Is CEO-to-Employee Pay Ratio Disclosure Relevant to Stakeholders?

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December 3, 2020

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We thank seminar participants at Bentley University for helpful comments and suggestions on our paper.

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Abstract

The CEO pay ratio – the ratio between the CEO's total annual compensation and the total annual compensation of the median employee, mandated by the Dodd-Frank Act of 2010 has generated an unprecedented level of public engagement in the long history of the SEC disclosure regime. The opponents of the rule argue that it imposes significant ongoing compliance costs on firms and yet provides no material information to investors. We find that the CEO pay ratio is negatively associated with employee productivity for firms with high CEO pay ratios and informs investors' decisions to vote against executive officers' compensation policies after controlling for CEO compensation. The CEO pay ratio also informs the likelihood of a "no" recommendation from a prominent proxy advisor. Our findings provide direct evidence of the relevance of CEO pay ratio disclosure beyond the level of CEO compensation to various stakeholders.

Keywords: *Dodd-Frank Act; CEO pay; Say-on-pay; Proxy advisors; Income inequality.*

I. INTRODUCTION

Sec 953(b) of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (DFA) directed the SEC to amend Item 402 of Regulation S-K to shed light on CEO-worker pay disparity. In 2015, the SEC issued the final rule, requiring public filers to disclose in their annual proxy statements the following information: the CEO's total annual compensation, the total annual compensation of the median employee, and the ratio between the two (hereafter, the "CEO pay ratio"). The rule became effective for proxies filed in 2018 (SEC 2015).

The materiality of information is the overriding principle that guides the SEC's decision to mandate a disclosure. By mandating CEO pay ratio disclosure, the SEC has concluded that disclosure is relevant to investors and others. However, this assertion requires empirical verification. Our goal is to study the relevance of CEO pay ratio disclosure by examining how the various stakeholders – employees, shareholders, a proxy advisor (Institutional Shareholder Services), boards of directors, and managers – respond to the first-time disclosure of the CEO pay ratio. We surmise that to the extent that stakeholders' responses are influenced by CEO pay ratio disclosure, disclosure is deemed relevant, i.e., capable of impacting users' decisions (FASB 2008).

Specifically, we address the following seven questions:

1. Does the CEO pay ratio inform about employee productivity?
2. Is there a relation between the CEO pay ratio and investors' decisions to vote against or abstain from voting to ratify executive officers' compensation (Say-On-Pay (SOP) votes)?
3. Is there a relation between the CEO pay ratio and a "no" vote recommendation on the SOP vote from Institutional Shareholder Services (ISS)?[1]

[1] ISS is the most influential proxy advisor in the US (Albuquerque et al. 2020).

4. Is there a relation between the CEO pay ratio and SOP votes against the election of members of the compensation committee of a board of directors?
5. Does the disclosure of the CEO pay ratio impact CEO compensation?
6. Is there a relation between the CEO pay ratio and CEO turnover? and
7. Does the disclosure of the CEO pay ratio impact the median employee's compensation?

Our study is motivated by several factors. More than seven years after it was proposed, the rule remains controversial, and two SEC Commissioners, Piwowar and Gallagher, strongly opposed it. Bank and Georgiev (2019) note that the rule has generated an unprecedented level of public engagement in the long history of the SEC disclosure regime. The SEC has received more than 300,000 comment letters on this rule. While private investors, union members, union organizations, investment managers, academics, and politicians supported the rule, lobbyists and firms opposed it (Boone et al. 2019). Opponents of the regulation have expressed two key concerns. First, the rule imposes an enormous administrative burden on firms since for *each employee*, firms have to estimate the total compensation and its various components – salary, incentives, grant date fair value of equity, changes in pension value, nonqualified deferred compensation earnings, and any other compensation (Pearl Myer 2015). Additionally, firms need to identify the median employee, which is a challenging exercise for multinational firms.[2] It is estimated that the initial costs of compliance with such disclosure are approximately $1.3 billion, and ongoing annual costs of compliance are estimated at $526 million (Pearl Meyer 2015). Second, opponents have argued that the CEO pay ratio has very little or no value to investors.[3] Edmans

[2] Firms need to identify the median employee once every three years. Firms can exclude non-U.S. employees up to 5 percent of their global workforce. Further, the following employees are excluded from the definition of "employees": leased workers, independent contractors, and employees of subsidiaries that are not consolidated. Additionally, Emerging Growth Companies and companies that are transitioning out of Smaller Reporting Companies need not provide such disclosure.

[3] Tom Quaadman, Executive Vice President of the Center for Capital Markets Competitiveness, states, "Of the many misguided corporate governance provisions included within Dodd-Frank, the CEO pay ratio … stands out for its

(2017) notes that CEO pay ratio disclosure "may actually do far more harm than good." On the other hand, proponents of the rule have argued that CEO pay ratio information is material and will enable investors to make more informed decisions when casting advisory votes on executive compensation (Heyman 2017). Senator Robert Menendez, a proponent of CEO pay ratio disclosure, argues that greater disparity in CEO-worker pay will put pressure on boards of directors to restrain CEO compensation (Shorter 2013). Similarly, Luis Aguilar, a former SEC Commissioner, states that pay ratio disclosure will make executive compensation more transparent and foster accountability (Aguilar 2013).

Given these strong views in support of and opposition to the rule, empirical evidence on the potential relevance of this disclosure to various stakeholders would help validate or refute the SEC's position that CEO pay ratio disclosure provides material information. For example, evidence of the real effects of CEO pay ratio disclosure, such as the impact on CEO compensation, median employee compensation or CEO turnover, would be of interest to regulators and activists who have claimed that disclosure would rein in excessive CEO compensation. Another issue concerns whether the CEO pay ratio can provide insight into workplace climates and employee productivity. Our findings shed light on these important financial reporting and public policy issues.

Another motivation comes from the mixed findings of the limited concurrent research on the effect of pay ratio disclosures on investors' SOP votes. While Boone et al. (2019) find that disclosing higher pay ratios increases investor SOP votes, Crawford et al. (2020) do not observe a significant relation between the CEO pay ratios and SOP votes for more than the majority of their

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audacity….it provides no material information to investors" (Quaadman 2017). Thomas Farley, President of the New York Stock Exchange states, "many of our listed companies question the value of this information and are concerned that the disclosure will not be meaningful to stakeholders" (Farley 2017).

sample, calling into question the relevance of this disclosure to investors. Knust and Oesch (2020) also find that the pay ratio does not change SOP voting outcomes. Finally, on a broader level, our study relates to the widening income inequality gap, one of the most pressing challenges facing both developed and developing countries (TIIP 2018).[4] There is limited research on the role of financial reporting in mitigating the income inequality gap.

We use a sample of 1,425 observations for which the CEO pay ratios are available for fiscal years 2017 and 2018 and the corresponding SOP votes are available for 2018 and 2019 to examine stakeholders' responses to the CEO pay ratio. In our models, we control for CEO compensation to provide evidence of whether CEO pay ratio disclosure is *incrementally* informative over the level of CEO compensation in explaining stakeholders' responses to disclosure.

We document several findings. First, the mean (median) CEO pay ratio is approximately 188 (114), and the mean value of SOP dissent votes is approximately 9 percent. Approximately 10 percent of firms in the sample received a "no" recommendation on SOP from ISS. Second, our results suggest that the disclosure of the CEO pay ratio has had a significant adverse effect on employee morale and workplace climate, resulting in lower employee productivity for firms with high CEO pay ratios but not for firms with low pay ratios. Third, we find that both total CEO compensation and the CEO pay ratio are positively associated with SOP votes, indicating that the CEO pay ratio is incrementally informative about shareholders' responses to pay ratio disclosure. In terms of economic significance, a 10 percent increase in the natural logarithm of the CEO pay ratio is associated with a 15 percent increase in SOP dissent votes. An additional analysis reveals that a high CEO pay ratio is associated with higher shareholder dissatisfaction with executive

[4] According to the Institute for Policy Studies (Hess 2019), the CEO pay ratio is more than 100 for nearly 80 percent of *S&P 500* firms and approximately 10 percent of firms paying their median workers below the poverty line. Further, it is estimated that median employees in 50 firms would have to work at least 1,000 years to earn what their CEOs earned in a year.

compensation only for poorly performing firms; we do not find a significant association between a high CEO pay ratio and shareholder dissatisfaction with executive compensation when firm performance is strong. Fourth, we compare SOP votes before and after the disclosure of the CEO pay ratio and find that the pay ratio is informative about SOP votes only for firms with high CEO pay ratios but not for firms with low CEO pay ratios. Fifth, the CEO pay ratio also informs of the likelihood of a "no" SOP recommendation being made by ISS. The marginal effect of the pay ratio on the probability of a negative recommendation is 4.31 percent. Sixth, the CEO pay ratio is positively associated with shareholders voting against the election of board of director's compensation committee members in firms where CEO pay is greater than the expected (predicted) pay. Seventh, we find that on average, the CEO pay ratio is associated with a decrease in the CEO's salary and a decrease in both the salary component and the performance pay component for firms where the CEO pay is greater than the expected pay. However, we do not find a relation between the CEO pay ratio and CEO turnover. Finally, we find that the CEO pay ratio is associated with an *increase* in median employee pay. Overall, the responses from stakeholders are consistent with social norms and equity theories (Adams 1965; Kohlberg 1969; Rest 1986).

We make three contributions to the literature. First, regarding the nascent literature on the consequences of CEO pay ratio disclosure, we provide empirical evidence that the CEO pay ratio is informative about stakeholders' responses. A concurrent study by Boone et al. (2019) also finds that disclosing higher pay ratios increases shareholder voting dissent on executive compensation. Crawford et al. (2020) also find that the CEO pay ratio is associated with SOP dissent votes, but this relation is found only for the top pay ratio decile. More importantly, neither study examines whether the CEO pay ratio is related to recommendations of proxy advisors or shareholders' voting against the election of a board of director's compensation committee members. There is a paucity

of evidence on whether CEO pay ratio information is relevant to other stakeholders and not just shareholders. Our findings are potentially important to the SEC and to others because the findings support the notion that pay ratio disclosures are relevant to investors in communicating their dissatisfaction about a firm's executive compensation practices. Thus, our findings provide direct evidence of the relevance of disclosures to capital market participants. Second, we contribute to the literature on financial reporting disclosure by documenting the "real effects" of Section 953(b) of the DFA, i.e., we find a *decrease* in CEO compensation as well as an *increase* in median employee pay following CEO pay ratio disclosure. These findings contribute to the debate on whether highlighting income inequality between CEOs and rank-and-file employees is effective in restraining excessive CEO compensation (Solomon 2013; Kess and Cohn 2014). Finally, on a broader level, our study is related to income inequality, a topic of fundamental interest for governments in both developed and developing nations, and sheds light on how financial reporting disclosures could play a role in enhancing the incomes of rank-and-file workers.

II. RELATED RESEARCH AND HYPOTHESES

Under the DFA, publicly held firms are required to hold a nonbinding advisory SOP vote once every three years. Several studies have examined the effect of SOP votes on CEO compensation. Cai and Walkling (2011) examine the market reaction to the passing of the SOP Bill by the U.S. House of Representatives in 2007 and find that the reaction was positive for firms with high abnormal CEO pay. However, the market reaction to proposals sponsored by activist shareholders was negative. The authors conclude that SOP creates value for firms with inefficient compensation practices but can hurt firms targeted by special interests. Ertimur et al. (2011) examine the effect of shareholder activism on CEO pay and find that firms with excess CEO pay targeted by "vote no" campaigns result in a $7.3 million (approximately 38 percent) decrease in

pay, while proposals from institutional shareholders result in a $2.3 million decrease in pay. These results suggest that SOP can be more effective than shareholder proposals in curbing excess CEO pay. However, Larcker et al. (2011) draw the opposite conclusion. Their results suggest that regulating executive pay will result in less efficient contracts and negatively affect shareholder wealth in these firms. Similarly, Armstrong et al. (2013) find that shareholder voting has little impact on CEO incentive compensation policies. Brunarski et al. (2015) examine managerial responses to SOP voting and find that overcompensated managers with low SOP support increase dividends, decrease leverage, and increase corporate investment. However, the authors find that excess compensation increases for managers that were overpaid before the SOP vote. Overall, Brunarski et al. (2015) conclude that SOP legislation did not produce its intended effect of improving compensation contracting. In a recent study, Illiev and Vitanova (2019) found that the adoption of SOPs has increased CEO pay.

More related to our study, only a handful of works have examined the impact of CEO pay ratio disclosure. Kelly and Seow (2016) conduct an experiment using MBA students from Singapore to proxy for investors and find that disclosing only higher-than-industry CEO pay may have limited negative effects on how participants perceive the company, but adding a higher-than-industry pay ratio significantly decreases perceived CEO pay fairness as well as perceived investment potential. These findings suggest that CEO pay ratio disclosures are relevant to investors. Using a sample of 233 firms that disclosed the CEO pay ratio in 2017, Anginer et al. (2020) find that the cost of capital is increasing in the pay ratio, consistent with higher agency costs for firms with a higher CEO pay ratio. Boone et al. (2019) find that firms with higher pay ratios engage in actions, such as lengthier pay ratio narratives, to mitigate the perception of pay disparity between the CEO and workers. The authors also find that higher pay ratios attract

negative media attention, more negative SOP votes, and lower labor productivity. Another recent study, Crawford et al. (2020), concludes that the costs of pay ratio disclosure may outweigh the benefits for more than a majority of firms. Our study complements Boone et al. (2019) by examining responses from ISS, a prominent proxy advisor, and SOP votes against the election of the board of director compensation committee members. Unlike Crawford et al. (2020), we find that on average, the prior-year CEO pay ratio is associated with SOP dissent votes incremental to the level of prior-year CEO compensation. In other words, our findings suggest that the relevance of CEO pay ratio information to shareholders is not restricted to firms with the highest CEO pay ratios.

Hypotheses

Our first hypothesis relates to the potential link between income disparity between the CEO and employees and employee productivity. Miller (2018) notes that with CEO pay ratio disclosure, it will be easier not only for employees to compare their CEO's pay with their own but also to see how their pay compares to that of the typical employee at their firm and at peer firms. Consistent with equity fairness theory (Adams 1965; Akerlof and Yellen 1988), a greater disparity in compensation between the CEO and the median employee is likely to be perceived by employees as unfair and create resentment in the workplace.[5] This is also consistent with prior research finding that fairness increases individuals' happiness (Tabibnia et al. 2008), which could impact their performance. For example, Cowherd and Levine (1992) find that egalitarian interclass reward distributions are related to higher product quality in corporate business units. On the other hand, Cornelissen et al. (2009) find that absenteeism is higher among German workers who perceive

[5] Peter Drucker recommended to the SEC to limit the pay ratio at 25-to-1 on the grounds that higher pay ratios would result in employee resentment and lower morale (McGregor 2013).

their CEO's compensation to be unfair. Pfeffer and Langton (1993) find that greater wage inequality is associated with lower employee satisfaction, productivity, and willingness to collaborate with fellow employees. Breza et al. (2018) provide experimental evidence that pay inequality reduces employee output, attendance, and willingness to cooperate with coworkers. These findings support the notion that pay inequality impacts worker morale. To the extent to which employees associate high CEO pay ratios with unfair treatment, we posit that CEO pay ratios will be informative about employee productivity. Thus, we propose the following hypothesis:

H1: The CEO pay ratio is negatively associated with employee productivity.

Edmans (2017) argues that CEOs and workers compete in very different markets, and thus, there is no reason to link their pay. Similarly, Kelly and Seow (2016) note that higher pay for the CEO is consistent with the CEO's higher input – skillset, experience, education, responsibilities, and reputation. Further, there is evidence that higher pay ratios are associated with superior long-term performance (Mueller et al. 2017; Faleye et al. 2013). Thus, *ex ante,* it is not clear whether higher CEO pay ratios would inevitably trigger an unfavorable response from stakeholders, such as voting against executive compensation policies or electing directors to the compensation committee.

On the other hand, in firms where the CEO's pay is *more* than the expected pay (after taking into account firm performance and other determinants of CEO pay), a higher CEO pay ratio is more likely to elicit a response from stakeholders than in firms where the CEO pay is equal to or less than the expected pay for the following reasons. First, Bank and Georgiev (2019) note that the CEO pay ratio is characterized by high public salience, i.e., it is intuitive and takes on a personal dimension and resonates with the public more than any other form of disclosure. Consistent with

this notion, Boone et al. (2019) find that the sentiment of media coverage becomes more negative for firms with a high pay CEO pay ratio. Second, individual investors' decisions are influenced by social and personal norms of fairness and the equitable treatment of fellow human beings, consistent with the moral psychology literature (Kohlberg 1969; Rest 1986). Cialdini and Trost (1998, 152) define social norms as "rules and standards that are understood by members of a group and that guide and/or constrain social behavior without the force of law." Consistent with this notion, Kelly and Seow (2016) find that disclosing a higher-than-industry CEO pay ratio has a significant indirect negative effect on perceived investment potential through perceived CEO pay fairness. Thus, we posit that negative publicity is likely to increase individual investors' awareness of the disparity in pay between the CEO and workers as well as reinforce social norms on equity and fairness, prompting an unfavorable response. Separately, there is also evidence that high pay ratios are associated with decreased firm sales (Mohan et al. 2018) and that excessive (unexplained) pay ratios are negatively associated with firm performance (Rouen 2020). Additionally, the equity market reacts negatively to the first-time disclosure of CEO pay ratios (Chang et al. 2019; Pan et al. 2020). Anginer et al. (2020) find that the cost of capital increases significantly as the CEO pay ratio increases, consistent with higher agency costs. These findings indicate that excessive pay ratios can impact firm value, prompting an SOP vote from shareholders, especially for firms where CEO pay is perceived to be excessive. The above lines of reasoning lead to the following hypothesis:

H2: The CEO pay ratio is associated with a negative SOP vote by shareholders when CEO pay is more than the expected pay.

Our third hypothesis focuses on the compensation committee because the board's compensation committee has several important mandates. Compensation committees are required to review and recommend the CEO's compensation, including salary, incentives, benefits and other

perquisites, and to assist the board in assessing and evaluating the CEO's pay-for-performance (Hermanson et al. 2012). Most compensation committees are required to approve and monitor the corporation's compensation and benefit programs, as developed by management, and to consider any other human resource-related issues that they consider inappropriate or that may be referred by the board. Therefore, the CEO-median employee pay disparity is within the purview of the board's compensation committee, and if a high CEO pay ratio is perceived by shareholders as a salient benchmark of excessive or unfair CEO pay or has a negative effect on shareholders' perceptions of fairness and workplace climate, then we expect shareholders to register their dissatisfaction with the compensation committee through the outcomes of director elections, especially when the CEO is overpaid. We thus propose the following hypothesis:

H3: The CEO pay ratio is associated with an SOP vote against the election of the board of directors' compensation committee members when CEO pay is more than the expected pay.

Next, Hong and Kacperczyk (2009) observe that institutional investors are more "norm constrained" than individual investors because their stock positions are known publicly and hence will avoid investing in firms that are inconsistent with social norms. TIIP (2018) notes that income inequality has become one of the most noteworthy socioeconomic issues and has important implications for institutional investors.[6] Income inequality can negatively impact long-term investment performance and lead to lower economic growth and more frequent and deeper recessions. Further, TIIP (2018, 31) notes that investors can vote against excessive pay proposals when compensation is out of line with their interests. Similarly, Kim and Venkatachalam (2011) find that although sin stocks (firms in the gaming, tobacco, alcohol, and adult entertainment

[6] ERAFP, the asset manager for France's public services and other pension plans, has set a maximum compensation ratio between managers and employees of 100 to minimize the negative effect of pay disparity on employee morale.

industries) are associated with higher financial reporting quality and higher expected returns, investors neglect them to comply with societal norms.

Proxy advisors act as information intermediaries by gathering and processing information about a company's executive and governance practices for institutional investors who need to fulfill their fiduciary duties to vote. Proxy advisors are valuable because they fill an information gap by establishing metrics for evaluating companies' governance practices, including board composition and executive compensation practices. There is prior research on the growing importance of proxy advisors as information intermediaries who advise institutional investors on SOP voting. Malenko and Shen (2016) find that a negative recommendation from ISS on an SOP proposal leads to a 25 percent reduction in SOP voting support, indicating strong influence over shareholder votes. Ertimur et al. (2013) find a small but significant negative market reaction for firms following a negative recommendation from ISS. Albuquerque et al. (2020) provide empirical evidence that unfavorable recommendations from ISS are associated with worse future accounting performance, suggesting that ISS is able to detect low-quality compensation packages. Thus, we posit that the likelihood of a negative vote from ISS increases in firms where the CEO is overpaid and propose the following hypothesis:

H4: The CEO pay ratio is associated with a negative SOP vote by the proxy advisor when CEO pay is more than the expected pay.

Next, boards of directors, especially those serving on the compensation committee, are likely to face pressure from proxy advisors and investors to rein in excessive CEO pay. Consistent with this notion, Norman et al. (2020) conduct an online experiment with practicing directors and find that directors are less willing to increase CEO pay when the CEO pay ratio is above the industry average. Thus, we propose the following hypothesis:

H5: The CEO pay ratio is likely to decrease CEO pay when it exceeds the expected pay.

In addition to decreasing the CEO's pay, another potential consequence for overpaid CEOs is dismissal. On the other hand, directors serving on the compensation committee as well as the board of directors may adjust the CEO's pay rather than replacing the CEO. Thus, we propose the following null hypothesis on the relation between the CEO pay ratio and CEO turnover:

H6: The CEO pay ratio is not associated with CEO turnover.

Similarly, managers will be under pressure to increase the median employee compensation, especially when the CEO's pay is more than the expected pay. Thus, we propose the following final hypothesis:

H7: The CEO pay ratio is likely to increase the compensation of the median employee.

III. EMPIRICAL MODELS

To test H1 on the relation between CEO pay ratio disclosure and employee productivity, we estimate the following model:

$$LNREVEMP = \alpha + \beta_1 PAYRATIODIS + \beta_2 HIPAYRATIO + \beta_3 HIPAYRATIO \times PAYRATIODIS + \beta_4 LOPAYRATIO + \beta_5 LOPAYRATIO \times PAYRATIODIS + controls + IND\ FE + \varepsilon_{i,t} \quad (1)$$

where $LNREVEMP_t$ is the natural logarithm of total revenues divided by the number of employees in year *t*, our measure employee productivity (Cronqvist et al. 2009). *PAYRATIODIS* equals 1 for 2018 and 2019 and 0 otherwise. *HIPAYRATIO* equals 1 if the firm's pay ratio is in the fourth quartile of all pay ratios and 0 otherwise. *LOPAYRATIO* equals 1 if the firm's pay ratio is in the first quartile of all pay ratios and 0 otherwise. We include firm size, profitability, stock performance, financial leverage, revenue growth, the book-to-market ratio, the volatility of *ROA* and stock returns in year *t-1*, cash balance, capital asset tangibility, and the Herfindahl index as drivers of employee productivity.

We use the following empirical model to test H2 through H4:

$$SOPNOVOTE_{i,t} = \alpha + \beta_1 LNPAYRATIO_{i,t-1} + \beta_2 LNCEOCOMPS_{t-1} + \mu X_{i,t-1} + \gamma Z_{i,t} + IND\ FE + YR\ FE + \varepsilon_{i,t} \quad (2)$$

The dependent variable, *SOPNOVOTE,* is the outcome of shareholder SOP votes, defined as the proportion of shareholder votes against the ratification of executive remunerations (*SOPNOVOTE*) in year *t*. The independent variable of interest is the natural log of the CEO pay ratio (*LNPAYRATIO*), defined as total CEO compensation in year *t-1* divided by median employee pay in year *t-1*. We also examine whether the findings are robust to controlling for the natural log of total CEO compensation (*LNCEOCOMPS*) in the model.

X includes control for the firm's financial statement characteristics in year *t-1* that could potentially influence how shareholders vote to ratify executive pay in year *t*. We control for firm size (*MKVL*), profitability (*ROA*), and stock performance (*RETURNS*) in year *t-1*. The executive compensation of large firms relative to small firms is more likely to attract the attention of analysts, proxy advisors, and activist shareholders (Ertimur et al. 2011). We also expect the executive pay of poorly performing firms to receive significantly fewer "for" ratification votes. We control for the firm's growth opportunities by including the book-to-market ratio (*BTM*) and revenue growth (*REVGROWTH*) in year *t-1*. We expect higher shareholder votes "for" the ratification of the executive compensation of companies experiencing higher growth. We control for monitoring by debtholders and its potential effect on how shareholders vote by including financial leverage and total long-term debt scaled by total assets.

Z includes controls that account for firm characteristics associated with the quality of corporate governance in the year of the SOP vote. While corporate governance includes a broad array of attributes, we focus on CEO entrenchment attributes such as CEO tenure (*CEOTENURE*), CEO gender (*CEOGENDER*), and CEO duality (*CEODUALITY*) and board characteristics such as the proportion of independent directors on the board (*PIND*), the proportion of female directors on

the board (*BDFEMALE*), average director tenure (*BDTENURE*) and age (*BDAGE*), and the proportion of board members with multiple board memberships (*BDBUSY*). We expect companies with an entrenched CEO or a weak board (poor monitoring) to garner fewer shareholder votes to ratify executive renumeration.

IV. SAMPLE

Our sample is compiled from several data sources. CEO pay ratio disclosure is required for a firm's first full fiscal year that begins on or after January 1, 2017. [7] Thus, calendar year-end companies will be required to include pay ratio disclosure as part of Item 402 in their proxy statements starting in 2018. CEO pay ratio data were obtained from The American Federation of Labor and Congress of Industrial Organization (AFL-CIO). According to the U.S. Department of Labor, the AFL-CIO is the largest federation of unions in the United States, with fifty-five national and international unions, representing more than 12 million active and retired workers.[8] The AFL-CIO collects and reports on their website the CEO pay ratio for Russell 3000 and S&P 500 firms.[9]

We obtain the outcome of SOP votes and ISS proxy recommendations on SOP votes from ISS's Voting Analytics database. This database provides the number of "for" and "withheld" shareholder votes made in the ratification of the renumeration of executives. We obtain financial statement data from Compustat and Director and CEO characteristics data from ISS. Our final sample includes 1,425 firm-year observations for 2018 and 2019. We relate the SOP vote in year *t* to the CEO pay ratio in year *t-1* to examine the effect of CEO pay ratio disclosure on SOP voting.[10] We also lag some of the control variables to mitigate endogeneity concerns.

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[7] An example of CEO pay ratio disclosure for Walmart for the fiscal year ending on January 31, 2020 appears in Appendix A.
[8] See https://olms.dol-esa.gov/query/orgReport.do?rptId=562569&rptForm=LM2Form
[9] https://aflcio.org/paywatch/company-pay-ratios
[10] For example, we use the CEO pay ratio for 2017 to test SOP voting in 2018.

Univariate analysis

Panel A, Table 1 provides information on the sample distribution by industry and information on the mean and median CEO pay ratios by industry. The top-3 industry categories of the sample are durable manufacturers, computers, and services. The industries with the highest mean CEO pay ratios include the retail, food processing, services, and textile and printing industries. This result is consistent with statistics reported by executive compensation advisory firms Equilar[11] and Pearl Meyer[12]. These are consumer discretionary and consumer staples sectors with many employees earning minimum wages. On the other hand, the utilities, extractive, and mining and construction industries have the lowest mean CEO pay ratios.

Panel B reports the summary statistics for the dependent and explanatory variables used in this study. The mean and median SOP dissent votes are approximately 9 percent and 5 percent, respectively. This result is consistent with the mean and median reported in Balsam et al. (2016). Approximately 10 percent of the firms in the sample had a "no" recommendation on SOP from the ISS. The mean and median CEO pay ratios are approximately 188 and 114, respectively. These values are comparable to the mean ratio of 173 reported by Pearl Meyer.

[Insert Table 1 About Here]

In Figures 1A and 1B, we divide the sample into quintiles based on the reported CEO pay ratios. We graph the mean and median employee productivity (*REVEMP*) and SOP vote outcomes (*SOPNOVOTE*) based on the reported CEO pay ratios, with the first quintile representing the lowest CEO pay ratio and the fifth quintile representing the highest CEO pay ratio. Both figures show that firms with higher quintiles of the CEO pay ratio show lower employee productivity and a higher proportion of SOP votes against the ratification of executive remuneration. We also

[11] https://www.equilar.com/blogs/438-ceo-pay-ratio-by-sector.html
[12] https://www.pearlmeyer.com/ceo-pay-ratio-data-and-perspectives-2018-proxy-season.pdf

observe that firms with lower quintiles of CEO pay ratios have higher employee productivity and a lower proportion of SOP votes against the ratification of executive remuneration. Figure 1 provides preliminary evidence that suggests that a higher CEO pay ratio is associated with lower (higher) employee productivity (shareholder dissatisfaction with executive pay). In Figures 2A and 2B, we graph shareholder employee productivity and SOP votes for the four-year period starting two years before the new CEO pay ratio disclosures became effective and two years after. The purpose of this graph is to visually depict the effect of disclosure on employee productivity and SOP votes based on the quintile of the CEO pay ratio. We divide the observations in the sample into quintiles based on reported CEO pay ratios for 2018, the first year of disclosure. We retroactively examine employee productivity (Figure 2A) and SOP votes (Figure 2B) for each quintile starting in 2016 and ending in 2019.

In Figure 2A, we show an increase in employee productivity after 2017 for quintiles 1 to 3. However, in quintiles 4 and 5, there is a decline in employee productivity after 2017 (the post disclosure period). In Figure 2B, we observe that for quintiles 2 to 5, there is very little dispersion in SOP votes prior to the new CEO pay ratio disclosure requirement. However, there is a spike in shareholder dissatisfaction with executive renumerations from 2017 to 2018, with the highest increase found for observations in the 5^{th} quintile. Overall, the graphical presentations suggest that a higher CEO pay ratio is associated with higher shareholder dissatisfaction with executive pay and that CEO pay ratio disclosure increases shareholder sensitivity to executive renumeration.

[Insert Figure 1 About Here]

[Insert Figure 2 About Here]

The correlation coefficient (not tabulated) between the CEO pay ratio (*PAYRATIO*) and SOP votes (*SOPNOVOTE*) and between the CEO pay ratio and SOP proxy advisor votes

(*SOPNOISSREC*) are positive and significant, providing some preliminary evidence that the CEO pay ratio is positively correlated with SOP dissent vote outcomes and the proxy advisor's "no" recommendation on SOP votes.

V. RESULTS

Before we test our hypotheses, we estimate a regression of the CEO pay ratio on a set of determinants of CEO compensation identified in prior research (see Appendix C) as well as industry fixed effects, and untabulated results indicate that the R^2 is approximately 45.37 percent. Firm size (*LNMKVL*) and industry fixed effects account for 45 percent and 29 percent of the R^2, respectively, followed by fixed assets as a proportion of total assets (7 percent), foreign operations (5 percent), and the standard deviation of ROA (4 percent). These results indicate that firm size and industry affiliation are the major drivers of CEO pay ratio. We discuss the results of tests of our hypotheses below.

CEO Pay Ratio Disclosure and Employee Productivity

The results for H1 are shown in Table 2. We present the results in four columns. In column 1, the coefficient on $LNPAYRATIO_{t-1}$ is negative and significant at the 0.01 level, indicating that employee productivity is decreasing in the lagged pay ratio. In column 2, we include lagged values of both the CEO pay ratio and CEO compensation and find that the coefficient on $LNPAYRATIO_{t-1}$ continues to be negative and significant, while the coefficient on lagged CEO compensation is positive and marginally significant. In column 3, we find that the coefficient on *HIPAYRATIO* is negative and significant at the 0.01 level, indicating that employee productivity is lower for firms with high CEO pay ratios. More importantly, the coefficient on the variable of interest, *HIPAYRATIO×PAYRATIODIS,* is -0.1945 and significant at the 0.05 level. This suggests that the disclosure of the CEO pay ratio has had a significantly adverse effect on employee morale and

workplace climates, resulting in lower employee productivity for firms with high CEO pay ratios. However, we do not find a change in employee productivity for firms with low CEO pay ratios. Interestingly, in column 4, when we replace *HIPAYRATIO* with *HICEOPAY*, an indicator for firms for which the CEO's actual compensation is *more* than the fitted compensation, we do not find the coefficients on *HICEOPAY* and *HICEOPAY×PAYRATIODIS* to be significant. In other words, there is no evidence that the disclosure of CEO compensation by itself impacts employee productivity. Overall, these results are consistent with H1 and suggest that CEO pay ratio disclosure has an adverse effect on employee productivity.[13] Our finding complements findings in Rouen (2020) showing that unexplained pay disparity between the CEO and the median employee is negatively associated with firm performance and suggests that employee productivity is one channel by which the pay ratio affects firm performance.

[Insert Table 2 About Here]

CEO Pay Ratio and SOP Vote Outcomes

To test H2 on the association between CEO pay ratios and shareholder SOP vote outcomes as measured by the proportion of shareholders against the ratification of executive renumeration, we divide our sample into firms in which the actual CEO pay is less than or equal to the expected pay and firms in which the actual CEO pay is more than the expected pay. Recall that H2 predicts that shareholders are likely to cast a negative SOP vote when the CEO pay is *more* than the expected pay. To calculate the CEO's expected pay in year *t-1*, we estimate the following model:

$$LNCEOCOMPS_{t-1} = \alpha + \gamma Z_{i,t-1} + FIRM\ FE + \varepsilon_{i,t} \quad (3)$$

where $LNCEOCOMPS_{t-1}$ is the natural logarithm of total CEO compensation in year *t-1*. Z is a vector of control variables that affect CEO compensation, as evidenced by the extant literature, as

[13] Our results are robust to including fixed effects for states to control for differences in the cost of living and minimum wage between states.

discussed below. We estimate the OLS regression with firm fixed effects to control for unobserved firm heterogeneity.

Z includes controls for the impact of firm characteristics on SOP votes (e.g., Cheng 2004; Firth et al. 2006; Frydman and Jenter 2010), such as firm complexity, profitability, stock performance, and the volatility of the company's operations in year *t-1*. We include the following proxies to measure the above attributes: firm size, return on assets, revenue growth, stock returns, stock return volatility and return on assets, the book-to-market ratio, asset tangibility, cash flow from operations, financial leverage, foreign operations, and mergers. Boyd (1994) and Chhaochharia and Grinstein (2009) show that managerial entrenchment and board governance quality play a role in determining executive compensation. We include several CEO-specific and board-related characteristics to capture the CEO's influence and the quality of board governance.

[Insert Table 3 About Here]

Appendix C presents the results of model (3). We find that total CEO compensation is positively correlated with firm size, profitability, revenue growth, stock performance, operating cash flows, foreign operations, and CEO tenure. We find a negative association between average board member tenure and total CEO compensation. The adjusted R^2 of the model is approximately 77 percent. From these results, we estimate the fitted value of CEO pay in year *t-1*. If the actual total CEO compensation is more than the fitted (expected) value of the CEO's total compensation in year *t-1*, we view the CEO's compensation as excessive and thus a concern for shareholders. However, if the actual total CEO compensation is less than or equal to the fitted value of the CEO's compensation in year *t-1*, the CEO's pay may not be viewed as excessive. We separately examine the association between the CEO pay ratio and SOP votes for both partitions, and the results are listed in Panel A, Table 3.

In the first three columns, the sample only includes observations for which actual total CEO compensation is less than or equal to the fitted value of CEO compensation. In column 1, the coefficient on total CEO compensation is positive but not significant. In column 2, the coefficient on the CEO pay ratio is positive and significant at the 0.01 level, suggesting that even when the CEO's total compensation is less than the expected compensation, a higher CEO pay ratio is associated with more shareholder votes against the ratification of executive compensation. The coefficient on the CEO pay ratio continues to be significant at the 0.01 level when we control for total CEO compensation in column 3.

In the last three columns, the sample only includes observations for which the actual total CEO compensation is more than the fitted value of CEO compensation. In column 4, the coefficient on total CEO compensation is positive and significant, indicating that SOP dissent votes are increasing in lagged CEO compensation. In column 5, the coefficient on the CEO pay ratio is positive and significant at the 0.01 level. This indicates that when the CEO's total compensation is more than the expected compensation, a higher CEO pay ratio is associated with more shareholder votes against the ratification of executive compensation. The coefficient on the CEO pay ratio continues to be positive and significant at the 0.01 level when we control for total CEO compensation in the last column. Overall, these results are consistent with H2.

Next, we examine whether the disclosure of the CEO pay ratio has had any significant effect on shareholder SOP vote outcomes by comparing SOP votes made before and after the disclosure with a focus on firms that reported a high (low) CEO pay ratio in 2018. In this analysis, we assume that companies with a high (low) CEO pay ratio in 2018 also had a high (low) CEO pay ratio in 2017 and 2016, though this information was not publicly available until after 2017. We consider a company to have a high (low) CEO pay ratio if the firm's CEO pay ratio is in the

fourth (first) quartile as indicated by *HIPAYRATIO* (*LOPAYRATIO*). We interact both *HIPAYRATIO* and *LOPAYRATIO* with *PAYRATIODIS*, an indicator variable that equals 1 for the period after 2017 and 0 otherwise. We estimate the following model:

$$SOPNOVOTE_{i,t} = \alpha + \beta_1 PAYRATIODIS + \beta_2 HIPAYRATIO + \beta_3 HIPAYRATIO \times PAYRATIODIS + \beta_4 LOPAYRATIO + \beta_5 LOPAYRATIO \times PAYRATIODIS + \mu X_{i,t-1} + \gamma Z_{i,t} + IND\ FE + YR\ FE + \varepsilon_{i,t} \quad (4)$$

We present the results of this analysis in Panel B, Table 3. First, we estimate a baseline OLS regression model in which the independent variable is *PAYRATIODIS* to broadly examine the effect of the disclosure of the CEO pay ratio on shareholder SOP vote outcomes. We do not include year fixed effects in the model. The observations used in this analysis are for 2016 to 2019 and include 2,728 firm-years. The coefficient on *PAYRATIODIS* is positive but not significant, suggesting that there is no significant difference in SOP vote outcomes before and after CEO pay ratio disclosures. In the second column, while the coefficient on *HIPAYRATIO*×*PAYRATIODIS* is positive and significant, the coefficient on *LOPAYRATIO*×*PAYRATIODIS* is insignificant. These findings suggest that the disclosure of the CEO pay ratio has had a significant positive effect on shareholder votes against the ratification of the executive compensation of companies with high CEO pay ratios. However, this is not the case for companies with low CEO pay ratios. The above findings are potentially important because while private investors, union organizations, investment managers, and others have argued that the CEO pay ratio information will be useful in evaluating executive compensation practices and in making informed decisions on proxy votes, lobbyists and firms have argued that such disclosure does not provide material information to investors (Stuckey 2017). Thus, our findings directly speak to this debate and support the notion that CEO pay ratio information is relevant to shareholders of firms with a high CEO pay ratio. Our findings are also

relevant to the SEC and suggest that the CEO pay ratio is material and a significant determinant of shareholders' decisions to vote against executive compensation practices.

The Effect of a Firm's Prior Year Stock Performance

We also examine whether the association between CEO pay ratios and SOP votes is sensitive to a firm's stock performance. Ideally, if a CEO's compensation is closely linked to the associated firm's performance, suggesting that the firm's CEO is operating in shareholders' interest, then shareholders may not perceive the unfairness of the CEO's compensation when there is a strong CEO – median employee pay disparity. For this analysis, we create two indicator variables, *HIRETURNS* and *LORETURNS*. *HIRETURNS* equals 1 if the firm's one-year holding period stock returns in year *t-1* are in the fourth quartile of all stock returns and 0 otherwise. *LORETURNS* equals 1 if the firm's one-year holding period stock returns in year *t-1* are in the first quartile of all stock returns and 0 otherwise. We interact *HIRETURNS* and *LORETURNS* with *HIPAYRATIO,* which equals 1 if the firm's pay ratio is in the fourth quartile of all pay ratios and 0 otherwise.

We present the results of this analysis in Panel C, Table 3. Column 1 presents the results for the full sample. We find that the coefficient on *HIPAYRATIO* is positive and significant, indicating that SOP votes are more frequent for firms with high CEO pay ratios. The coefficient on *HIPAYRATIO×LORETURNS* is positive and significant. However, the coefficient of *HIPAYRATIO×HIRETURNS* is not significant. In columns 2 and 3, we separately examine the effect of stock performance on the association between the CEO pay ratio and SOP votes for observations for which the actual CEO pay is lower than or equal to the predicted CEO pay and for observations for which the actual CEO pay is higher than the predicted CEO pay. Note *HIPAYRATIO* is not significant in column 2. In both columns 2 and 3, we find that

HIPAYRATIO×LORETURNS is positive and significant. Overall, our results suggest that when firm performance is poor, a high CEO pay ratio is associated with higher shareholder dissatisfaction with executive compensation. However, we do not find any association between a high CEO pay ratio and shareholder dissatisfaction with executive compensation when prior-year firm performance is strong. Thus, firm performance measured by stock returns moderates the relation between SOP votes and the CEO pay ratio.

CEO Pay Ratio Disclosure and Compensation Committee Director Elections

Next, we discuss the results of H3 on the relation between the CEO pay ratio and shareholders' voting to elect members of the board's compensation committee. We obtain director election vote outcomes pertaining to members of the compensation committee from the ISS voting database. We calculate the average shareholder dissatisfaction vote outcome for the slate of directors on the board's compensation committee (*CCOMNOVOTE*). Results in Table 4 indicate that for the subsample for which the actual CEO pay is lower than the predicted CEO pay, we do not find any associations between total CEO pay, the CEO pay ratio and shareholder dissatisfaction with members of the compensation committee. However, for the subsample for which the actual CEO pay is higher than the predicted CEO pay, we find a significant positive relation between total CEO pay, the CEO pay ratio and shareholder dissatisfaction with members of the compensation committee. These results support H3 and indicate that the CEO pay ratio is incrementally informative over CEO compensation about shareholders' voting against electing directors who serve on the compensation committee.

[Insert Table 4 About Here]

CEO Pay Ratio Disclosure and SOP Vote Recommendations from ISS

Next, we substitute *SOPNOVOTE* with *SOPNOISSREC* and reestimate model (2) to examine ISS's responses to CEO pay disclosure. Proxy advisory firms ISS and Glass, Lewis & Company provide services to investors by issuing voting recommendations and assisting institutional investors in formulating voting guidelines (Choi et al. 2008). Voting recommendations from proxy advisors are usually based on research and analyses of a company's corporate governance structure, risk management, and compensation plan (Ertimur et al. 2013). In model (2), we estimate logistic regressions of the CEO pay ratio on recommendations made by proxy advisors to shareholders to "vote no" on the SOP proposal.

In Panel A, Table 5 we examine the association between the CEO pay ratio and an ISS vote "no" recommendation separately for the subsample of firms for which the actual total CEO compensation is less than or equal to the fitted value of CEO compensation (see columns 1-3) and for the subsample of firms for which the actual total CEO compensation is more than the fitted value of total CEO compensation (see columns 4-6). In the first three columns, we do not find any significant association between total CEO pay (*LNCEOCOMPS*) and the likelihood of an ISS vote "no" recommendation on executive compensation. However, we find a significantly positive association between the CEO pay ratio (*LNPAYRATIO*) and the likelihood of an ISS vote "no" recommendation on executive compensation in columns 2 and 3. In the last three columns of Panel B, where the sample includes only observations for which actual total CEO compensation is more than the fitted value of CEO compensation, we also find a significant positive association between the CEO pay ratio (*LNPAYRATIO*) and the likelihood of an ISS vote "no" recommendation on executive compensation after controlling for CEO pay. These findings are consistent with H4.

In Panel B, we examine whether the disclosure of the CEO pay ratio has had any significant impact on a "no" vote recommendation on executive compensation from the ISS. We first examine the association between *PAYRATIODIS* and *SOPNOISSREC*. The coefficient on *PAYRATIODIS* is positive but not significant, suggesting no significant difference in ISS vote "no" recommendations made on executive compensation before and after CEO pay ratio disclosures. However, in the second column, the coefficient on *HIPAYRATIO×PAYRATIODIS* is positive and marginally significant, while the coefficient on *LOPAYRATIO×PAYRATIODIS* is not significant. This finding suggests that the disclosure of the CEO pay ratio has had an impact on ISS vote "no" recommendations on executive compensation for companies with high CEO pay ratios. However, this finding does not hold for firms with low CEO pay ratios.

Panel C reports the effect of a firm's stock performance on the association between the CEO pay ratio and ISS recommendations on SOP votes. In column 1, the coefficient on *HIPAYRATIO×LORETURNS* is positive and significant, and the coefficient on *HIPAYRATIO×HIRETURNS* is not significant. In column 2 (firms for which the actual CEO pay is less than or equal to the fitted pay), the coefficient on *HIPAYRATIO×LORETURNS* is also positive and significant, but the coefficient on *HIPAYRATIO×HIRETURNS* is not significant. In column 3, (firms for which the actual CEO pay is greater than the fitted pay), the coefficient on *HIPAYRATIO×LORETURNS* is also positive and significant at the 0.01 level, but the coefficient on *HIPAYRATIO×HIRETURNS* is positive and marginally significant. Overall, our results suggest that when firm performance is poor, a high CEO pay ratio is associated with a higher likelihood of an ISS vote "no" recommendation on SOP.

[Insert Table 5 About Here]

CEO Pay Ratio Disclosure and Change in CEO Compensation

Next, we discuss the results of H5 on the relation between the CEO pay ratio and the change in CEO compensation measured three ways: the change in total CEO compensation (*ΔCEOCOMPS*), change in the nonperformance component of CEO pay ($\Delta SALARY_t$), and change in the pay for performance component of CEO pay ($\Delta PERFPAY_t$). Results in Table 6 indicate that the coefficient on the CEO pay ratio is not significant for firms for which the actual CEO pay is less than or equal to the expected CEO pay. However, the coefficient on $LNPAYRATIO_{t-1}$ is negative and significant for all three measures of change in CEO pay for firms for which the actual CEO pay is more than the expected CEO pay. Furthermore, the magnitude of the coefficient is greater for the performance component of CEO pay than for the nonperformance component, suggesting that the board of directors responds by restraining excessive CEO pay, lending support to H5.

[Insert Table 6 About Here]

CEO Pay Ratio Disclosure and CEO Turnover

We present the results for H6 on the relation between the CEO pay ratio and CEO turnover in Table 7. The results indicate that even for firms for which the actual CEO pay is more than the expected (fitted) pay, the CEO pay ratio is not associated with CEO turnover. Thus, there is no evidence that CEO pay ratio disclosure results in CEO turnover, and we thus fail to reject H6.

[Insert Table 7 About Here]

CEO Pay Ratio Disclosure and Change in Median Employee Compensation

We present the results of H7 on the relation between the CEO pay ratio and the change in the median employee compensation in Table 8. In column 1, we present the results for the full sample. We find that the coefficient on $LNPAYRATIO_{t-1}$ is positive and significant at the 0.01 level,

indicating that the prior-year CEO pay ratio is associated with an increase in the current-year median employee compensation. In columns 2 and 3, respectively, we present the results for firms for which the actual CEO pay is less than or equal to the expected pay and for firms where the actual CEO pay is more than the expected pay. In both columns, the coefficient on $LNPAYRATIO_{t-1}$ is positive and significant at the 0.01 level, consistent with the results shown in column 1. Thus, the results are consistent with H7 and suggest that managers adjust the median employee pay following the disclosure of the CEO pay ratio.

[Insert Table 8 About Here]

VI. CONCLUSION

The CEO pay ratio required under the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 remains a controversial disclosure and has generated an unprecedented level of public engagement in the long history of the SEC disclosure regime. Investors have argued that CEOs' pay ratio information will enable them to make more informed decisions when casting advisory votes on executive compensation. Others have argued that the disclosure of disparity in CEO-worker pay will put pressure on boards of directors to restrain CEO compensation and foster accountability. However, opponents of the regulation have expressed concerns of significant compliance costs and have argued that the CEO pay ratio has very little or no value to investors. We find that the CEO pay ratio informs about employee productivity. Furthermore, we find that the CEO pay ratio informs of investors' decisions to vote against executive officers' compensation policies, of the election of the board of director's compensation committee members, and of the likelihood of a "no" recommendation from a prominent proxy advisor. We also find that the CEO pay ratio is associated with a decrease in CEO salary and a decrease in both the salary component

and the performance pay component in firms where CEO pay is greater than expected pay and an increase in median employee pay.

Our findings have important implications for the SEC, boards of directors, managers, investors, and others. To the SEC, by examining the perspectives of multiple stakeholders, our findings speak to the materiality and relevance of CEO pay ratio disclosure, which are central to the SEC's decision to mandate disclosure. More importantly, our findings indicate that the CEO pay ratio provides additional information over and above the level of CEO compensation. Our findings are relevant to other jurisdictions that are considering mandating a similar disclosure. For boards of directors, investors and others, our results indicate that greater disparity in CEO-worker pay can impact worker productivity and hence can impact firm performance and valuation. Future research can examine the long-term implications of disclosing the CEO pay ratio on CEO compensation, especially for firms with high pay ratios.

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Appendix A: Walmart Stores CEO Pay Ratio Disclosure for Fiscal Year Ended on 1/31/2020

In accordance with SEC rules, we are providing the ratio of the annual total compensation of our CEO to the annual total compensation of our median associate, which is a reasonable estimate calculated in a manner consistent with SEC rules and is based on our payroll and employment records and the methodology described below. In calculating this estimated ratio, SEC rules allow companies to adopt a variety of methodologies, apply different exclusions, and make reasonable estimates and assumptions reflecting their unique employee populations. As discussed on pages 48-49 above, our company is unique because we are significantly larger than most of our peer group companies in terms of revenue, market capitalization, and the size and scope of our worldwide employee population. Therefore, our reported pay ratio may not be comparable to that reported by other companies due to differences in industries, scope of international operations, business models, and scale, as well as the different estimates, assumptions, and methodologies applied by other companies in calculating their respective pay ratios.

Considered Population. As of December 31, 2019, we employed approximately 2,234,894 associates worldwide, other than our CEO. As permitted by SEC rules, in order to determine our median associate, we excluded approximately 3.5% of our total associate population or approximately 78,976 associates outside of the U.S. from the following countries: Argentina (9,558); Bangladesh (86); Botswana (888); Costa Rica (15,134); El Salvador (4,904); France (1); Ghana (215); Guatemala (10,507); Honduras (3,641); Hong Kong (23); India (27,558); Indonesia (9); Ireland (106); Israel (40); Kenya (190); Lesotho (178); Luxembourg (2); Malawi (133); Morocco (2); Mozambique (481); Namibia (306); The Netherlands (1); Nicaragua (3,751); Nigeria (341); Pakistan (16); Peru (8); Singapore (1); Spain (18); Swaziland (66); Tanzania (61); Thailand (5); Turkey (69); Uganda (90); Vietnam (24); and Zambia (563). Therefore, an aggregate associate population of approximately 2,155,918 was considered (the "considered population") in determining our median associate.

Identifying our Median Associate. In determining our median associate, we used calendar year 2019 gross earnings – meaning total amounts paid before deductions or adjustments, including wages, overtime, bonuses, and the value of any equity awards that vested and were paid to an associate during calendar year 2019. Adjustments were made to annualize the gross earnings of all newly hired permanent associates in the considered population who did not work for the entire calendar year 2019. From the considered population, we then used statistical sampling to identify a group of associates who were paid within a range of 0.5% above or below what we estimated to be our median gross earnings amount (the "median population"). We then reviewed recent historical taxable wage data of the median population, and for those associates within the median population with stable wages, we calculated each of their fiscal 2020 total compensation in the same way as we calculated our CEO's fiscal 2020 total compensation as set forth in the Summary Compensation table on page 68 and identified the median compensated associate from this group.

Based upon the estimates, assumptions, and methodology described above, the fiscal 2020 annual total compensation of our CEO was $22,105,350, the fiscal 2020 annual total compensation of our median associate was $22,484, and the ratio of these amounts was **983:1.**

Appendix B: Definition of Variables

ASTTANG	Total fixed assets as a proportion of total assets;
BDAGE	The average board member age;
BDBUSY	The proportion of members on the board with membership on more than three boards, 0 otherwise;
BDFEMALE	The proportion of female directors on the board, 0 otherwise;
BDSIZE	The total number of directors on the company's board
BDTENURE	The average board member tenure;
BTM	Book value per share scaled by market price per share;
CASH	Total cash and cash equivalents divided by total assets.
CCOMNOVOTE	The mean proportion of shareholders' vote against the election of members of the board's compensation committee;
CEOCOMPS	The sum of the CEO's base salary, bonus, long-term incentive payouts, the value of restricted stock grants, and the value of options;
CEODUALITY	Equals 1 if the company's CEO is also the chairman of the board, 0 otherwise;
CEOGENDER	Equals 1 for a male CEO, 0 otherwise;
CEOTENURE	The tenure of the CEO with the company;
CEOTOVER	Equals 1 if there is a CEO turnover, 0 otherwise;
FOREIGN	Equals 1 if the company reported foreign currency translation gain or reported foreign income tax expense, 0 otherwise;
HERFINDAHL	Herfindahl index;
HICEOPAY	Equals 1 if the CEO's total compensation is more than the fitted CEO compensation estimated from model (3), 0 otherwise;
HIPAYRATIO	Equals 1 if the firm's pay ratio is in the fourth quartile of all pay ratios, 0 otherwise.
HIRETURNS	Equals 1 if the firm's stock returns is in the fourth quartile of all stock returns, 0 otherwise;
LEVERAGE	Total long-term debt scaled by total assets;
LNBDAGE	The natural logarithm of *BDAGE*;
LNCEOCOMPS	The natural logarithm of *CEOCOMPS;*
LNMKVL	The natural logarithm of *MKVL*;
LNPAYRATIO	The natural logarithm of *PAYRATIO;*
LNREVEMP	The natural logarithm of *REVEMP*;
LOCEOPAY	Equals 1 if the CEO's total compensation is less than the fitted CEO compensation estimated from model (3), 0 otherwise;
LOPAYRATIO	Equals 1 if the firm's pay ratio is in the first quartile of all pay ratios, 0 otherwise.
LORETURNS	Equals 1 if the firm's stock returns is in the first quartile of all stock returns, 0 otherwise;
MERGER	Equals 1 if the company reported expenses from a merger or an acquisition, 0 otherwise;
MKVL	Market value of equity;
OCF	Operating cash-flow scaled by total assets;
PAYRATIO	The sum of the CEO's base salary, bonus, long-term incentive payouts, the value of restricted stock grants, and the value of options divided by the median employee compensation in year *t-1*;
PAYRATIODIS	Equals 1 for fiscal year 2018 and 2019, 0 otherwise;
PIND	The proportion of outside independent directors on the board;
RETSTD	The standard deviation of annual holding period stock returns calculated over five years;
RETURNS	The one-year holding period return on the company's stock;

REVEMP	Total sales revenue divided by the number of employees;
REVGROWTH	Growth in sales revenue from year *t-1* to t;
ROA	Income before extra-ordinary items scaled by total assets;
ROASTD	The standard deviation of annual *ROA* calculated over five years;
SOPNOISSREC	1 if there is a "No" recommendation on the SOP shareholder vote from ISS, 0 otherwise;
SOPNOVOTE	The sum of shareholders' advisory vote to ratify executive officers' compensation classified as abstain or against divided by total shareholder votes
ΔMEDEMPAY	The change in median employee pay from year 2018 to year 2019;
ΔPERFPAY	The change in the non-salary portion of total CEO pay (performance pay) from year *t-1* to year t*;*
ΔSALARY	The change in the salary portion of the total CEO pay (non-performance pay) from year *t-1* to year t.

Appendix C: Predicted CEO Pay

This appendix reports the coefficients and t-values of ordinary least squares (OLS) regressions to estimate predicted CEO pay in year *t-1*. The full sample consists of 1,425 firm-years during the period 2018–2019. The dependent variable, $LNCEOCOMPS_{t-1}$, is the natural logarithm of the total CEO compensation in year *t-1*, defined as the sum of the base salary, bonus, long-term incentive payouts, the value of restricted stock grants, and the value of options. All other variables are defined in Appendix B. Firm-fixed effects are included and *t*-values are based on standard errors that are clustered by firm are in parentheses. ∗, ∗∗, and ∗∗∗represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

Dependent Variable	$LNCEOCOMPS_{t-1}$
$LNMKVL_{t-1}$	0.3592***
	[12.64]
ROA_{t-1}	0.7038**
	[2.47]
$REVGROWTH_{t-1}$	0.3374***
	[2.67]
$RETURNS_{t-1}$	0.0251**
	[2.03]
$RETSTD_{t-1}$	-0.1230
	[1.00]
$ROASTD_{t-1}$	0.9892
	[1.61]
BTM_{t-1}	0.0644
	[0.58]
$ASTTANG_{t-1}$	-0.1813
	[0.42]
OCF_{t-1}	1.4945**
	[2.27]
$LEVERAGE_{t-1}$	0.0670
	[0.13]
$FOREIGN_{t-1}$	0.1451*
	[1.94]
$MERGER_{t-1}$	0.0081
	[0.14]
$CEOTENURE_{t-1}$	0.0185***
	[4.18]
$CEOGENDER_{t-1}$	-0.0951
	[0.86]
$CEODUALITY_{t-1}$	0.0439
	[0.75]
$BDSIZE_{t-1}$	-0.0236
	[0.87]
$PIND_{t-1}$	0.3882
	[1.02]
$BDFEMALE_{t-1}$	-0.1805
	[0.66]

$DBDTENURE_{t-1}$	-0.0239**
	[2.04]
$LNBDAGE_{t-1}$	0.0106
	[0.98]
$BDBUSY_{t-1}$	0.7076**
	[2.23]
INTERCEPT	4.5703***
	[5.41]
FIRM FE	Yes
Obs.	1,425
Adj. R^2	0.765

Table 1: Industry Representation and Descriptive Statistics

Panel A: Sample by Industry

Panel A shows the number and proportion of firms in sample by industry and the mean and median SOP votes by industry. The number of observations equals 718 and 707 for 2017 and 2018, respectively. Panel B presents summary statistics for the main variables. All variables are defined in Appendix B.

			PAYRATIO	
Industry	Number of Observations	Percentage	Mean	Median
Chemicals	63	4.42	148.01	108.24
Computers	190	13.33	210.53	140.13
Durable Manufacturers	384	26.95	198.49	133.99
Extractive	91	6.39	108.09	89.82
Food Processing	45	3.16	292.61	250.53
Mining and Construction	53	3.72	131.39	102.49
Others	6	0.42	288.34	288.34
Pharmaceuticals	74	5.19	149.24	129.33
Retail	132	9.26	297.23	176.62
Services	137	9.61	281.92	197.44
Textiles & Printing	59	4.14	250.68	133.79
Transportation	90	6.32	227.65	113.52
Utilities	101	7.09	81.31	76.24
Total	1,425	100.00		

Panel B: Summary Statistics

Variable	Obs.	Mean	Median	Lower Quartile	Upper Quartile	Std Dev
REVEMP	1,425	605.5648	375.4446	254.8503	584.9194	834.4178
$SOPNOVOTE_t$	1,425	0.0902	0.0488	0.0275	0.0863	0.1171
$SOPNOISSREC_t$	1,425	0.1039	0.0000	0.0000	0.0000	0.3052
$PAYRATIO_{t-1}$	1,425	187.5430	113.5232	67.1182	210.7501	225.1615
$CEOCOMPS_{t-1}$ ($,000)	1,425	10,042.09	6,453.16	3,577.38	11,885.26	14,748.12
$MKVL_{t-1}$	1,425	21,512.40	4,182.55	1,618.89	14,454.10	71,527.14
ROA_{t-1}	1,425	0.0581	0.0539	0.0234	0.0926	0.0728
BTM_{t-1}	1,425	0.4161	0.3409	0.1887	0.5481	0.3496
OCF_{t-1}	1,425	0.1047	0.0962	0.0645	0.1381	0.0693
$LEVERAGE_{t-1}$	1,425	0.2622	0.2618	0.1344	0.3607	0.1820
$RETURNS_{t-1}$	1,425	0.0604	0.0281	-0.1835	0.2661	0.3508
$RETSTD_{t-1}$	1,425	0.3339	0.2750	0.1772	0.3905	0.2837
$ROASTD_{t-1}$	1,425	0.0392	0.0237	0.0136	0.0484	0.0426
$ASTTANG_{t-1}$	1,425	0.0807	0.0286	0.0017	0.1009	0.1602
$FOREIGN_{t-1}$	1,425	0.8148	1.0000	1.0000	1.0000	0.3887
$MERGER_{t-1}$	1,425	0.3339	0.2750	0.1772	0.3905	0.2837
$REVGROWTH_{t-1}$	1,425	0.1175	0.0824	0.0302	0.1635	0.1867
$CEOTENURE_t$	1,425	7.3333	5.0000	3.0000	10.0000	7.0640
$CEOGENDER_t$	1,425	0.9446	1.0000	1.0000	1.0000	0.2289
$CEODUALITY_t$	1,425	0.1677	0.0000	0.0000	0.0000	0.3737
$BDSIZE_t$	1,425	9.3565	9.0000	8.0000	11.0000	1.9583
$PIND_t$	1,425	0.4294	0.6250	0.0000	0.8571	0.4160
$BDFEMALE_t$	1,425	0.2146	0.2222	0.1429	0.2857	0.1049
$BDTENURE_t$	1,425	8.4997	8.1818	6.1429	10.2857	3.4516
$BDAGE_t$	1,425	62.3973	62.5000	60.1818	64.6000	3.4677
$BDBUSY_t$	1,425	0.0661	0.0000	0.0000	0.1111	0.0908
CEOTOVER	1,425	0.0956	0.0000	0.0000	0.0000	0.2943
HERFINDAHL	1,425	0.0840	0.0582	0.0315	0.0861	0.0920
CASH	1,425	0.1412	0.0882	0.0339	0.1944	0.1511

Figure 1A: Quintile of CEO pay ratio and Employee Productivity (*REVEMP$_t$*)

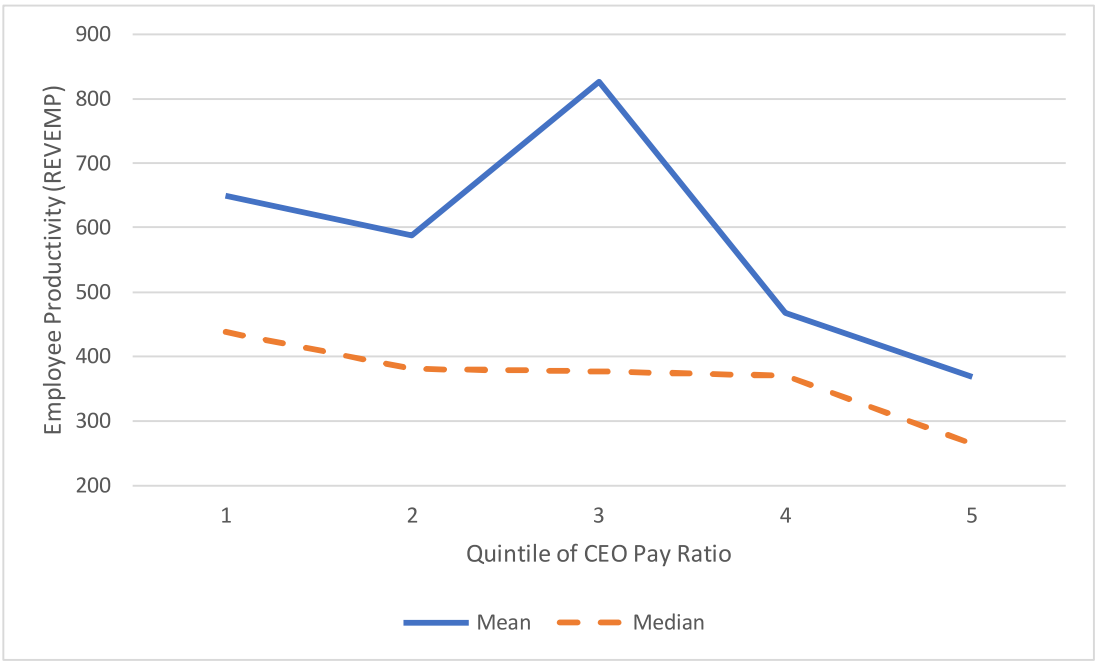
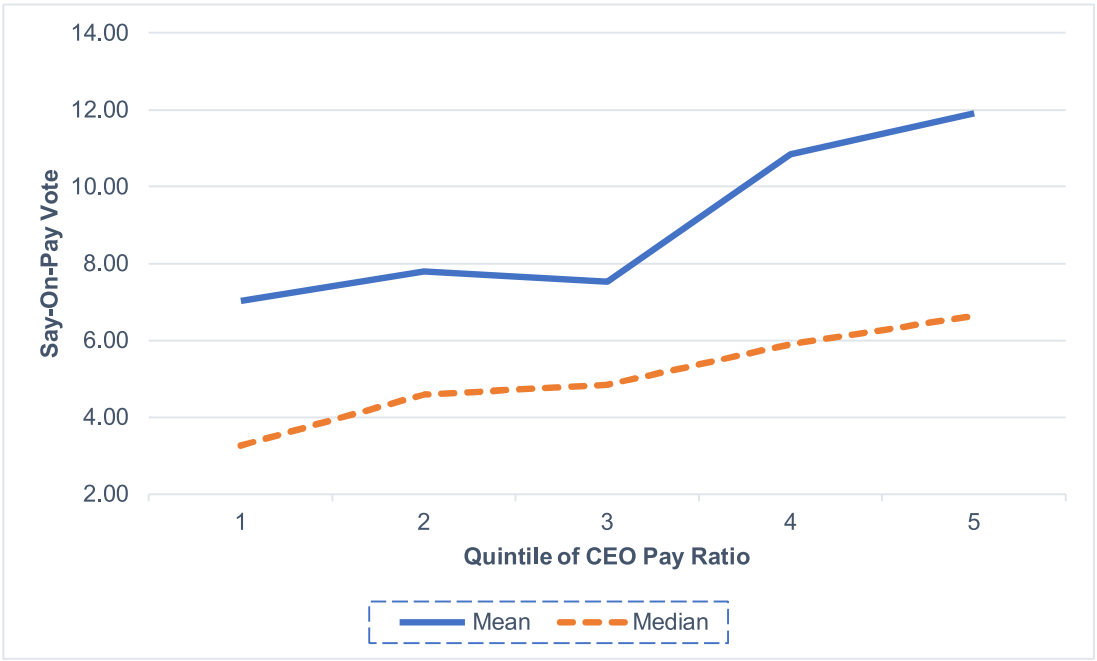


Figure 1B: Quintile of CEO pay ratio and Say on Pay Votes (*SOPNOVOTE$_t$*)



The first quintile represents the lowest CEO pay ratios and the fifth quintile represents the highest CEO pay ratios.

Figure 2A: Trend of Employee Productivity (*REVEMP$_t$*) by quintile of CEO pay ratio

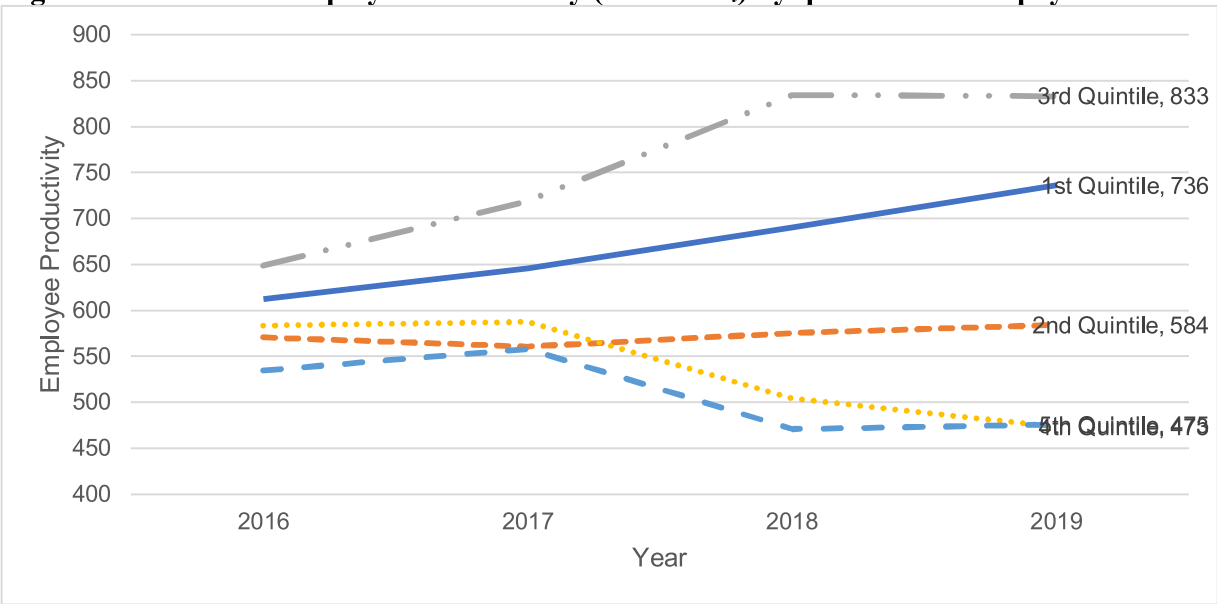


Figure 2B: Trend of Say on Pay Votes (*SOPNOVOTE$_t$*) by quintile of CEO pay ratio

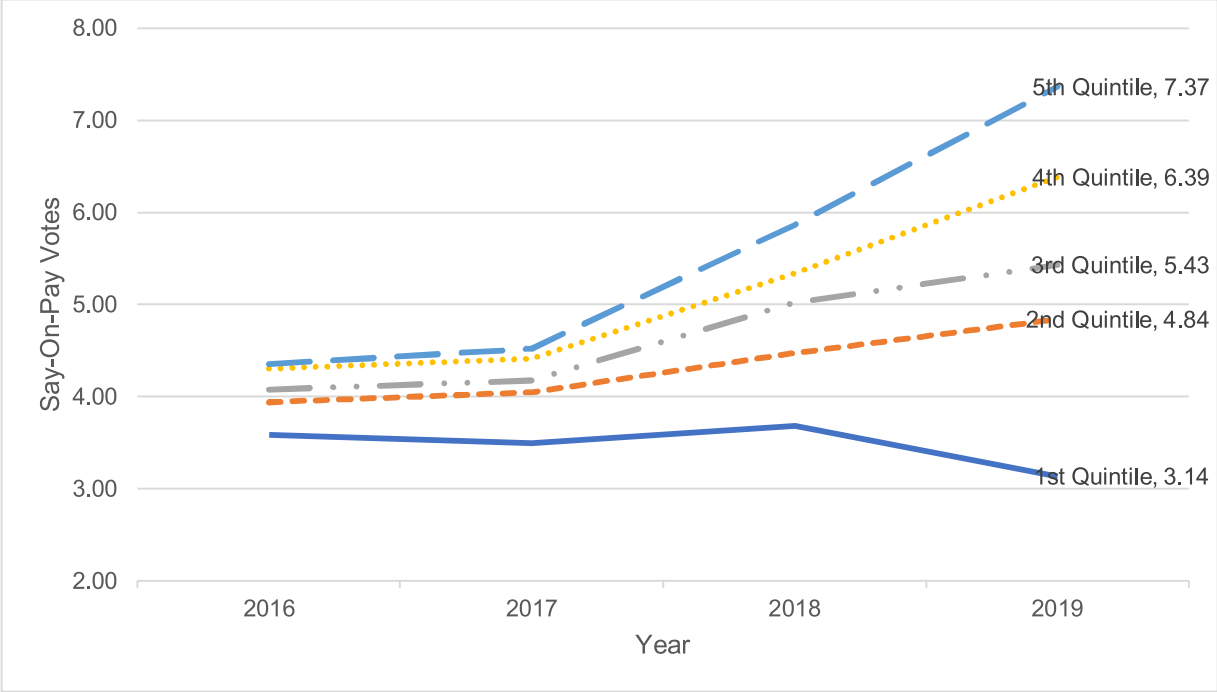


Table 2: CEO Pay Ratio Disclosure and Employee Productivity

This table reports the coefficients and t-values of ordinary least squares (OLS) regressions of the CEO pay ratio on employee productivity. The dependent variable, $LNREVEMP_t$ is the natural logarithm of total sales revenue divided by the total number of employees in year *t*. The independent variable of interest, $LNPAYRATIO_{t-1}$ is the natural logarithm of the total CEO compensation in year *t*-1, defined as the sum of the base salary, bonus, long-term incentive payouts, the value of restricted stock grants, and the value of options divided by the median employee compensation in year *t*-1. $LNCEOCOMPS_{t-1}$ is the natural logarithm of the total CEO compensation in year *t-1*. *PAYRATIODIS* equals 1 for fiscal year 2018 and 2019, 0 otherwise. *HIPAYRATIO* equals 1 if the firm's pay ratio is in the fourth quartile of all pay ratios, 0 otherwise. *LOPAYRATIO* equals 1 if the firm's pay ratio is in the first quartile of all pay ratios, 0 otherwise. *HICEOPAY* equals 1 if CEO's total compensation is more than the fitted CEO compensation estimated from model (3), 0 otherwise. *LOCEOPAY* equals 1 if CEO's total compensation is less than the fitted CEO compensation estimated from model (3), 0 otherwise. All other variables are defined in Appendix B. Year- and industry-fixed effects are included in all regressions. *t*-values are based on standard errors that are clustered by firm are in parentheses. *, **, and *** indicate significance at the 0.10, 0.05, and 0. levels, respectively.

Dependent Variable	$LNREVEMP_t$			
	(1)	(2)	(3)	(4)
***LNPAYRATIO*$_{t-1}$**	**-0.3016*** [10.05]**	**-0.3139*** [10.14]**		
$LNCEOCOMPS_{t-1}$		0.0460* [1.66]		
PAYRATIODIS			0.0404 [1.20]	0.0315 [0.79]
HIPAYRATIO			-0.4728*** [10.00]	
HIPAYRATIO×PAYRATIODIS			**-0.1945** [2.34]**	
LOPAYRATIO			0.0865 [1.08]	
LOPAYRATIO×PAYRATIODIS			-0.0135 [0.14]	
HICEOPAY				0.0164 [0.41]
HICEOPAY×PAYRATIODIS				-0.0156 [0.79]
LOCEOPAY				0.1000

				[1.04]
LOCEOPAY×PAYRATIODIS				0.0482
				[0.56]
$LNMKVL_t$	0.2020***	0.1901***	0.1886***	0.1110***
	[11.40]	[9.66]	[14.09]	[9.44]
$LEVERAGE_t$	0.0976	0.0982	0.0433	0.128
	[0.69]	[0.70]	[0.39]	[1.09]
BTM_t	0.3292***	0.3308***	0.2311***	0.1790***
	[4.22]	[4.19]	[3.88]	[2.80]
$HERFINDAHL_t$	1.6351	1.2411	0.1956	-0.1851
	[0.40]	[0.31]	[0.21]	[0.19]
$ASTTANG_t$	0.4530**	0.4625**	0.4118***	1.0002***
	[2.09]	[2.12]	[2.74]	[2.76]
$CASH_{t-1}$	0.4821***	0.4867***	0.4118***	0.6036***
	[2.95]	[2.97]	[4.12]	[4.43]
ROA_{t-1}	0.9334***	0.8997***	0.6636***	0.7620***
	[3.03]	[2.96]	[3.02]	[3.27]
$REVGROWTH_{t-1}$	0.2190*	0.1993*	0.0952	0.14201
	[1.87]	[1.67]	[0.95]	[1.32]
$RETURNS_{t-1}$	0.0072	0.0036	0.0511	0.0297
	[0.13]	[0.07]	[1.25]	[0.68]
$RETSTD_{t-1}$	-0.3510***	-0.3569***	-0.3840***	-0.3529***
	[4.28]	[4.34]	[5.61]	[4.85]
$ROASTD_{t-1}$	-1.5967***	-1.5046**	-2.5818***	-4.2230***
	[2.71]	[2.54]	[5.82]	[4.61]
INTERCEPT	4.5547***	4.4294***	3.8522***	4.1403
	[4.87]	[4.75]	[14.81]	[16.14]
Industry FE	Yes	Yes	Yes	Yes
Obs.	1,425	1,425	2,728	2,728
Adj. R^2	0.603	0.606	0.560	0.503

Table 3: The Relation between CEO Pay Ratios on Say-On-Pay Votes

Panel A: Say-On-Pay Votes Conditioned on Expected CEO Pay

This panel reports the coefficients and t-values of ordinary least squares (OLS) regressions of CEO pay ratio on shareholder SOP votes separately for firms where the actual CEO pay is less than or equal to the expected CEO pay and where the actual CEO pay is greater than the expected CEO pay. See Appendix C for the model used to estimate the expected CEO pay. The full sample consists of 1,425 firm-years during the period 2018–2019. The dependent variable, $SOPNOVOTE_t$, is the sum of shareholders' advisory vote to ratify executive officers' compensation classified as abstain or against divided by total shareholder votes (in the Institutional Shareholder Services' Company Vote Results database) in year *t*. $LNPAYRATIO_{t-1}$ is the natural logarithm of the total CEO compensation in year *t*-1, defined as the sum of the base salary, bonus, long-term incentive payouts, the value of restricted stock grants, and the value of options divided by the median employee compensation in year *t*-1. $LNCEOCOMPS_{t-1}$ is the natural logarithm of the total CEO compensation in year *t-1*. All other variables are defined in Appendix B. Year- and industry-fixed effects are included in all regressions. T-values clustered by firm are in parentheses. *, **, and ***represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

	Actual CEO Pay ≤ Fitted CEO Pay			Actual CEO Pay > Fitted CEO Pay		
Dependent Variable	$SOPNOVOTE_t$					
	(1)	(2)	(3)	(4)	(5)	(6)
$LNPAYRATIO_{t-1}$		**0.0272*** **	**0.0238*** **		**0.0272*** **	**0.0235*** **
		[3.35]	**[2.88]**		**[3.54]**	**[3.23]**
$LNCEOCOMPS_{t-1}$	0.0037		0.0015	0.0244**		0.0216**
	[1.41]		[0.78]	[2.31]		[2.30]
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
YR FE	Yes	Yes	Yes	Yes	Yes	Yes
IND FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	577	577	577	848	848	848
Adj. R^2	0.157	0.171	0.178	0.148	0.142	0.164

Panel B: Effect of CEO Pay Ratio Disclosure on Say-On-Pay Votes

This panel reports the results of ordinary least squares (OLS) regressions of the effect disclosing the CEO pay ratio on shareholder SOP votes. The full sample consists of 2,728 firm-years during the period 2016–2019. The dependent variable, $SOPNOVOTE_t$, is the sum of shareholders' advisory votes to ratify executive officers' compensation classified as abstain or against divided by total shareholder votes (in the Institutional Shareholder Services' Company Vote Results database) in year *t*. *PAYRATIODIS* equals 1 for fiscal year 2018 and 2019, 0 otherwise. *HIPAYRATIO* equals 1 if the firm's pay ratio is in the fourth quartile of all pay ratios, 0 otherwise. *LOPAYRATIO* equals 1 if the firm's pay ratio is in the first quartile of all pay ratios, 0 otherwise. All other variables are defined in Appendix B. Industry-fixed effects are included in all regressions. *t*-values are based on standard errors that are clustered by firm are in parentheses. ∗, ∗∗, and ∗∗∗represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

Dependent Variable	$SOPNOVOTE_t$	
	(1)	(2)
PAYRATIODIS	0.0056	-0.0050
	[1.25]	[0.81]
HIPAYRATIO		0.0117
		[1.50]
HIPAYRATIO×PAYRATIODIS		**0.0265*** **
		[2.78]
LOPAYRATIO		-0.0175*
		[1.87]
LOPAYRATIO×PAYRATIODIS		0.0080
		[0.61]
Other Controls	Yes	Yes
IND FE	Yes	Yes
Obs.	2,728	2,728
Adj. R^2	0.101	0.112

Panel C: The effect of firm's stock performance on the association between CEO pay ratios on SOP votes

This panel reports the coefficients and *t*-values of ordinary least squares (OLS) regressions of the CEO pay ratio on shareholder SOP votes. See Appendix C for the model used to estimate the expected CEO pay. The full sample consists of 1,425 firm-years during the period 2018–2019. The dependent variable, $SOPNOVOTE_t$, is the sum of shareholders' advisory votes to ratify executive officers' compensation classified as abstain or against divided by total shareholder votes (in the Institutional Shareholder Services' Company Vote Results database) in year *t*. $HIRETURNS_{t-1}$ equals 1 if the firm's stock returns in year *t-1* is in the fourth quartile of all stock returns, 0 otherwise. $LORETURNS_{t-1}$ equals 1 if the firm's stock returns in year *t-1* is in the first quartile of all stock returns, 0 otherwise. *HIPAYRATIO* equals 1 if the firm's pay ratio is in the fourth quartile of all pay ratios, 0 otherwise. All other variables are defined in Appendix B. Year- and industry-fixed effects are included in all regressions. *t*-values are based on standard errors that are clustered by firm are in parentheses. ∗, ∗∗, and ∗∗∗ represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

		Actual CEO Pay ≤ Fitted CEO Pay	Actual CEO Pay > Fitted CEO Pay
Dependent Variable		$SOPNOVOTE_t$	
	(1)	(2)	(3)
$HIRETURNS_{t-1}$	-0.0048	-0.0112	-0.0013
	[0.57]	[0.80]	[0.12]
$HIPAYRATIO_{t-1}$	**0.0435*** **	**0.0293**	**0.0571*** **
	[3.56]	**[1.19]**	**[3.44]**
$HIPAYRATIO_{t-1} \times HIRETURNS_{t-1}$	-0.0032	-0.0084	-0.0070
	[0.19]	[0.33]	[0.34]
$LORETURNS_{t-1}$	0.0185**	0.0048	0.0340**
	[2.04]	[0.38]	[2.41]
$HIPAYRATIO_{t-1} \times LORETURNS_{t-1}$	**0.0178****	**0.0586****	**0.1700*** **
	[2.33]	**[1.98]**	**[3.38]**
Other Controls	Yes	Yes	Yes
YR FE	Yes	Yes	Yes
IND FE	Yes	Yes	Yes
Obs	1,425	577	848
Adj. R^2	0.112	0.178	0.143

Table 4: CEO Pay Ratio Disclosure and Shareholder Vote Against Election Board's Compensation Committee Members

This table reports the coefficients and *t*-values of ordinary least squares (OLS) regressions of CEO pay ratio on shareholder votes to elect members of the board's compensation committee separately for firms where the actual CEO pay is less than or equal to the expected CEO pay and where the actual CEO pay is greater than the expected CEO pay. See Appendix C for the model used to estimate the expected CEO pay. The full sample consists of 1,425 firm-years during the period 2018–2019. The dependent variable, $CCOMNOVOTE_t$, is the mean of shareholders' votes against the election of members of the board's compensation committee (in the Institutional Shareholder Services' Company Vote Results database) in year *t*. $LNPAYRATIO_{t-1}$ is the natural logarithm of the total CEO compensation in year *t*-1, defined as the sum of the base salary, bonus, long-term incentive payouts, the value of restricted stock grants, and the value of options divided by the median employee compensation in year *t*-1. $LNCEOCOMPS_{t-1}$ is the natural logarithm of the total CEO compensation in year *t-1*. All other variables are defined in Appendix B. Year- and industry-fixed effects are included in all regressions. *t*-values are based on standard errors that are clustered by firm are in parentheses. ∗, ∗∗, and ∗∗∗represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

	Actual CEO Pay ≤ Fitted CEO Pay			Actual CEO Pay > Fitted CEO Pay		
Dependent Variable	$CCOMNOVOTE_t$					
	(1)	(2)	(3)	(4)	(5)	(6)
LNPAYRATIO$_{t-1}$		**0.0056**	**0.0041**		**0.0065****	**0.0071****
		[1.63]	**[1.10]**		**[2.17]**	**[2.35]**
$LNCEOCOMPS_{t-1}$	0.0074		0.0064	0.0278**		0.0354**
	[1.53]		[0.99]	[2.23]		[2.47]
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
YR FE	Yes	Yes	Yes	Yes	Yes	Yes
IND FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	577	577	577	848	848	848
Adj. R^2	0.217	0.214	0.220	0.243	2.491	0.252

Table 5: Effect of CEO Pay Ratios on Proxy Advisory Firm Recommendations

Panel A: The Relation between CEO Pay Ratios and ISS Recommendations Conditioned on Expected CEO Pay

This panel reports the coefficients and chi-square values of logistic regressions of CEO pay ratio on proxy advisory firm recommendations separately for firms where the actual CEO pay is less than or equal to the expected CEO pay and where the actual CEO pay is greater than the expected CEO pay. See Appendix C for the model used to estimate the expected CEO pay. The full sample consists of 1,425 firm-years during the period 2018–2019. The dependent variable, $SOPNOISSREC_t$, equals 1 if there is a vote "No" recommendation on the SOP vote from ISS, 0 otherwise (in the Institutional Shareholder Services' Company Vote Results database) in year *t*. $LNPAYRATIO_{t-1}$ is the natural logarithm of the total CEO compensation in year *t*-1, defined as the sum of the base salary, bonus, long-term incentive payouts, the value of restricted stock grants, and the value of options divided by the median employee compensation in year *t*-1. $LNCEOCOMPS_{t-1}$ is the natural logarithm of the total CEO compensation in year *t-1*. All other variables are defined in Appendix B. Year- and industry-fixed effects are included in all regressions. *, **, and ***represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

	Actual CEO Pay ≤ Fitted CEO Pay			Actual CEO Pay > Fitted CEO Pay		
Dependent Variable	$SOPNOISSREC_t$					
	(1)	(2)	(3)	(4)	(5)	(6)
LNPAYRATIO$_{t-1}$		**0.7173*** **	**0.6304** **		**0.6148*** **	**0.533*** **
		[8.66]	**[6.56]**		**[14.21]**	**[10.04]**
$LNCEOCOMPS_{t-1}$	0.4984		0.3992	0.8184***		0.7240***
	[1.83]		[1.64]	[15.57]		[11.95]
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
YR FE	Yes	Yes	Yes	Yes	Yes	Yes
IND FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	577	577	577	848	848	848
Pseudo R^2	0.297	0.312	0.321	0.271	0.265	0.290

Panel B: Effect of CEO Pay Ratio Disclosure on Proxy Advisory Firm Recommendations

This panel reports the coefficients and chi-square values of logistic regressions of the disclosure of CEO pay ratio and proxy advisory firm recommendations. The full sample consists of 2,728 firm-years during the period 2016–2019. The dependent variable, $SOPNOISSREC_t$, equals 1 if there is a vote "No" recommendation on the SOP vote from ISS, 0 otherwise (in the Institutional Shareholder Services' Company Vote Results database) in year *t*. *PAYRATIODIS* equals 1 for fiscal year 2018 and 2019, 0 otherwise. *HIPAYRATIO* equals 1 if the firm's pay ratio is in the fourth quartile of all pay ratios, 0 otherwise. *LOPAYRATIO* equals 1 if the firm's pay ratio is in the first quartile of all pay ratios, 0 otherwise. All other variables are defined in Appendix B. Industry-fixed effects are included in all regressions. *, **, and *** represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

Dependent Variable	$SOPNOISSREC_t$,	
	(1)	(2)
PAYRATIODIS	0.2313	-0.0209
	[1.83]	[0.01]
HIPAYRATIO		0.2596
		[1.17]
HIPAYRATIO×PAYRATIODIS		**0.5375***
		[3.48]
LOPAYRATIO		-0.7465
		[2.17]
LOPAYRATIO×PAYRATIODIS		**0.2279**
		[0.13]
Other Controls	Yes	Yes
IND FE	Yes	Yes
Obs.	2,728	2,728
Adj. R^2	0.160	0.173

Panel C: The effect of firm's stock performance on the association between CEO pay ratios on proxy advisory firm recommendations

This panel reports the coefficients and chi-square values of logistic regressions of the disclosure of CEO pay ratio and proxy advisory firm recommendations. See Appendix C for the model used to estimate the expected CEO pay. The full sample consists of 1,425 firm-years during the period 2018–2019. The dependent variable, $SOPNOISSREC_t$, equals 1 if there is a vote "No" recommendation on the SOP shareholder vote from ISS, 0 otherwise (in the Institutional Shareholder Services' Company Vote Results database) in year *t*. $HIRETURNS_{t-1}$ equals 1 if the firm's stock returns in year *t-1* is in the fourth quartile of all stock returns, 0 otherwise. $LORETURNS_{t-1}$ equals 1 if the firm's stock returns in year *t-1* is in the first quartile of all stock returns, 0 otherwise. *HIPAYRATIO* equals 1 if the firm's pay ratio is in the fourth quartile of all pay ratios, 0 otherwise. All other variables are defined in Appendix B. Year- and industry-fixed effects are included in all regressions. ∗, ∗∗, and ∗∗∗ represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

		Actual CEO Pay ≤ Fitted CEO Pay	Actual CEO Pay > Fitted CEO Pay
Dependent Variable		$SOPNOISSREC_t$,	
	(1)	(2)	(3)
$HIRETURNS_{t-1}$	-0.5224	-0.2463	-0.8113
	[1.78]	[0.18]	[1.97]
$HIPAYRATIO_{t-1}$	**1.3882*** **	**0.7257**	**1.8504*** **
	[14.26]	**[1.26]**	**[12.46]**
$HIPAYRATIO_{t-1} \times HIRETURNS_{t-1}$	0.8369	-0.7855	1.2499*
	[2.40]	[0.66]	[2.77]
$LORETURNS_{t-1}$	0.6557*	0.3894	1.2123**
	[3.47]	[0.42]	[5.59]
$HIPAYRATIO_{t-1} \times LORETURNS_{t-1}$	**1.7920** **	**1.5191** **	**1.8047*** **
	[4.17]	**[4.50]**	**[7.64]**
Other Controls	Yes	Yes	Yes
YR FE	Yes	Yes	Yes
IND FE	Yes	Yes	Yes
Obs.	1,425	577	848
Pseudo R^2	0.189	0.294	0.112

Table 6: CEO Pay Ratio Disclosure and Change in CEO Compensation

This table reports the coefficients and t-values of ordinary least squares (OLS) regressions of CEO pay ratio on changes in CEO compensation separately for firms where the actual CEO pay is less than or equal to the expected CEO pay and where the actual CEO pay is greater than the expected CEO pay. See Appendix C for the model used to estimate the expected CEO pay. The dependent variable, *ΔCEOCOMPS*, is the change in total CEO pay from year *t-1* to year t. *ΔSALARY*, is the change in the salary portion of total CEO pay(non-performance pay) from year *t-1* to year t. *ΔPERFPAY*, is the change in the non-salary portion of total CEO pay (performance pay) from year *t-1* to year t. $LNPAYRATIO_{t-1}$ is the natural logarithm of the total CEO compensation in year *t*-1, defined as the sum of the base salary, bonus, long-term incentive payouts, the value of restricted stock grants, and the value of options divided by the median employee compensation in year *t*-1. *PAYRATIODIS* equals 1 for fiscal year 2018 and 2019, 0 otherwise. *HIPAYRATIO* equals 1 if the firm's pay ratio is in the fourth quartile of all pay ratios, 0 otherwise. *LOPAYRATIO* equals 1 if the firm's pay ratio is in the first quartile of all pay ratios, 0 otherwise. All other variables are defined in Appendix B. Year- and industry-fixed effects are included in all regressions. *t*-values are based on standard errors that are clustered by firm are in parentheses. *, **, and *** represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

	Actual CEO Pay ≤ Fitted CEO Pay			Actual CEO Pay > Fitted CEO Pay		
Dependent Variable	$\Delta CEOCOMPS_t$	$\Delta SALARY_t$	$\Delta PERFPAY_t$	$\Delta CEOCOMPS_t$	$\Delta SALARY_t$	$\Delta PERFPAY_t$
***LNPAYRATIO*$_{t-1}$**	**-0.0400**	**-0.0057**	**-0.2166**	**-0.0834****	**-0.0797***	**-0.3759*****
	[0.46]	**[0.90]**	**[0.71]**	**[2.36]**	**[1.72]**	**[2.10]**
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
YR FE	Yes	Yes	Yes	Yes	Yes	Yes
IND FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	577	577	577	848	848	848
Adj. R^2	0.097	0.139	0.192	0.076	0.164	0.072

Table 7: CEO Pay Ratio Disclosure and CEO Turnover

This table reports the coefficients and chi-square values of logistic regressions of the CEO pay ratio on CEO turnover separately for firms where the actual CEO pay is less than or equal to the expected CEO pay and where the actual CEO pay is greater than the expected CEO pay. See Appendix C for the model used to estimate the expected CEO pay. The dependent variable, *CEOTOVER*, equals 1 if there is a CEO turnover, 0 otherwise. $LNPAYRATIO_{t-1}$ is the natural logarithm of the total CEO compensation in year *t*-1, defined as the sum of the base salary, bonus, long-term incentive payouts, the value of restricted stock grants, and the value of options divided by the median employee compensation in year *t*-1. *PAYRATIODIS* equals 1 for fiscal year 2018 and 2019, 0 otherwise. *HIPAYRATIO* equals 1 if the firm's pay ratio is in the fourth quartile of all pay ratios, 0 otherwise. *LOPAYRATIO* equals 1 if the firm's pay ratio is in the first quartile of all pay ratios, 0 otherwise. All other variables are defined in Appendix B. ∗, ∗∗, and ∗∗∗ represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

	Actual CEO Pay ≤ Fitted CEO Pay	Actual CEO Pay > Fitted CEO Pay
Dependent Variable	*CEOTOVER*	
LNPAYRATIO$_{t-1}$	**0.1801**	**0.4468**
	[0.58]	**[1.14]**
Other Controls	Yes	Yes
YR FE	Yes	Yes
IND FE	Yes	Yes
Obs.	1,425	2,728
Pseudo R^2	0.272	0.083

Table 8: CEO Pay Ratio Disclosure and Change in Median Employee Compensation

This table reports the coefficients and t-values of ordinary least squares (OLS) regressions of the CEO pay ratio on changes in the median employee pay from 2018 to 2019. The dependent variable, *ΔMEDEMPAY*, is the change in the median employee pay from year 2018 to year 2019. $LNPAYRATIO_{t-1}$ is the natural logarithm of the total CEO compensation in year *t*-1, defined as the sum of the base salary, bonus, long-term incentive payouts, the value of restricted stock grants, and the value of options divided by the median employee compensation in year *t*-1. All other variables are defined in Appendix B. See Appendix C for the model used to estimate the expected CEO pay. Year- and industry-fixed effects are included in all regressions. *t*-values are based on standard errors that are clustered by firm are in parentheses. *, **, and ***represent significance at the 0.10, 0.05, and 0.01 levels, respectively.

		Actual CEO Pay ≤ Fitted CEO Pay	Actual CEO Pay > Fitted CEO Pay
Dependent Variable		*ΔMEDEMPAY*	
	(1)	(2)	(3)
LNPAYRATIO$_{t-1}$	**0.4152*** **	**0.3177*** **	**0.4594*** **
	[10.51]	**[5.39]**	**[15.38]**
$LNMKVL_{t-1}$	0.1456***	0.1129**	0.1685***
	[5.77]	[2.45]	[8.62]
ROA_{t-1}	1.0625*	0.0914	0.9345**
	[1.84]	[0.09]	[2.12]
$REVGROWTH_{t-1}$	0.3948*	0.3627***	0.3337**
	[1.90]	[3.04]	[2.46]
$RETURNS_{t-1}$	0.3542***	0.1066	0.3497**
	[3.29]	[0.95]	[2.24]
$RETSTD_{t-1}$	-0.1433	-0.2658*	-0.2287**
	[1.04]	[1.86]	[2.24]
$ROASTD_{t-1}$	0.0081	1.2732	-3.6819***
	[0.72]	[1.30]	[4.39]
BTM_{t-1}	0.1627	0.2943	0.1190
	[1.48]	[1.13]	[1.31]
$ASTTANG_{t-1}$	0.7861***	2.0340***	0.6018**
	[4.09]	[3.13]	[2.37]
OCF_{t-1}	0.6793	0.8773	0.5457
	[1.21]	[1.07]	[1.12]
$LEVERAGE_{t-1}$	0.1440	0.3831	-0.0104
	[0.89]	[1.39]	[0.07]
$FOREIGN_{t-1}$	-0.0737	0.3504	0.1131
	[0.97]	[3.37]	[1.68]
$MERGER_{t-1}$	-0.0852	-0.0971	-0.0723
	[1.56]	[1.16]	[1.53]
CEOTENURE	-0.0029	-0.0010	-0.0057
	[0.64]	[0.12]	[1.51]
CEOGENDER	0.0252	0.1713	0.0231
	[0.20]	[0.48]	[0.20]

CEODUALITY	-0.1491	-0.0912	-0.1468**
	[0.97]	[0.90]	[2.09]
BDSIZE	0.0173	0.0129	-0.0083
	[0.92]	[0.46]	[0.58]
PIND	0.0583	0.5049	0.0903
	[0.45]	[1.10]	[1.52]
BDFEMALE	0.3178	0.3252	0.2463
	[1.12]	[1.10]	[1.05]
BDTENURE	-0.0146	0.3252	-0.0030
	[1.52]	[0.59]	[0.34]
LNBDAGE	0.0148	0.0432***	-0.0452
	[1.62]	[3.40]	[1.16]
BDBUSY	0.2859	0.3348	0.2295
	[1.07]	[0.71]	[0.14]
INTERCEPT	-0.3306	-2.5554***	0.8669
	[0.55]	[2.45]	[1.49]
IND FE	Yes	Yes	Yes
Obs.	646	269	377
Adj. R^2	0.519	0.523	0.572