), five-year standard deviation of stock returns (*return variance*), yearly change in total sales (*revenue change*), natural log of the number of years the firm is in CRSP (*age*), total sales divided by the number of employees (*labor productivity*), capital expenditures divided by total sales (*capital intensity*), R&D expenses divided by total sales (*R&D intensity*), book value of equity to market value of equity (*book-to-market*), and total debt as a percentage of total assets (*leverage*). To capture foreign workforce, we include an indicator equal to one if the firm utilizes a *de minimis* exemption in its pay ratio disclosure (*de minimis exemption*). For these tests we also use 2-digit SIC codes for industry adjustments and industry fixed effects.

We model the CEO pay ratio as follows:

$$Pay\ Ratio_{i,t} = \alpha + \Psi_{it} + Industry\ FE + \epsilon_{it} \tag{3}$$

For this regression, our controls, Ψ_{it} , include only variables that load significantly in equations (5) and (6), and use 2-digit SIC codes for industry fixed effects. To determine whether industry factors explain CEO pay, median employee pay, or the pay ratio, we report marginal contribution to the R^2 value for each regressor (Shapley value) and the group of industry fixed effects (Owen value) and denote this as R^2 *%* (Huettner and Sunder, 2012). Higher values indicate that the regressors contribute more to the goodness of fit in the regression, and thus explain a larger portion of variation in the dependent variable. To the extent that pay or pay ratios are comparable across industries, we expect industry fixed effects to explain a significant portion of the variation.

3.2 Textual analysis of pay ratio disclosure

The SEC provides considerable flexibility in how firms disclose the pay ratio, and thus, we expect that some firms might use the disclosure as an opportunity to provide additional context as to how they generated the ratio, or to justify a potentially high ratio. Firms might also attempt to modify the perception of the CEO pay ratio by spinning the disclosure to highlight positive attributes of employees or executive compensation packages. Thus, we conduct a textual analysis of pay ratio disclosure as follows.

We employ a Python script to scrape the full pay ratio disclosure from the proxy statement. We glean all information in the pay ratio disclosure section, which is frequently, but not always, under the header "Pay Ratio" or "CEO Pay Ratio." We then manually verify that the information is complete. A very small percentage of firms disclose the pay ratio disclosure in a separate SEC filing (e.g., Form 10-K). We hand collect these disclosures and those not obtained by our Python script. The results are robust to excluding these firms from our analysis.

We then construct our measures of the properties of pay ratio disclosure. First, we generate a variable, *number of words*, which is a simple count of the number of words in the pay ratio disclosure section of the proxy statement. Greater word count could proxy for two things. First, managers that want to influence the perception of the pay ratio could have longer descriptions and justifications of their values. Second, longer disclosures could proxy for more complex company dynamics. For instance, some of these firms might exclude a portion of their international employees under the *de minimis* exemption, which would mechanically increase the disclosure length as the SEC requires an explanation as to which employees were excluded. While we expect higher pay ratios to be positively correlated with the number of words, word count might not fully capture the intentions of managers in providing additional information. Thus, we develop additional measures of the textual properties of pay ratio disclosures to better gauge if managers are simply providing additional transparency into the construction of the ratio or if they are potentially attempting to influence the reception of a high pay ratio.

Our next two measures gauge the use of corporate spin in the pay ratio disclosure. Using the pay ratio disclosure text, we generate a dictionary and frequency distribution of all words used in the first year

of pay ratio disclosure. We then manually flag all words that could potentially spin the pay ratio disclosure in a positive light. These spin words include positive language about employees or employee relations, or justification of a CEO's compensation based on recent performance or risk-based components. We manually verify the context in which each flagged word is used and retain only words where the majority of instances reflect spin. We provide a full dictionary of 101 unique pay ratio disclosure spin words and excerpts from the proxy statement for each word in Appendix B and C, respectively.

For example, consider the word "attract," which we designate as spin in the pay-ratio disclosure context. Firms sometimes note they have low median employee pay and attempt to spin the disclosure by stating their compensation practices are intended to attract employees. Starbucks Corporation, which reports a CEO pay ratio of 1,049-to-1 in fiscal year 2018, states, "*to attract and retain talent, we pay competitively and tailor employee benefits in each jurisdiction, resulting in total rewards offerings that vary from country to country*."[11]

Similarly, the word "talented" is sometimes used to describe employees in the context of pay ratio. Wynn Resorts (with a fiscal year 2017 CEO pay ratio of 909-to-1) notes in their pay ratio disclosure, "*Our talented and dedicated employees play an integral role in our overall success and we place great emphasis on creating an environment for our employees to excel and advance. We are committed to the development, health and well-being of our workforce through various programs, benefits and amenities*."[12] The pay ratios for Starbucks and Wynn are both above the 90th percentile of our sample firms.

We also find examples where firms use spin language to attempt to justify executive compensation based on recent performance or the pay-for-performance construct of their CEO compensation packages. McDonald's reports a pay ratio of 3,101-to-1, which is in the 99th percentile of our sample. They provide the following pay ratio disclosure and include spin words such as "revitalized" to describe their corporate performance:

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[11] See Starbucks Corporation, SEC Form DEF 14A, January 25, 2019, available at https://www.sec.gov/Archives/edgar/data/829224/000119312519017145/d623511ddef14a.htm#toc623511_50.

[12] See Wynn Resorts, Limited, SEC Form DEF 14A, April 18, 2018, available at https://www.sec.gov/Archives/edgar/data/1174922/000119312518121082/d572661ddef14a.htm.

> For executives, McDonald's is committed to a strong pay for performance culture that stresses "at risk" compensation in order to closely align their interests with those of shareholders. Over 90% of our CEO's direct compensation opportunity is "at risk" based on the Company's performance against robust objective targets. Over the past three years, the McDonald's Brand has been revitalized, successfully completing a transition from turnaround to growth. In fact, during 2017, the Company's value grew about $36 billion. Driven largely by strong financial performance over both the short- and long-term, our CEO's 2017 total compensation was $21,761,052, resulting in a ratio of 3,101:1.[13]

Once we identify all words that denote corporate spin in the context of pay ratio disclosure, we create two variables to measure the presence and intensity of spin. *Spin indicator* equals one if the pay ratio disclosure contains at least one word from our spin dictionary and zero otherwise. *Spin words* is a count of the number of spin words in a firm's pay ratio disclosure. We then test the use of spin in the following equation using OLS for length and number of spin words and probit for the spin indicator:

$$PR\ disclosure_{it} = \alpha + \beta_1 Pay\ Ratio_{it} + X_{it} + Industry\ FE + \epsilon_{it}\ , \qquad (4)$$

where *total number of words*, *spin indicator*, and *spin words* are tested separately as the *PR disclosure* dependent variable. All regressions include a vector of control variables (X_{it}) described in Subsection 3.8, and industry fixed effects using the Fama-French 49 industries. A positive coefficient on β_1 would indicate that managers use more words or use spin words to describe the pay ratio when the ratio is higher. For tests of *spin words*, we do not scale this measure by the number of total words because firms using any spin might also provide longer disclosures. Instead, we include a separate control for the *total number of words.*

3.3 Measures of pay disparity

Our main variable of interest is the natural log of one plus the CEO pay ratio, *Ln(pay ratio*), which is the SEC-reported total annual compensation of the CEO divided by the total annual compensation of the median employee. We sort firms into deciles based on their pay ratio and create a variable, *pay ratio decile*, that takes the value of one to ten, with the largest ratios in the tenth decile. Certain pay ratio thresholds might influence the optics of pay disparity between CEOs and employees as they do for earnings (Degeorge et al., 1999). The notion is that any correlation between pay ratio levels and stakeholder outcomes might be

[13] See McDonald's Corporation, SEC Form DEF 14A, April 12, 2018, available at https://www.sec.gov/Archives/edgar/data/63908/000120677418001176/mcd3291681-def14a.htm.

present or exacerbated if stakeholders believe the pay ratio is "high." Given the novelty of pay ratio disclosure, it is difficult to define what constitutes a high or low pay ratio. We use the distribution of pay ratios and label firms with a pay ratio above the 75th percentile as *high pay ratio* and those with a ratio below the 75th percentile as *low pay ratio*. We also test the sensitivity of this value using other key thresholds and find similar results.

Certain industries might have a wage structure such that a pay ratio above what we designate as high could actually reflect relatively lower pay disparity versus their peers. Similarly, a pay ratio that we designate as low versus the full sample distribution could reflect relatively higher pay disparity within that industry. Thus, we generate an indicator variable, *high industry pay ratio*, that equals one if the disclosed pay ratio is greater than or equal to the 75th percentile of firms within the same 2-digit SIC industry; and otherwise zero. The results are similar if we instead define peers based on Fama-French industry codes or define high pay ratio as at or above the 75th percentile of firms in the same geographic area.

For all tests, we also decompose the pay ratio into its components of CEO and median employee pay. We then re-estimate our tests using the natural log of one plus these measures and label these variables as *Ln(CEO pay)* and *Ln(ME pay)*. These tests help us isolate the driver of pay ratio correlations by determining if the outcome is due to high CEO compensation or low median employee pay. We also conduct tests of the pay ratio after controlling for CEO and median employee pay to see if the ratio contains special explanatory content beyond its components.

To test whether firms and stakeholders respond to the "expected" or "unexpected" portion of the pay ratio, we utilize equations (1) and (2) above to estimate the expected CEO and median employee pay. For each firm year, we retain the fitted value from the regression and denote this as expected pay. Dividing the expected CEO and median employee pay generates an *expected pay ratio*. We subtract the expected pay ratio from the disclosed pay ratio and denote this variable as *unexpected pay ratio*.

3.4 Media coverage

We measure changes in the level and sentiment of media coverage using data from Ravenpack News Analytics. To the extent that higher pay ratios attract media coverage, we expect any variation in the properties of media coverage to occur shortly after the ratio is disclosed, typically in the annual proxy statement. Thus, we measure media coverage for the period 30 calendar days after the initial proxy statement filing and compare these to the same period in the prior year. To gauge the level of media coverage, we count the news articles mentioning the firm in the Ravenpack Dow Jones and Web Edition databases (*media level*). To assess the sentiment of media coverage, we follow Ho et al. (2013) and Shi et al. (2016) by generating a weighted event sentiment score (*WESS*) that weights the tone of news stories based on the novelty of the article. It is calculated as follows:

$$WESS_{i,t} = \frac{1}{T}\sum\frac{(ESS_{i,\tau}-50)ENS_{i,\tau}}{100}, \tag{5}$$

where i and t indicate firm and year, T is the total number of news stories, *ESS* is Ravenpack's Event Sentiment Score, *ENS* is Ravenpack's event novelty score; and τ = time when story is received. We average *WESS* for all stories during the 30-day period and label this value as *media sentiment*.

We test *media level* and *media sentiment* as the dependent variable, *media*, in this OLS regression:

$$Media_{it} = \alpha + \beta_1 Pay\ Ratio_{it} + Media_{it-1} + X_{it} + Industry\ FE + \epsilon_{it}\ , \tag{6}$$

where i and t indicate firm and year, respectively. The variable of interest, *pay ratio*, includes various computations as outlined in Subsection 3.3. We include the lagged values of the media variables to control for the expected media coverage prior to the disclosure of the pay ratio. All regressions include a vector of control variables (X_{it}) described in Subsection 3.8, and industry fixed effects using the Fama-French 49 industries. To the extent that higher pay ratios attract negative media attention, we expect changes in media coverage to be higher (i.e., for β_1 to be positive), and the sentiment of media coverage to be lower (i.e., for β_1 to be negative) for firms with higher pay ratios.

3.5 Shareholder say-on-pay

We measure shareholder response to the CEO pay ratio disclosure using data on advisory votes for executive compensation. Dodd-Frank Section 951 requires most public firms to hold a non-binding vote by shareholders to approve or disapprove the compensation package of the highest paid executive at least once every three years. These advisory votes are commonly referred to as "Say-On-Pay" (SOP). We measure two aspects of SOP voting. First, we tally the percentage of votes disapproving SOP (*SOP vote against %*), calculated as the number of votes against SOP scaled by the total votes for, against, or abstaining. Second, we generate a variable, *SOP fail*, that equals one if the SOP advisory vote fails to receive majority approval, and zero if the vote passes. To the extent that shareholders view the pay ratio reflecting high pay disparity, we expect a positive relation between *pay ratio* both *SOP vote against %* and *SOP fail*.

We formally test the relation between pay ratio and SOP voting by estimating this equation:

$$SOP\ Voting_{it} = \alpha + \beta_1 Pay\ Ratio_{it} + SOP\ Voting_{it-1} + X_{it} + Industry\ FE + \epsilon_{it} \qquad (7)$$

where *i* and *t* indicate firm and year, respectively. The dependent variable, *SOP Voting*, is estimated separately for our two voting measures (*SOP vote against %,* and *SOP fail).* The variable of interest, *Pay Ratio*, is measured various ways as described in Subsection 3.3. We include the lagged percentage of votes as a control variable (*SOP vote against %*$_{t-1}$), which we expect to load positively with the contemporaneous SOP voting outcome. All regressions include a vector of control variables (X_{it}) described in Subsection 3.8, and industry fixed effects using the Fama-French 49 industries. We use OLS regressions for the voting percentage tests, tobit regressions for the probability of SOP failure, and report adjusted (pseudo) R^2 values.

3.6 Employee productivity

We follow prior literature (e.g., Cronqvist et al., 2009) in measuring firm-level employee productivity as the natural log of sales divided by the number of employees (*productivity*). To the extent that employees view the disclosure of pay ratios as reflecting unfair pay disparity, we expect that relative productivity declines in the year after initial disclosure for firms with higher ratios. Thus, we measure

productivity in the first year of pay ratio reporting (*productivity*$_t$) and the subsequent year (*productivity*$_{t+1}$). We test the relation between pay ratio and productivity changes by estimating this equation:

$$Productivity_{i,t+1} = \alpha + \beta_1 Pay\ Ratio_{it} + Productivity_{it} + X_{it} + Industry\ FE + \epsilon_{it} \qquad (8)$$

In addition to the standard control variables described below in Subsection 3.8, X_{it} includes the percentage of fixed assets (*fixed-to-total assets*), as prior work shows capital-intense firms are more productive (Cronqvist et al., 2009). We control for industry fixed effects using the Fama-French 49 industries.

3.7 Interaction of spin and stakeholder outcomes

Our next set of tests examine the interaction between the use of spin in the pay ratio disclosure and stakeholder outcomes. For these tests, we utilize the unexpected pay ratio (UPR) discussed in Subsection 3.3 in the following equation:

$$Y_{it} = \alpha + \beta_1 UPR_{it} + \beta_2 Spin_{it} + \beta_3 UPR_{it} \times Spin + X_{it} + Industry\ FE + \epsilon_{it} \qquad (9)$$

where *Y* includes the *media sentiment*, *SOP votes against %* and *productivity*$_{t+1}$. We test the variable *spin* separately using the *spin indicator*, which equals one if the firm uses a spin word in its pay ratio disclosure, and the *number of spin words*. All control variables are similar to those used in equations (6), (7), and (8). To the extent that spin attenuates negative stakeholder outcomes, then we would expect a positive coefficient on β_3 for tests of media sentiment and productivity, and a negative coefficient on β_3 for tests of shareholder dissent.

3.8 Control variables

We include the following controls in all regressions except models of CEO and median employee pay described in Subsection 3.1. We control for *size* using the natural log of total assets. We control for growth opportunities using the *market-to-book* ratio, which is the market capitalization divided by the book value of equity. All regressions control for the use of *leverage*, which is measured as total debt divided by total assets. We also control for performance using *return-on-assets*, and both *sales growth* and total shareholder return (*TSR*) over the past year. Other controls include the percentage of *cash-to-assets* and

R&D-to-assets. We zero out the R&D intensity measure when missing from Compustat. We include the variable *union indicator*, which equals one if the firm discloses that some of its employees are unionized, subject to a collective bargaining agreement, or works council. We also control for the percentage of *institutional ownership* as prior work establishes a relation with executive compensation (Hartzell and Starks, 2003). Appendix D provides variable definitions.

3.9 Data

We construct our sample by obtaining data on pay ratios for the Russell 3000 from Equilar, a leading industry provider of executive compensation data. These data include the pay ratio and disclosed compensation for the CEO and median employee during fiscal years 2017 and 2018. As noted in Section 2, certain firms are exempt from disclosing CEO pay ratios (e.g., Emerging Growth Companies), thus our sample contains fewer than 3,000 members of the Russell 3000 in each year. As of the writing of this paper, not all firms have disclosed their fiscal year 2018 pay ratios, while some firms are no longer listed. Our fiscal year 2018 data have over 80% of the firms that reported their pay ratios in fiscal year 2017. The sample includes 4,323 pay ratio disclosures by 2,480 firms.

Equilar also provides us with information disclosed in the pay ratio on the choices firms make on particular items that affect the identification of the median employee and reported compensation. These include: exceptions or exclusions, the method for identifying the median employee (including use of statistical sampling and the CACM for identifying compensation), the date at which the employee is chosen relative to the fiscal year end, and the location of the pay ratio disclosure.

SOP voting data are from Institutional Shareholder Services (ISS) Voting Analytics. Institutional ownership data are obtained from the Thomson Reuters Institutional (13f) Holdings database. Media coverage data are from Ravenpack News Analytics. We utilize media data from both the Dow Jones Edition and Web Edition databases. Financial variables are from Compustat, and stock price data are from CRSP. Data on CEO age and tenure are obtained from Execucomp, MSCI GMI, proxy statements, and Capital IQ.

We employ a Python script to collect pay ratio disclosure text from SEC proxy filings (DEF 14A). We obtained the date of the proxy filings from the WRDS SEC Analytics Suite. We collect information on the number of employees from Item 1 of each firm's annual report (SEC Form 10-K). We follow Huang et al. (2017) in collecting information on labor unions from 10-Ks and generate a *union indicator* that equals one when the firm mentions the presence of a union, collective bargaining agreement, or works council. For firms in which union membership was not mentioned, we augment 10-K data with information from the Bloomberg Terminal and Google searchers. If the 10-K, Bloomberg Terminal, and Google search provides no indication of union membership, then we assume the firm has no union.

Information on Right to Work laws were collected from Workplace Fairness. Data on college education are obtained from the U.S. Census Bureau's 2017 American Community Survey. Income data are obtained from the Quarterly Census of Employment and Wages via the Bureau of Labor and Statistics.

4. Results

4.1 Summary statistics

Panel A of Table 1 presents summary statistics of the pay ratio and total compensation for the CEO and median employee for the first two years of disclosure.[14] In the first year of reporting, fiscal year 2017, the mean and median pay ratios are 150-to-1 and 70-to-1, respectively, indicating that the pay-ratio distribution is positively skewed. This skew is graphically depicted in Panel A of Figure 1 with ratios above 500-to-1 winsorized in the right tail. In the second reporting year, the mean (median) pay ratio rises to 174-to-1 (78-to-1). The distribution remains highly skewed and is presented in Panel B of Figure 1. For many of our tests, we include a *high pay ratio* indicator for firms at or above the 150-to-1 pay ratio, which approximately corresponds to the top quartile of firms across the two sample years. Firms with a pay ratio below 150 are designated as *low pay ratio*.

[Insert Table 1 and Figure 1 about here]

[14] The data for the second reporting year are through June 30, 2019.

To understand the drivers of the pay ratio, we examine the underlying components, CEO and median employee compensation. In the first reporting year, the average CEO earns $6.7 million in total compensation in fiscal year 2017, while the median employee earns $80,300, on average. Mean CEO compensation rises by $1.6 million to $8.3 million in reporting year two, while average compensation of the median employee rises by only $700 to $81,000. For firms that are in the sample in both years, the median value of CEO compensation rises by 2.4%, while employee compensation rises by 3.4% if focusing on the median value. The 75th percentile of CEO compensation change is 24%, while the 75th percentile change in employee pay is 9.5%. Thus, some CEOs experienced very large pay increases from reporting year 1 to reporting year 2. In fact, the mean CEO pay ratio increased by more than 2,000%, but this was driven by a few outliers, such as Tesla Inc. that reports a pay ratio of 0.91-to-1 in fiscal year 2017 and 40,668-to-1 in fiscal year 2018.

Figure 2 captures the distribution of the *change* in CEO pay from fiscal year 2017 to 2018. It suggests that, while a large number of ratios changed only slightly, there were significant outliers, including 64 firm with increases of greater than 200% for which we winsorize in the figure. Figure 3 illustrates that the changes in the ratio are largely driven by the change in CEO compensation, which exhibits much greater variability than median employee pay across the two years.

[Insert Figure 2 and Figure 3 about here]

Panel B of Table 1 reports the distribution of sample firm characteristics over reporting years one and two. The average firm has $7 billion in sales and $19 billion in assets, while the median firm has $1.6 billion and $2.9 billion in sales and assets, respectively. Our median sample firm has a leverage ratio of 22.1% of total assets and a market-to-book ratio of 1.2, Tobin's Q of 1.4, a cash ratio of 6.9% of total assets, and 81.7% institutional ownership. For performance, the median sample firm has a return on assets of 5.4%, sales growth of 8.3% and TSR of 1.0% and 29.1% over the one and three years ending at the end of the fiscal year, respectively. The median firm has zero percent R&D intensity, 2.0% capital expenditure intensity, and 3.7% free cash flow to assets. Approximately 38% of firms have a union (i.e., have employees who belong to a union, are covered under a collective bargaining agreement, or a works council).

4.2 Correlations

Table 2 presents pairwise correlation coefficients between key outcome and control variables. The full sample shows a positive and significant correlation between pay ratio levels and shareholder dissent for say-on-pay voting. Higher pay ratios are also significantly correlated with lower employee productivity in the following year and greater intensity of media coverage with negative sentiment. Thus, initial evidence suggests that higher pay ratios are correlated with negative stakeholder outcomes.

[Insert Table 2 about here]

There is a positive and significant correlation between higher pay ratios and both the presence and intensity of spinning language in the pay ratio disclosure. As expected, larger and more profitable firms have higher pay ratios. Pay ratios are not significantly correlated with total shareholder return over the past one or three years, and are not related to sales growth, growth opportunities as proxied by market-to-book ratios, or levels of cash or institutional ownership. The presence of a union is positively and significantly correlated with pay ratios.

4.3 Modeling the pay ratio

Table 3 presents decomposition analysis of the pay ratio. We first model CEO and median employee pay following equations (1), (2), and (3) and then present tests of the marginal contribution to the goodness of fit. For CEO pay, *size* contributes the greatest percentage to the overall R^2 of the model at 49.4%, and *industry fixed effects* contribute 30.2%. Thus, 80% of the variation in CEO pay explained by the model comes from these two factors. For median employee pay, the group of *industry fixed effects* provide 63.6% of the overall R^2 of the model, while *labor productivity* (14.3%) provides the next largest percentage of the overall R^2 of the model. Therefore, industry factors are quite important for explaining median employee pay. For the CEO pay ratio, *industry fixed effects* contribute to 77.4% of the goodness of fit of the model. We interpret these results suggesting that pay ratios have some comparability across industries because industry fixed effects help explain much of the variation in pay ratio values. In other

words, if the ratios were not comparable across industries, then we would not expect industry fixed effects to explain so much of the variation in CEO pay, median employee pay, and the pay ratio.

[Insert Table 3 about here]

4.4 Textual analysis of pay ratio disclosure

As firms have significant flexibility in the methods used to determine both the median employee and that person's compensation, we present summary statistics of these choices in Table 4. Generally, firms with higher pay ratios take more exemptions. For example, around 43% of those firms with a high pay ratio take the *de minimis* exemption for foreign workers versus 26% for low pay ratio firms.[15] High pay ratio firms are more likely to use statistical sampling techniques and use cash compensation for identifying the median employee. Approximately 84% of firms disclose the pay ratio away from the CD&A and SCT sections of the proxy statement. Fewer than 10% of firms disclose the ratio under the CD&A section, likely because it implies the compensation committee takes the ratio into account when determining CEO pay. Only 9% present the pay ratio disclosure after the SCT. High pay ratio firms are 2.7% less likely to disclose the ratio in the CD&A and 5.1% less likely to report it after the SCT. Finally, those firms with higher pay ratios are more likely to pick a date for identifying the median worker other than the fiscal year end. We did not find any firms that disclose use of the data privacy exemption in reporting year one.

[Insert Table 4 about here]

Table 5 presents a textual analysis of pay ratio disclosure. In this table, we test the relation between pay ratio, the length of the pay ratio in words, and the use of "spin" words. Panel A presents summary statistics. The average pay ratio disclosure is 376 words in length. Firms with a *high pay ratio* describe pay ratios using 423 words on average. Firms with a *low pay ratio* use 62.5 fewer words on average. Overall, approximately 27% of pay ratio disclosures use at least one word from our spin dictionary. Almost 37% of firms with a *high pay ratio* use at least one spin word, while this figure drops to just over 24% for firms

[15] The results reported below are robust to controlling for the number of foreign employees when disclosed, and to controlling for vertical integration using data from Fresard et al. (2019) or sales-to-assets.

with a *low pay ratio*. The differences are similar if we count the total number of spin words rather than the presence of at least one spin word.

[Insert Table 5 about here]

Panel B presents OLS regressions of pay ratio length. The coefficients on *Ln(pay ratio)*, *pay ratio decile*, and *high pay ratio, and high industry pay ratio* are all positive and statistically different from zero at the 1% level. For example, the coefficient on *high pay ratio* indicates that pay ratios at or above 150 have an average of 49 more words (p<0.001). Thus, the tests confirm that that pay ratio disclosures are longer when the ratio between CEO and median employee pay is larger. Interestingly, the coefficients on *Ln(CEO pay)* and *Ln(ME pay)* indicate that longer pay ratio descriptions are a function of both higher CEO and lower median employee pay. Column (6) indicates that the coefficient on *high pay ratio* is still significant after controlling for CEO and median employee pay. Finally, in the last two columns we examine the relationship between the length and the expected and unexpected components of the pay ratio and find that the positive relation between pay ratio and disclosure length is related to the unexpected component of the pay ratio, but not the expected component.

Panel C presents tests of the probability that a firm uses at least some spin to describe the pay ratio. These probit regressions show that higher pay ratios are more likely to include spin words. For example, the coefficient on *high pay ratio* shows that firms are 35% more likely to include spin when the ratio crosses the 150 threshold (p<0.001). Similarly, if the pay ratio is higher than industry peers, the firm is 28% more likely to use spin language (p<0.001). Tests of *Ln(CEO pay)* and *Ln(ME pay)* indicate the probability of using spin is primarily driven by lower median employee pay, rather than by higher levels of executive compensation. Yet, when we include the *high pay ratio* indicator along with *Ln(CEO pay)* and *Ln(ME pay)* in the regression, only the *high pay ratio* coefficient retains significance (p=0.001). Column (6) shows that the *high pay ratio* remains significantly related to spin even when controlling for the number of words. Finally, as with the length, spin is related to the unexpected, and not expected, component of the pay ratio.

Panel D also tests the relation between spin and pay ratios. In this panel, the dependent variable is a count of the number of spin words in the pay ratio disclosure. We report OLS regressions, but the results

are similar if we employ a negative binomial framework. Overall, the positive relation between pay ratio levels and the intensity of spin is similar to tests of the probability of spin in Panel C.

Collectively, the results in Table 5 indicate that firms with higher pay ratios use more words to describe the relation between CEO and median employee pay. These firms also have a greater propensity to "spin" the disclosure and use more spin words in describing the pay ratio. Such flexibility could result in the SEC issuing a comment letter if firms did not adequately provide the requisite information or if it felt the firms mislead investors. We did not, however, find any SEC comment letters that reference the pay ratio disclosure during the first two reporting years.

4.5 Pay ratio and media coverage

We first examine the relation between pay ratios and the sentiment and level of media coverage. For these tests, we focus on the 30-day period after the pay ratio is first disclosed in the proxy statement. Panel A of Table 6 presents the sentiment of media coverage using WESS. The average sample firm has a mean (median) sentiment score of 0.94. Firms with a high pay ratio have a sentiment score that is –0.32 (31.6%) lower than those firms reporting a pay ratio below the 150 threshold. The results are similar when using the median sentiment score. Panel A also shows that sample firms have an average of 57.2 articles during this period (for these values, we use a relevancy score of 100%). Firms with a high pay ratio have 44.6 more articles than those below the 150-to-1 threshold.

Panel B presents OLS regressions of changes in media sentiment. Coefficients on *Ln(pay ratio), high pay ratio,* and *high industry pay ratio* are negative and statistically significant at the 10% level or better, indicating the sentiment of media coverage becomes more negative for firms with high pay ratios in a regression setting. For example, the coefficient on *high pay ratio* is –0.175 and statistically significant at the 1% level (p=0.005). This value is also economically significant as it represents 18.7% of the sample mean and 14.7% of the sample standard deviation of 1.19.

Column (5) of Panel B controls for CEO and median employee pay and shows no statistical relation between these values and changes in media sentiment. Column (6) adds back the *high pay ratio* indicator

variable. The coefficient (–0.213) and significance (p=0.003) increase, suggesting that the CEO pay ratio communicates unique information beyond its constituent parts. Thus, media sentiment appears to be influenced by the ratio itself, rather than individual components of CEO and median employee pay. Moreover, in columns (7) and (8), we show that neither the expected nor unexpected component of the pay ratio drives the relationship.

[Insert Table 6 about here]

Panel C tests the relation between pay ratios and changes in the level of media coverage. In most regressions, the coefficients on pay ratio are not statistically significant, indicating that the media does not necessarily increase the intensity of its coverage based on pay ratio levels. Again, as in Panel B, we repeat our analysis in Columns (5) and (6) after controlling for CEO and median employee pay. The coefficient in Column (6) is 0.101 and is significant at the 5% level (p=0.027), providing suggestive evidence that the pay ratio might attract increased media coverage. Neither the expected nor the unexpected components of the pay ratio are significantly related to the level of media coverage.

Overall, the results in on media coverage indicate that the sentiment of media coverage becomes more negative for firms with a high pay ratio, and that the pay ratio itself communicates unique information beyond levels of pay for the CEO and median employee.

4.6 Pay ratio and say-on-pay voting

Our next research question examines whether firms with higher pay ratios experience greater voting dissent for executive compensation packages. Panel A of Table 6 shows that for the average firm, 17% of SOP votes are against, and on average, 2.2% of votes fail to receive majority support. The average firm with a high pay ratio receives 12% more votes against SOP (26% vs 14%) and has a 3% higher likelihood of failing to receive a majority vote approving SOP (4.4% vs 1.5%).

We present OLS regressions estimating the dependent variables percentage of votes against SOP voting in Panel D. Tests reveal a positive association between pay ratio levels and increased percentage of votes against compensation plans. The coefficients on *pay ratio*, *pay ratio decile*, *high pay ratio,* and *high*

industry pay ratio are all positive and statistically different from zero at the 1% level. For example, the coefficient on *high pay ratio* indicates that pay ratios greater than 150 have 5.1% more votes against SOP (p<0.001). This coefficient is also economically significant as it represents 30% of the sample mean (17.0%) and 27% of the sample standard deviation (18.9%). In column (5), we find that CEO pay is positively related to SOP voting dissent, while median worker pay is not related. We find that the *high pay ratio* variable is remains significant at the 1% level (p<0.001) when controlling for CEO and median employee pay.[16] Column (8) shows that the unexpected, rather than the expected, component of the pay ratio is significantly correlated with greater SOP voting dissent.

Panel E employs a tobit regression to test the probability that an SOP vote fails to receive majority support. The coefficients on *pay ratio*, *pay ratio decile*, *high pay ratio,* and *high industry pay ratio* are all positive and statistically different from zero. For example, the coefficient on *high pay ratio* in column (4) indicates that firms with pay ratios at or above 150 have a 4.7% higher probability of an SOP vote failing to receive majority support (p<0.001).

Similar to Panel D, the coefficient and significance levels for *high pay ratio* are similar when controlling for CEO and median employee pay, suggesting the ratio contains incremental information beyond the wage components. The coefficients on *Ln(CEO pay)* are significant and directionally similar to those on pay ratio. The coefficients on *Ln(ME pay)* are not statistically different from zero, which suggests that the SOP voting patterns reflect high CEO compensation rather than low median employee pay. Moreover, the unexpected component of the pay ratio is significantly related to SOP failure in column (8). Taken together, t Table 6 shows higher pay ratios correlate with increased SOP voting dissent.

4.7 Pay ratio and employee productivity

Panel A of Table 6 shows the association between pay ratios and employee productivity, which we proxy for using sales per employee. Because these tests analyze change in productivity after pay ratio

[16] In unreported results, we find similar results for votes for SOP, but no variation in the percentage of votes abstaining from SOP approval based on pay ratio levels. Thus, shareholders do not simply abstain from SOP voting with higher pay ratios. Instead, they switch from voting for SOP to voting against SOP when firms report a higher pay ratio.

disclosure, we focus on productivity following reporting in year 1 (fiscal year 2017). Panel A displays productivity summary statistics. Sample firms generate an average (median) revenue of $950,000 ($333,000) per employee during the first year of pay ratio reporting. Firms with a pay ratio threshold below 150 have a mean increase in productivity of 16.4% in the following year. Firms disclosing a pay ratio at or above 150 have a smaller average (median) increase of 4.4% (3.3%).

Panel F examines the relation between pay ratio levels and change in productivity in an OLS regression framework. In these tests, we use the natural log of one plus sales divided by the number of employees, i.e., *Ln(Productivity)*, as the dependent variable. The coefficients on *pay ratio*, *pay ratio decile*, and *high pay ratio* are all negative and statistically different from zero at the 1% level, while *high industry pay ratio is negative* and statically significant at the 5% level. For example, the coefficient on *high pay ratio* of –0.075 is significant at the 1% level (p<0.001). This value is also economically significant as it represents 7.9% of the sample mean and 7.2% of the standard deviation of the dependent variable.

Interestingly, when we decompose the pay ratio into CEO and median employee pay in column (5), we find the employee productivity results are driven by both the level of median employee pay and the level of CEO compensation. Specifically, the coefficient on *Ln(ME pay)* is 0.080 and is statistically different from zero at the 1% level (p=0.003). The coefficient on *Ln(CEO pay)* is –0.008 significant at the 5% level (p=0.018). This difference is important given that firms disclosed CEO compensation levels prior to the pay ratio rule. The disclosure of median employee pay, however, was first revealed for the full sample for fiscal year 2017. Those with higher pay disparity experienced a subsequent productivity decline, which appears to be driven by median employee compensation levels.

Again, we verify in column (6) that the relationship between *high pay ratio* and productivity remains significant in the presence of controls for CEO and median employee pay. While the coefficient of –0.034 is smaller, it is still significant at the 10% level of significance (p=0.079). Moreover, the results are driven by both the expected and unexpected components of the pay ratio as shown in columns (7) and (8).

4.8 Interaction of pay ratio spin and stakeholder outcomes

The results in Subsection 4.5 suggest that managers attempt to modify the perception of the CEO pay ratio by providing longer disclosures and through greater use of corporate spin words. Our straightforward hypothesis is that firms use spin words to potentially mitigate the negative impact it might have on stakeholder views of pay disparity. In this subsection, we test the interaction of the use of spin with the following stakeholder outcomes in a regression framework: media sentiment, shareholder votes against say-on-pay, and employee productivity. For these tests, we interact the *spin* indicator variable with the *unexpected pay ratio*. The results are presented in Table 7.

[Insert Table 7 about here]

For tests of media sentiment, the interaction term using the *spin indicator* is negative and marginally significantly different from zero at the 10% level. For tests of SOP voting dissent, the interaction term is positive and marginally significant at the 10% level. The coefficient on the interaction term in the productivity regression is negative but not statistically different from zero. When using the number of spin words, interaction terms are negative and marginally significant for tests of media sentiment and labor productivity. Thus, the use of spin appears to exacerbate the negative relation between high pay ratios and subsequent declines in media sentiment, shareholder support for compensation, and labor productivity. Thus, the use of spin does not appear to attenuate the relation between higher pay ratios and negative stakeholder outcomes, and potentially exacerbates these relations.

4.9 Additional tests

In this section we conduct additional analyses. First, we examine whether firms with higher pay ratios are more likely to hire compensation consultants to assist with the pay disclosure and their relation with disclosure spin. Second, we present alternative measures of the pay ratio and test the relation of these measures with spin and stakeholder outcomes. Third, we examine changes in pay ratio disclosure properties in the second year of reporting. Fourth, we study changes in the components of the CEO pay ratio in the second year of reporting. Finally, we conduct additional falsification and identification tests.

4.9.1 Compensation consultants

In Table 8, we explore the role of compensation consultants in the pay ratio setting. As most firms have at least one compensation consultant, we examine how the number of compensation consultants, which can be related to complexity, are related to certain aspects of the pay ratio disclosure. Although the SEC did not issue any comment letters regarding pay ratio disclosure in the first year, we find anecdotal evidence that compensation consultants discouraged firms from providing information that would lead to scrutiny from the investors, the SEC, proxy advisors, or institutional investors (Barrall, 2017, Lifshey, 2018). Therefore, we expect that the presence of more compensation consultants would be related to a lower propensity to include spin language that could over-explain a high pay ratio.

[Insert Table 8 about here]

Table 8 presents the relation between the number of compensation consultants disclosed in the proxy statement and the properties of pay ratio disclosure. Columns (1) to (3) interact the *number of consultants* with the *high pay ratio* indicator. The interaction coefficient in columns (2) and (3) show the presence of more compensation consultants is correlated with less use of spin for high pay ratio firms. Such findings are consistent with anecdotal evidence suggesting consultants advise against using language in pay ratio disclosures that could attract scrutiny. Columns (4) to (6) include compensation consultant fixed effects. The results are similar to those reported in Table 5, which confirms that our main results are not driven by the use of a particular consulting firm.

4.9.2 Alternative pay ratios

It is possible that some firms report a high pay ratio in years when the CEO receives a large equity grant. In Table 9, we present alternative pay ratio calculations to understand whether the pay ratio disclosure and stakeholder outcomes differ when we employ alternative measures of CEO compensation. Specifically, we first calculate the pay ratio using the three-year average of the total compensation of the CEO (TDC1 in Execucomp) divided by the disclosed median employee pay (*3-Year Average Pay Ratio*). This measure should smooth out anomalous years of high compensation. Second, we calculate the pay ratio based on

salary and bonus alone, thereby excluding equity compensation (*Salary and Bonus Pay Ratio*). For these tests, we utilize the Execucomp database, and thus our sample is limited to this subset of firms, which is the S&P1500.

[Insert Table 9 about here]

In Panel A, we first replicate our primary results for the Execucomp subsample. Consistent with our findings in subsections 4.5 and 4.6, we show that that the natural log of one plus the pay ratio, *Ln(Actual Pay Ratio)*, is positively related to the use of spin and changes in shareholder SOP dissent, and negatively related to changes in media sentiment and labor productivity. In Panel B, we repeat these tests using the natural log of one plus the *3-Year Average Pay Ratio*. We find similar results, indicating that the findings are not driven by one-time events that influence executive compensation. In Panel C, the results are also similar for spin, media sentiment, and SOP voting dissent when using the natural log of one plus the *Salary and Bonus Pay Ratio*. The coefficient on this variable only fails to achieve statistical significance in tests of labor productivity, although the sign and magnitude of the coefficient are similar.

Panels D and E present regressions of the difference in the actual and alternative pay ratio measures. The results are generally stronger for firms where the reported pay ratio is much higher than the alternative measure, which is consistent with the findings in subsections 4.5 and 4.6 that the use of spin and the stakeholder response are largely driven by the unexpected portion of the pay ratio. Overall, the results in this table illustrate the results are robust to alternative measures of the pay ratio and are not driven by firms that experience an uncharacteristic year of elevated CEO compensation.

Another ratio studied in the prior literature is the CEO pay slice, measured as proportion of pay that the CEO receives relative to the other top executives. This measure could capture both tournament incentives, or the ability of the CEO extract concessions form the board (Bebchuk et al., 2011). It is possible that the pay ratio metric using median employee pay is capturing similar information as conveyed by the pay slice. Thus, for the S&P1500 firms, we compute this metric and include it as a control in our regressions of spin, media sentiment, SOP voting, and labor productivity. We do not find that CEO pay slice loads

significantly, and the CEO pay ratio coefficient is of similar magnitude and significance as our main specifications. Thus, the pay ratio does not appear to just proxy for pay slice.

4.9.3 Changes in pay ratio disclosure in year two

Our primary analyses examine the first year of pay ratio disclosure as this period is the first time the market learns of median employee pay and the ratio for all firms. In this subsection, we examine the pay ratio disclosure properties in the second year of reporting. The results are presented in Table 10.

[Insert Table 10 about here]

Panel A presents the mean levels and change in the number of words, spin indicator, and spin words in year two. The levels are presented for all firms, while changes only reflect firms that reported the pay ratio in both years. We present these values for all firms and separately for firms that are deemed high and low pay ratio in reporting year two. The univariate results in Table 4 show that the overall percentage of firms that include spin in their disclosure essentially doubles to 54.3% from 27.4%. Firms with a high pay ratio continue to provide disclosures with more words and more spin. In unreported results, we confirm these relations in the regression setting. Firms with a high pay ratio in the second year also tend to lengthen their prior disclosure by 13 words and include 0.2 more spin words on average.

Panels B to D present tests of changes in the total number of words, spin indicator, and spin words. All tests include lagged dependent values and the same controls as those in Table 5. In column (1) of Panel B, we examine the natural log of one plus the percentage change in the pay ratio. The coefficient is positive, which indicates that firms with larger changes in their pay ratio are more likely to increase their pay ratio disclosure length. The results in columns (2) to (4) show that firms with a high pay ratio, regardless of the prior level, tend to increase the number of words in their pay ratio disclosure. The results in Panels C and D largely indicate that firms with a higher pay ratio do not increase the intensity of or propensity to spin. Only the coefficient in column (2) of Panel D is significant.

Overall, these tests indicate that firms with higher pay ratios or larger changes to the pay ratio tend to provide longer disclosures, but do not necessarily increase their use of spin more than the low pay ratio

firms. In untabulated analysis, we examine the properties of disclosure in reporting year two conditioned on negative stakeholder outcomes. Firms with a decline in media sentiment or an increase in SOP to reduce the length of their disclosure and use of spin.

4.9.4 Changes in pay ratio components in year two

One potential objective of requiring CEO pay ratio disclosure, as noted in the SEC's final rule, is to shrink the gap between CEO and median employee pay. Managers might also take actions to reduce the reported CEO pay or increase the median employee compensation. For example, prior work shows managers altered valuation methods to diminish reported CEO compensation when the SEC first required disclosure of stock option grants (Murphy, 1996). The results in Table 1 suggest that the average and median CEO pay ratio increased for the full sample. We show, however, that high pay ratio firms tend to experience negative stakeholder outcomes. Thus, we conjecture that high pay ratio firms might take actions to reduce the reported pay ratio with the objective of attenuating these outcomes moving forward.

[Insert Table 11 about here]

In Table 11, we examine whether firms alter the components of the pay ratio in the second year. To the extent that firms strive to reduce the pay ratio, we expect these firms would be more likely to reduce reported CEO compensation, increase median employee compensation, or retain the same median employee in order to deflate the pay ratio. This table shows that firms with high pay ratios in the first reporting year are more likely to have decreased CEO compensation, increased median employee compensation, or are more likely to retain the same median employee in year two of reporting.

This examination provides evidence that the reporting of a high pay ratio in year one is associated with a higher probability of closing the gap in year two. In fact, in an analysis of the top 20 highest pay ratio firms in reporting year one, we find an average decline in the pay ratio of -23.3% in year two, where 11 firms report a lower pay ratio and eight firms report a higher pay ratio versus year one.

Given the higher probability of a CEO pay decrease when firms report a high pay ratio in year one, a question that arises is whether the high pay ratio results are driven by one-time equity compensation. We

include an indicator equal to one if the firm uses the term "one-time" in its pay ratio disclosure. These firms are more likely to decrease CEO pay. However, the last column shows that even after controlling for these firms, high pay ratio firms are still more likely to report a decrease in CEO pay.

Overall, this table provides some early evidence that, despite the fact that the CEO-worker pay gap increases in year two, those firms at the higher part of the distribution might take actions to reduce this ratio in the second year of reporting. As a longer time of series of data becomes available, it will be interesting see if this correlation continues moving forward.

4.9.5 Endogeneity tests

One potential concern with our primary analyses is that the properties of pay ratio disclosure and the stakeholder response could be endogenously determined by factors omitted from our regressions. We take two approaches to mitigate this concern. First, we utilize the staggered nature of the SEC's compliance dates to examine firms that disclose pay ratios early versus late. Second, we exploit quasi-random variation in the distribution of pay ratios to ascertain whether firms disclosing a ratio just above a key threshold experience more negative outcomes than those just below a key threshold.

The SEC requires firms to report the pay ratio disclosure for their first fiscal year starting on or after January 1, 2017. This date generally corresponds to fiscal year 2017 for those firms with a fiscal year end prior to June. We categorize firms in our sample with a fiscal year ending in June or later as late adopters and repeat our analyses of stakeholder outcomes based on pay ratios in the Internet Appendix. For these regressions, we test for changes in SOP voting and labor productivity based on the period that the firms were not required to disclose a pay ratio but utilizing the pay ratio that was eventually disclosed. The regressions show that none of the coefficients on *Ln(pay ratio)* or the *high pay ratio* indicator are statistically different from zero. Thus, late adopters with a high pay ratio did not experience the same adverse stakeholder outcomes during the period that early adopters were disclosing their ratio.

For the second test, we examine key thresholds of the pay ratio distribution. We create a treatment variable, *just over,* that equals one if the firm discloses a pay ratio equal to 100-105, 150-155, 200-205,

300-305, or 400-405. This variable takes the value of zero if the pay ratio is just under the threshold at 95-99, 145-149, 195-199, 295-299, or 395-399. We then re-estimate our regressions of the properties of pay ratio disclosure and stakeholder outcomes with *just over* as the variable of interest.

In the Internet Appendix, we first establish that firms on either side of these thresholds are similar along several observable dimensions. Specifically, we find no differences in firm size, union presence, market-to-book, return-on-assets, institutional ownership, R&D or cash to assets, leverage, sales growth, or one-year TSR for firms with a *just over* value equal to one or zero. We then repeat our primary regressions and find a positive coefficient for *just over* in tests of the *number of words*, *spin indicator*, and *spin words*. The coefficient on just over is positively related to votes against say-on-pay and negatively related to changes in productivity. All of these coefficients are of similar direction and magnitude, and significantly different from zero at the 10% level or better despite the small subsample size used for identification.

5. Conclusion

Our study provides a comprehensive examination of the newly mandatory CEO pay ratio disclosures. We find that firms with higher pay ratios use discretion afforded by the SEC rule, which tends to deflate the reported figure. These firms provide lengthier pay ratio disclosures and include language that spins the disclosure, which is consistent with firms attempting to sway the perception of vertical pay disparity.

Our tests show that the disclosure of a high pay ratio overall, and within an industry, is associated with several negative stakeholder outcomes. For firms reporting a high pay ratio, the tone of media coverage becomes more negative, they have less support in SOP proposals, and lower subsequent worker productivity gains, even after controlling for CEO pay and median employee wages. Decomposing the components of pay ratio shows that the media, shareholder, and employee responses are driven largely by the unexpected component of the pay ratio. The use of spin, however, does not offset the consequences of high pay disparity and potentially attracts negative attention to the firm.

We find that variation in pay ratio values and median employee pay are largely explained by industry-level factors. However, even for the same firm, the reported pay ratio value varies widely in the

first two years of reporting, mostly due to changes in CEO compensation associated with one-time awards or changes in the CEO. We also show that some firms, particularly those with a high ratio, tend to reduce CEO pay or select a new median worker in the second reporting year. Thus, a single data point on pay ratios for a firm might not fully reveal differentials in vertical pay disparity over an extended period.

Our analysis provides the first direct insight into the disclosure of the CEO pay ratio by SEC reporting firms and the discretion managers use to report this metric. Though some of our results imply that higher ratios are associated with potentially negative outcomes, future research with additional years of data could explore how the ratio affects other corporate outcomes, such as bargaining with unionized workers, who were strong proponents of the pay ratio disclosure rule.

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Appendix A: Summary of pay ratio comment letters submitted to the SEC

The SEC proposed the Pay Ratio Disclosure rule on September 18, 2013. The rule was finalized on August 5, 2015. During the rulemaking process, the SEC received 308,561 comment letters and held 14 meetings with unions, academics, shareholder groups, advocacy groups, and other market participants. This appendix provides a brief summary of the comments on the rule. We categorize commenters into nine types: private individuals, union, lobbyist, investment professional, compensation consultant, corporate, academic, politician, and other. In Table A-1, we summarize the number of letters received from each group and the percentage whose comments are for, against, or are neutral with respect to the proposed Pay Ratio Disclosure rule. We also summarize the number of meetings between members of these groups and SEC staff or commissioners, categorized by the SEC division or the political affiliation of the commissioner. In Table A-2, we provide examples of common arguments in comment letters partitioned by their support or opposition to the proposed rule, as well as the topics of comment discussions.

Table A-1. Summary of SEC comment letters and meetings regarding the Pay Ratio Disclosure rule

		Comment Letters					**Meetings**	
Commenter Type	*Description*	*N*	*For (%)*	*Neutral (%)*	*Against (%)*		*N*	*SEC Division or Commissioner*
1. Private individual	Private investors, workers, individual union members	308,402	308,348 (>99%)	30 (<1%)	23 (<1%)		0	
2. Union	Union organizations, trusts or pensions	12	12 (100%)	0 (0%)	0 (0%)		1	Division of Corporation Finance
3. Lobbyist	Trade organizations, advocacy groups	39	14 (36%)	5 (13%)	20 (51%)		10	Commissioners Dem. (8), Rep. (2)
4. Investment professional	Investment manager, advisor, or lobbyist	40	37 (93%)	3 (8%)	0 (0%)		0	
5. Compensation consultant	Compensation consultants and attorneys	13	1 (8%)	7 (54%)	5 (38%)		0	
6. Corporate	Corporations, consultants, law firms	33	4 (12%)	14 (42%)	15 (45%)		2	Commissioners Dem. (0), Rep. (2)
7. Academics	Business and law scholars	10	5 (50%)	2 (20%)	3 (30%)		1	Division of Economic and Risk Analysis
8. Politicians	Congress members, federal and state officials	7	6 (86%)	0 (0%)	1 (14%)		0	
9. Other	Not related to pay ratio rule	5	n/a	n/a	n/a		0	
TOTAL		308,561	308,427 (99.96%)	61 (0.02%)	67 (0.02%)		14	

Note: Of the 308,402 comment letters by 'private individuals', 307,012 were one of 13 generic form types, potentially submitted via website petitions. All of these comments were in favor of the Pay Ratio Disclosure rule. We identified the origin of three of the form types as petitions from the Teamsters Union of Ohio (20 letters), the AFL-CIO (36,299 letters), and a progressive advocacy group, Credo Action (75,333 letters). Of the 1,390 remaining comment letters that were not a generic form types, the majority were in favor of the proposed rule. In a few letters, individuals did not indicate whether they approved or disapproved of the proposed rule but argued that the rule needed to be strengthened before passage. Even though these individuals indicate a preference for wage transparency, we classify these comment letters were classified as 'Neutral' to err on the side of caution.

Appendix A (continued)

Table A-2. Excerpts of comments supporting and opposing the Pay Ratio Disclosure Rule

Panel A. Comment-letter arguments *for* the Pay Ratio Disclosure rule
• "…CEO-to-worker pay ratio disclosure is valuable information for the investing public." • "…large pay disparities contribute to an unethical culture within corporations." • "…companies integrating best environmental, social, and governance practices into their strategy and operations will build long-term sustainable value for all stakeholders and provide higher risk-adjusted returns to shareholders." • "The proposed rule will promote capital formation as investors can more clearly see details of asset being purchased…" • "High pay disparities inside a company can be detrimental to employee motivation and productivity, increase turnover and have a negative impact on a company's overall performance."
Panel B. Comment-letter arguments *against* the Pay Ratio Disclosure rule
• "Our cost of compliance will be significant." • "…we do not believe that the proposed pay ratio rules will provide investors with useful or accurate information" • "The Pay Ratio provides a highly misleading and potentially harmful disclosure which contradicts the goals of the federal securities laws." • "The only argument I can foresee to disclose pay ratio is to provide some kind of public embarrassment to firms that have high ratios of CEO pay to median employee pay."
Panel C. Common topics in comment letters on the Pay Ratio Disclosure rule
• Whether the pay ratio should be 'filed' or 'furnished'; furnished disclosures have lower levels of liability under the Securities Act • Whether certain employees, such as foreign, seasonal, part-time, should be included in the ratio • Whether firms should have discretion in choosing date to determine median employee • Whether to provide additional data: total enterprise pay, number of full- and part-time and foreign employees, pay ratio for subsidiaries • Whether statistical sampling should be permitted • Which firms should be required to provide the Pay Ratio (e.g., should smaller firms should be exempt from the disclosure)

Appendix B: List of spin words and frequency in CEO pay ratio disclosures (FY 2017)

Spin word	Frequency	Firms	Spin word	Frequency	Firms
abilities	2	2	motivated	3	3
ability	6	6	opportunities	34	32
align	11	11	pay for performance	14	14
amazing	1	1	pay with performance	3	3
anomalous	53	47	philosophy	105	98
anomaly	4	4	responsibilities	37	37
attract	40	38	responsibility	8	8
attracting	5	5	responsible	2	2
atypically	3	2	retain	49	46
balance	17	17	retaining	6	6
balanced	2	2	revitalized	1	1
balances	4	4	reward	37	35
benchmark	5	5	rewarded	1	1
benchmarked	15	15	rewarding	4	4
benchmarking	5	5	rewards	18	13
benchmarks	2	2	rigorous	3	3
capabilities	2	2	robust	1	1
career	6	3	shareholder	57	54
careers	3	3	shareholders	68	46
challenging	2	2	significant	149	141
commensurate	5	5	significantly	107	100
creative	4	4	skills	8	7
critical	14	14	specialized	9	6
culture	3	3	stewardship	2	2
cultures	2	2	strategic	10	9
demonstrate	2	2	strategically	2	2
demonstrated	1	1	strategies	14	14
demonstrates	1	1	strategy	17	15
demonstrating	1	1	strive	34	30
diverse	38	38	strives	7	7
diversification	1	1	success	41	30
diversified	3	3	successful	5	5
diversity	8	8	successfully	3	3
dramatically	3	3	sustainable	2	2
empower	1	1	talent	32	27
empowering	2	2	talented	15	15
encourage	19	19	talents	2	2
encourages	2	2	team	136	37
encouraging	2	2	teammate	19	2
enjoys	2	2	teammates	19	3
equitable	123	120	transformation	2	2
equitably	1	1	transformative	2	2
essential	5	5	transforming	1	1
exceptional	4	3	transparency	10	6
flexible	13	11	transparent	3	2
fulfilling	1	1	tremendous	1	1
holistically	1	1	turnaround	4	4
incentivize	4	4	turnarounds	1	1
incentivized	4	4	uniquely	4	4
integral	2	2	uniqueness	1	1
motivate	92	91	TOTAL	1,665	1,423

Appendix C: Excerpts from use of spin words in CEO pay ratio disclosure

Spin word	Excerpt from pay ratio disclosure
abilities	providing opportunities for all employees to contribute, develop new skills and abilities, and manage their careers
ability	our success depends on its ability to attract, motivate and retain highly qualified, talented and creative employees
amazing	benefits to ensure we attract and retain people who will enable us to deliver our "Most Amazing Personal Service" to our customers
attract	to attract and retain talent, we pay competitively and tailor employee benefits in each jurisdiction
attracting	a competitive wage in those locations aimed at attracting and retaining qualified employees using local benchmarks
balance	company's compensation programs and practices were designed with the appropriate balance of risk and reward
balanced	a performance-based system that provides a balanced foundation for strong and effective leadership into the future
balances	we invest in our employees at all levels in the company by rewarding performance that balances risk and reward
capabilities	requires a wide range of member capabilities and expertise to carry product from design and fabrication through delivery
commensurate	our objective is to provide competitive compensation commensurate with an employee's position and geographic location
creative	our success depends on its ability to attract, motivate and retain highly qualified, talented and creative employees
culture	committed to a strong pay for performance culture that stresses "at risk" compensation
demonstrate	to motivate the company's employees and create shareholder value. to demonstrate the company's commitment to that principle
demonstrated	the company believes its compensation philosophy and process yield an equitable result, as demonstrated below
demonstrates	we believe our CEO pay ratio for 2017 demonstrates our pay-for-performance philosophy
demonstrating	demonstrating commitment to balance equitable compensation stewardship with competitively based compensation
diverse	comprehensive total rewards program to attract, retain, and reward highly qualified, diverse and productive employees
diversification	diversification should be considered by readers who would compare our CEO pay ratio to those within our peer or industry group
diversified	some companies in our peer groups given the composition of our workforce across our uniquely diversified company
diversity	median of local labor markets within our diverse industry segments is essential to ensuring a productive, engaged workforce
empower	company mission: value our customers, empower our employees, care for our communities, and deliver for our shareholders
empowering	rewarding performance that balances risk and reward, empowering professional growth and development
encourage	benefit programs are broadly similar across the organization to encourage and reward all employees who contribute to our success
encourages	promotes fiscally responsible pay decisions, encourages efficient use of our resources
encouraging	compensation level, and reflect the importance of (1) paying for performance; (2) encouraging firm wide orientation and culture
enjoys	employees enjoys a comprehensive compensation, benefit and company and/or state-sponsored retirement package
equitable	the company believes its compensation philosophy and process yield an equitable result
exceptional	strives to provide competitive base pay, market-leading benefits, and an exceptional work environment
holistically	designed to attract and engage talent, and reward performance, viewed holistically across individual, team, and business results
integral	our talented and dedicated employees play an integral role in our overall success
motivate	pay must be internally consistent and equitable to motivate our employees to create shareholder value
motivated	success is also highly dependent upon the retention of experienced, motivated and loyal employees at all levels of our organization
opportunities	we provide opportunities for professional growth and development, and offer affordable benefits and programs
pay for performance	we compete for talent, and reflect the company's commitment to maintaining a pay for performance CEO pay philosophy
pay with performance	our compensation committee has determined that this estimated ratio does not link pay with performance
philosophy	we believe our compensation philosophy and process yield an equitable result for all of our employees
responsibilities	compensation of every employee reflects their talents, skills, responsibilities and experience and is competitive in our peer group
responsibility	appropriate given each employee's job complexity level of responsibility in the organization

Appendix C (continued)

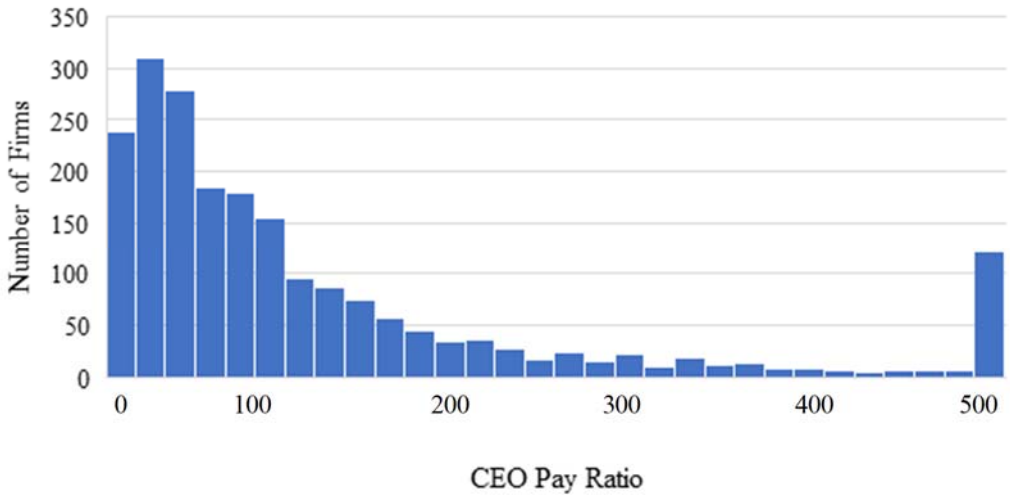
Spin word	Excerpt from pay ratio disclosure
responsible	the program also promotes fiscally responsible pay decisions
retain	labor markets in which our various employee segments operate to ensure that we can attract and retain the best talent for each role
retaining	actively support recruiting, motivating and retaining talented employees at all levels within our organization
revitalized	past three years, the brand has been revitalized, successfully completing a transition from turnaround to growth
reward	across the organization to encourage and reward all employees who contribute to our success
rewarded	we believe it is important to be consistent in how employees are rewarded
rewarding	feels strongly and is committed to investing in our employees at all levels by rewarding performance
rewards	based compensation that drives and rewards performance
rigorous	more than 91% of our CEO's annual compensation is tied to rigorous performance conditions
robust	direct compensation opportunity is "at risk" based on the company's performance against robust objective targets
shareholder	executive pay must be internally consistent and equitable to motivate our employees to create shareholder value
shareholders	shareholders should keep in mind that the rule was not designed to facilitate comparisons of pay ratios among different companies
significant	this had a significant impact on the amount of our CEO pay ratio
significantly	where wages are significantly lower than other locations in which we operate
skills	compensation of every employee reflects their talents, skills, responsibilities and experience and is competitive in our peer group
specialized	individual's role and responsibilities as well as his or her experience, education, specialized training
stewardship	balance equitable compensation stewardship with competitively based compensation that drives and rewards performance
strategic	incentivize key executives, and aligned the vesting to measures that are critical to the achievement of long-term strategic plan
strategically	100 countries through a network of more than 30 manufacturing and distribution facilities strategically located around the globe
strategies	pay ratios may vary significantly among companies due to differences in business strategies and workforce composition
strategy	our compensation strategy's essential objective is to compensate all employees appropriately and competitively
strive	we strive to ensure the compensation of every employee reflects their talents, skills, responsibilities and experience
strives	strives to establish fair and competitive employee compensation programs in each local market within our global operations
success	overall structure of our compensation and benefit programs are designed to reward all employees who contribute to our success
successful	enhance our overall performance and profitability through the successful execution of our short- and long-term business strategies
successfully	cash and equity compensation that we paid to our CEO in 2017 in order to successfully recruit him to our company
sustainable	within our diverse industry segments is essential to ensuring a productive, engaged workforce and a sustainable business
talent	markets in which we compete for talent, and reflect the company's commitment to maintaining a pay for performance philosophy
talented	in each local market within our global operations to effectively attract, retain, and motivate our talented workforce
talents	we strive to ensure the compensation of every employee reflects their talents, skills, responsibilities and experience
team	committee believes executive pay must be consistent and equitable to motivate our team members to create shareholder value
teammate	to determine the annual total compensation of our median teammate and our CEO
teammates	relationship of the annual total compensation of our teammates and the annual total compensation of our CEO
transformation	to induce her to join us in support of our transformation efforts
transformative	importance and critical nature of the performance goals, given the divestiture and the transformative nature of the corporate changes
transforming	transforming us into a new fee-based, capital-efficient business model
tremendous	CEO recruitment package had a tremendous effect on the above pay ratio

Appendix D: Variable definitions

Compensation variables	
Pay ratio	Disclosed ratio of CEO pay to the median employee pay
Pay ratio decile	Takes the value of one to ten, with the largest ratios in the tenth decile
High pay ratio	Equals one if the firm's pay ratio is greater than or equal to 150-to-1; otherwise zero
Low pay ratio	Equals one if the firm's pay ratio is less than 150-to-1
High industry pay ratio	Equals one if the firm's pay ratio is greater than or equal to the 75th percentile of the industry pay ratio; otherwise zero
CEO pay	Total compensation of the CEO reported in the pay ratio disclosure
Median employee pay	Total compensation of the median employee reported in the pay ratio disclosure
Expected pay ratio	Ratio of the modeled components of CEO pay from equation (1) and median employee pay from equation (2)
Unexpected pay ratio	Actual pay ratio minus the expected pay ratio
Text analysis variables	
Number of words	Length of the pay ratio disclosure using a count of the number of words
Spin indicator	Equals 1 if the pay ratio disclosure contains at least one word from the "spin" dictionary; otherwise 0
Spin words	Count of the number of "spin" words in the pay ratio disclosure
De minimums exemption	Equal 1 if the firm excludes up to 5% of its non-U.S. employees from the median worker computation
M&A exclusion	Equal 1 if the firm excludes employees from a recent acquisition from the median worker computation
CACM	Consistently applied compensation measure denotes the method the firm uses to identify the median worker
Other variables	
Media level	Count of the news articles mentioning the firm in the Ravenpack Dow Jones edition and Ravenpack Web Edition databases
Media sentiment	Media sentiment is the weighted event sentiment score (WESS) of articles in Ravenpack
SOP vote against %	Number of votes against say-on-pay proposal scaled by the total votes for, against, or abstaining
SOP fail	Equals 1 if the SOP advisory vote fails to receive majority approval, and 0 if the vote passes
Productivity	Natural log of total annual sales divided by the number of employees from Compustat
Employees	Number of employees from the 10-K
Union indicator	Equals 1 if the firm discloses a union, works council, or collective bargaining agreement in its 10-K; otherwise 0
Total assets	Natural log of the book value of total assets from Compustat
Total sales	Natural log of the total annual from Compustat
Sales growth	Average growth in total sales over past three fiscal years
Market-to-book	Market-to-book is the U.S. market capitalization from CRSP divided by book value of equity from Compustat
Leverage	Leverage is the total debt divided by total assets from Compustat
Return on assets	Return on assets is operating income divided by total assets from Compustat
TSR	Total stock return over trailing 1-year period based on share price appreciation and annualized dividend yield
Institutional ownership	Percent of shares held by institutional investors based on 13-F filings

Figure 1: Pay ratio histogram in fiscal years 2017 and 2018

Panel A: Reporting year 1 (FY2017)



Panel B: Reporting year 2 (FY2018)

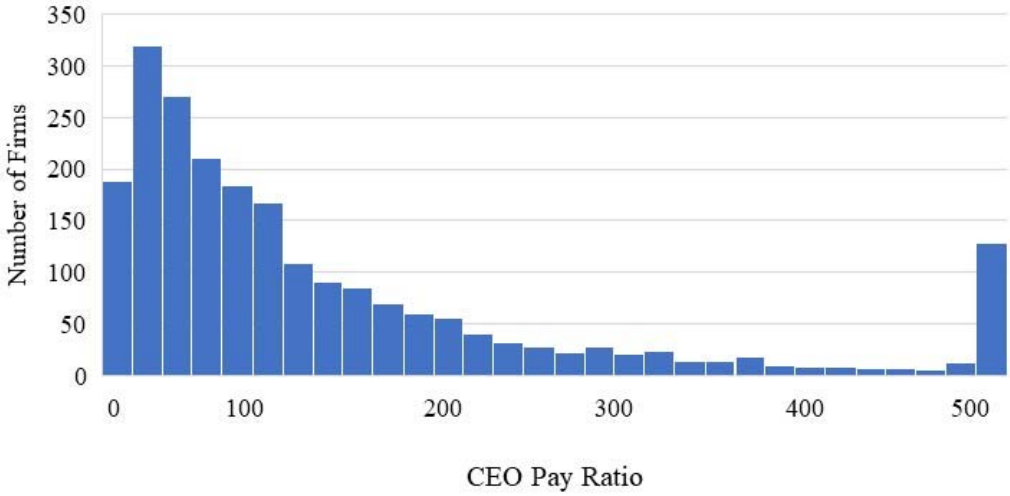


Figure 2: Change in the pay ratio from fiscal year 2017 to 2018 (%)

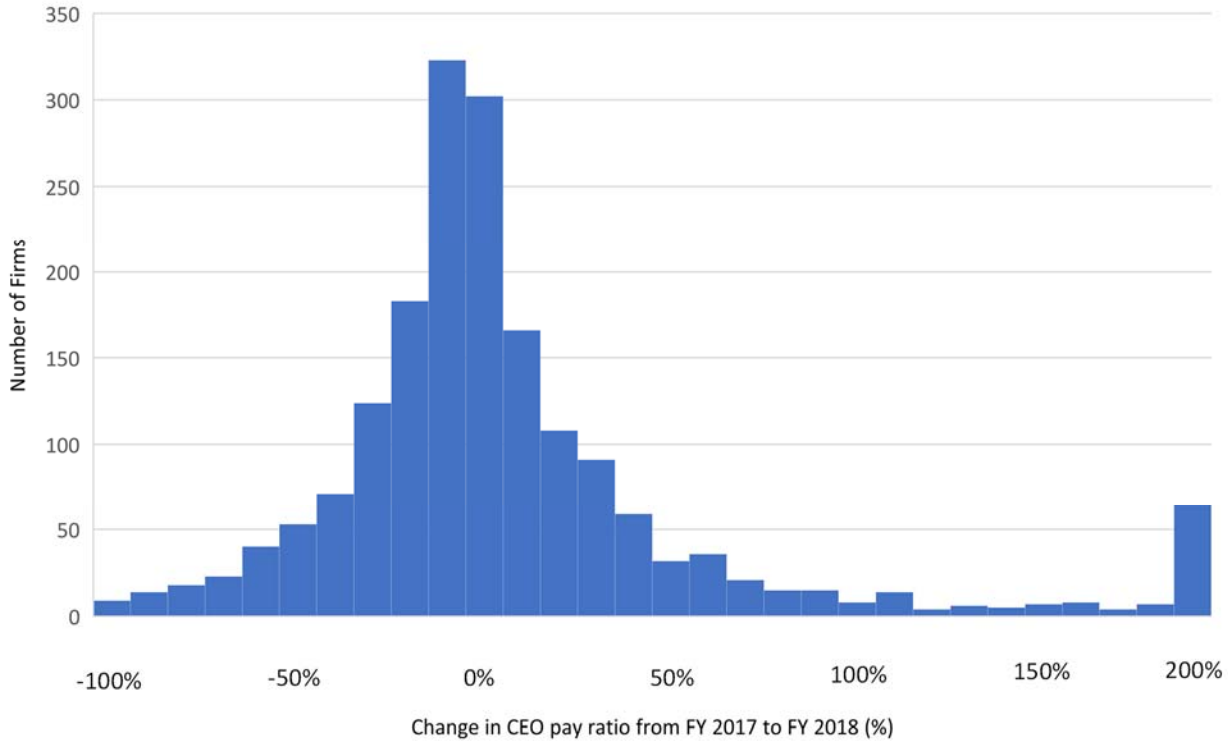
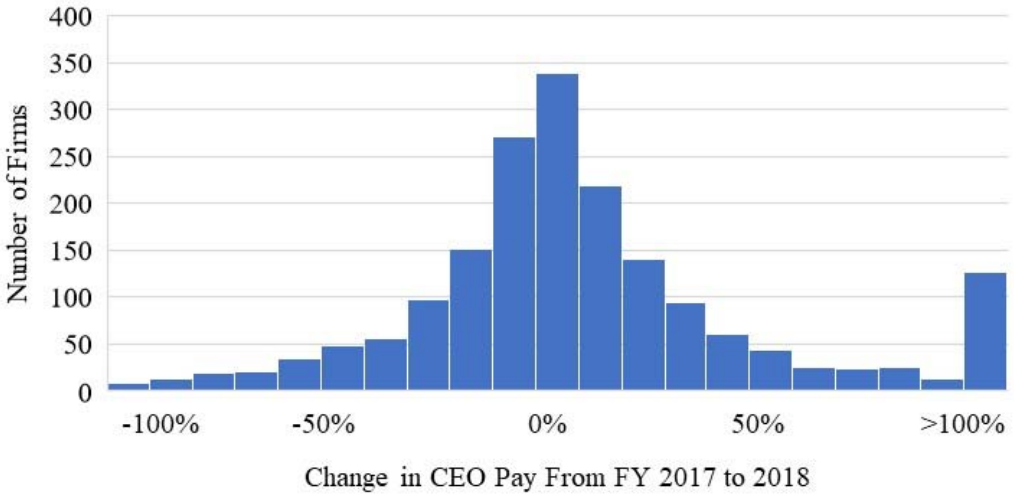


Figure 3: Change in pay from fiscal year 2017 to 2018 (%)

Panel A: Change in CEO pay



Panel B: Change in median worker pay

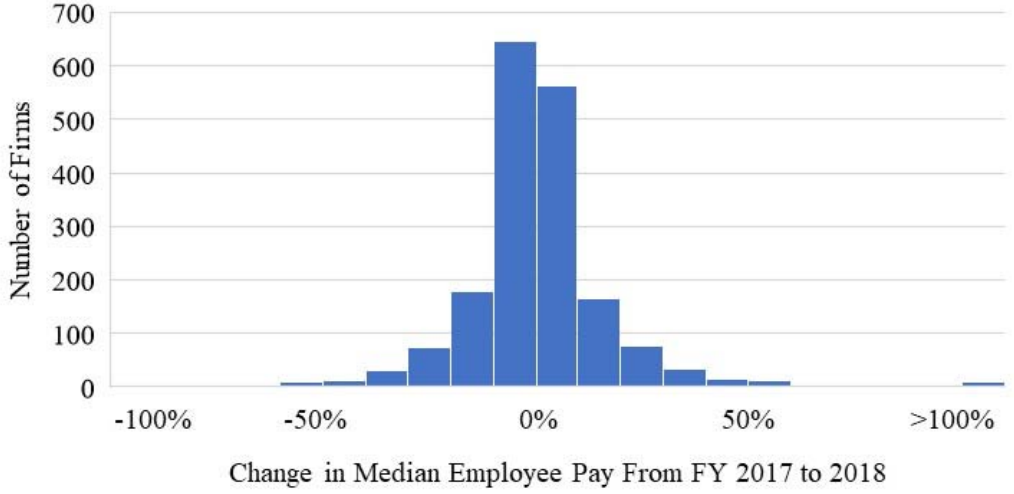


Table 1: Summary statistics

Panel A: Compensation Statistics						
Variable	Mean	Standard deviation	Bottom quartile	Median	Top quartile	N
CEO Pay Ratio						
FY 2017	149.7	311.3	32.8	70.0	144	2,097
FY 2018	174.2	905.3	37.0	78.0	159	2,226
Total	162.3	684.9	34.0	74.0	153	4,323
Total Compensation ($000s)						
CEO Pay FY2017	6,653	7,575	2,312	4,609	8,462	2,097
CEO Pay FY2018	8,275	49,040	2,770	5,110	9,191	2,226
Median Employee Pay FY2017	80.3	63.9	43.8	63.0	99.0	2,097
Median Employee Pay FY2018	81.0	65.0	44.7	64.4	97.8	2,226
Change from FY2017 to 2018 (%)						
CEO Pay Ratio	2,477.9	1,043.5	-13.33	2.37	24.37	1,834
CEO Pay	2,532.6	1,069.2	-9.37	5.87	26.10	1,834
Median Employee Pay	4.58	20.95	-2.38	3.39	9.51	1,844

Panel B: Firm characteristics						
Variable	Mean	Standard deviation	Bottom quartile	Median	Top quartile	N
Firm characteristics						
Sales ($ billions)	6.9	22.7	0.5	1.6	4.8	3,267
Total Assets ($ billions)	19.1	108.1	1.0	2.9	8.9	4,322
Tobin's Q	2.1	1.9	1.1	1.4	2.3	4,064
Market-to-book	1.7	1.9	0.7	1.2	2.0	4,301
Return-on-assets (%)	4.5	17.2	2.1	5.4	10.2	4,322
Institutional ownership (%)	76.1	21.5	66.9	81.7	91.7	4,040
R&D to assets (%)	3.6	9.9	0.0	0.0	2.1	4,322
Capex to assets (%)	3.6	5.8	0.4	2.0	4.6	4,322
FCF to assets (%)	2.4	14.8	0.8	3.7	7.8	4,311
Cash to assets (%)	15.1	19.8	2.5	6.9	18.8	4,322
Leverage (%)	25.3	24.8	4.6	22.1	38.6	4,304
Sales Growth (%)	51.3	1322.6	2.2	8.3	17.7	4,287
TSR (%)	6.4	49.0	-18.8	1.0	23.0	4,321
Union indicator (%)	37.9	48.5	0.0	0.0	100.0	4,323

This table presents summary statistics, including mean, standard deviation, bottom quartile, median, top quartile, and count (N) for the variables used in this paper.

Table 2: Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) Ln(pay ratio)	1.00																		
(2) Number of words	**0.20**	1.00																	
(3) Spin indicator	**0.10**	**0.31**	1.00																
(4) Spin words	**0.09**	**0.26**	**0.69**	1.00															
(5) Media sentiment	**-0.09**	-0.01	0.01	0.03	1.00														
(6) Media level	**0.38**	**0.16**	**0.12**	**0.11**	**-0.21**	1.00													
(7) SOP vote against %	**0.31**	**0.09**	**0.07**	**0.06**	**-0.11**	**0.37**	1.00												
(8) SOP vote fail %	**0.09**	0.04	0.02	-0.01	-0.03	0.02	**0.33**	1.00											
(9) Productivity$_{t+1}$	**-0.13**	**-0.09**	-0.05	-0.03	0.00	-0.01	**0.08**	0.01	1.00										
(10) Size	**0.42**	**0.07**	**0.06**	**0.08**	**-0.09**	**0.56**	**0.42**	-0.02	**0.09**	1.00									
(11) Market-to-book	**-0.04**	0.03	**0.05**	0.03	-0.01	**0.09**	0.00	-0.01	-0.03	**-0.35**	1.00								
(12) Return on assets	**0.29**	0.02	0.00	0.02	0.01	**0.12**	0.02	**-0.05**	**0.07**	**0.23**	**-0.09**	1.00							
(13) Inst. ownership	**0.27**	**0.10**	0.02	0.01	0.02	**0.17**	0.00	0.03	-0.05	**0.11**	**0.05**	**0.11**	1.00						
(14) R&D to assets	**-0.21**	0.00	0.02	0.00	-0.03	0.01	-0.02	0.01	**-0.07**	**-0.35**	**0.45**	**-0.63**	-0.02	1.00					
(15) Cash to assets	**-0.23**	0.02	**0.05**	0.03	-0.01	0.04	-0.03	0.03	**-0.06**	**-0.42**	**0.50**	**-0.38**	-0.02	**0.62**	1.00				
(16) Leverage	**0.16**	0.03	-0.02	-0.02	-0.06	0.08	**0.09**	0.04	**0.19**	**0.08**	**0.09**	**0.07**	**0.15**	**-0.05**	**-0.17**	1.00			
(17) Sales growth	-0.02	0.03	0.03	0.00	-0.01	-0.01	0.02	0.00	-0.01	-0.03	**0.04**	**-0.07**	0.02	**0.06**	**0.08**	0.02	1.00		
(18) TSR	-0.02	0.00	**0.07**	**0.05**	**0.06**	**0.09**	**-0.06**	**-0.05**	-0.04	**-0.10**	**0.40**	0.01	-0.02	**0.13**	**0.21**	**-0.06**	0.02	1.00	
(19) Union indicator	**0.30**	**0.08**	0.02	0.01	**-0.05**	**0.13**	**0.07**	0.01	**-0.09**	**0.19**	**-0.09**	**0.15**	**0.12**	**-0.13**	**-0.19**	**0.19**	0.00	**-0.05**	1.00

This table presents pairwise correlation coefficients. Bold indicates that the correlation coefficient is significantly different from zero at the 5% level or lower.

Table 3: Decomposing the pay ratio

Marginal contribution to goodness of fit

CEO Pay			Median Employee Pay			Pay Ratio		
Variable	Coef.	R^2 %	Variable	Coef.	R^2 %	Variable	Coef.	R^2 %
Industry fixed effects	--	30.24	Industry fixed effects	--	63.63	Industry fixed effects	--	77.41
Size	0.38***	49.40	Size	0.01	0.27	Size	58.00***	14.67
Adjusted ROA	-0.09	2.51	Adjusted RNOA	0.00	0.01	Ln(CEO age)	45.35	0.20
ROA variance	-0.02	0.18	RNOA variance	0.01***	2.41	Loss	-8.03	1.12
Ln(CEO tenure)	0.04	0.07	College graduate	0.02***	3.36	Book-to-market	-14.52	0.52
Ln(CEO age)	0.56**	1.08	Right to work	-0.10***	1.80	RNOA variance	0.06	0.37
Return $_t$	0.02	0.14	De minimis exemption	0.03	0.12	College graduate	-0.62	0.09
Return $_{t-1}$	-0.02	0.28	Return $_t$	0.04	0.24	Right to work	-20.88	0.16
Return variance	0.38	3.48	Return variance	1.12***	2.81	Return variance	360.25*	1.26
Loss	-0.20**	2.87	Revenue change	0.06***	2.60	Revenue change	-5.94	0.33
Book-to-market	-0.39***	8.35	Ln(age)	-0.01	0.82	Labor productivity	-0.03***	3.36
Leverage	-0.11	1.40	Labor productivity	0.00***	14.83	R&D intensity	-1.46	0.51
			Capital intensity	-0.01	1.89			
			R&D intensity	0.07***	4.96			
			Book-to-market	-0.02	0.07			
			Leverage	-0.09	0.19			
Overall R^2		25.07			53.44			31.55
N = 1,819								

This table decomposes the pay ratio and its components. Panel A decomposes the R^2 values for models of CEO pay (equation 1), median employee pay (equation 2), and pay ratio (equation 3) into the marginal contribution to the overall R^2 for the regression. We define variables in Section 3.5.

Table 4: Pay ratio disclosure statistics

Variable	All firms	High pay ratio	Low pay ratio	Difference
De Minimis Exemption (%)				
2017	29.7	43.5	25.3	29.7***
2018	30.3	41.8	26.0	15.8***
Both years	30.0	42.6	25.7	16.9***
M&A Exclusions (%)				
2017	7.6	11.1	6.5	4.7***
2018	8.0	10.0	7.2	2.9**
Both years	7.8	10.5	6.8	7.8***
Multiple Exemptions (%)				
2017	5.9	9.1	4.8	4.3***
2018	7.7	9.5	7.0	2.6**
Both years	6.8	9.4	5.9	5.1***
Statistical Sampling (%)				
2017	2.7	5.4	1.9	3.5***
2018	2.8	5.1	1.9	3.2***
Both years	2.8	5.2	1.9	3.3***
CACM for Identifying Median Employee (%)				
Cash	41.0	50.0	37.8	12.2***
W-2 or tax records	18.9	15.6	20.0	-4.4***
Total with benefits	12.1	13.5	11.6	1.9*
Total with benefits and equity	27.3	20.4	30.0	-9.2***
Other or not disclosed	0.8	0.5	0.9	-0.5
Median Employee Pay Date (%)				
Fiscal year end	65.0	52.7	69.2	-16.6***
Three months before fiscal year end	16.1	24.6	13.1	11.5***
Other or not disclosed	19.0	22.8	17.7	5.1***
Location of Pay Ratio (%)				
Compensation Discussion & Analysis	7.1	5.0	7.8	-2.7***
Summary Compensation Table	8.9	5.1	10.2	-5.1***
Other	84.0	89.8	82.0	7.9***

This table presents information on managerial choices in identifying and disclosing the pay ratio, including exemptions, use of statistical sampling, consistently applied compensation methods for identifying the median worker, date chosen for median worker income, and location of the pay ratio disclosure in the proxy statement. We partition the sample by *high pay ratio* and *low pay ratio* firms and test the difference between the two groups using a two-tailed *t*-test. ***, **, and * denote statistically significant differences at the 1%, 5% and 10% level, respectively. We define variables in Appendix D.

Table 5: Textual analysis of pay ratio disclosure

Panel A: Univariate statistics

Variable	All firms	High pay ratio	Low pay ratio	Difference
Total number of words	376.4	423.1	360.6	62.5***
Spin indicator	27.4	36.9	24.2	12.7***
Spin words	0.72	1.00	0.63	0.37***
N	2,356	596	1,760	

Panel B: Regressions of total number of words in pay ratio disclosure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PR Type:	Ln(pay ratio)	Pay ratio decile	High pay ratio	High industry pay ratio	Components	High pay ratio + components	Expected pay ratio	Unexpected pay ratio
Pay ratio	22.635***	9.346***	49.252***	42.666***		34.614***	-13.952	14.680**
	(5.32)	(5.04)	(4.95)	(4.62)		(3.16)	(-0.45)	(2.45)
Ln(CEO pay)					7.610***	5.163**		
					(2.95)	(2.09)		
Ln(ME pay)					-24.352***	-14.715*		
					(-3.51)	(-1.95)		
Controls/Ind. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	2,244	2,244	2,244	2,241	2,244	2,244	1,439	1,439
Adjusted R^2	0.070	0.069	0.066	0.089	0.064	0.068	0.066	0.074

Table 5 (continued)

Panel C: Probability of spinning pay ratio disclosure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PR Type:	Ln(pay ratio)	Pay ratio decile	High pay ratio	High industry pay ratio	Components	High pay ratio + components	High pay ratio + PR words	Expected pay ratio	Unexpected pay ratio
Pay ratio	0.116***	0.038**	0.349***	0.277***		0.303***	0.235***	0.022	0.095**
	(3.34)	(2.56)	(4.33)	(3.73)		(3.25)	(2.86)	(0.08)	(2.30)
Ln(CEO pay)					0.029	0.007			
					(1.14)	(0.30)			
Ln(ME pay)					-0.144***	-0.058			
					(-2.67)	(-0.97)			
PR words							0.003***		
							(13.37)		
Controls/Ind. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	2,225	2,225	2,225	2,222	2,225	2,225	2,225	1,424	1,424
Pseudo R^2	0.042	0.039	0.045	0.043	0.041	0.045	0.117	0.050	0.052

Panel D: Number of spin words in pay ratio disclosure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PR Type:	Ln(pay ratio)	Pay ratio decile	High pay ratio	High industry pay ratio	Components	High pay ratio + Components	Expected pay ratio	Unexpected pay ratio
Pay ratio	0.130***	0.046***	0.311***	0.225**		0.225*	0.323	0.113***
	(3.69)	(2.68)	(2.85)	(2.32)		(1.71)	(0.77)	(2.59)
Ln(CEO pay)					0.045**	0.030		
					(2.37)	(1.47)		
Ln(ME pay)					-0.150**	-0.087		
					(-2.32)	(-1.17)		
Controls/Ind. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	2,244	2,244	2,244	2,241	2,244	2,244	1,439	1,439
Adjusted R^2	0.015	0.008	0.015	0.039	0.014	0.015	0.049	0.052

This table presents the textual analysis of the pay ratio disclosure. Panel A presents summary statistics. Panel B uses an OLS regression to test the total *number of words*. Panel C tests the probability of using spin (*spin indicator*) in the pay ratio disclosure in a probit regression. Panel D uses an OLS regression to test the *number of spin words* in the pay ratio disclosure. All regressions include control variables and industry fixed effects with robust standard errors. *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5% and 10% level, respectively. We define variables in Appendix D.

Table 6: Pay ratio and stakeholder outcomes

Panel A: Univariate statistics

	Mean Levels				Mean Change			
Variable	All firms	High pay ratio	Low pay ratio	Diff	All firms	High pay ratio	Low pay ratio	Diff
Media								
Media sentiment	0.94	0.70	1.02	-0.32***	0.02	-0.04	0.05	-0.09
Media level	57.20	90.76	46.15	44.61***	25.17	38.13	20.91	17.22***
Shareholders								
SOP votes against %	17.0	26.0	13.8	12.2***	1.41	3.56	0.65	2.90***
SOP fail %	2.2	4.4	1.5	2.9***	1.84	3.34	1.31	2.03***
Employees ($M/employee)								
Productivity	0.95	0.38	1.18	0.80	13.03	4.46	16.41	-11.95**

Panel B: Change in sentiment of media coverage

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ln(pay ratio)	Pay ratio decile	High pay ratio	High industry pay ratio	Components	High pay ratio + Components	Expected pay ratio	Unexpected pay ratio
Pay ratio	-0.029**	-0.012	-0.175***	-0.097*		-0.213***	-0.234	-0.002
	(-2.46)	(-0.92)	(-2.82)	(-1.70)		(-2.98)	(-1.33)	(-0.07)
Ln(CEO pay)					-0.001	0.013		
					(-0.04)	(0.64)		
Ln(ME pay)					0.021	-0.038		
					(0.46)	(-0.75)		
Media sentiment $_{t-1}$	0.067***	0.067***	0.067***	0.068***	0.067***	0.067***	0.076**	0.073**
	(2.83)	(2.84)	(2.83)	(2.86)	(2.82)	(2.82)	(2.25)	(2.16)
Controls + Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	2,075	2,075	2,075	2,075	2,075	2,075	1,374	1,374
Adjusted R^2	0.041	0.041	0.043	0.041	0.040	0.042	0.057	0.057

Table 6 (continued)

Panel C: Change in level of media coverage								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ln(pay ratio)	Pay ratio decile	High pay ratio	High industry pay ratio	Components	High pay ratio + Components	Expected pay ratio	Unexpected pay ratio
Pay ratio	0.001	0.003	0.045	0.008		0.101**	-0.019	-0.024
	(0.07)	(0.45)	(1.16)	(0.22)		(2.21)	(-0.20)	(-1.49)
Ln(CEO pay)					0.003	-0.003		
					(0.28)	(-0.28)		
Ln(ME pay)					0.050**	0.078***		
					(2.13)	(2.83)		
Media level $_{t-1}$	0.685***	0.684***	0.683***	0.685***	0.684***	0.680***	0.678***	0.663***
	(31.21)	(31.21)	(30.98)	(31.20)	(31.10)	(30.81)	(30.09)	(30.60)
Controls + Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	2,075	2,075	2,075	2,075	2,075	2,075	1,374	1,374
Adjusted R^2	0.775	0.775	0.776	0.776	0.776	0.776	0.844	0.839

Panel D: Change in percentage of votes against say-on-pay								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ln(pay ratio)	Pay ratio decile	High pay ratio	High industry pay ratio	Components	High pay ratio + Components	Expected pay ratio	Unexpected pay ratio
Pay ratio	0.024***	0.009***	0.051***	0.052***		0.053***	0.004	0.025***
	(4.86)	(4.67)	(4.83)	(5.30)		(4.52)	(0.15)	(4.31)
Ln(CEO pay)					0.014***	0.010**		
					(3.00)	(2.36)		
Ln(ME pay)					-0.001	0.015*		
					(-0.11)	(1.94)		
SOP votes against $_{t-1}$	0.507***	0.508***	0.514***	0.506***	0.514***	0.509***	0.503***	0.489***
	(17.34)	(17.34)	(17.79)	(17.50)	(17.44)	(17.51)	(13.05)	(12.64)
Controls + Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,895	1,895	1,895	1,895	1,895	1,895	1,212	1,212
Adjusted R^2	0.451	0.452	0.452	0.454	0.449	0.456	0.408	0.419

Table 6 (continued)

Panel E: Change in likelihood of say-on-pay voting failure	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ln(pay ratio)	Pay ratio decile	High pay ratio	High industry pay ratio	Components	High pay ratio + Components	Expected pay ratio	Unexpected pay ratio
Pay ratio	0.022***	0.009***	0.047***	0.044***		0.046***	0.038	0.021***
	(5.30)	(4.83)	(4.87)	(5.06)		(4.17)	(1.17)	(4.02)
Ln(CEO pay)					0.012***	0.009***		
					(3.97)	(2.67)		
Ln(ME pay)					-0.004	0.010		
					(-0.63)	(1.36)		
SOP votes against $_{t-1}$	0.111***	0.112***	0.117***	0.112***	0.117***	0.113***	0.129***	0.123***
	(5.17)	(5.21)	(5.46)	(5.19)	(5.45)	(5.28)	(4.54)	(4.32)
Controls + Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,895	1,895	1,895	1,895	1,895	1,895	1,212	1,212
Pseudo R^2	0.071	0.069	0.069	0.070	0.065	0.074	0.074	0.088

Panel F: Change in employee productivity	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ln(pay ratio)	Pay ratio decile	High pay ratio	High industry pay ratio	Components	High pay ratio + Components	Expected pay ratio	Unexpected pay ratio
Pay ratio	-0.036***	-0.017***	-0.075***	-0.040**		-0.034*	-0.145**	-0.028***
	(-3.49)	(-3.45)	(-3.36)	(-2.19)		(-1.76)	(-2.31)	(-2.81)
Ln(CEO pay)					-0.009**	-0.006*		
					(-2.36)	(-1.76)		
Ln(ME pay)					0.080***	0.071***		
					(3.01)	(2.63)		
Labor productivity $_{t-1}$	0.904***	0.903***	0.909***	0.921***	0.888***	0.887***	0.918***	0.914***
	(31.28)	(30.76)	(31.86)	(34.62)	(26.68)	(26.55)	(34.21)	(34.60)
Controls + Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,405	1,405	1,405	1,405	1,405	1,405	1,306	1,306
Adj. R^2	0.904	0.904	0.904	0.908	0.905	0.905	0.900	0.900

This table presents changes in stakeholder outcomes based on pay ratio levels. Panel A presents summary statistics. Panels B and C present OLS regressions of *media sentiment* and *media level*. Panels D and E present tests of shareholder Say-On-Pay voting. We use OLS regressions in tests of *SOP votes against (%)* and Tobit regressions in tests of the likelihood of say-on-pay voting failure (*SOP fail %*). Panel F presents tests of the change in *productivity*. All regressions include lagged dependent variables and industry fixed effects with robust standard errors. *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5% and 10% level, respectively. We define variables in Appendix D.

Table 7: Influence of pay ratio disclosure spin on stakeholders

	Spin indicator			Spin words		
Variable	Media sentiment	SOP votes against %	Productivity $_{t+1}$	Media sentiment	SOP votes against %	Productivity $_{t+1}$
Unexpected pay ratio × Spin	-0.091*	0.015*	-0.020	-0.028*	0.002	-0.010**
	(-1.86)	(1.65)	(-1.04)	(-1.77)	(0.72)	(-2.06)
Unexpected pay ratio	0.006	0.022***	-0.025**	-0.003	0.025***	-0.025**
	(0.15)	(2.95)	(-0.76)	(-0.09)	(4.31)	(-2.27)
Spin	-0.118	0.034	-0.028	-0.030	0.003	-0.012*
	(-1.05)	(1.56)	(-0.99)	(-1.15)	(0.63)	(-1.87)
Controls/Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,357	1,211	1,279	1,357	1,211	1,279
Adjusted R^2	0.055	0.440	0.902	0.056	0.439	0.903

This table tests the interaction of spin with stakeholder outcomes in an OLS framework. The variable *unexpected pay ratio* is described in Section 3.3. We interact this variable with the *spin* indicator and *spin words*. All regressions include lagged dependent variables and other standard controls, and industry fixed effects with robust standard errors. *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5% and 10% level, respectively. We define variables in Appendix D.

Table 8: Pay ratio disclosure and compensation consultants

	(1)	(2)	(3)	(4)	(5)	(6)
Variable	Number of words	Spin indicator	Spin words	Number of words	Spin indicator	Spin words
High pay ratio	72.394***	0.578***	0.691***	47.456***	0.352***	0.296***
	(3.74)	(3.60)	(3.57)	(4.77)	(4.33)	(2.67)
Number of consultants	19.032**	0.109	0.211***			
	(2.53)	(1.57)	(2.70)			
High pay ratio × Number of consultants	-21.819	-0.209*	-0.350**			
	(-1.43)	(-1.67)	(-2.43)			
Controls/Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Consultant FE	No	No	No	Yes	Yes	Yes
N (Firms)	2,244	2,244	2,244	2,244	2,244	2,244
Adjusted R^2	0.068	0.046	0.017	0.075	0.053	0.020

This table examines the interaction between the *number of consultants* and the *high pay ratio* indicator on the properties of pay ratio disclosure in columns (1) to (3), and with consultant fixed effects in columns (4) to (6). ***, **, and * denote statistical significance at the 1%, 5% and 10% level, respectively. We define variables in Appendix D.

Table 9: Alternative pay ratio tests

Panel A: Actual pay ratio using Execucomp sample						
Variable	Number of words	Spin indicator	Spin words	Media sentiment	SOP votes against %	Productivity $_{t+1}$
Ln(Actual Pay Ratio)	28.231***	0.199***	0.150***	-0.071*	0.028***	-0.019**
	(4.75)	(4.23)	(3.02)	(-1.88)	(4.22)	(-2.38)
Controls/Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,466	1,442	1,466	1,354	1,310	947
Adjusted (Pseudo) R^2	0.097	0.060	0.062	0.102	0.520	0.969

Panel B: Pay ratio using three-year average CEO pay in Execucomp						
Variable	Number of words	Spin indicator	Spin words	Media sentiment	SOP votes against %	Productivity $_{t+1}$
Ln(3-Year Average Pay Ratio)	30.749***	0.182***	0.154***	-0.090**	0.024***	-0.023**
	(4.66)	(3.48)	(2.71)	(-2.00)	(3.38)	(-2.20)
Controls/Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,465	1,465	1,465	1,353	1,309	947
Adjusted (Pseudo) R^2	0.095	0.056	0.062	0.102	0.515	0.969

Panel C: Pay ratio using salary plus bonus in Execucomp						
Variable	Number of words	Spin indicator	Spin words	Media sentiment	SOP votes against %	Productivity $_{t+1}$
Ln(Pay Ratio Salary + Bonus)	13.339**	0.181***	0.136**	-0.080**	0.013*	-0.011
	(1.98)	(3.53)	(2.50)	(-2.17)	(1.91)	(-1.26)
Controls/Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,462	1,462	1,462	1,350	1,307	944
Adjusted (Pseudo) R^2	0.080	0.055	0.058	0.102	0.511	0.969

Table 9 (continued)

Panel D: Difference in actual pay ratio and 3-year average pay ratio in Execucomp

Variable	Number of words	Spin indicator	Spin words	Media sentiment	SOP votes against %	Productivity $_{t+1}$
Ln(Actual Pay Ratio – 3-Year Average Pay Ratio)	21.893***	0.138***	0.099***	-0.007	0.016***	-0.020***
	(5.43)	(3.72)	(2.60)	(-0.22)	(4.01)	(-2.62)
Controls/Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,044	1,044	1,044	969	934	671
Adjusted (Pseudo) R^2	0.121	0.068	0.093	0.108	0.536	0.969

Panel E: Difference in actual pay ratio and salary + bonus pay ratio in Execucomp

Variable	Number of words	Spin indicator	Spin words	Media sentiment	SOP votes against %	Productivity $_{t+1}$
Ln(Actual Pay Ratio – Salary and Bonus Pay Ratio)	23.578***	0.142***	0.107**	-0.057	0.023***	-0.018***
	(4.69)	(3.38)	(2.19)	(-1.58)	(4.30)	(-2.65)
Controls/Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,461	1,461	1,461	1,350	1,306	944
Adjusted (Pseudo) R^2	0.095	0.055	0.058	0.102	0.520	0.969

Panel F: Controlling for CEO pay slice

	Number of words	Spin indicator	Spin words	Media sentiment	SOP Votes against %	SOP Fail against %	Productivity t+1
Ln(pay ratio)	29.302***	0.212***	0.152***	-0.068*	0.030***	0.032***	-0.017*
	(4.30)	(4.17)	(2.93)	(-1.71)	(4.44)	(5.81)	(-1.79)
CEO pay slice	-52.820	0.041	0.084	-0.066	0.022	0.018	-0.040
	(-1.20)	(0.12)	(0.23)	(-0.24)	(0.48)	(0.46)	(-0.51)
Controls + Ind. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,405	1,382	1,405	1,297	1,254	1,254	910
Adjusted (Pseudo) R^2	0.093	0.065	0.067	0.105	0.522	0.095	0.968

This table presents tests of pay ratio disclosure and stakeholder outcomes using alternative pay ratio calculations and a subsample of firms in the Execucomp database. In Panel A, we repeat our primary results for the Execucomp subsample. Panel B presents tests where pay ratio is the natural log of one plus the ratio determined by the average CEO compensation value (TDC1) over the past three years and the reported median employee pay (*3-Year Average Pay Ratio)*. Panel C replaces generates the pay ratio based on one plus the ratio of the CEO salary and bonus divided by the median employee pay (*Salary and Bonus Pay Ratio*). Panels D and E present tests of the difference in the actual and alternative pay ratio measures. For these tests we use the natural log of the disclosed pay ratio less the *3-Year Average Pay Ratio* and *Salary and Bonus Pay Ratio*, respectively. Panel F estimates our main regressions including the variable *CEO pay slice* as a control, which is the percentage of total compensation of the CEO in Execucomp divided by the sum of the top five highest paid executives. All regressions include lagged dependent variables and other standard controls, and industry fixed effects with robust standard errors. *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5% and 10% level, respectively. We define variables in Appendix D.

Table 10: Changes in pay ratio disclosure in second year of reporting

Panel A: Univariate statistics

	Mean Levels				Mean Change			
Variable	All firms	High pay ratio	Low pay ratio	Diff	All firms	High pay ratio	Low pay ratio	Diff
Total number of words	397.2	449.7	378.6	71.0***	24.3	34.1	20.8	13.3**
Spin indicator	54.3	64.2	50.8	13.4***	27.6	30.2	26.7	3.5
Spin words	1.3	1.8	1.2	0.62***	0.62	0.77	0.56	0.21***
N	1,964	514	1,450		1,838	484	1,354	

Panel B: Change in total number of words in pay ratio disclosure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PR Type:	Change in pay ratio	Ln(pay ratio)	Pay ratio decile	High pay ratio	High industry pay ratio	Components	High pay ratio + Components	Expected pay ratio	Unexpected pay ratio
Pay ratio	0.737***	7.950**	2.808**	18.684**	8.881		19.141**	10.153	1.514
	(24.73)	(2.34)	(2.03)	(2.22)	(1.12)		(1.97)	(0.83)	(0.52)
Ln(CEO pay)						5.664***	4.386***		
						(3.73)	(2.95)		
Ln(ME pay)						1.967	7.654		
						(0.36)	(1.23)		
Number of words $_{t-1}$	0.737***	0.729***	0.729***	0.729***	0.730***	0.732***	0.731***	0.732***	0.732***
	(24.73)	(24.24)	(24.24)	(24.40)	(24.24)	(24.34)	(24.27)	(23.51)	(23.40)
Controls/Ind. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,628	1,638	1,638	1,638	1,638	1,638	1,638	1,258	1,258
Adjusted R^2	0.551	0.549	0.548	0.549	0.564	0.549	0.550	0.542	0.543

Table 10 (continued)

Panel C: Change in probability of spinning pay ratio disclosure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
PR Type:	Change in pay ratio	Ln(pay ratio)	Pay ratio decile	High pay ratio	High industry pay ratio	Components	High pay ratio + Components	High pay ratio + PR words	Expected pay ratio	Unexpected pay ratio
Pay ratio	0.034	0.051	0.007	0.071	-0.047		0.025	-0.007	-0.077	0.033
	(0.48)	(1.20)	(0.41)	(0.69)	(-0.51)		(0.22)	(-0.07)	(-0.41)	(0.83)
Ln(CEO pay)						0.003	0.002			
						(0.13)	(0.06)			
Ln(ME pay)						-0.084	-0.076			
						(-1.16)	(-0.96)			
PR words								0.003***		
								(9.56)		
Spin indicator $_{t-1}$	1.597***	1.595***	1.599***	1.598***	1.605***	1.596***	1.596***	1.534***	1.566***	1.559***
	(16.75)	(16.73)	(16.80)	(16.78)	(16.89)	(16.73)	(16.74)	(15.55)	(14.16)	(14.07)
Controls/Ind. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,625	1,635	1,635	1,635	1,635	1,635	1,635	1,635	1,251	1,251
Pseudo R^2	0.221	0.223	0.223	0.223	0.223	0.223	0.223	0.268	0.219	0.218

Panel D: Change in number of spin words in pay ratio disclosure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PR Type:	Change in pay ratio	Ln(pay ratio)	Pay ratio decile	High pay ratio	High industry pay ratio	Components	High pay ratio + Components	Expected pay ratio	Unexpected pay ratio
Pay ratio	0.074	0.070**	0.020	0.126	0.075		0.063	0.086	0.027
	(1.18)	(2.02)	(1.28)	(1.30)	(0.83)		(0.59)	(0.64)	(0.89)
Ln(CEO pay)						0.034**	0.030**		
						(2.35)	(2.04)		
Ln(ME pay)						-0.074	-0.056		
						(-1.23)	(-0.88)		
Spin words $_{t-1}$	0.867***	0.864***	0.866***	0.865***	0.865***	0.865***	0.864***	0.876***	0.875***
	(31.92)	(31.59)	(31.69)	(31.56)	(31.46)	(31.65)	(31.53)	(28.09)	(27.94)
Controls/Ind. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,628	1,638	1,638	1,638	1,638	1,638	1,638	1,258	1,258
Adjusted R^2	0.623	0.623	0.622	0.623	0.636	0.623	0.623	0.625	0.625

This table tests the changes in pay ratio disclosure properties. Panel A presents the mean levels and change in the number of words, spin indicator, and spin words in year two. Panels B to D presents tests of changes in the *total number of words*, *spin indicator*, and *spin words*, respectively. All regressions include lagged dependent variables and other standard controls, and industry fixed effects with robust standard errors. *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5% and 10% level, respectively. We define variables in Appendix D.

Table 11: Changes in pay ratio components in second year of reporting

Panel A: Univariate statistics

Variable	All firms	High pay ratio	Low pay ratio	Difference
Decline in CEO pay	38.8	49.8	35.1	14.7***
Increase in median employee pay	67.1	69.9	66.2	3.6
Change in median employee	67.8	66.8	68.1	-1.3

Panel B: Decline in CEO pay

	Ln(pay ratio)	Pay ratio decile	Pay ratio decile	High pay ratio	Expected CEO pay	Unexpected CEO pay	Expected pay ratio	Unexpected pay ratio	High pay ratio
Pay ratio	0.133***	0.053***		0.193***	0.091*	0.167***	0.087	0.104***	0.174***
	(9.01)	(9.07)		(5.81)	(1.94)	(7.75)	(0.82)	(6.18)	(5.27)
Decile 2			0.018						
			(0.35)						
Decile 3			0.162***						
			(2.98)						
Decile 4			0.188***						
			(3.49)						
Decile 5			0.276***						
			(4.80)						
Decile 6			0.290***						
			(5.02)						
Decile 7			0.270***						
			(4.52)						
Decile 8			0.338***						
			(5.46)						
Decile 9			0.415***						
			(6.53)						
Decile 10			0.555***						
			(8.27)						
"One-time"									0.411***
									(8.09)
Controls + Ind. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,748	1,748	1,748	1,748	1,515	1,515	1,214	1,214	1,748
Adjusted R^2	0.069	0.066	0.069	0.039	0.025	0.084	0.025	0.062	0.061

Table 11 (continued)

Panel C: Increase in median employee pay								
	Ln(pay ratio)	Pay ratio decile	Pay ratio decile	High pay ratio	Expected ME pay	Un-expected ME pay	Expected pay ratio	Un-expected pay ratio
Pay ratio	0.028**	0.014**		0.021	-0.108**	-0.072**	0.058	0.030**
	(2.11)	(2.42)		(0.66)	(-2.27)	(-2.49)	(0.64)	(1.99)
Decile 2			-0.049					
			(-0.89)					
Decile 3			-0.026					
			(-0.46)					
Decile 4			0.070					
			(1.29)					
Decile 5			0.060					
			(1.06)					
Decile 6			0.038					
			(0.66)					
Decile 7			0.097*					
			(1.68)					
Decile 8			0.069					
			(1.16)					
Decile 9			0.034					
			(0.56)					
Decile 10			0.129**					
			(2.03)					
Controls/Ind FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,758	1,758	1,758	1,758	1,233	1,233	1,223	1,214
Adjusted R^2	0.015	0.016	0.016	0.012	0.010	0.011	0.005	0.009

Panel D: Change in median employee						
	Ln(pay ratio)	Pay ratio decile	Pay ratio decile	High pay ratio	Expected pay ratio	Unexpected pay ratio
Pay ratio	-0.079**	-0.027*		0.030	0.169	-0.014
	(-2.23)	(-1.74)		(0.34)	(0.60)	(-0.31)
Decile 2			0.105			
			(0.65)			
Decile 3			-0.175			
			(-1.10)			
Decile 4			-0.116			
			(-0.75)			
Decile 5			-0.422***			
			(-2.64)			
Decile 6			-0.231			
			(-1.43)			
Decile 7			-0.345**			
			(-2.11)			
Decile 8			-0.185			
			(-1.08)			
Decile 9			-0.217			
			(-1.24)			
Decile 10			-0.216			
			(-1.19)			
Controls + Ind. FE	Yes	Yes	Yes	Yes	Yes	Yes
N (Firms)	1,746	1,746	1,746	1,746	1,212	1,203
Pseudo R^2	0.053	0.051	0.057	0.051	0.061	0.061

This table tests the changes in the components of the pay ratio. We create three indicator variables that equal one if the firm has a *decline in the CEO pay*, *increase in median employee pay*, or a *change in median employee* in reporting year two. Panel A presents the mean values for all firms and partitioned by high and low pay ratio. Panels B to D present regressions of these indicators based on reported pay ratio values in year one. For tests of the *pay ratio decile*, we report coefficients overall and for each decile as compared to decile one, which is pushed into the intercept of the regression. All regressions include standard controls and industry fixed effects with robust standard errors. *t*-statistics are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5% and 10% level, respectively. We define variables in Appendix D.