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Khim KELLY
University of Waterloo

Jean Lin SEOW
Singapore Management University, jeanseow@smu.edu.sg

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Investor Reactions to Company Disclosure of High CEO Pay and High CEO-to-Employee Pay Ratio: An Experimental Investigation

Khim Kelly

University of Waterloo

Jean Lin Seow

Singapore Management University

ABSTRACT: There is significant debate about the usefulness of disclosing the CEO-to-median employee pay ratio, as required under Section 953(b) of the Dodd-Frank Act in the United States. Using an experiment, we find that disclosing higher-than-industry CEO pay (versus comparable-to-industry CEO pay) marginally decreases perceived CEO pay fairness and perceived workplace climate, which is counteracted by a significant positive effect on perceived CEO attraction/retention ability, although there are no significant indirect effects through these perceptions on perceived investment potential. However, incrementally disclosing a higher-than-industry pay ratio (versus disclosing only higher-than-industry CEO pay) significantly decreases perceived CEO pay fairness and marginally decreases perceived workplace climate, and we find a significant indirect negative effect on perceived investment potential through perceived CEO pay fairness. If companies are concerned about negative public perceptions, then our results suggest that pay ratio disclosures may be better able than current CEO pay disclosures at shaming companies into restraining CEO pay.

Keywords: Dodd-Frank Act; CEO compensation; CEO-to-employee pay ratio; investor judgments.

Data Availability: Contact the authors.

INTRODUCTION

Regulators have increased the disclosure requirements of CEO pay over the past two decades. The U.S. Securities and Exchange Commission (SEC) increased the scope and detail of executive compensation disclosure first in 1992 and then in 2006, to highlight CEO pay and thereby potentially curb the trend of excessive CEO pay (Bachelder 2007; Lublin and Thurm 2006; SEC 2006). However, increased CEO pay disclosure could have the opposite effect of ratcheting CEO pay upward when companies begin benchmarking CEO pay to their peers, ostensibly to attract and retain CEO talent (Bachelder 2007; Bizjak, Lemmon, and Naveen 2008; Faulkender and Yang 2013; Lublin and Thurm 2006). Beginning in 2017, Section 953(b) of the Dodd-Frank Act will require disclosure of the median employee pay and the ratio between CEO pay and median employee pay (hereafter, pay ratio) (SEC 2015). It has been argued that this new pay ratio disclosure requirement may better counteract the upward spiral in CEO pay by providing median employee pay as a salient benchmark that can be used to evaluate the excessiveness or fairness of CEO pay (Aguilar 2013; Kess and Cohn 2014; Solomon 2013).¹

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This study provides evidence on whether the new pay ratio disclosure has negative effects on perceptions of fairness and workplace climate incremental to current CEO pay disclosures, which in turn could either shame companies into restraining excessive CEO pay and/or dampen investment potential evaluations and thus investments in companies with high pay ratios.

The literature on the effects of shaming corporations and their agents argues that public disclosure of behavior that violates social norms allows a target audience (e.g., shareholders, consumers of the corporations' products, peers) to exercise moral disapproval of that behavior, thereby punishing offenders and deterring potential offenders (Skeel 2001). For example, corporations and their agents respond to shaming by improving their corporate governance or corporate social responsibility (Skeel 2001; Campbell 2007). Thus, we study how disclosing higher-than-industry (versus comparable-to-industry) CEO pay and how incrementally disclosing a higher-than-industry pay ratio (versus disclosing only higher-than-industry CEO pay) directly affect participant perception of CEO pay fairness to determine the potential shaming effects of these disclosures. We also examine the direct effects of these disclosures on the perceived workplace climate to contribute to the debate over whether pay ratio disclosures provide investors with material and relevant information on workplace climate that could ultimately be related to firm performance (e.g., American Benefits Council 2012; Miller 2011; Trumka 2010; Woll 2011; Warren 2010; Wartzman 2011). We also examine the *indirect* negative effects of these disclosures on perceived investment potential through either negative perceptions of CEO pay fairness (i.e., unfair companies are shunned by investors, customers, and suppliers) or workplace climate (i.e., a poor workplace climate negatively impacts firm performance), which may also help curb excessive CEO pay. Finally, we examine the direct effects of these disclosures on the perceived ability of the company to attract and retain CEO talent and the associated indirect effects on perceived investment potential. We do this because any potential effects on curbing excessive CEO pay achieved through shaming or dampening investment potential when high CEO pay and pay ratio are disclosed may be counteracted by the perception that high CEO pay helps companies compete for CEO talent.

We use an experiment because we are not aware of any regulatory regime, other than South Korea, that has already implemented a pay ratio disclosure rule and therefore available archival data are limited (see Shin, Kang, Hyun, and Kim 2015). Instead of using archival data of stock return performance to infer how investors interpret pay ratio disclosures, we directly examine the perceptions of participants assuming the role of investors. We use Singapore M.B.A. students to proxy for investors.² Our experiment has three between-subjects conditions. All three conditions disclose the same industry CEO pay. The *FAIRCEO-NORATIO* and *HIGHCEO-NORATIO* conditions disclose comparable-to-industry CEO pay and higher-than-industry CEO pay respectively, and provide no information on pay ratio or median employee pay. The *HIGHCEO-HIGHRATIO* condition discloses higher-than-industry CEO pay as in the *HIGHCEO-NORATIO* condition, and then incrementally discloses the higher-than-industry pay ratio and comparable-to-industry median employee pay.³ Hence, the higher-than-industry pay ratio is a ratio of higher-than-industry CEO pay to comparable-to-industry median employee pay.⁴ All other information about the company is held constant across conditions.

Our results suggest that disclosing only higher-than-industry CEO pay may have limited negative effects on participant perceptions about the company, but adding a higher-than-industry pay ratio to the higher-than-industry CEO pay disclosure may have incremental negative effects on participant perceptions about the company. We find that disclosing higher-than-industry CEO pay relative to comparable-to-industry CEO pay (*HIGHCEO-NORATIO* versus *FAIRCEO-NORATIO*) marginally decreases perceived CEO pay fairness and perceived workplace climate, and increases a perceived company ability to attract and retain CEO talent, but there are no significant indirect effects through these perceptions on perceived investment potential. However, incrementally disclosing a higher-than-industry pay ratio in addition to higher-than-industry CEO pay

² As in the U.S., Singapore public companies are currently required to disclose CEO pay but not median employee pay or pay ratio (Singapore Exchange Rulebooks 2011, Chapter 12). Although we use M.B.A. students as our participants, we expect nonprofessional investors and institutional investors to respond similarly to the violation of fairness norms and to make similar inferences about the effects of perceptions of pay fairness, workplace climate, and CEO talent attraction/retention on firm performance. In fact, Hong and Kacperczyk (2009) find that large institutional investors are more likely to be constrained by social norms than individual investors.

³ In *HIGHCEO-HIGHRATIO*, we choose to disclose both pay ratio and median employee pay because in a setting where CEO pay is already disclosed, disclosing the pay ratio effectively discloses the associated median employee pay. We do not examine conditions that incrementally disclose only either pay ratio or median employee pay. It is possible that disclosing the pay ratio (in addition to CEO pay and median employee pay) reduces the effort required from participants and increases the salience of information about pay inequity, thereby increasing the likelihood of the information affecting participants' judgments. Thus, providing both pieces of information in *HIGHCEO-HIGHRATIO* allows for a stronger setting for finding effects on participants' judgments compared to conditions that incrementally provide only one of the two pieces of information. Providing both pieces of information is also in accordance with Section 953(b) (U.S. House of Representatives 2010) requirements.

⁴ Comparable-to-industry median employee pay is more neutral than either lower-than-industry or higher-than-industry median employee pay. Lower-than-industry median employee pay could exacerbate negative participant perceptions, making it difficult to tease out whether any incremental negative effects are due to the higher-than-industry pay ratio or the lower-than-industry median employee pay. Conversely, higher-than-industry median employee pay could improve participant perceptions, reducing the ability to find any incremental negative effects from disclosing the higher-than-industry pay ratio.

(*HIGHCEO-HIGHRATIO* versus *HIGHCEO-NORATIO*) decreases perceived CEO pay fairness, marginally decreases perceived workplace climate, and does not significantly affect perceived CEO attraction/retention ability. Mediation analyses show a significant indirect negative effect of incrementally disclosing a higher-than-industry pay ratio on perceived investment potential through perceived CEO pay fairness.

Our study provides companies and regulators with evidence on how investors may perceive the disclosure of higher-than-industry CEO pay and pay ratio.⁵ For our participants, CEO pay disclosure alone, per existing regulations, may have limited ability to shame companies into curbing excessive CEO pay. Disclosing higher-than-industry CEO pay only marginally decreases perceived CEO pay fairness and perceived workplace climate. In fact, disclosing higher-than-industry CEO pay significantly increases perceived CEO attraction/retention ability. Hence, our participants may believe the justification often used by companies to set CEO pay at higher-than-industry levels, which critics claim has contributed to the upward spiral in CEO pay (Bachelder 2007; Lublin and Thurm 2006). However, disclosing a higher-than-industry pay ratio in addition to higher-than-industry CEO pay, per the soon-to-be implemented Section 953(b) of the Dodd-Frank Wall Street Reform and Consumer Protection Act (U.S. House of Representatives 2010), decreases perceived CEO pay fairness and marginally decreases perceived workplace climate, and also has an indirect negative effect on perceived investment potential through perceived CEO pay fairness. Given that companies are concerned about whether investors, employees, and the public perceive their CEO pay and employee pay to be fair (Greene 2014), our results are consistent with the argument by supporters of Section 953(b) that pay ratio disclosures may be better able than current CEO pay disclosures to shame companies into restraining CEO pay (Aguilar 2013; Menendez et al. 2014).

Our study is of interest to management accountants, as management accountants are involved in designing compensation packages for both executive-level and rank-and-file employees to attract, retain, and motivate employees, including choices about wage levels relative to comparable companies and relative wage levels of employees within the company. Management accountants are also involved in operational decisions such as the proportion of part-time versus full-time employees, the use of temporary versus permanent employees, and the geographical location of operations, all of which have a significant impact on median employee pay and pay ratios. Although these compensation design choices and operational decisions are internal to the company, they become part of external reporting with regulated disclosures on CEO pay, median employee pay, and pay ratios. Our results suggest that companies may need to consider how to manage the fairness perceptions of investors or the public through changes in compensation or changes in business structure, or explanations about how their existing pay structure is fair and appropriate given their strategy and operations.

The remainder of the paper is organized as follows. We first develop the hypotheses. We then describe the experimental design and results. Finally, we conclude with a discussion of the findings and limitations of the study.

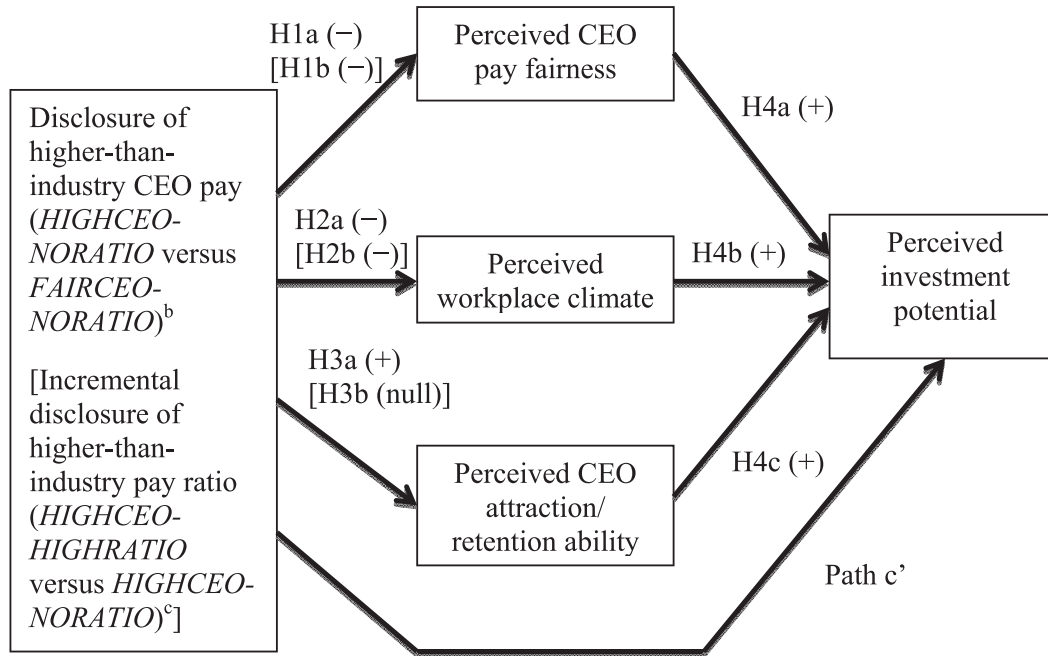
THEORY AND HYPOTHESES DEVELOPMENT

U.S. companies currently disclose CEO compensation in their annual proxy statements, which enables investors to evaluate a company's CEO pay relative to comparable companies. Section 953(b) of the Dodd-Frank Act, effective beginning January 2017, requires additional disclosure of median employee compensation and the ratio of CEO compensation to median employee compensation (i.e., pay ratio) (SEC 2015). These additional disclosures allow investors to further assess the company's CEO pay relative to the pay of the average employee in the company, as well as to assess the company's pay ratio *vis-à-vis* that of comparable companies. Investors often compare a company's data with industry averages when performing financial statement analysis (Revsine, Collins, Johnson, and Mittelstaedt 2014). We examine CEO pay and a pay ratio that are significantly greater than that of comparable companies in the same industry and hence are higher than expected and more likely to be perceived as excessive. The theoretical mechanisms through which disclosures of higher-than-industry CEO pay and pay ratio affect investor judgments are discussed in detail below. Overall, we predict similar negative effects on investor perceptions of CEO pay fairness and workplace climate from disclosing higher-than-industry CEO pay and from incrementally disclosing a higher-than-industry pay ratio. However, while we predict a positive effect on investor perception of a company's ability to attract and retain CEO talent from disclosing higher-than-industry CEO pay, we predict a null effect from incrementally disclosing a higher-than-industry pay ratio. We also predict indirect effects of disclosing higher-than-industry CEO pay and incrementally disclosing a higher-than-industry pay ratio on perceived investment potential through investor perceptions of CEO pay fairness, workplace climate, and company ability to attract and retain CEO talent. Our hypotheses are depicted in Figure 1.

⁵ We acknowledge that we do not examine how participant perceptions are affected by the disclosure of comparable-to-industry pay ratio or lower-than-industry pay ratio.

FIGURE 1

Effects of Disclosure of Higher-than-Industry CEO Pay (Incremental Disclosure of Higher-than-Industry Pay Ratio) on Perceived Investment Potential^a



Predicted Indirect Effects of Disclosure of Higher-than-Industry CEO Pay on Perceived Investment Potential:

H5a: Indirect negative effect through perceived CEO pay fairness (H1a * H4a).

H5b: Indirect negative effect through perceived workplace climate (H2a * H4b).

H5c: Indirect positive effect through perceived CEO attraction/retention ability (H3a * H4c).

Predicted Indirect Effects of Incremental Disclosure of Higher-than-Industry Pay Ratio on Perceived Investment Potential:

H6a: Indirect negative effect through perceived CEO pay fairness (H1b * H4a).

H6b: Indirect negative effect through perceived workplace climate (H2b * H4b).

^a See Table 1 for the definitions of conditions (*FAIRCEO-NORATIO*, *HIGHCEO-NORATIO*, *HIGHCEO-HIGHRATIO*) and participant perception variables (perceived CEO pay fairness, workplace climate, CEO attraction/retention ability, and investment potential).

^b With respect to the effects of disclosure of higher-than-industry CEO pay (*HIGHCEO-NORATIO* versus *FAIRCEO-NORATIO*), H1a, H2a, and H3a are Path a; H4a, H4b, and H4c are Path b; H5a, H5b, and H5c are indirect effects (Path a * Path b); and Path c' is the effect after controlling for the mediators in the mediation model tested in Table 2, Panels A–C.

^c With respect to the effects of incremental disclosure of a higher-than-industry pay ratio (*HIGHCEO-HIGHRATIO* versus *HIGHCEO-NORATIO*), H1b, H2b, and H3b are Path a; H4a, H4b, and H4c are Path b; H6a and H6b are indirect effects (Path a * Path b); and Path c' is the effect after controlling for the mediators in the mediation model tested in Table 2, Panels D–F.

Investor Perception of CEO Pay Fairness

People hold strong social norms about fair allocation of resources (Elster 1989; Kahneman, Knetsch, and Thaler 1986). Equity theory posits that people evaluate fairness by considering the ratio of the outcomes received to the inputs provided (Adams 1965). People also respond negatively to violations of fairness norms and punish perpetrators of unfairness even when the inequitable treatment is not experienced personally but by others (Carpenter and Mathews 2012; Fehr and Fischbacher 2004).

Holding constant firm performance, higher-than-industry CEO pay (versus a comparable-to-industry CEO pay) is more likely to be perceived by investors as less fair because it shows the CEO being paid significantly more than (versus comparable to) peer CEOs in the same industry. In comparison to peer CEOs in the same industry, investors may perceive the ratio of the outcomes received to the inputs provided to be higher and less fair for the CEO with higher-than-industry pay than for the CEO with comparable-to-industry pay. As such, our hypothesis is as follows.

H1a: Compared to disclosing comparable-to-industry CEO pay, disclosing higher-than-industry CEO pay decreases investor perception of the fairness of CEO pay in the company.

Disclosing a higher-than-industry pay ratio incremental to disclosing higher-than-industry CEO pay is also likely to decrease investor perception of the fairness of CEO pay because it highlights the pay inequity between the CEO and the average employee in the company as being significantly higher than that in comparable companies. Hence, *vis-à-vis* the average employee in the company, investors may perceive the ratio of the outcomes received to the inputs provided by the CEO to be higher and less fair when a higher-than-industry pay ratio is provided than when no pay ratio is provided.

H1b: Incrementally disclosing a higher-than-industry CEO pay ratio, given higher-than-industry CEO pay that is already disclosed, decreases investor perception of the fairness of CEO pay in the company.

Investor Perception of Workplace Climate

Under equity theory, employees evaluate the fairness of their pay by comparing their pay, job responsibilities, and work efforts to those of other employees in their own company and other companies (Adams 1965). Employees who feel that they are under rewarded relative to others will perceive inequity (Carrell and Dittrich 1978). Employees' perception of inequity is associated with poor workplace climate characterized by poor employee morale, job satisfaction, productivity, cooperation among employees, and the quality of the relationship between top management and employees (Cornelissen, Himmler, and Koenig 2011; Cowherd and Levine 1992; Pfeffer and Langton 1993; Pritchard, Dunnette, and Jorgenson 1972; Wade, O'Reilly, and Pollock 2006).

A higher-than-industry (versus comparable-to-industry) CEO pay, holding constant firm performance, is more likely to result in rank-and-file employees perceiving that the CEO is unfairly overpaid relative to them since the CEO is paid significantly more than (versus comparable to) peer CEOs in the same industry. If investors believe that employees respond to perceived pay inequity as detailed above, then investor perception of workplace climate in the company would decrease with the disclosure of higher-than-industry (versus comparable-to-industry) CEO pay.

H2a: Compared to disclosing comparable-to-industry CEO pay, disclosing higher-than-industry CEO pay decreases investor perception of workplace climate in the company.

A pay ratio showing that the CEO is paid more than the median employee will not in itself be perceived by employees as unfair because the CEO's higher pay is commensurate with the CEO's higher input (i.e., skills, abilities, education, responsibilities, assumed personal risk, etc.) (Becker 1961). However, a higher-than-industry pay ratio makes salient to employees that the pay disparity between the CEO and the median employee is larger than in comparable companies. Employees may then be more likely to perceive the CEO as unfairly "taking a bigger piece of the pie" than them compared to peer CEOs in the same industry. If investors believe that employees respond to perceived pay inequity as detailed above, then incrementally disclosing a higher-than-industry CEO pay ratio would have a negative effect on investors' perceived workplace climate in the company.

H2b: Incrementally disclosing a higher-than-industry CEO pay ratio, given higher-than-industry CEO pay that is already disclosed, decreases investor perception of workplace climate in the company.

Investor Perception of Company Ability to Attract and Retain CEO Talent

Investors may believe that higher-than-industry CEO pay is indicative of a competitive CEO compensation structure that enables the company to attract and retain the best CEO talent (Bizjak et al. 2008; Zajac and Westphal 1995). Firms often justify CEO compensation at levels equal to or above the median for CEOs at comparable companies on this basis (Faulkender and Yang 2013; Whoriskey 2011; Zajac and Westphal 1995). Consistent with this view, prior research finds higher voluntary CEO turnover when the CEO is underpaid and better firm performance when the CEO is overpaid (Bizjak et al. 2008; Fong, Misangyi, and Tosi 2010). We therefore propose the following hypothesis.

H3a: Compared to disclosing comparable-to-industry CEO pay, disclosing higher-than-industry CEO pay increases investor perception of company ability to attract and retain CEO talent.

Incrementally disclosing a higher-than-industry pay ratio (versus disclosing only higher-than-industry CEO pay) may decrease investor perception of company ability to attract and retain CEO talent if investors think that CEOs are less attracted to companies with a higher-than-industry disparity between CEO pay and median employee pay. This may be because investors believe that CEOs hold personal fairness norms that are violated by excessive pay inequity or that CEOs are embarrassed by negative public opinion about a high pay ratio. However, based on equity theory, people are more tolerant of being over rewarded than under rewarded; they also compare themselves to others who share similar attributes such as similar jobs, responsibilities, and requisite skills (Adams 1965; Scholl, Cooper, and McKenna 1987). Thus, investors may believe that CEOs are more tolerant

toward being overpaid *vis-à-vis* rank-and-file employees, that CEOs are unlikely to consider rank-and-file employees as natural referents, and that they are more concerned about their pay relative to their CEO peers in a similar industry. If so, then there should be no significant decrease in the perceived attractiveness of a company to CEOs if the company incrementally discloses a higher-than-industry pay ratio (versus disclosing only higher-than-industry CEO pay), because CEO pay is higher-than-industry in both conditions. Given these opposing arguments, we make the following null prediction.

H3b (null): Incrementally disclosing a higher-than-industry CEO pay ratio, given higher-than-industry CEO pay that is already disclosed, has no effect on investor perception of company ability to attract and retain CEO talent.

Investor Perception of Investment Potential

Investor perceptions of a company's CEO pay fairness, workplace climate, and ability to attract and retain CEO talent may in turn be related to investor perception of the company's investment potential. First, investors who perceive that a company's CEO pay is unfair and violates fairness norms may shun investments in the egregious company and decrease their evaluation of the company's investment potential (Gopalan 2007). Research shows that investors are willing to incur a financial cost to shun investments in companies involved in the production of alcohol, tobacco, and gaming so as to adhere with social norms of investing in moral and ethical companies (Hong and Kacperczyk 2009; Kim and Venkatachalam 2011). Investors may also believe that key stakeholders such as customers and suppliers share those fairness norms and are less willing to do business with an unfair company, thereby decreasing the company's investment potential (Trudel and Cotte 2009).

Second, investors may believe that a poor workplace climate negatively affects firm performance, and hence investment potential. Prior research has documented increased dysfunctional employee behaviors related to a poor workplace climate arising from perceived inequity by employees, such as less effort (Pritchard et al. 1972), poor product quality (Cowherd and Levine 1992), reduced productivity and cooperation (Pfeffer and Langton 1993), absenteeism (Cornelissen et al. 2011), and turnover (Bloom and Michel 2002; Wade et al. 2006; Shin et al. 2015), all of which could hurt future firm performance. Research finds that a positive workplace climate (as proxied by being on the "100 Best Companies to Work for in America" list) is associated with better accounting and stock market performance (Edmans 2011; Fulmer, Gerhart, and Scott 2003), and that there is a favorable stock price reaction to the announcement of being on this list, which suggests that investors respond to indicators of workplace climate (Faleye and Trahan 2011).

Third, investors may believe that the ability to attract and retain CEO talent is critical for enhancing firm performance, and hence investment potential. Research shows that CEOs can have a significant effect on firm performance (Mackey 2008; Quigley and Hambrick 2015). There is also a positive stock price reaction to appointments of CEOs who are believed to be capable of improving future firm performance, which suggests that investors react to a company's ability to attract a good CEO (Tian, Haleblian, and Rajagopalan 2011; Lubatkin, Chung, Rogers, and Owers 1989).

Based on our discussion above, we make the following predictions. We expect the relationships predicted in H4a, H4b, and H4c below to hold for all our participants, regardless of the regulatory regime condition.

H4a: Investor perception of the fairness of CEO pay in the company is positively associated with investor perception of a company's investment potential.

H4b: Investor perception of workplace climate in the company is positively associated with investor perception of a company's investment potential.

H4c: Investor perception of company ability to attract and retain CEO talent is positively associated with investor perception of a company's investment potential.

Indirect Effects of Disclosures of Higher-than-Industry CEO Pay and Pay Ratio on Investor Perception of Investment Potential

In H1a, H2a, and H3a, we predict that disclosing higher-than-industry CEO pay respectively decreases perceived CEO pay fairness, decreases perceived workplace climate, and increases perceived ability to attract and retain CEO talent. In turn, perceptions of CEO pay fairness, workplace climate, and CEO attraction/retention ability are predicted to be positively associated with perceived investment potential in H4a, H4b, and H4c. As such, we predict the following indirect effects of disclosing higher-than-industry CEO pay on perceived investment potential.

H5a: Compared to disclosing comparable-to-industry CEO pay, disclosing higher-than-industry CEO pay has an indirect negative effect on investor perception of a company's investment potential through investor perception of the fairness of CEO pay in the company.

H5b: Compared to disclosing comparable-to-industry CEO pay, disclosing higher-than-industry CEO pay has an indirect negative effect on investor perception of a company's investment potential through investor perception of workplace climate in the company.

H5c: Compared to disclosing comparable-to-industry CEO pay, disclosing higher-than-industry CEO pay has an indirect positive effect on investor perception of a company's investment potential through investor perception of company ability to attract and retain CEO talent.

Our posited negative effects of disclosing high CEO pay on perceived CEO pay fairness and workplace climate, in contrast to our posited positive effect on perceived CEO attraction/retention ability, and the associated indirect effects on investment potential through these perceptions, may explain why increased CEO pay disclosure requirements alone have not been very successful at curbing the trend of excessive CEO pay. This is because any potential effects on curbing excessive CEO pay achieved via shaming or via dampening investment potential when high CEO pay is disclosed may be counteracted by the perception that high CEO pay is necessary for companies to compete for CEO talent.

In H1b and H2b, we predict that incrementally disclosing a higher-than-industry pay ratio respectively decreases perceived CEO pay fairness and the perceived workplace climate. Perceptions of CEO pay fairness and workplace climate are, in turn, predicted to be positively associated with perceived investment potential in H4a and H4b, respectively. Therefore, we predict the following negative indirect effects of incrementally disclosing a higher-than-industry pay ratio on perceived investment potential. This line of argument is consistent with [Shin et al. \(2015\)](#), who find that higher pay ratios are associated with poorer future operating performance (i.e., return on assets) and stock returns in South Korean companies.

H6a: Incrementally disclosing a higher-than-industry CEO pay ratio, given higher-than-industry CEO pay that is already disclosed, has an indirect negative effect on investor perception of a company's investment potential through investor perception of the fairness of CEO pay in the company.

H6b: Incrementally disclosing a higher-than-industry CEO pay ratio, given higher-than-industry CEO pay that is already disclosed, has an indirect negative effect on investor perception of a company's investment potential through investor perception of the workplace climate in the company.

METHOD

Experiment Design

Our experiment has three between-subjects conditions. The first two conditions, *FAIRCEO-NORATIO* and *HIGHCEO-NORATIO*, both provide only information on the amount of the company's CEO pay and the mean CEO pay for the company's comparison group, but do not provide pay ratio information. This is consistent with the type of information currently available to investors without Section 953(b) requirements. In *FAIRCEO-NORATIO* and *HIGHCEO-NORATIO*, the company's CEO pay is manipulated to be comparable to (\$4,346,753) and much higher than (\$7,365,124), respectively, the comparison group's mean CEO pay (\$4,216,350).⁶ Participants in *FAIRCEO-NORATIO* (*HIGHCEO-NORATIO*) are also told that the company's CEO compensation is at the 55th (75th) percentile of its comparison group.

The third condition, *HIGHCEO-HIGHRATIO*, is similar to the *HIGHCEO-NORATIO* condition in all aspects except for the additional information that the company's pay ratio (161.91) is higher than the mean pay ratio of comparison companies (95.55). Providing a pay ratio in *HIGHCEO-HIGHRATIO* in addition to CEO pay results in providing information on both pay ratio and median employee pay, creating a natural confound (see footnote 3). Given that the CEO pay is manipulated as higher-than-industry (\$7,365,124 versus \$4,216,350) and the pay ratio is manipulated as higher-than-industry (161.91 versus 95.55), the company's median employee compensation is automatically derived and set as comparable to its comparison group (\$45,490 versus \$44,125).⁷ As such, the higher-than-industry pay ratio in *HIGHCEO-HIGHRATIO* is then primarily due to higher-than-industry CEO pay rather than to lower-than-industry median employee pay (see footnote 4).

⁶ In order to provide CEO compensation figures that are realistic to our participants, the experimental company's CEO pay in *FAIRCEO-NORATIO* is set as the actual CEO compensation of a real company listed on NASDAQ in the year 2010 (\$4,346,753), whereas that in *HIGHCEO-NORATIO* and *HIGHCEO-HIGHRATIO* is set as the actual mean CEO compensation of two comparison group companies with a higher CEO compensation than that NASDAQ company (\$7,365,124). The comparison group's mean CEO pay is then arbitrarily set as \$4,216,350 to create comparable-to-industry CEO pay in *FAIRCEO-NORATIO* and higher-than-industry CEO pay in *HIGHCEO-NORATIO* and *HIGHCEO-HIGHRATIO*.

⁷ In *HIGHCEO-HIGHRATIO*, the company's median employee pay of \$45,490, which gives a pay ratio of 161.91 (\$7,365,124/\$45,490) is also the [Bureau of Labor Statistics \(2010\)](#) median pay in the semiconductor industry so that our participants are provided with realistic compensation figures for the median employee.

Participants

We recruited 75 participants from M.B.A. programs at two Singapore universities.^{8,9} Our experimental task does not require the complex integration of information to form a judgment, nor expert skills or knowledge. As such, we believe that M.B.A. students are a reasonable proxy for investors, and in particular nonprofessional investors (Elliott, Hodge, Kennedy, and Pronk 2007).

Participants were recruited during class and completed the experiment during a classroom break; they were paid SGD\$25 for completing the study.¹⁰ Participants had an average of 6.19 years of working experience, with about 28 percent of them working primarily in accounting and finance-related fields (i.e., auditing, accounting and finance, banking, or investing). About 55 percent of participants indicated accounting and/or business as their major area of educational study, while the remaining indicated nonbusiness majors such as engineering, arts, or the sciences.¹¹ On a scale of 0 (“never”) to 14 (“with high frequency”), participants reported an average of 4.72 (s.d. = 3.45) when asked to indicate how frequently they invest in the stock market. They also reported an average of 7.01 (s.d. = 2.88) when asked to assess their level of accounting knowledge on a scale of 0 (“no accounting knowledge”) to 14 (“high accounting knowledge”). Our results are similar after controlling for these demographic variables.

We use the five-item Equity Sensitivity Instrument from Huseman, Hatfield, and Miles (1985) to measure and control for participants’ differential reactions to perceived inequity. The equity sensitivity measure is the composite score for the values assigned to each of the five items, with a theoretical range of 0 to 50 and a higher value indicating a stronger preference for one’s outcome to be greater than one’s input. The mean equity sensitivity for our participants is 25.93 (s.d. = 5.89), and it is similar to the equity sensitivity of some U.S. samples in prior studies (e.g., Kickul and Lester 2001; Mueller and Clarke 1998).¹² Equity sensitivity is not significantly different across conditions ($F = 0.12$; two-tailed $p = 0.889$), and our results are similar after controlling for equity sensitivity.

Experimental Procedures

We provide each participant with a package comprising the written instructions and case materials. Participants are randomly assigned to one of the three experimental conditions. The case materials comprise three sections, with each section in a separate envelope (see Figure 2 for the order of experimental materials). Participants are asked to proceed through each section sequentially and return a completed section to its envelope before beginning the next section.

In the first section, participants are asked to assume that they work in the investment department of a firm. Their firm is considering making a medium to long-term investment in a company and they are asked to assess the investment potential of the company. This design choice of asking participants to assess the company on behalf of their firm rather than for their own personal investment has been used in prior studies such as Elliott, Hodge, and Sedor (2012). This design choice likely increases participants’ objectivity in that they may be less likely to bring their personal investment preferences into their judgments.¹³ Participants are told that the company is in the semiconductor industry and it is considered an industry leader in terms of market share and innovation. Next, participants are given the company’s financial data (e.g., net revenues, net income, working capital, long-term debt, new sales orders) and a note disclosure on CEO compensation. The financial data and note disclosure are adapted from a real NASDAQ-listed company in the semiconductor industry. The note disclosure on CEO compensation in all conditions discloses the amount of CEO pay in the company and the mean CEO pay of the company’s comparison group. The company’s comparison group comprises 17 publicly traded semiconductor companies with which the company competes for

⁸ The results are similar controlling for the two different universities. The authors were not instructors of the M.B.A. classes from which the participants were recruited.

⁹ There are similar concerns in Singapore as in the U.S. about the upward spiral in CEO pay (Chan 2011) and the increasing disparity between average workers and top executives (Ong 2013; Jones and Kim 2014; Wong 2013). There is also awareness in Singapore of the potential for pay ratio disclosure to affect investors’ fairness perception that could shame companies into structuring fairer pay for CEOs and rank-and-file employees (Chan 2013). Further, Singapore companies, like U.S. companies, often benchmark the pay of their top executives to peers and argue that high CEO pay is necessary to attract top talent, which is critical for firm performance (Chan 2011).

¹⁰ The exchange rate was approximately SGD\$1.27: USD\$1 when the data were collected.

¹¹ The M.B.A. programs accept individuals with nonbusiness undergraduate degrees, who would have indicated nonbusiness as their educational major.

¹² For example, Kickul and Lester (2001) measure the equity sensitivity of U.S. employees pursuing a part-time M.B.A. degree (mean = 25.15 [or 24.85 reverse-coded in their paper], s.d. = 6.69, $n = 183$). Mueller and Clarke (1998) measure the equity sensitivity of third and fourth year U.S. university students studying business and economics in 1994 (mean = 25.25, s.d. = 6.05, $n = 449$) and in 1996 (mean = 23.71, s.d. = 6.24, $n = 490$). The equity sensitivity of our Singapore M.B.A. student participants (mean = 25.93, s.d. = 5.89, $n = 75$) is not different from that of the Kickul and Lester sample ($t = 0.879$; two-tailed $p = 0.380$) or the 1994 Mueller and Clarke sample ($t = 0.90$; two-tailed $p = 0.366$); but it is significantly higher than that of the 1996 Mueller and Clarke sample ($t = 2.89$; two-tailed $p = 0.004$).

¹³ Prior research suggests that findings on individuals making risky financial decisions for themselves are consistent with findings on individuals making those decisions for others (Stone, Yates, and Caruthers 2002).

FIGURE 2

Order of Experimental Materials and Manipulations

MATERIALS

MANIPULATIONS

Section 1

1) Participants were given information on a potential medium to long-term investment:

- a) Company description
- b) 3-year financial data
- c) Note disclosure on CEO compensation comprising:
 - i. Company and comparison group CEO pay
 - ii. Median employee pay (only in the *HIGHCEO-HIGHRATIO* condition)
 - iii. CEO-to median employee pay ratio (only in the *HIGHCEO-HIGHRATIO* condition)

2) Participants made investment potential judgments

Information included in the manipulations:

1)FAIRCEO-NORATIO

- Only company and comparison group CEO pay were provided
- Company CEO pay was at the 55th percentile of comparison group, and manipulated as comparable-to-industry (\$4,346,753 vs. \$4,216,350)

2)HIGHCEO-NORATIO

- Only company and comparison group CEO pay were provided
- Company CEO pay was at the 75th percentile of comparison group, and manipulated as higher-than-industry (\$7,365,124 vs. \$4,216,350)

3)HIGHCEO-HIGHRATIO

- Company and comparison group CEO pay, pay ratio, and median employee pay were provided
- Company CEO pay was at the 75th percentile of comparison group, and manipulated as higher-than-industry (\$7,365,124 vs. \$4,216,350)
- Company pay ratio was manipulated as higher-than-industry (161.91 vs. 95.55)
- Company median employee pay was automatically derived as comparable-to-industry (\$45,490 vs. \$44,125)

Section 2

1) Participants were given the same company's financial data and note disclosure on CEO compensation as in Section 1

2) Participants answered post-experimental questionnaire

Section 3

1) Participants answered manipulation check questions.

2) Participants answered demographic questions and ethical sensitivity instrument

executive talent. Participants in all conditions are told that 86 percent of the CEO's annual total pay is attributable to variable incentive awards tied to the company's performance, which is based on data from the NASDAQ-listed company in the year 2010.¹⁴ Participants in all conditions are also told that the company's three-year change in the price of its common stock has exceeded the 65th percentile of its comparison group—this design feature holds constant the past stock price performance of the company.

For the *HIGHCEO-HIGHRATIO* condition, the note disclosure on CEO compensation additionally reports the amount of median employee pay and the CEO-to-median employee pay ratio of 161.91 for the company, as well as the mean median employee pay and the mean CEO-to-median employee pay ratio of 95.55 for the comparison group. All participants then complete a set of questions relating to the company's investment potential.

In the second section, participants are first given the same information on the company's financial data and note disclosure on CEO compensation as in Section 1 of Figure 2. Participants then answer questions relating to their perceptions of the fairness of CEO compensation, rank-and-file employee morale, rank-and-file employee job satisfaction, rank-and-file employee productivity, the quality of teamwork among rank-and-file employees, the quality of the relationship between rank-and-file employees and top management, and the company's ability to attract and retain CEO talent. These questions are asked after questions about the company's investment potential to avoid priming participants.

In the third section, participants complete a post-experiment questionnaire containing manipulation checks, demographic questions, and the five-item Equity Sensitivity Instrument (Huseman et al. 1985). Participants are not given any information from the prior two sections. On average, participants report that they took about 16 minutes to complete the experiment.

Dependent Variables

For H1a and H1b, our dependent variable is the participants' perception of the fairness of CEO pay in the company. For H2 and H2b, our dependent variable is the participants' perception of the workplace climate in the company, which is the average of the responses to five questions on rank-and-file employee morale, rank-and-file employee job satisfaction, rank-and-file employee productivity, the quality of teamwork among rank-and-file employees, and the quality of the relationship between rank-and-file employees and top management. The five questions on workplace climate have a Cronbach's alpha of 0.91 and confirmatory factor analysis indicates that all questions load on a single factor with all individual factor loadings above 0.70. For H3a and H3b, our dependent variable is the participants' perception of the company's ability to attract and retain CEO talent. All questions on investor perceptions are on -7 to $+7$ scales.

For the dependent variable in H4a, H4b, and H4c, H5a, H5b, and H5c, and H6a and H6b, we ask participants to rate on -7 to $+7$ scales (1) the attractiveness of the stock as a medium to long-term investment, (2) the stock's potential for price appreciation over the next three years, and (3) the company's earnings potential over the next three years (Kelly, Low, H. Tan, and S. Tan 2012). Perceived investment potential is the average of the responses to these three questions (Cronbach's alpha = 0.85). The results for each of these three investment potential questions are the same as the results for the composite measure.

RESULTS

Manipulation Checks

For the manipulation of the comparable-to-industry versus higher-than-industry CEO pay, 93 percent (70 of 75 participants) correctly identify whether the CEO pay is "more or less the same as its comparison group" in the *FAIRCEO-NORATIO* (i.e., \$4,346,753 versus \$4,216,350), or "a lot higher than its comparison group" in *HIGHCEO-NORATIO* and *HIGHCEO-HIGHRATIO* (i.e., \$7,365,124 versus \$4,216,350).¹⁵ The three conditions have similar failure rates for this manipulation check (Wald $\chi^2 = 0.223$; two-tailed $p = 0.895$). For the manipulation of no pay ratio versus a higher-than-industry pay ratio, 77 percent (58 of 75 participants) correctly identify whether the pay ratio is not provided in the *FAIRCEO-NORATIO* and *HIGHCEO-NORATIO* conditions, or whether it is "a lot higher than its comparison group" in the *HIGHCEO-HIGHRATIO* condition (i.e., a ratio of 161.91 versus 95.55). The failure rate for this manipulation check does not differ significantly across conditions (Wald $\chi^2 = 1.045$; two-tailed $p = 0.593$).

¹⁴ There are companies in the NASDAQ-listed company's comparison group that have percentages of CEO pay attributable to variable incentive awards comparable to 86 percent.

¹⁵ We also asked participants about the median employee pay. Eighty percent (60 of 75 participants) correctly identified whether the median employee pay was not provided in *FAIRCEO-NORATIO* and *HIGHCEO-NORATIO*, or "more or less the same as its comparison group" in the *HIGHCEO-HIGHRATIO* (i.e., \$45,490 versus \$44,125). The rate of incorrect answers for this question was not significantly different across the three conditions (Wald $\chi^2 = 1.444$; two-tailed $p = 0.486$).

We retain all participants in our analyses because failing to answer the manipulation check questions correctly may be a function of poor recall and does not mean that participants' perceptions are not influenced by what they read in the disclosures (Perdue and Summers 1986). In a post-experimental question, we ask participants to rate whether the CEO pay is too high, just right, or too low (on a scale of -7 "too high," to 0 "just right," to $+7$ "too low"). Consistent with our manipulation of the comparable-to-industry versus higher-than-industry CEO pay, participants believe that the CEO pay is too high in *HIGHCEO-NORATIO* more so than in *FAIRCEO-NORATIO* ($-2.48 < -0.04$, $t = 4.50$; two-tailed $p < 0.001$), and there is no significant difference in the extent to which participants believe that CEO pay is too high in *HIGHCEO-NORATIO* and *HIGHCEO-HIGHRATIO* (-2.48 versus -2.84 , $t = 0.66$; two-tailed $p = 0.509$). Consistent with our manipulation of no pay ratio versus a higher-than-industry pay ratio, and as reported in the results for our tests of hypotheses, there is an incremental decrease in perceptions of CEO pay fairness and workplace climate from adding the disclosure of a higher-than-industry pay ratio to a higher-than-industry CEO pay (i.e., *HIGHCEO-HIGHRATIO* versus *HIGHCEO-NORATIO*). Together, these results indicate that our manipulations are successful regardless of the participants' recall ability (Sigall and Mills 1998).¹⁶ The inferences from our results are similar when we exclude participants who fail the manipulation check questions. We discuss the results for the smaller sample that excludes participants who fail the manipulation checks in the footnotes in the "Test of Hypotheses" subsection.¹⁷

Test of Hypotheses

The descriptive results of participant perceptions of CEO pay fairness, workplace climate, company ability to attract and retain CEO talent, and investment potential are reported in Table 1. We conduct mediation analyses to test our hypotheses as depicted in the mediation models in Figure 1, and the results are reported in Table 2. We use the bootstrapping method (Hayes 2009; Preacher and Hayes 2008) to test for the indirect effects of disclosures on perceived investment potential.¹⁸ A 95 percent bias-corrected confidence interval based on 5,000 bootstrap samples is computed for each indirect effect. An indirect effect is significant if 0 is not in the confidence interval.

Effects of Disclosure of Higher-than-Industry CEO Pay

Table 2, Panels A, B, and C report the mediation analyses for the effects of disclosing higher-than-industry (versus a comparable-to-industry) CEO pay as depicted in the mediation model in Figure 1. We first perform a set of regressions to obtain the Path a coefficients where higher-than-industry (versus comparable-to-industry) CEO pay disclosure is the independent variable and each of the mediators are the dependent variables (Table 2, Panel A). The Path a coefficients are negative and marginally significant for perceived CEO pay fairness (one-tailed $p = 0.097$) and perceived workplace climate (one-tailed $p = 0.065$), marginally supporting H1a and H2a; and positive and significant for perceived CEO attraction/retention ability, supporting H3a (one-tailed $p = 0.009$). A second set of regressions generates the Path b and Path c' coefficients where the mediators and higher-than-industry CEO pay disclosure are the independent variables and perceived investment potential is the dependent variable (Table 2, Panel B). Consistent with H4a, H4b, and H4c, the Path b coefficients for perceptions of CEO pay fairness (one-tailed $p = 0.004$), workplace climate (one-tailed $p = 0.062$), and CEO attraction/retention ability (one-tailed $p = 0.090$) are all positive and at least marginally significant. The direct effect of disclosing higher-than-industry CEO pay (Path c') after controlling for the mediators is not significant (two-tailed $p = 0.862$).

Finally, based on a 95 percent bootstrapped confidence interval, there are no significant indirect effects of disclosing higher-than-industry CEO pay (versus comparable-to-industry CEO pay) on perceived investment potential (Path a * Path b) through perceived CEO pay fairness (indirect effect = -0.30 , confidence interval of -1.29 to 0.02), perceived workplace climate (indirect effect = -0.20 , confidence interval of -1.20 to 0.03), or perceived CEO attraction/retention ability (indirect

¹⁶ According to Sigall and Mills (1998, 221), differences between experimental conditions on a measure of the conceptual independent variable or a dependent measure provide evidence that participants notice the manipulated differences between conditions.

¹⁷ Of the 55 (out of 75) participants who passed both the manipulation check questions, 17 (out of 25) were in *FAIRCEO-NORATIO*, 18 (out of 25) were in *HIGHCEO-NORATIO*, and 20 (out of 25) were in *HIGHCEO-HIGHRATIO*.

¹⁸ Perceived investment potential is not significantly different in *HIGHCEO-NORATIO* versus *FAIRCEO-NORATIO* (3.03 versus 3.36 , $t = 0.57$; two-tailed $p = 0.568$), nor in *HIGHCEO-HIGHRATIO* versus *HIGHCEO-NORATIO* (3.11 versus 3.03 , $t = -0.14$; two-tailed $p = 0.891$). Although our independent variables of CEO pay and pay ratio disclosures have no effect on perceived investment potential, more recent research on mediation analyses notes that a significant relationship between the independent variable and the dependent variable is not necessary to establish an indirect effect of the independent variable on the dependent variable through mediating variables (Kenny, Kashy, and Bolger 1998; Shrout and Bolger 2002; MacKinnon, Fairchild, and Fritz 2007). The indirect effect can be significant even when there is no significant effect of the independent variable on the dependent variable because the total effect of the independent variable on the dependent variable is the "sum of many different paths of influence, direct and indirect, not all of which may be part of a formal model" (Hayes 2009, 414).

TABLE 1
Means (Standard Deviations) of Participant Perceptions

Condition ^a	n	CEO Pay Fairness ^b (s.d.)	Workplace Climate ^c (s.d.)	CEO Attraction/ Retention Ability ^d (s.d.)	Investment Potential ^e (s.d.)
<i>FAIRCEO-NORATIO</i>	25	1.12 (2.60)	1.69 (2.16)	2.88 (2.37)	3.36 (2.09)
<i>HIGHCEO-NORATIO</i>	25	0.12 (2.76)	0.66 (2.55)	4.40 (1.98)	3.03 (2.30)
<i>HIGHCEO-HIGHRATIO</i>	25	-1.32 (2.58)	-0.23 (2.17)	3.84 (2.39)	3.11 (1.73)

^a Participants in the *FAIRCEO-NORATIO* and *HIGHCEO-NORATIO* (*HIGHCEO-HIGHRATIO*) conditions were provided information on CEO pay (CEO pay, median employee pay, and pay ratio of those two amounts). The company's pay ratio (161.91) in the *HIGHCEO-HIGHRATIO* condition was higher than that of a comparison group of companies in the same industry (95.55). Participants in the *FAIRCEO-NORATIO* (*HIGHCEO-NORATIO* and *HIGHCEO-HIGHRATIO*) condition were told that the company's CEO pay was at the 55th (75th) percentile of its comparison group and the amount of \$4,346,753 (\$7,365,124) was a comparable-to-industry (higher-than-industry) amount of \$4,216,350. Therefore, in the *HIGHCEO-HIGHRATIO* condition, the company's median employee pay was automatically derived at \$45,490 and was the comparable-to-industry amount is \$44,125.

^b Participants rated the fairness of the CEO compensation (on a scale of -7 to 7).

^c Workplace climate was the average of the responses to five questions on participants' perceptions of rank-and-file employee morale, rank-and-file employee job satisfaction, rank-and-file employee productivity, the quality of teamwork among rank-and-file employees, and the quality of the relationship between rank-and-file employees and top management (on scales of -7 to 7).

^d Participants rated the company's ability to attract and retain the CEO talent necessary to meet its business objectives (on a scale of -7 to 7).

^e Investment potential was the average of the responses to three questions regarding the stock's attractiveness as a medium to long-term investment, potential for stock price appreciation, and the company's earnings potential (on scales of -7 to 7).

effect = 0.27, confidence interval of -0.08 to 0.86) (Table 2, Panel C). The Sobel tests are also insignificant for all three indirect effects (all one-tailed *p* values > 0.109).¹⁹ Therefore, H5a, H5b, and H5c are not supported.²⁰

Effects of Incremental Disclosure of Higher-than-Industry Pay Ratio

Table 2, Panels D, E, and F report the mediation analyses for the effects of incrementally disclosing a higher-than-industry pay ratio as depicted in the mediation model in Figure 1. The first set of regressions generates the Path a coefficients where the incremental pay ratio disclosure (versus disclosure of higher-than-industry CEO pay only) is the independent variable and each of the mediators are the dependent variables (Table 2, Panel D). The Path a coefficients are negative and significant for perceived CEO pay fairness (one-tailed *p* = 0.031), supporting H1b; negative and marginally significant for perceived workplace climate (one-tailed *p* < 0.094), marginally supporting H2b; and negative but insignificant for perceived CEO attraction/retention ability, providing no evidence to reject the null H3b (two-tailed *p* = 0.372). The second set of regressions generates the Path b and Path c' coefficients, where the mediators and pay ratio disclosure are the independent variables and perceived investment potential is the dependent variable (Table 2, Panel E). Consistent with H4a and H4b, the Path b coefficients for perceptions of CEO pay fairness (one-tailed *p* = 0.001) and workplace climate (one-tailed *p* = 0.009) are both positive and significant. However, the Path b coefficient for perceived CEO attraction/retention ability is negative and insignificant (two-tailed *p* = 0.139), which does not support H4c. Hence, as reported in the preceding subsection, H4c is supported in the sample comprising the two conditions with no pay ratio disclosure (*FAIRCEO-NORATIO* and *HIGHCEO-NORATIO*). However, H4c is not supported in the sample comprising the two conditions with higher-than-industry CEO pay

¹⁹ The Sobel test assumes that the sampling distribution of the indirect effect (Path a * Path b) is normal (Hayes 2009). The Preacher and Hayes test relies on bootstrapping to generate an approximation of the sampling distribution of the indirect effect and may be more powerful (Hayes 2009; Preacher and Hayes 2008).

²⁰ We test our hypotheses using the smaller sample with only participants who passed the manipulation checks. The inferences from the smaller sample are generally consistent with that from the full sample. The Path a coefficients are negative and not significant for perceived CEO pay fairness (one-tailed *p* = 0.256) and perceived workplace climate (one-tailed *p* = 0.134), providing no support for H1a and H2a; and positive and significant for perceived CEO attraction/retention ability, supporting H3a (one-tailed *p* = 0.003). The Path b coefficients are positive and significant for perceived CEO pay fairness (one-tailed *p* = 0.010) and perceived workplace climate (one-tailed *p* = 0.043), supporting H4a and H4b; but positive and not significant for perceived CEO attraction/retention ability, providing no support for H4c (one-tailed *p* = 0.104). The results for H5a, H5b, and H5c are similar, wherein the confidence interval tests and the Sobel tests are insignificant for all three indirect effects (all one-tailed *p* values > 0.106).

TABLE 2
Mediation Analyses
Preacher and Hayes (2008) Approach^a

Panel A: Regressions of Effect of Disclosing Higher-than-Industry (versus Comparable-to-Industry) CEO Pay on Mediators (Path a) (n = 50)

<u>Dependent Variable</u>	<u>Predicted Sign</u>	<u>Coefficient Estimate</u>	<u>t</u>	<u>p^b</u>	<u>R²</u>
<i>CEO Pay Fairness</i>	H1a: –	–1.00	–1.32	0.097	3.49%
<i>Workplace Climate</i>	H2a: –	–1.03	–1.54	0.065	4.70%
<i>CEO Attraction/Retention Ability</i>	H3a: +	1.52	2.46	0.009	11.21%

Panel B: Regression of Effects of Mediators on Perceived Investment Potential (Path b) (n = 50)

<u>Mediator as Independent Variables</u>	<u>Predicted Sign</u>	<u>Coefficient Estimate</u>	<u>t</u>	<u>p</u>
<i>CEO Pay Fairness</i>	H4a: +	0.30	2.82	0.004
<i>Workplace Climate</i>	H4b: +	0.19	1.57	0.062
<i>CEO Attraction/Retention Ability</i>	H4c: +	0.18	1.36	0.090
<i>Higher-than-Industry CEO Pay</i>	Null (Path c')	–0.11	–0.17	0.862

(two-tailed)

R² = 26.82%

Panel C: Indirect Effects of Disclosing Higher-than-Industry (versus Comparable-to-Industry) CEO Pay on Perceived Investment Potential through Mediators (Path a * Path b)

<u>Mediator</u>	<u>Sobel Test</u>				<u>95 Percent Confidence Interval Limits^c</u>		
	<u>Indirect Effect Path a Coefficient * Path b Coefficient</u>	<u>SE</u>	<u>Z</u>	<u>p</u>	<u>Boot SE</u>	<u>Lower</u>	<u>Upper</u>
H5a: <i>CEO Pay Fairness</i>	–1.00 * 0.30 = –0.30	0.25	–1.21	0.112	0.30	–1.29	0.02
H5b: <i>Workplace Climate</i>	–1.03 * 0.19 = –0.20	0.18	–1.13	0.130	0.24	–1.20	0.03
H5c: <i>CEO Attraction/Retention Ability</i>	1.52 * 0.18 = 0.27	0.22	1.23	0.109	0.25	–0.08	0.86

Panel D: Regressions of Effect of Disclosing Higher-than-Industry Pay Ratio (versus Disclosing Higher-than-Industry CEO Pay Only) on Mediators (Path a) (n = 50)

<u>Dependent Variable</u>	<u>Predicted Sign</u>	<u>Coefficient Estimate</u>	<u>t</u>	<u>p</u>	<u>R²</u>
<i>CEO Pay Fairness</i>	H1b: –	–1.44	–1.91	0.031	7.04%
<i>Workplace Climate</i>	H2b: –	–0.90	–1.34	0.094	3.60%
<i>CEO Attraction/Retention Ability</i>	H3b: Null	–0.56	–0.90	0.372	1.67%

(two-tailed)

Panel E: Regression of Effects of Mediators on Perceived Investment Potential (Path b) (n = 50)

<u>Mediator as Independent Variables</u>	<u>Predicted Sign</u>	<u>Coefficient Estimate</u>	<u>t</u>	<u>p</u>
<i>CEO Pay Fairness</i>	H4a: +	0.33	3.36	0.001
<i>Workplace Climate</i>	H4b: +	0.27	2.45	0.009
<i>CEO Attraction/Retention Ability</i>	H4c: +	–0.18	–1.51	0.139
<i>Higher-than-Industry Pay Ratio</i>	Null (Path c')	0.69	1.36	0.179

(two-tailed)

R² = 33.29%

(continued on next page)

TABLE 2 (continued)

Panel F: Indirect Effects of Disclosing Higher-than-Industry Pay Ratio (versus Disclosing Higher-than-Industry CEO Pay Only) on Perceived Investment Potential through Mediators (Path a * Path b)

Mediator	Sobel Test				95 Percent Confidence Interval Limits		
	Indirect Effect Path a Coefficient * Path b Coefficient	SE	Z	p	Boot SE	Lower	Upper
H6a: <i>CEO Pay Fairness</i>	-1.44 * 0.33 = -0.47	0.28	-1.69	0.046	0.27	-1.18	-0.06
H6b: <i>Workplace Climate</i>	-0.90 * 0.27 = -0.24	0.21	-1.20	0.116	0.24	-0.96	0.05
<i>CEO Attraction/Retention Ability</i>	-0.56 * -0.18 = 0.10	0.13	0.79	0.430	0.16	-0.05	0.64

(two-tailed)

^a See Table 1 for the definitions of the participant perception variables (perceived *CEO Pay Fairness*, *Workplace Climate*, *CEO Attraction/Retention Ability*, and *Investment Potential*).

^b All p-values are one-tailed for hypothesized relationships. Two-tailed p-values are indicated for null predictions and when the direction of the effects is contrary to that hypothesized.

^c Percentile bootstrap confidence intervals based on 5,000 bootstrap samples.

disclosure (*HIGHCEO-NORATIO* and *HIGHCEO-HIGHRATIO*), possibly because there is less variation in perceived CEO attraction/retention ability in both of these conditions.²¹ The direct effect of disclosing a higher-than-industry pay ratio (Path c') after controlling for the mediators is not significant (two-tailed $p = 0.179$).

Finally, based on a 95 percent bootstrapped confidence interval, there is a significant indirect effect of incrementally disclosing a higher-than-industry pay ratio (i.e., in addition to higher-than-industry CEO pay) on perceived investment potential (Path a * Path b) through perceived CEO pay fairness (indirect effect = -0.47, confidence interval of -1.18 to -0.06; Sobel test one-tailed $p = 0.046$) (see Table 2, Panel F). However, there are no significant indirect effects for perceived workplace climate (indirect effect = -0.24, confidence interval of -0.96 to 0.05; Sobel test one-tailed $p = 0.116$) or perceived CEO attraction/retention ability (indirect effect = 0.10, confidence interval of -0.05 to 0.64; Sobel test two-tailed $p = 0.430$). Therefore, H6a is supported but H6b is not supported.²²

Supplementary Analyses of Post-Experimental Questions

We ask participants in a post-experimental question to rate the performance of the company's CEO (on a scale of -7 "very poor" to +7 "very good"). There is no difference in perceived CEO performance across conditions ($F = 0.27$; two-tailed $p = 0.761$). Individual contrasts show no significant difference in perceived CEO performance between *FAIRCEO-NORATIO* and *HIGHCEO-NORATIO* (2.52 versus 2.24, $t = 0.37$; two-tailed $p = 0.712$), and between *HIGHCEO-NORATIO* and *HIGHCEO-HIGHRATIO* (2.24 versus 1.96, $t = 0.37$; two-tailed $p = 0.712$). Thus, holding constant the financial and stock price performance of the company, disclosure of higher-than-industry CEO pay and incremental disclosure of a higher-than-industry pay ratio do not affect how our participants perceive the CEO's performance.

Excessive CEO pay and pay inequity have been argued to be indicative of undue CEO influence over the board of directors in setting excessive CEO compensation and, more generally, of an ineffective board (Bebchuk and Fried 2003). Prior studies find that weaker boards are associated with greater CEO compensation and higher pay differentials between the CEO and the

²¹ To test H4a, H4b, and H4c for the full sample, we conduct an ordinary least squares regression for the entire sample with all three conditions. Perceived investment potential is positively associated with perceptions of CEO pay fairness (coefficient = 0.25, $t = 3.06$; one-tailed $p = 0.002$) and workplace climate (coefficient = 0.17, $t = 1.71$; one-tailed $p = 0.045$), consistent with H4a and H4b, respectively. However, perceived CEO attraction/retention ability (coefficient = 0.04, $t = 0.46$; one-tailed $p = 0.323$) is not significantly associated with perceived investment potential, providing no support for H4c.

²² We test our hypotheses using the smaller sample with only participants who passed the manipulation checks. The inferences from the smaller sample are generally consistent with that from the full sample. Path a coefficients are negative and marginally significant for perceived CEO pay fairness (one-tailed $p = 0.076$), marginally supporting H1b; negative and significant for perceived workplace climate (one-tailed $p = 0.026$), supporting H2b; and negative but not significant for perceived CEO attraction/retention ability, providing no evidence to reject the null H3b (two-tailed $p = 0.122$). The Path b coefficients for perceptions of CEO pay fairness (one-tailed $p = 0.001$) and workplace climate (one-tailed $p = 0.003$) are positive and significant, supporting H4a and H4b; but negative and significant for perceived CEO attraction/retention ability (two-tailed $p = 0.070$), which does not support H4c. Indirect effects predicted in H6a (one-tailed $p = 0.084$) and H6b (one-tailed $p = 0.043$) are at least marginally supported using the Sobel tests, while only H6b (confidence interval of -1.67 to -0.03) is supported using the confidence interval tests.

average employee (Boyd 1994; Core, Holthausen, and Larcker 1999; Shin et al. 2015; Faleye, Reis, and Venkateswaran 2013). Therefore, we ask three post-experimental questions on the effectiveness of the board in setting CEO compensation, the overall effectiveness of the board, and the quality of corporate governance (on scales of -7 “very ineffective/very poor” to $+7$ “very effective/very good”). The Cronbach’s alpha for these three questions is 0.83 and confirmatory factor analysis indicates that all three questions load on a single factor with all individual factor loadings above 0.70. A composite board quality measure (based on the average of the responses to these three questions) is not significantly lower in *HIGHCEO-NORATIO* than *FAIRCEO-NORATIO* (1.33 versus 2.05, $t = 1.12$, one-tailed $p = 0.134$), and it is also not significantly lower in *HIGHCEO-HIGHRATIO* than *HIGHCEO-NORATIO* (1.43 versus 1.33, $t = 0.15$; two-tailed $p = 0.885$). Hence, disclosure of higher-than-industry CEO pay and incremental disclosure of a higher-than-industry pay ratio have no significant negative impact on the perceived quality of the board and corporate governance in the company.

Additional Analyses of Supplementary Conditions

Participants in all conditions of our main experiment are told that 86 percent of the CEO pay is attributable to variable incentive pay. This high variable CEO pay may have dampened any negative effect of higher-than-industry CEO pay and pay ratio on perceived investment potential. Participants may have believed that higher-than-industry CEO pay and, consequently, the higher-than-industry pay ratio are justified by the high variable CEO pay. To address this concern, we examine, in a supplementary experiment, two new conditions similar to the *HIGHCEO-HIGHRATIO* condition, with 86 percent and 29 percent of the CEO pay being variable, respectively. In this supplementary experiment, perceived investment potential is not lower when CEO pay is more attributable to fixed pay (mean = 3.77, $n = 20$) than variable pay (mean = 3.35, $n = 20$) ($t = 0.84$; two-tailed $p = 0.408$) in the *HIGHCEO-HIGHRATIO* setting. Also, perceived investment potential is not significantly different in these two new conditions and the original *HIGHCEO-HIGHRATIO* condition in the main experiment (mean = 3.11, $n = 25$) ($F = 0.91$; two-tailed $p = 0.409$).

Participants in all conditions of our main experiment are also told that the company’s three-year change in the price of its common stock has exceeded the 65th percentile of its comparison group. This relatively strong past stock price performance may have muted any negative effect of higher-than-industry CEO pay and pay ratio on perceived investment potential. We address this concern by examining two new conditions identical to the *HIGHCEO-NORATIO* and *HIGHCEO-HIGHRATIO* conditions, except that the past stock price performance is set at the 50th rather than the 65th percentile of its comparison group.²³ Similar to the results in the main experiment, perceived investment potential is not significantly lower in *HIGHCEO-HIGHRATIO* (mean = 2.90, $n = 34$) than in *HIGHCEO-NORATIO* (mean = 3.02, $n = 30$) in this supplementary experiment ($t = 0.20$, one-tailed $p = 0.840$).²⁴ Also, perceived investment potential is not significantly different whether the past stock price performance is set at the 50th percentile in this supplementary experiment versus the 65th percentile in the main experiment under *HIGHCEO-NORATIO* (means = 3.02 versus 3.03, $t = 0.01$; two-tailed $p = 0.994$) and under *HIGHCEO-HIGHRATIO* (means = 2.90 versus 3.11, $t = 0.35$; two-tailed $p = 0.728$).

CONCLUSION

In this paper, we conduct an experiment to assess whether and how disclosures about CEO pay and the ratio between CEO pay and median employee pay influence the judgments of our participants who assume the role of investors. Our results suggest that disclosing only higher-than-industry CEO pay may have limited negative effects on participant perceptions about the company, but adding a disclosure of a higher-than-industry pay ratio to higher-than-industry CEO pay may have incremental negative effects on participants’ perceptions about the company. Specifically, disclosing higher-than-industry CEO pay (versus comparable-to-industry CEO pay) only marginally decreases perceived CEO pay fairness and perceived workplace climate, which is counteracted by a significant positive effect on the perceived company ability to attract and retain CEO talent, although there are no significant indirect effects through these perceptions on perceived investment potential. These results suggest that under current CEO disclosure regulations, disclosure of higher-than-industry CEO pay may have limited ability to curb excessive CEO pay if investors do not perceive higher-than-industry CEO pay to be that inequitable. Investors and

²³ In these two additional conditions where the past stock price performance is set at the 50th percentile of the company’s comparison group, we also remove references about the company being considered as an industry leader in terms of market share and innovation.

²⁴ ANOVAs for perceived CEO pay fairness and perceived workplace climate indicate that neither the stock price performance variable (50th percentile versus 65th percentile) nor the interaction between the stock price performance variable and the pay ratio variable (*NORATIO* versus *HIGHRATIO*) are significant (all two-tailed p values > 0.519). However, the pay ratio variable is significant in that perceived CEO pay fairness and perceived workplace climate are lower under *HIGHCEO-HIGHRATIO* than *HIGHCEO-NORATIO* (all one-tailed p values < 0.047), consistent with H1b and H2b. ANOVA for perceived CEO attraction/retention ability indicates that the stock price performance variable, the pay ratio variable (i.e., consistent with the null H3b), and the interaction effect are all not significant (all two-tailed p values > 0.143).

employees may be desensitized to higher-than-industry CEO pay and may agree with the company's justification that higher-than-industry CEO pay is necessary to compete for top CEO talent.

However, incrementally disclosing a higher-than-industry pay ratio (versus disclosing only higher-than-industry CEO pay) significantly decreases perceived CEO pay fairness and marginally decreases perceived workplace climate, and has a significant indirect negative effect on perceived investment potential through perceived CEO pay fairness. Thus, disclosing a higher-than-industry pay ratio under the soon-to-be implemented Section 953(b) of the Dodd-Frank Act (U.S. House of Representatives 2010) may be effective in creating incremental negative perceptions of CEO pay fairness that could shame companies into restraining CEO pay. Furthermore, incremental disclosure of a higher-than-industry pay ratio has an indirect negative effect on perceived investment potential through perceived CEO pay fairness, which could provide further incentive for companies to restrain CEO pay or to better manage investor perception of CEO pay fairness.

Our study is subject to the following limitations. First, we use participants from Singapore. As we noted in the paper, our Singapore participants do not differ significantly from some samples of U.S. participants in prior studies in terms of their equity sensitivities. Nevertheless, if cultural differences result in varying degrees of aversion toward inequity or identification with rank-and-file employees across investors from different countries, then the effect size of CEO pay and pay ratio disclosures may differ across countries; this could be a potential future research area.

Second, we created a neutral experimental setting so as not to create strong biases toward perceived unfairness when higher-than-industry CEO pay or pay ratio are disclosed, to provide a more stringent test of investor reactions to the higher-than-industry CEO pay and pay ratio disclosures. Future research could explore settings where investors may be more sensitive to unfairness such as when the CEO pay and the pay ratio are higher than the levels we manipulated in the experiment, when the company is performing poorly, when the company has received significant government bailouts, or when investors are currently invested in the company.

Third, we examine the effect of incrementally disclosing a higher-than-industry pay ratio by comparing a condition that has no pay ratio disclosure to a condition that discloses a higher-than-industry pay ratio. The negative effects on perceived workplace climate and CEO pay fairness from the incremental disclosure of the higher-than-industry pay ratio could be due to either the mere disclosure of a pay ratio indicating that the CEO is paid more than the median employee or the fact that the pay ratio is higher than the industry. However, as discussed in our hypotheses development, equity theory suggests that investors and employees expect CEOs to be paid more than the median employee and it is less likely that our participants are reacting to the mere disclosure that the CEO is paid more than the median employee and more likely that they are reacting to the pay ratio being higher than the industry.

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