# Broken Rung: Female Employees in Higher-Paying Positions and Firm Performance[*]

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March 18, 2021

## Abstract

In the workplace, women are less likely than men to hold higher paying positions. We refer to this phenomenon as the *gender position gap*. While the gender position gap is an important problem that affects millions of women and their families, its implications for firms are unclear. In this paper, we examine the gender position gap of firm employees and its association with future firm performance. We use novel gender and salary data on employees that hold various positions within firms. We find that the gender position gap is wider for firms with larger female–male differences in human capital characteristics (prior work experience and education), fewer female leaders, and weaker monitoring. Firms with a larger gender position gap have poorer future performance. This negative association is not driven by employees at the top or bottom end of the corporate hierarchy. The negative association is stronger for firms that rely more on human capital. Firms with a larger gender position gap also have lower future stock returns, which suggests that investors do not fully utilize information about gender position gaps. Overall, our findings are consistent with the view that gender position gaps contain information about future firm performance.

Keywords: gender position gap, female employees, gender diversity, gender equality, firm performance, stock returns

[*] We thank Elizabeth Chuk, David Hirshleifer, Joanna Ho, Yifan Li, Radhika Lunawat, Mort Pincus, Thomas Ruchti, Devin Shanthikumar, Siew Hong Teoh, Chenqi Zhu, and seminar participants at Carnegie Mellon University, Pennsylvania State University and the University of California-Irvine for their helpful comments. We gratefully acknowledge the financial support provided by the Paul Merage School of Business at the University of California-Irvine and the University of Illinois at Chicago.

## 1. Introduction

One of the most intractable problems of our time is the significant obstacles women face when they pursue higher paying positions. Companies increasingly claim they provide fair compensation for both the men and women who hold the same position within a firm. However, women are still less likely to hold higher paying positions than men. We refer to this lower representation of women in higher paying positions as the *gender position gap*. While the gender position gap is a serious social problem that hurts millions of women and their families, it is not clear whether it has negative implications for firms. In this paper, we examine the association between the gender position gap and firms' future performance.

The low representation of women in higher paying positions is a major concern for the general public, firms, and regulators. This topic is discussed extensively both in business journals and in popular media.[1] A growing number of firms publicly document the strategies they use to improve gender equality in career advancement (Mercer 2020). Firms often hire experts to help mitigate unconscious gender bias in the workplace (Zelevansky 2019). Some firms even tie executive compensation to diversity and inclusion goals (PayScale 2019). The large disparity in salaries between female and male employees was the primary motivation for the Paycheck Fairness Act (2019).[2,3] Regulators abroad are equally concerned about gender inequality in the workplace (e.g., The Equality Act (2010) in the United Kingdom). The problem has recently attracted even more attention from regulators and firms as the COVID-19 pandemic has increased both gender

[1] See, for example, Dychtwald (2018); Hauck (2019); and Sheth, Gal, and Hoff (2020).
[2] The US Congress argues that in many cases, these disparities result either from continued discrimination or from the lingering effects of past discrimination. Even though gender discrimination is illegal in practice, gender biases in recruitment and promotion decisions are often unconscious and are difficult to observe.
[3] The Act requires firms to submit to the Department of Labor their compensation, hiring, and promotion data separately for women and men, and they must demonstrate that salary differences are due to factors not related to discrimination.

inequality (Zeballos-Roig 2020) and the importance of human capital management to firms (Maiden 2020).

The investment community now demands more information on gender diversity. Investors increasingly view that how a firm utilizes female talent is important to its growth. Some investors are now urging firms to expand disclosures on gender diversity and advancement.[4] Other investors advocate for mandating these disclosures. In a letter to the SEC (SEC 2019), a large group of institutional investors argue that employees are a key driver of value creation. This group specifically recommends that the SEC require firms to disclose gender diversity across various levels of seniority within the firm.

Gender disparity usually arises early in the careers of female employees. McKinsey and Company recently issued a report on gender issues in US firms (McKinsey and Company 2019) in which they conclude that the "glass ceiling" is not the primary barrier that excludes female employees from the top executive positions in a firm.[5] Rather, female employees are hindered primarily by a "broken rung" in which female employees are less likely to be hired as managers or promoted to management positions. Our study examines this lower representation of women in higher level positions and its implications for firm performance.

The literature offers conflicting predictions about the direction of the relationship between the gender position gap and performance. First, the literature on gender effects in the workplace argues that gender bias is widespread and persistent.[6] Women are less likely to be interviewed, and

[4] See, for example, Trillium Asset Management (https://www.sec.gov/comments/s7-11-19/s71119-6067407-191464.pdf).

[5] In fact, women may have higher promotion rates once they reach the top executive level (e.g., Gayle, Golan, and Miller 2012).

[6] Theories of gender biases posit that gender biases arise from statistical discrimination (e.g., Phelps 1972; Arrow 1973), where managers facing imperfect information use gender as a signal of individual abilities, and personal tastes (e.g., Becker 1971; Eagly and Karau 2002), where male managers prefer to work with men.

they receive fewer offers and promotions than men who have similar characteristics (e.g., Neumark, Bank, and Van Nort 1996; Blau and DeVaro 2007).[7] Gender bias occurs even in professions in which women are well represented and it is driven by managers who deny any gender bias in their firms (e.g., Begeny, Ryan, Moss-Racusin, and Ravetz 2020).

If gender bias hinders qualified women from obtaining higher paying positions, the firm's ability to attract, retain, and motivate productive women may suffer. And even when managers want to recruit more female talent to higher paying positions, their ability to do so may be inhibited by a limited supply of qualified applicants (e.g., fewer female candidates in Science, Technology, Engineering and Math (STEM) fields). Furthermore, less gender diversity among a firm's higher paying positions may hurt firm performance, since more diverse groups are likely to perform better than less diverse ones (e.g., Merkley, Michaely, and Pacelli 2020). These arguments suggest that a large gender position gap is associated with poorer firm performance.

However, external pressure from the government and from nongovernmental organizations may lead to hiring and promotions based on affirmative action, which is not intended to maximize profit (Holzer and Neumark 2000). Also, if managers and boards of directors derive utility from being perceived as socially responsible, they may pursue socially desirable goals at the expense of shareholders (Kolev 2012). If firms hire and promote women to higher paying positions for reasons other than profit maximization, this may hinder firm performance.

Which prediction is borne out in reality is an important question. If the view that a large gender position gap has negative implications for firm performance is valid, then managers should ensure that their firm's hiring and promotion practices mitigate gender inequality, and investors

[7] Perhaps the most direct evidence on gender biases comes from field experiments and studies using discrimination audits. This research finds significant gender biases even when the same employee is randomly assigned a female- or male-gendered name (e.g., MacNell, Driscoll, and Hunt 2015; Begeny et al. 2020).

should reward firms that do so. Furthermore, if gender diversity in higher paying positions is associated with future performance, then regulators should consider policies that ensure this information is available to investors.

It is important to note that we do not examine whether the gender position gap causes poor firm performance. This is a difficult question because hiring and promotions to higher paying positions are inherently endogenous. Instead, we examine the relationship between the gender position gap and future firm performance and how this relationship is affected by the firm's reliance on human capital (we discuss later several steps that we take to alleviate endogeneity concerns). We use novel data from a leading provider of labor market data. This company collects information on employee characteristics based on employees' online profiles on various websites and from social media platforms such as LinkedIn. The company obtains salaries for positions within firms from firms' job postings.

In contrast to the Bureau of Labor Statistics data and the United States Census Bureau data that are commonly used to study gender pay gaps, the data in our study are linked to publicly traded firms. This is an important advantage that enables us to investigate the relationship between the gender position gap and firm performance. A limitation of our data is that they provide salaries for job positions only, and not for individual employees.

We use a measure of the gender position gap that reflects the difference between the average salary for positions held by female employees and the average salary for positions held by male employees within a firm.[8] The gender position gap is an important component of the total gender differences in salaries. Specifically, the gender position gap includes gender differences in salaries across positions and excludes gender pay gaps within the same position (we provide a

[8] The measure focuses on the gender position gap that is not driven by differences in the number of female employees across firms. In all our tests, we control for the fraction of female employees.

simple illustration of the gender position gap calculation in Appendix A). Although the effects on firms of gender pay gaps within the same position are a very important and little understood issue, unfortunately data on salaries of individual employees linked to public firms are difficult to obtain. We find that the average gender position gap in our sample is 0.116. This indicates that, on average, women hold positions that pay 11.6% less than the positions held by men in the same firm.[9]

We begin our analysis by examining the determinants of the gender position gap. We find that part of the gender position gap reflects female–male differences in human capital characteristics. The gender position gap is smaller when differences in the quality of previous employment and education between female and male employees are smaller. We also find evidence consistent with female leadership mitigating the gender position gap. The gender position gap is smaller for firms with a larger fraction of female executives and female board members. Finally, we find that the gender position gap is smaller for firms with stronger monitoring, as proxied by institutional ownership, analyst following, and firm size.

Next, we examine the association between the gender position gap and firm performance. Our primary measure of firm performance is the return on assets in the next year. Consistent with the gender position gap predicting poor future performance, we find a negative association between the gender position gap and next-year return on assets.

We conduct a sensitivity analysis to rule out the possibility that the results are driven by employees in very low or very high positions, such as top managers. To this end, we employ a measure of the gender position gap that is based on gender median salaries instead of gender mean salaries. This median-based measure is insensitive to employees holding very high or very low positions. We find similar results using this measure. This finding shows that the results are not

[9] As mentioned above, the gender position gap does not include differences in salaries between women and men in the same position.

driven by employees at the top or bottom end of the corporate hierarchy.

We further examine how a firm's reliance on human capital impacts the relationship between the gender position gap and firm performance. Past research argues that human capital is often tied to a firm's key employees, and firms vary significantly in their dependence on human capital (e.g., Eisfeldt and Papanikolaou 2013; Belo, Lin, and Zhao 2017). The gender position gap affects employees in higher paying positions who likely comprise the firm's key talent. Therefore, we expect the gender position gap to have a stronger impact on the performance of firms that depend more on human capital. We proxy for a firm's reliance on human capital using its SG&A expense (e.g., Eisfeldt and Papanikolaou 2013; Bova, Kolev, Thomas, and Zhang 2015). We also use R&D expense because human capital is more important in knowledge-based businesses that rely on innovation (e.g., Zingales 2000; Dezsö and Ross 2012).

A firm's key employees are likely to be high-quality employees. Furthermore, because high-quality employees have better job market opportunities, they are more likely to move to a competitor if they are dissatisfied with the gender inequality at their firm. Therefore, we expect the gender position gap to have a stronger effect when firms rely more on high-quality employees. Because higher-quality employees are likely to have superior education and prior employment, we proxy the quality of firm employees using the average quality of employees' education and previous employment. Since high-quality employees typically have higher salaries, we also use the average employee salary as a proxy for employee quality.

Our empirical findings are consistent with the predicted moderating effect of a firm's reliance on human capital. The association between the gender position gap and future performance is more negative for firms with high SG&A expenses, firms with high R&D expenses, firms with employees that have better education and previous employment, and firms with high-

salary employees.

Our finding that the gender position gap predicts future performance raises the question of whether the market fully incorporates the information contained in the gender position gap. Although this information is publicly available, it is spread across many employees' profiles and firms' job postings. The high cost of information acquisition and processing suggests that investors may not take full advantage of information about a firm's gender position gap. Our findings are consistent with this expectation. Firms with a larger gender position gap have lower one-year-ahead stock returns. This result also corroborates our finding that firms with a wider gender position gap have poorer future performance. It is likely that part of the gender position gap information about future firm performance is incorporated in prices when subsequent performance is announced to investors. In line with this expectation, we find that the gender position gap is associated with lower stock returns around the quarterly earnings announcements in the next year.

As mentioned above, hiring and promotions to higher positions are inherently endogenous and suitable exogenous shocks are difficult to find. For this reason, studies on executive gender and pay usually test associations rather than causal effects. For instance, Carter, Franco, and Gine (2017) examine factors explaining compensation gaps between female and male executives; Adhikari, Agrawal, and Malm (2019) show that firms with female executives have fewer lawsuits; Rouen (2020) find that explained (unexplained) component of the ratio of CEO pay to average employee pay is positively (negatively) associated with future firm performance.

Similar to these studies, we do not make causal inferences. Nevertheless, we take several steps to mitigate specific endogeneity concerns. First, we use a lead-lag approach and control for current performance to mitigate concerns related to omitted correlated variables and reverse causality (e.g., Bova, Kolev, Thomas, and Zhang 2015). Second, the test of future return

predictability also helps alleviate the concerns of omitted correlated variables and reverse causality (e.g., Edmans, Li, and Zhang 2020). Third, we employ entropy balance matching approach to control for multiple moments of the covariate distribution (e.g., Hainmueller 2012; Merkley et al. 2020). Finally, we use an instrumental variable approach as a further step to mitigate endogeneity concerns (e.g., Li et al. 2020; Holzman et al. 2021). Still, because we cannot control for endogeneity completely, we advise caution in drawing causal inferences.

Our study contributes to the research on the relationship between gender and firm outcomes. Most prior work examines gender at the top executive level. These studies find mixed evidence on the relationship between the gender of executives and firm performance (e.g., Kolev 2012; Khan and Vieito 2013; Niessen-Ruenzi and Ruenz 2019).[10,11] However, the findings for top executives may not be generalizable to other employees because the executives represent a select group of competitive individuals with superior abilities and substantial power over the firm. We add to this literature by studying the gender of employees at various levels in a firm. We examine a new factor that affects female employees: the gender position gap. The low representation of women in higher paying positions is an important social issue, yet its implications for firms are little understood. We provide evidence on the relationship between the gender position gap and future firm performance, and the moderating effect of the firm's dependence on human capital.

Our study has policy implications. The SEC has recently proposed an expansion of the current limited disclosure requirements for human capital (SEC 2019). The proposal has generated an ongoing debate on whether firms should disclose gender disparity in salaries and gender

[10] Kolev (2012) finds that firms with female CEOs have lower future stock returns. Khan and Vieito (2013) find that firms with female CEOs have higher future return on assets. Niessen-Ruenzi and Ruenz (2019) find no differences in performance between female- and male-managed mutual funds.

[11] Other studies examine the determinants of the executive gender pay gap (Carter, Franco, and Gine 2017) and gender effects on governance (Adams and Ferreira 2009), the informativeness of stock prices (Gul, Srinidhi, and Ng 2011), conservatism (Francis, Hasan, Park, and Wu 2015), audit quality (Lai, Srinidhi, Gul, and Tsui 2017), internal control quality (Liang, Lourie, and Yeung 2019), and corporate litigation (Adhikari, Agrawal, and Malm 2019).

representation across various levels of their organization. Some investors argue that these human capital attributes are important for evaluating a firm's prospects, and these attributes should be disclosed in a way that is comparable between firms and across time. Socially responsible investors (SRIs) and advocates for gender equality argue that the lack of transparency contributes to gender disparity. The opponents of this disclosure rule argue that mandatory disclosure is unnecessary because current regulations already require disclosure of material information. Further, they point out the need to protect competitive or sensitive information, and they argue that disclosure requirements may be unduly burdensome due to high administrative costs.[12] The findings of our study are consistent with the argument that the disclosure of gender representation across various levels of the firm can provide investors with relevant information about future firm performance.

In the next section, we describe the sample data and variable measurement. Section 3 presents descriptive statistics, research design, and empirical results. Section 4 summarizes our main findings and provides concluding remarks.

## 2. Sample Data and Variable Measurement

### *2.1 Data*

We obtain data on employee characteristics and salaries of various positions within firms from a leading provider of labor market analytics. This data provider continuously collects data containing employee's online profiles and resumes from various websites and social media platforms such as LinkedIn. These data comprise more than 380 million online profiles and resumes. The data provider uses these data to extract an employee's position, gender, education, and current and previous employers. The data provider also gathers salary data at the position level

[12] Proponents of these disclosures counter that firms are already required to report gender diversity and salaries data by positions to the US Equal Employment Opportunity Commission (https://www.eeoc.gov/employers/reporting.cfm), and thus additional data administration costs should be small.

within firms from job postings. These job postings are collected from the firms' career websites. The data provider provides historical data at the job position level for more than 5,000 public firms and over one million private firms around the world.

The data have limitations because not all employees share their information online. This measurement error may attenuate our estimates of gender position gap effects. The data have the largest representation of employees in white-collar jobs, which suggests that our ability to detect gender position gaps among blue-collar occupations may be reduced. Thus, our inferences are likely to be most relevant for employees in white-collar occupations.

To assess the accuracy of the employee data, we collect the information on the percentage of female employees for 240 firms that disclose this information in various filing, including corporate social responsibility reports and diversity and inclusion reports. For example, Walmart discloses in its 2018 Global Responsibility Report that "[w]omen make up 55 percent of total U.S. workforce."[13] We find that the correlation between the percentage of female employees reported by the data provider based on employee online profiles and firm disclosures is 87.2%, suggesting that the data extracted by the data provider from employee online disclosures are reasonably accurate.

Table 1 Panel A presents the sample construction. We begin with the sample of US firms that appear in COMPUSTAT and CRSP and have nonmissing salary data for fiscal years 2008 (the year the salary data commences) to 2017 (the last year of the salary data we obtained from the provider). The initial sample includes 3,718 firms. We then eliminate observations that lack the necessary financial data and stock returns. The final sample consists of 3,345 distinct firms and 24,350 firm–year observations.

[13] See https://corporate.walmart.com/media-library/document/2018-grr-summary/_proxyDocument?id=00000162-e4a5-db25-a97f-f7fd785a0001.

Table 1 Panel B reports the distribution of the sample across industries, using the 12 Fama–French industry classifications.[14] The industries with the largest number of observations are *Finance* and *Business Equipment*. The second and third columns compare the industry composition of our sample with that of the Compustat/CRSP population. These results show that there are no large differences in the composition of our sample and the Compustat/CRSP universe. The last column shows that the industries with the largest gender position gap are *Finance* and *Energy*. The industries with the smallest gender position gap are *Consumer Non-Durables, Wholesale and Retail*, and *Utilities*.

### *2.2 Variable Measurement*

#### *2.2.1 Gender position gap*

Our main measure of the gender position gap reflects the difference between the average salary for positions held by female employees and the average salary for positions held by male employees within a firm. Specifically, the gender position gap, $GPG_{j,t}$, for firm $j$ in year $t$ is one minus the ratio of the mean salary for job positions held by female employees to the mean salary for job positions held by male employees. To illustrate the interpretation of the gender position gap measure, a *GPG* of 10% indicates that, on average, female employees at the firm hold positions that pay 10% less than the positions held by male employees. We provide a simple numerical illustration of the *GPG* calculation in Appendix A.

We measure *GPG* using mean salaries rather than median salaries because the median only considers whether employees hold positions above or below the median and ignores other differences in the level of positions. For example, the median remains the same when employees move (i) from one position below the median to another position below the median or (ii) from

[14] Available from Ken French at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

one position above the median to another position above the median. In contrast, the mean is sensitive to employee moves across all position levels, which is important for our research question. Nevertheless, we conduct a sensitivity analysis using a gender position gap measure that is based on the median salaries in Section 3.6.

*2.2.2 Firm Performance and Stock Returns*

Our measure of firm performance is the return on assets, *ROA*, which equals the firm's earnings before extraordinary items for the year, scaled by total assets. We use future stock returns to examine whether investors fully incorporate gender position gap information. The variable *AbnRet* is the market-adjusted stock return over the next year, where the market-adjusted return is the firm's stock return minus the value-weighted CRSP return. We use returns around future earnings announcements to examine whether investors incorporate part of the gender position gap information about future firm performance in stock prices when the firm announces subsequent financial results. The variable *CAR[window]* is the sum of the cumulative abnormal returns around the next four quarterly earnings announcements, where the time window is [0], [−1, +1], or [−2, +2].

*2.2.3 Employee Characteristics*

We control for various employee characteristics in our analysis. The variable *%Female Employees* represents the percentage of female employees for the firm for the year. The variable *Prestige* is the average ranking of a firm's employees based on the prestige of their previous employers and universities attended, as calculated by the data provider. The university rankings are based on *The Times Higher Education World University Rankings* (https://www.timeshighereducation.com/world-university-rankings). The employer rankings are

based on the average ranking of the universities that feed graduates into the firm.[15] The variable *Female Prestige/Male Prestige* is the ratio of the average prestige ranking of female employees to the average prestige ranking of male employees. The variable *Salary* is the natural logarithm of the average employee salary.

*2.2.4 Gender of Board Members and Top Management*

We include controls for the female representation on a firm's board of directors and top management based on data from BoardEx. The variable *%Female Directors* is the percentage of female directors of the firm's board in that year. The variable %*Female Executives* is the percentage of female executives in the firm's top management team in that year as listed in BoardEx.

*2.2.5 Other Variables*

We control for various firm characteristics and measures of past performance. Firm size, *Size*, is the natural logarithm of total assets at the end of the previous year. The variable *Return* is the firm's stock return for the current year, *Firm Age* is the natural logarithm of the number of years the firm has appeared in Compustat, *Leverage* is as the ratio of debt to total assets at the end of the previous year, *BTM* is the book-to-market ratio at the end of the previous year, and *Inst Ownership* is the percentage of outstanding shares owned by institutional investors at the end of the previous year. The variable *Ana Following* is the natural logarithm of one plus the number of analysts following the firm, and *SG&A Intensity* is the selling, general, and administrative expenses for the year, scaled by total assets at the beginning of the year. The variable *R&D Intensity* represents research and development expenses for the year, scaled by total assets

[15] The company does not provide separate measures of the quality of previous employers and the quality of education.

at the beginning of the year.[16] We winsorize all continuous variables at 1 and 99 percent to reduce the impact of outliers.

## 3. Empirical Results

### *3.1 Descriptive Statistics*

We report the descriptive statistics in Table 2. Panel A shows the summary statistics for employee and leadership variables. The gender position gap, *GPG*, has a mean of 0.116, which indicates that, on average, female employees hold positions that pay 11.6% less than the positions held by male employees. The gender position gap exhibits significant variation, with a standard deviation of 0.081 and an interquartile range of 0.068–0.150. The median-based gender position gap, $GPG_{median}$, has a mean of 0.121. The representation of women in top leadership positions is meager. On average, only 11.8% of executives and only 11.3% of directors are women.

The representation of women at the employee level is much higher. On average, 43.3% of the employees in our sample are women. The percentage of female employees exhibits high variation, with a standard deviation of 15.0% and an interquartile range of 31.5–53.6%. Additional untabulated statistics show that the percentage of female employees is slightly above the parity in lower paying positions, but it is significantly below the parity in higher paying positions. Specifically, 51% (36%) of the employees in job positions that pay below (above) the median pay in the firm are women.

The average annual salary is $83,366.35 (exp(11.331) = 83,366.35).[17] Even though women hold positions that pay significantly less than the positions held by men, we do not find significant

[16] We set missing R&D and SG&A expenses to zero. The results are similar when we exclude firms that have missing R&D or SG&A expenses (untabulated).

[17] The average salary in our sample is relatively high because our data reflects a larger portion of white-collar employees in relatively large publicly traded companies.

differences in the average prestige of education and previous employers between female and male employees. The mean of *Female Prestige/Male Prestige* is 1.00.

Panel B shows the descriptive statistics for firm characteristics. For comparison, the first three columns show the summary statistics for our sample and the last three columns show the statistics for the Compustat/CRSP universe. These results indicate that there are no large differences in firm characteristics between our sample and the Compustat/CRSP population. Combined with the evidence on the industry composition from Table 1, the results suggest that the selection bias in our sample is not large.

### *3.2 Determinants of the Gender Position Gap*

We begin our analysis by examining the determinants of the gender position gap. A number of studies examine factors that affect differences in the average earnings of women and men. (For reviews of this literature, see Weichselbaumer and Winter-Ebmer 2005, Marianne 2011, and Blau and Kahn 2017). The factors examined in this research relate to the human capital characteristics of employees (e.g., education, experience) and the characteristics of employers.

Building on this literature, we identify the determinants of the gender position gap. Employees with more prior experience and better education are more likely to hold higher paying positions. Therefore, we expect the gender position gap to be smaller when the differences in these human capital characteristics between female and male employees are smaller. Regarding firm characteristics, having female leaders likely mitigates a firm's gender inequality. Thus, we expect that firms with greater representation of women in their top management and on their boards will have a smaller gender position gap. Finally, because greater monitoring and regulatory oversight are likely to constrain gender inequality, we expect that firms with higher institutional ownership, firms with greater analyst following, and larger firms will have a smaller gender position gap.

We examine the determinants of the gender position gap by estimating the following regression at the firm–year level:

$$\begin{aligned} GPG_{j,t} = {} & \alpha_1 + \beta_1 \, Female\ Prestige/Male\ Prestige_{j,t} + \beta_2 \, Prestige_{j,t} \\ & + \beta_3 \, \%Female\ Employees_{j,t} + \beta_4 \, Salary_{j,t} + \beta_5 \, \%Female\ Executives_{j,t} \\ & + \beta_6 \, \%Female\ Directors_{j,t} + \beta_7 \, Inst\ Ownership_{j,t} + \beta_8 \, Ana\ Following_{j,t} + \beta_9 \, Size_{j,t} \\ & + \beta_{10} \, Firm\ Age_{j,t} + \beta_{11} \, SG\&A\ Intensity_{j,t} + \beta_{12} \, R\&D\ Intensity_{j,t} + Industry\ FE \\ & + Year\ FE + \varepsilon_{j,t}. \end{aligned} \tag{1}$$

If better human capital characteristics of female employees relative to those of male employees reduce the gender position gap, we expect a negative coefficient on the ratio of female to male prestige rankings, *Female Prestige/Male Prestige*. The prestige rankings reflect the prestige of employees' previous employment and education. If having female leaders reduces a firm's gender position gap, we expect negative coefficients on the percentage of female executives, *%Female Executives*, and on the percentage of female directors, *%Female Directors*. If the monitoring by institutional investors, analysts, and regulators mitigates the gender position gap, we expect negative coefficients on the percentage of institutional ownership, *Inst Ownership*, the number of analysts following, *Ana Following*, and firm size, *Size*.

We include the average employee prestige within a firm. Evidence of prestigious education and previous employers likely contains useful information about an employee's abilities. If gender bias stems from the employer's reliance on gender as a signal of individual abilities (Phelps 1972, Arrow 1973), the information derived from an employee's prestigious education and previous employers may reduce the employer's reliance on gender. This suggests that the gender position gap should be smaller when employee prestige, *Prestige*, is high.

We also include the percentage of female employees. If having more female employees helps mitigate gender inequality within a firm, we expect a negative coefficient on the percentage

of female employees, *%Female Employees*. However, the relationship between the gender position gap and the number of female employees may be positive rather than negative if most female employees hold lower positions and therefore do not have the power to improve gender inequality.

Finally, we include the following variables to control for a firm's workforce. We include SG&A expenses (*SG&A Intensity*) and R&D expenses (*R&D Intensity*) to control for the firm's reliance on human capital (e.g., Eisfeldt and Papanikolaou 2013; Bova, Kolev, Thomas, and Zhang 2015; Zingales 2000). If firms make a greater effort to mitigate the gender position gap when they depend more on human capital, we expect negative coefficients on *SG&A Intensity* and *R&D Intensity*. However, if a limited supply of female candidates in STEM fields inhibits R&D intensive firms' ability to recruit female talent to higher paying positions, we expect a positive coefficient on *R&D Intensity*. We include firm age, *Firm Age*, and the average employee salary, *Salary*, as further controls for the workforce. If younger firms have a younger workforce where gender inequality is likely to be lower (McKinsey and Company 2019), we expect a negative coefficient on *Firm Age*. If gender inequality is greater in higher paying occupations, we expect a positive coefficient on *Salary*. We include Fama–French 48–industry fixed effects and year fixed effects to control for industry- and time-specific factors. All variables are defined in Section 2.

Table 3 presents the results of estimating three variants of Equation (1): the model that includes only employee characteristics (Column 1), the model that includes employee characteristics and leadership characteristics (Column 2), and the model that includes all variables (Column 3). The results are generally consistent with expectations. The gender position gap is smaller when the differences in human capital characteristics between female and male employees are smaller. The coefficient on *Female Prestige/Male Prestige* is negative and significant. Firms with female leadership have a smaller gender position gap. Both *%Female Executives* and

*%Female Directors* are negative and significant. The gender position gap is smaller for firms that are subject to greater monitoring. The coefficients on *Inst Ownership*, *Ana Following*, and *Size* are all negative and significant.

Regarding other determinants, we do not find conclusive evidence that employee prestige mitigates the gender position gap. Although the coefficient on *Prestige* is negative, it is significant only in the first model; it is not significant in the second and third models. The positive and significant coefficient on *%Female Employees* is inconsistent with the notion that having more female employees reduces gender inequality. Instead, this result suggests that firms with more female employees tend to employ them in lower paying positions, which widens the gender position gap. The results for *SG&A Intensity* and *Salary* are in line with expectations. The coefficient on *SG&A Intensity* is negative and significant, which suggests that the gender position gap is lower for firms that likely depend more on human capital. The positive and significant coefficient on *Salary* suggests that firms with higher paying jobs have a larger gender position gap.

### *3.3 Future Firm Performance*

Next, we examine whether the gender position gap is associated with future firm performance. As discussed earlier, the direction of the relationship between the gender position gap and firm performance is unclear. On the one hand, research finds that gender bias hinders qualified female employees from achieving higher paying positions and more diverse groups perform better than less diverse ones. These streams of research suggest that a larger gender position gap may be associated with poorer firm performance.

On the other hand, external pressure from the government may lead to the hiring and promotion of female employees based on affirmative action. Furthermore, managers and boards may derive utility from pursuing socially desirable goals such as promoting gender diversity in

higher positions. These considerations suggest that firms may hire and promote women to higher paying positions for reasons other than profit maximization, which may lead to worse firm performance.

We test the association between the gender position gap and future firm performance by estimating the following regression:

$$\begin{aligned} ROA_{j,t+1} = {} & \alpha_1 + \beta_1 GPG_{j,t} + \beta_2 ROA_{j,t} + \beta_3 Return_{j,t} \\ & + \beta_4 Female\ Prestige/Male\ Prestige_{j,t} + \beta_5 Prestige_{j,t} + \beta_6 \%Female\ Employees_{j,t} \\ & + \beta_7 Salary_{j,t} + \beta_8 \%Female\ Executives_{j,t} + \beta_9 \%Female\ Directors_{j,t} \\ & + \beta_{10} Inst\ Ownership_{j,t} + \beta_{11} Ana\ Following_{j,t} + \beta_{12} Size_{j,t} + \beta_{13} BTM_{j,t} + \beta_{14} Leverage_{j,t} \\ & + \beta_{15} Firm\ Age_{j,t} + \beta_{16} SG\&A\ Intensity_{j,t} + \beta_{17} R\&D\ Intensity_{j,t} + Industry\ FE \\ & + Year\ FE + \varepsilon_{j,t}, \end{aligned} \tag{2}$$

where the dependent variable $ROA_{t+1}$ is the return on assets for the next year. We include all variables from Equation (1) to control for observable determinants of the gender position gap. We also include the return on assets for the current year, $ROA_t$, and the stock return for the current year, $Return_t$, to control for current performance; the book-to-market ratio, *BTM*, to control for growth opportunities; and the leverage ratio, *Leverage*, to control for risk. By including stock returns, Equation (2) examines the information contained in the gender position gap that is incremental to the forward-looking information contained in the current returns.

Table 4 presents the results of estimating three variants of Equation (2): Column 1 shows the model that includes current performance and employee characteristics. Column 2 shows the model that includes current performance, employee characteristics, and leadership characteristics. Column 3 shows the estimation that includes all variables. These results show that a larger gender position gap is associated with poorer future performance. The coefficient on *GPG* is negative and significant in all regressions. This effect is economically meaningful. For instance, based on the

results in Column 3, a one standard deviation increase in *GPG* is associated with a 0.79% decrease in the next-year *ROA* (−0.098 × 0.081 = −0.0079). In comparison, the mean and median of the next-year *ROA* in our sample are −4.0% and 2.0%, respectively.

Turning to control variables, the positive and significant coefficients on *ROA* and *Return* are consistent with current performance and stock returns containing information about future performance. The variable *Prestige* is negative and significant, which suggests that future performance is worse for firms that hire employees who have prestigious education and previous employers, perhaps because these employees are expensive. The positive and significant coefficient on *%Female Employees* suggests that having a higher percentage of female employees is associated with better future performance.

*3.4 Sensitivity to Employees at the Top or Bottom End of the Corporate Hierarchy*

Next, we employ a median-based gender position gap measure to rule out the possibility that the results are driven by employees holding very low or very high positions, such as top managers. This possibility is unlikely because our sample comprises relatively large publicly traded firms that have thousands of employees. Nevertheless, we conduct a sensitivity analysis using a gender position gap measure that is based on median salaries instead of mean salaries. Because the median is insensitive to employees holding very high or very low positions, a median-based measure helps rule out the effect of employees at the top or bottom end of the corporate ladder. Specifically, we calculate the variable $GPG_{median\,j,t}$ for firm *j* in year *t* as one minus the ratio of the median salary for job positions held by female employees to the median salary for job positions held by male employees.

Table 5 reports the results of estimating an equation similar to Equation (2), except we use the gender position gap based on the median salaries, $GPG_{median}$. Consistent with the findings from

Table 4, the results show that the median-based gender position gap is negatively associated with future firm performance. The coefficient on $GPG_{median}$ is negative and significant. These results show that the negative relationship between the gender position gap and future performance is not driven by employees at the top or bottom end of the corporate hierarchy.[18]

*3.5 Entropy Balance Matching*

Studies often use matching to mitigate endogeneity concerns (e.g., Armstrong, Jagolinzer, and Larcker 2010; Merkley et al. 2020; Rouen 2020). The underlying logic is that a proper matching strategy maximizes variation in the variable of interest while minimizing the variation in control variables (Armstrong et al. 2010; Rouen 2020). Recent research indicates that entropy balance matching is more effective than simple matching or propensity-score matching because it achieves balance for the higher moments of the covariate distribution, reduces model dependency, and avoids sample attrition (e.g., Hainmueller 2012; Merkley et al. 2020).

Table 6 Panel A presents the results from the entropy balance matching procedure. The treatment group comprises firms with gender position gaps above the annual median, and the control group includes firms with gender position gaps below the annual median. Column 1 shows the results for the sample matched on the mean of the covariate distribution and Column 2 for the sample matched on the mean, variance, and skewness. Consistent with the findings from Table 4, the results indicate a strong negative association between the gender position gap and future firm performance. The coefficient on *GPG* is negative and highly significant in both columns.

[18] In additional untabulated analyses, we reestimate the other tests using $GPG_{median}$ and find similar results.

*3.6 Instrumental Variable Approach*

We use an instrumental variable approach to further mitigate endogeneity concerns. Our approach is similar to that of Li, Nekrasov, and Teoh (2020) and Holzman, Marshall, Schroeder, and Yohn (2021) who endogenize a firm's disclosure using the disclosure by the firm's industry peers. In our context, we use the industry peers' gender position gap as an instrument that is not directly driven by the firm but is a significant predictor of the firm's gender position gap. Specifically, our instrumental variable *Industry Peer GPG* is the average gender position gap across peer firms in the same three-digit SIC industry in that year.

Table 6 Panel B presents the results of the instrumental variable analysis. Column 1 shows the results of the first stage regression of the gender position gap on the instrument and control variables. Consistence with the industry peers' gender position gap predicting the firm's gender position gap, the coefficient on *Industry Peer GPG* is positive and highly significant. The weak under-identification test reported at the bottom of Panel B rejects the null that there is only a weak correlation between the instrument and the endogenous variable. Column 2 shows the results for the second-stage estimation. These results are consistent with our main findings on the negative association between the gender position gap and future firm performance. The coefficient on the instrumented gender position gap is negative and significant.

*3.7 The Role of the Firm's Reliance on Human Capital*

Next, we examine how a firm's reliance on human capital affects the relationship between the firm's gender position gap and firm performance. Research shows that human capital is an important driver of firm performance, and there is significant variation among firms in their degree of dependence on human capital (e.g., Eisfeldt and Papanikolaou 2013; Belo, Lin, and Zhao 2017). This literature argues that many modern firms depend on the intangible input provided by high-

skilled employees. This human capital is often concentrated in the firm's key talent, which makes performance particularly sensitive to the firm's ability to acquire, develop, and retain key employees. The gender position gap reduces the gender diversity of employees in higher paying positions who embody a significant part of the firm's key talent. Therefore, for firms that depend more on human capital, the gender position gap is likely to have a stronger impact on performance. Conversely, for firms that rely more on physical capital, in which employees are less important, the effect of the gender position gap is unclear.

We proxy a firm's reliance on human capital using two measures. First, we use SG&A expense, following prior studies (e.g., Eisfeldt and Papanikolaou 2013; Bova, Kolev, Thomas, and Zhang 2015). The idea behind using this measure is that SG&A expense includes many expenditures related to human capital rather than a specific unit of output. Second, past research emphasizes that human capital is essential in knowledge-based businesses that rely on product innovation (e.g., Zingales 2000; Dezsö and Ross 2012). Accordingly, we use R&D expense as our second proxy for a firm's dependence on human capital.

We also examine the effect of employee quality to provide further evidence on the role of a firm's reliance on human capital. As discussed above, human capital is concentrated in a firm's key talent, which is embodied in its high-quality employees. Moreover, since high-quality employees have better opportunities outside the firm than low-quality employees, they are more likely to move to a competitor if they are not satisfied with the gender position gap at their firm. Therefore, a firm's performance may be more sensitive to the adverse effects of the gender position gap due to the combined effects of the firm's greater dependence on high-quality employees and the flexibility these employees have to leave the firm if they are not satisfied. Thus, we expect the

association between the gender position gap and performance to be more negative for firms that rely on high-quality employees.

We use two proxies for the quality of firm employees. First, since high-quality employees often have better education and better prior employment, we use the average prestige of employees' education and previous employment. Second, because firms typically must pay higher salaries to higher quality employees, we also proxy employee quality using the average employee salary.

We test the predicted moderating effect of a firm's reliance on human capital by estimating the following regressions:

$$\begin{aligned} ROA_{j,t+1} = \alpha_1 + \beta_1 GPG_{j,t} + \beta_2 \{GPG_{j,t}*&\text{High SG\&A Intensity or} \\ GPG_{j,t}*&\text{High R\&D Intensity or } GPG_{j,t}*\text{High Prestige or } GPG_{j,t}*\text{High Salary}\} \\ + \beta_3 \{&\text{High SG\&A Intensity or High R\&D Intensity or High Prestige or} \\ &\text{High Salary}\} + \text{Controls} + \text{Industry FE} + \text{Year FE} + \varepsilon_{j,t}, \end{aligned} \tag{3}$$

where *High SG&A Intensity* (*High R&D Intensity*, *High Prestige*, *High Salary*) equals 1 if *SG&A Intensity* (*R&D Intensity*, *Prestige*, *Salary*) is above the sample median and 0 otherwise. All other variables are the same as in Equation (2). We expect the coefficients on the interaction terms to be negative.

The results from estimating Equation (3) are reported in Table 7. These results show that the association between the gender position gap and firm performance is more negative for firms that rely more on human capital. In the regressions reported in Panel A, we gauge a firm's reliance on human capital using SG&A and R&D expenses. The coefficients on the interaction terms *GPG*High SG&A Intensity* and *GPG*High R&D Intensity* are negative and significant. The results are similar when the reliance on human capital is proxied by the average employee prestige

and salary. In Panel B, the coefficients on the interaction terms *GPG*High Prestige* and *GPG*High Salary* are negative and significant.

*3.8 Future Stock Returns*

Given that we find the gender position gap to be informative about future firm performance, it is natural to ask whether investors fully incorporate the information contained in the gender position gap into stock prices. This gender position gap information is publicly available, and investors have incentives to use all available information. However, unlike the disclosures made through typical investor relations channels, information on a firm's gender position gap is difficult to obtain because it is dispersed among many employees' online profiles and firms' job postings. The resulting high processing costs increase the likelihood that investors do not fully incorporate the gender position gap information into stock prices. In this case, we expect a negative association between the gender position gap and future returns.

We use stock returns over the next year to test whether investors fully incorporate gender position gap information. We estimate the following Fama–MacBeth (1973) cross-sectional regressions:

$$AbnRet_{j,t+1} = \alpha_1 + \beta_1 GPG_{j,t} + Controls + Industry\ FE + \varepsilon_{j,t}, \quad (4)$$

where the dependent variable $AbnRet_{t+1}$ is the firm's market-adjusted return for the next year.[19] All other variables are the same as in Equation (2).

Table 8 presents the results. The results show that the gender position gap is associated with lower next-year stock returns. The coefficient on *GPG* is negative and significant. This

[19] We find similar results when we use returns adjusted for the three Fama-French (1993) factors, SMB, HML, and Rm-Rf (untabulated).

finding is consistent with investors not fully incorporating the information contained in a firm's gender position gap.

In our last analysis, we examine returns around future earnings announcements. As discussed above, investors are unlikely to immediately incorporate the information contained in the gender position gap into stock prices because it is costly to obtain. Consequently, we expect future price corrections when the gender position gap manifests in subsequent financial results that can be readily observed by investors. Thus, we investigate whether firms with high gender position gaps have lower future earnings announcements returns.

We estimate the following Fama–MacBeth (1973) cross-sectional regressions of future announcement returns:

$$CAR_{j,t+1}[window] = \alpha_1 + \beta_1 GPG_{j,t} + Controls + Industry\ FE + \varepsilon_{j,t}, \quad (5)$$

where the dependent variable $CAR_{t+1}[window]$ is the cumulative abnormal return around the four quarterly earnings announcements in the next year, and the announcement window is [0], [−1, +1], or [−2, +2]. All other variables are the same as in Equation (2).

Table 9 presents the results. Columns (1), (2), and (3) show the results of estimating Equation (5) for the [0], [−1, +1], and [−2, +2] announcement windows, respectively. The results show that the gender position gap is associated with lower future earnings announcement returns. The coefficient on *GPG* is negative and significant in all regressions. These results are consistent with the market not immediately incorporating the information contained in the gender position gap and at least partly incorporating it into stock prices when future financial results are announced.

## 4. Conclusion

Recent years have seen significant progress in women's equality in the workplace. Still, in most firms, women are less likely than men to hold higher paying positions. In this paper, we examine this gender position gap and its association with future firm performance using novel employee gender and salary data at the position level within firms.

In our analysis of the determinants of the gender position gap, we find a wider gap among firms that have larger female–male differences in human capital characteristics (prior work experience and education), firms that have fewer female leaders, and firms that are subject to less monitoring. We find that firms with a wider gender position gap have lower future performance. This negative association is not driven by employees at the top or bottom end of the corporate hierarchy. The negative association is stronger when firms rely more on human capital. Finally, we find that firms with a larger gender position gap have lower future stock returns, which suggests that investors do not fully incorporate the information contained in the gender position gap.

Our study has important implications. First, our findings are relevant to policymakers. The SEC recently proposed a new rule that will require firms to provide greater disclosure of human capital metrics important to the firm. Many investors argue that information about gender diversity and advancement is material for evaluating a firm's prospects. Our study provides evidence that is consistent with this argument by showing that the gender position gap is informative about a firm's future performance and stock returns.

Second, our results have implications for managers, investors, and stakeholders. A firm may be viewed as a zero-sum game between shareholders and stakeholders, raising the concern that greater advancement of female employees, although it appears to be socially desirable, may come at the expense of shareholders. However, our evidence that firms with a smaller gender

position gap have better performance and higher stock returns is inconsistent with the argument that greater gender equality is detrimental to firm performance.

Finally, our results are relevant to managers and financial intermediaries who are responsible for processing and communicating information about important aspects of firm operations and performance to investors. The gender position gap contains information about future performance. Thus, firms and financial intermediaries should consider whether they can communicate this information to the investment community more effectively.

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## Appendix A. A Simple Illustration of the GPG Calculation

While firms often have thousands of employees and hundreds of job positions, for ease of exposition, we provide a simple example with 280 employees and 2 job positions. We present the numbers and calculations in the table below.

| | Number of Male Employees | Number of Female Employees | Percent of Female Employees |
|---|---|---|---|
| Higher paying position, salary = $120,000 | 50 | 30 | 0.375 |
| Lower paying position, salary = $50,000 | 100 | 100 | 0.500 |
| Total male or female employees | 150 | 130 | 0.464 |
| The mean salary for positions held by male or female employees | (50*120,000+100*50,000)/150 = 73,333 | (30*120,000+100*50,000)/130 = 66,154 | |
| The gender position gap | GPG = 1−66,154/73,333 = 0.098 | | |

## Appendix B. Variable Definitions

| Variable | Description |
|---|---|
| *AbnRet* | The market-adjusted stock return in the next year. The market-adjusted return is the firm's stock return minus the value-weighted CRSP return. |
| *Ana Following* | Analyst following calculated as the natural logarithm of one plus the number of analysts who follow the firm. |
| *BTM* | The book-to-market ratio measured at the end of the previous fiscal year. |
| *CAR[window]* | The sum of cumulative abnormal returns around the next four quarterly earnings announcements, where the time window is [0], [−1, +1], or [-2,2]. |
| *%Female Directors* | The percentage of female directors of the firm's board in that year. |
| *%Female Employees* | The percentage of female employees of the firm in that year. |
| *%Female Executives* | The percentage of female executives in the firm's top management team in that year. |
| *Female Prestige/Male Prestige* | The ratio of the average prestige ranking of female employees to the average prestige ranking of male employees. The employee prestige rankings reflect the prestige of an employee's previous employers and universities attended, as calculated by the data provider. The university rankings are based on *The Times Higher Education World University Rankings* (https://www.timeshighereducation.com/world-university-rankings). The employer rankings are based on the average ranking of the universities that feed graduates into the firm. |
| *Firm Age* | Firm age measured as the natural logarithm of the number of years the firm has appeared in Compustat. |
| *GPG* | The gender position gap calculated as one minus the ratio of the mean salary for job positions held by female employees to the mean salary for job positions held by male employees. |
| $GPG_{median}$ | The gender position gap calculated as one minus the ratio of the median salary for job positions held by female employees to the median salary for job positions held by male employees. |
| *Inst Ownership* | The percentage of outstanding shares owned by institutional investors at the end of the previous year. |
| *Leverage* | Leverage ratio calculated as the ratio of debt to total assets at the end of the previous fiscal year. |
| *Prestige* | The average rankings of firm employees based on the prestige of their previous employers and universities attended, as calculated by the data provider. The university rankings are based on *The Times Higher Education World University Rankings* (https://www.timeshighereducation.com/world-university-rankings). The employer rankings are based on the |

| | |
|---|---|
| | average ranking of the universities that feed graduates into the firm. |
| *R&D Intensity* | Research and development expenses for the year, scaled by total assets at the beginning of the year. |
| *Return* | Stock return of the firm in the current year. |
| *ROA* | Earnings before extraordinary items scaled by the total assets in that year. |
| *Salary* | The natural logarithm of the average employee's salary. |
| *SG&A Intensity* | Selling, general, and administrative expenses in the year, scaled by total assets at the beginning of the year. |
| *Size* | Firm size measured as the natural logarithm of total assets at the end of the previous fiscal year. |

## Table 1. Sample Description

### Panel A: Sample Selection

| | No. of firms | No. of firm–years |
|---|---|---|
| Firms that appear in Compustat and have salary data available for FY 2008–2017 | 3,718 | 30,422 |
| *Less:* | | |
| Missing stock returns | 39 | 3,276 |
| Missing necessary financial data | 334 | 2,796 |
| Final sample | 3,345 | 24,350 |

### Panel B: Distribution by Industry

| | N | Sample Percentage in our sample | Sample Percentage in Compustat/CRSP | Mean of *GPG* |
|---|---|---|---|---|
| Consumer Non-Durables | 1,131 | 4.65 | 4.01 | 0.087 |
| Consumer Durables | 680 | 2.79 | 2.10 | 0.114 |
| Manufacturing | 2,371 | 9.74 | 8.08 | 0.107 |
| Energy | 1,036 | 4.25 | 5.06 | 0.131 |
| Chemicals | 614 | 2.52 | 2.13 | 0.099 |
| Business Equipment | 4,205 | 17.27 | 16.80 | 0.106 |
| Telecommunications | 503 | 2.07 | 2.89 | 0.094 |
| Utilities | 587 | 2.41 | 2.69 | 0.092 |
| Wholesale and Retail | 2,279 | 9.36 | 7.62 | 0.091 |
| Healthcare | 3,278 | 13.46 | 12.54 | 0.128 |
| Finance | 4,296 | 17.64 | 22.61 | 0.157 |
| Other | 3,370 | 13.84 | 13.48 | 0.102 |

This table reports the description of the sample. Panel A reports the sample selection procedure. Panel B reports the distribution of the sample according to the 12 Fama–French industries as well as the comparison with the Compustat/CRSP population. Appendix B contains definitions of all variables.

## Table 2. Descriptive Statistics

**Panel A: Summary statistics for employee-related variables**

| Variable | Mean | StdDev | P25 | Median | P75 |
|---|---|---|---|---|---|
| *GPG* | 0.116 | 0.081 | 0.068 | 0.102 | 0.150 |
| $GPG_{median}$ | 0.121 | 0.113 | 0.053 | 0.105 | 0.175 |
| *%Female Employees* | 0.433 | 0.150 | 0.315 | 0.416 | 0.536 |
| *%Female Executives* | 0.118 | 0.176 | 0.000 | 0.000 | 0.250 |
| *%Female Directors* | 0.113 | 0.108 | 0.000 | 0.111 | 0.182 |
| *Prestige* | 34.607 | 1.075 | 34.009 | 34.724 | 35.348 |
| *Female Prestige/Male Prestige* | 1.000 | 0.010 | 0.997 | 1.000 | 1.003 |
| *Salary* | 11.331 | 0.171 | 11.231 | 11.344 | 11.447 |

**Panel B: Summary statistics for firm characteristics**

| | Our Sample | | | Compustat/CRSP | | |
|---|---|---|---|---|---|---|
| Variable | Mean | Median | StdDev | Mean | Median | StdDev |
| *Size* | 6.757 | 6.727 | 2.120 | 6.759 | 6.745 | 2.215 |
| *Firm Age* | 2.970 | 2.996 | 0.704 | 2.696 | 2.773 | 0.818 |
| *Leverage* | 0.207 | 0.152 | 0.213 | 0.228 | 0.170 | 0.227 |
| *BTM* | 0.614 | 0.494 | 0.599 | 0.699 | 0.538 | 0.772 |
| *Inst Ownership* | 0.592 | 0.669 | 0.322 | 0.522 | 0.564 | 0.344 |
| *Ana Following* | 1.429 | 1.609 | 1.075 | 1.263 | 1.386 | 1.059 |
| *SG&A Intensity* | 0.248 | 0.156 | 0.298 | 0.224 | 0.114 | 0.303 |
| *R&D Intensity* | 0.059 | 0.000 | 0.137 | 0.057 | 0.000 | 0.140 |
| *ROA* | -0.040 | 0.020 | 0.240 | -0.050 | 0.014 | 0.259 |
| *Return* | 0.127 | 0.074 | 0.555 | 0.107 | 0.056 | 0.577 |
| $AbnRet_{t+1}$ | 0.021 | -0.033 | 0.496 | 0.009 | -0.046 | 0.529 |
| $CAR_{t+1}[0]$ | 0.002 | 0.002 | 0.020 | 0.002 | 0.002 | 0.020 |
| $CAR_{t+1}[-1,1]$ | 0.005 | 0.006 | 0.032 | 0.005 | 0.006 | 0.032 |
| $CAR_{t+1}[-2,2]$ | 0.009 | 0.016 | 0.043 | 0.008 | 0.010 | 0.043 |

This table reports descriptive statistics. *GDP* is the gender position gap. $GDP_{median}$ is the median-based gender position gap. *%Female Employees* is the percentage of female employees. *%Female Executives* is the percentage of female executives. *%Female Directors* is the percentage of female directors. *Prestige* is the average prestige of employees' education and previous employers. *Female Prestige/Male Prestige* is the ratio of the average prestige ranking of female employees to the average prestige ranking of male employees. *Salary* is the natural logarithm of the average employee salary. *Size* is the natural logarithm of total assets. *Firm Age* is the natural logarithm of the number of years the firm appeared in Compustat. *Leverage* is the leverage ratio. *BTM* is the book-to-market ratio. *Inst Ownership* is institutional ownership. *Ana Following* is the natural logarithm of one plus the number of analysts following. *SG&A Intensity* is SG&A expense. *R&D Intensity* is R&D expense. *ROA* is the return on assets. *Return* is the stock return for the year. $AbnRet_{t+1}$ is the market-adjusted return for the next year. $CAR_{t+1}[window]$ is the cumulative abnormal return around the next year's four quarterly earnings announcements. Appendix B contains definitions of all variables.

## Table 3. Determinants of Gender Position Gap

| | Dependent Variable: *GPG* | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| *Female Prestige/Male Prestige* | -1.100*** | -1.063*** | -1.056*** |
| | (-5.19) | (-5.19) | (-5.47) |
| *Prestige* | -0.004** | -0.002 | -0.001 |
| | (-2.02) | (-1.10) | (-0.47) |
| *%Female Employees* | 0.089*** | 0.112*** | 0.110*** |
| | (6.07) | (7.61) | (7.59) |
| *Salary* | 0.039*** | 0.045*** | 0.054*** |
| | (3.22) | (3.80) | (4.46) |
| *%Female Executives* | | -0.046*** | -0.039*** |
| | | (-7.76) | (-6.83) |
| *%Female Directors* | | -0.113*** | -0.041*** |
| | | (-10.25) | (-3.61) |
| *Inst Ownership* | | | -0.016*** |
| | | | (-3.92) |
| *Ana Following* | | | -0.004*** |
| | | | (-3.52) |
| *Size* | | | -0.010*** |
| | | | (-11.52) |
| *Firm Age* | | | -0.001 |
| | | | (-0.43) |
| *SG&A Intensity* | | | -0.014** |
| | | | (-2.34) |
| *R&D Intensity* | | | 0.008 |
| | | | (0.66) |
| Industry FE, year FE | Yes | Yes | Yes |
| Observations | 24,350 | 24,350 | 24,350 |
| Adjusted $R^2$ | 0.157 | 0.192 | 0.265 |

This table reports the results of estimating Equation (1), where the dependent variable *GDP* is the gender position gap. Appendix B contains definitions of all variables. The regressions include Fama–French 48-industry fixed effects and year fixed effects. Standard errors are clustered by firm. The *t*-statistics are shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed tests.

## Table 4. Future Firm Performance

| | Dependent Variable: $ROA_{t+1}$ | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| ***GPG*** | **-0.188*** ** | **-0.174*** ** | **-0.098*** ** |
| | **(-8.64)** | **(-7.79)** | **(-4.37)** |
| *ROA* | 0.646*** | 0.643*** | 0.541*** |
| | (41.77) | (41.35) | (33.50) |
| *Return* | 0.046*** | 0.046*** | 0.046*** |
| | (15.13) | (15.17) | (15.64) |
| *Female Prestige/Male Prestige* | -0.425*** | -0.416*** | -0.389*** |
| | (-3.02) | (-2.94) | (-2.71) |
| *Prestige* | -0.006*** | -0.007*** | -0.003*** |
| | (-5.39) | (-5.92) | (-2.73) |
| *%Female Employees* | 0.056*** | 0.047*** | 0.025** |
| | (5.02) | (4.12) | (2.08) |
| *Salary* | -0.015* | -0.018** | -0.015* |
| | (-1.81) | (-2.20) | (-1.78) |
| *%Female Executives* | | 0.003 | 0.000 |
| | | (0.41) | (0.02) |
| *%Female Directors* | | 0.059*** | -0.001 |
| | | (5.29) | (-0.10) |
| *Inst Ownership* | | | 0.047*** |
| | | | (9.88) |
| *Ana Following* | | | -0.001 |
| | | | (-0.98) |
| *Size* | | | 0.004*** |
| | | | (4.96) |
| *Firm Age* | | | 0.014*** |
| | | | (6.94) |
| *Leverage* | | | -0.007 |
| | | | (-0.92) |
| *BTM* | | | -0.025*** |
| | | | (-8.04) |
| *SG&A Intensity* | | | -0.001 |
| | | | (-0.07) |
| *R&D Intensity* | | | -0.333*** |
| | | | (-13.04) |
| Industry FE, year FE | Yes | Yes | Yes |
| Observations | 24,350 | 24,350 | 24,350 |
| Adjusted $R^2$ | 0.572 | 0.573 | 0.598 |

This table reports the results of estimating Equation (2), where the dependent variable $ROA_{t+1}$ is the return on assets for year *t+1*. Appendix B contains definitions of all variables. The regressions include Fama–French 48-industry fixed effects and year fixed effects. Standard errors are clustered by firm. The *t*-statistics are shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed tests.

**Table 5. Sensitivity to Employees at the Top or Bottom End of the Corporate Hierarchy**

| | Dependent Variable: $ROA_{t+1}$ | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| ***$GPG_{median}$*** | **-0.094*** ** | **-0.085*** ** | **-0.048*** ** |
| | **(-6.67)** | **(-5.87)** | **(-3.40)** |
| *ROA* | 0.650*** | 0.647*** | 0.541*** |
| | (42.40) | (41.86) | (33.53) |
| *Return* | 0.046*** | 0.046*** | 0.046*** |
| | (15.09) | (15.14) | (15.62) |
| *Female Prestige/Male Prestige* | -0.350** | -0.347** | -0.351** |
| | (-2.49) | (-2.46) | (-2.47) |
| *Prestige* | -0.006*** | -0.006*** | -0.003** |
| | (-4.90) | (-5.56) | (-2.58) |
| *%Female Employees* | 0.048*** | 0.037*** | 0.019 |
| | (4.32) | (3.31) | (1.64) |
| *Salary* | -0.019** | -0.022*** | -0.018** |
| | (-2.25) | (-2.67) | (-2.09) |
| *%Female Executives* | | 0.007 | 0.002 |
| | | (1.03) | (0.32) |
| *%Female Directors* | | 0.066*** | -0.000 |
| | | (5.91) | (-0.00) |
| *Inst Ownership* | | | 0.048*** |
| | | | (10.03) |
| *Ana Following* | | | -0.001 |
| | | | (-0.88) |
| *Size* | | | 0.005*** |
| | | | (5.50) |
| *Firm Age* | | | 0.014*** |
| | | | (6.97) |
| *Leverage* | | | -0.006 |
| | | | (-0.86) |
| *BTM* | | | -0.025*** |
| | | | (-8.08) |
| *SG&A Intensity* | | | 0.000 |
| | | | (0.03) |
| *R&D Intensity* | | | -0.334*** |
| | | | (-13.08) |
| Industry FE, year FE | Yes | Yes | Yes |
| Observations | 24,350 | 24,350 | 24,350 |
| Adjusted $R^2$ | 0.571 | 0.571 | 0.598 |

This table reports the results of estimating an equation similar to Equation (2), except we use the gender position gap measure based on median salaries, $GPG_{median}$. Appendix B contains definitions of all variables. The regressions include Fama–French 48-industry fixed effects and year fixed effects. Standard errors are clustered by firm. The *t*-statistics are shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed tests.

## Table 6. Entropy Balance Matching and Instrumental Variable Analyses

### Panel A: Entropy Balance Matching Analysis

| | Dependent Variable: $ROA_{t+1}$ | |
|---|---|---|
| | (1) | (2) |
| *GPG* | -0.087*** | -0.088*** |
| | (-3.81) | (-3.55) |
| Controls, industry FE, year FE | Yes | Yes |
| Observations | 24,350 | 24,350 |
| Adjusted $R^2$ | 0.600 | 0.599 |

### Panel B: Instrumental Variable Analysis

| | Dependent Variable: | |
|---|---|---|
| | 1st stage: *GPG* | 2nd stage: $ROA_{t+1}$ |
| | (1) | (2) |
| *Industry Peer GPG* | 0.184*** | |
| | (4.43) | |
| *Instrumented GPG* | | -0.577** |
| | | (-2.41) |
| Controls, industry FE, year FE | Yes | Yes |
| Observations | 24,007 | 24,007 |
| Adjusted $R^2$ | 0.271 | 0.580 |
| Under-identification test | | |
| (Kleibergen-Paap LM statistic) | 18.76*** | |
| *p*-value | <0.001 | |
| Weak identification test | | |
| (Kleibergen-Paap Wald F statistic) | 19.62*** | |
| *p*-value | <0.001 | |

Panel A reports the results of the entropy balance matching estimation. The treatment (control) group comprises firms with gender position gaps above (below) the annual median. Column 1 shows the results for the sample matched on the mean of the covariate distribution. Column 2 shows the results for the sample matched on the mean, variance, and skewness. Panel B reports the results of the two-stage instrumental variable estimation. Column 1 report the first stage estimation, where the instrumental variable *Industry Peer GPG* is the average gender position gap across peer firms in the same three-digit SIC industry in that year. In Column 2, *Instrumented GPG* is predicted *GPG* from the first stage. Appendix B contains definitions of all variables. The regressions include the same set of control variables as in Table 4, Fama–French 48-industry fixed effects, and year fixed effects. Standard errors are clustered by firm. The *t*-statistics are shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed tests.

## Table 7. The Role of the Firm's Reliance on Human Capital

### Panel A: Importance of Human Capital

| | Dependent Variable: $ROA_{t+1}$ | |
|---|---|---|
| | (1) | (2) |
| *GPG* | -0.026 | -0.025 |
| | (-1.05) | (-1.26) |
| ***GPG * High SG&A Intensity*** | **-0.161*** ** | |
| | **(-3.78)** | |
| *High SG&A Intensity* | 0.027*** | |
| | (4.98) | |
| ***GPG * High R&D Intensity*** | | **-0.191*** ** |
| | | **(-4.06)** |
| *High R&D Intensity* | | 0.026*** |
| | | (4.76) |
| Controls, industry FE, year FE | Yes | Yes |
| Observations | 24,350 | 24,350 |
| Adjusted $R^2$ | 0.599 | 0.599 |

### Panel B: Reliance on High-Quality Employees

| | Dependent Variable: $ROA_{t+1}$ | |
|---|---|---|
| | (1) | (2) |
| *GPG* | -0.056** | -0.055** |
| | (-2.26) | (-2.43) |
| ***GPG * High Prestige*** | **-0.090** ** | |
| | **(-2.40)** | |
| *High Prestige* | 0.009* | |
| | (1.85) | |
| ***GPG * High Salary*** | | **-0.083** ** |
| | | **(-2.33)** |
| *High Salary* | | 0.010* |
| | | (1.85) |
| Controls, industry FE, year FE | Yes | Yes |
| Observations | 24,350 | 24,350 |
| Adjusted $R^2$ | 0.598 | 0.598 |

This table reports the results of estimating Equation (3), where the dependent variable $ROA_{t+1}$ is the return on assets for year *t+1*. *High SG&A Intensity* (*High R&D Intensity*, *High Prestige* or *High Salary*) equals to one if *SG&A Intensity* (*R&D Intensity*, *Prestige* or *Salary*) is higher than the annual median, and zero otherwise. Appendix B contains definitions of all variables. The regressions include the same set of controls as in Table 4, Fama–French 48-industry fixed effects, and year fixed effects. Standard errors are clustered by firm. The t-statistics are shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed tests.

## Table 8. Future Stock Returns

| | Dependent Variable: $AbnRet_{t+1}$ | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| ***GPG*** | **-0.135*** ** | **-0.133*** ** | **-0.124*** ** |
| | **(-4.46)** | **(-4.30)** | **(-3.97)** |
| *ROA* | 0.152*** | 0.151*** | 0.142*** |
| | (3.53) | (3.52) | (3.58) |
| *Return* | -0.092 | -0.092 | -0.073 |
| | (-1.18) | (-1.18) | (-1.18) |
| *Female Prestige/Male Prestige* | -0.548** | -0.550** | -0.537** |
| | (-2.52) | (-2.51) | (-2.48) |
| *Prestige* | 0.005 | 0.005 | 0.008* |
| | (1.75) | (1.69) | (2.05) |
| *%Female Employees* | 0.028 | 0.026 | 0.016 |
| | (1.59) | (1.65) | (0.94) |
| *Salary* | 0.030 | 0.030 | 0.028 |
| | (0.60) | (0.60) | (0.63) |
| *%Female Executives* | | 0.006 | 0.009 |
| | | (0.37) | (0.62) |
| *%Female Directors* | | 0.002 | -0.004 |
| | | (0.15) | (-0.29) |
| *Inst Ownership* | | | 0.102*** |
| | | | (4.43) |
| *Ana Following* | | | -0.001 |
| | | | (-0.30) |
| *Size* | | | -0.008*** |
| | | | (-5.06) |
| *Firm Age* | | | 0.010* |
| | | | (2.05) |
| *Leverage* | | | 0.087 |
| | | | (1.23) |
| *BTM* | | | 0.033 |
| | | | (1.56) |
| *SG&A Intensity* | | | 0.033 |
| | | | (1.68) |
| *R&D Intensity* | | | -0.009 |
| | | | (-0.33) |
| Industry FE | Yes | Yes | Yes |
| Observations | 23,939 | 23,939 | 23,939 |
| Adjusted $R^2$ | 0.097 | 0.097 | 0.113 |

This table reports the results of estimating Equation (4), where the dependent variable $AbnRet_{t+1}$ is the market-adjusted return for year *t+1*. Appendix B contains definitions of all variables. The regressions include Fama–French 48-industry fixed effects. The coefficients are estimated using Fama–MacBeth (1973). Fama–MacBeth *t*-statistics, shown in parentheses, are corrected for serial correlation using the Newey–West (1987) adjustment. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed tests.

**Table 9. Future Earnings Announcement Returns**

| | Dependent Variable: | | |
|---|---|---|---|
| | $CAR_{t+1}[0]$ | $CAR_{t+1}[-1, 1]$ | $CAR_{t+1}[-2, 2]$ |
| | (1) | (2) | (3) |
| ***GPG*** | **-0.002**** | **-0.003**** | **-0.005***** |
| | **(-2.85)** | **(-2.50)** | **(-3.56)** |
| *ROA* | -0.002** | -0.000 | -0.002 |
| | (-2.93) | (-0.36) | (-1.35) |
| *Return* | 0.000 | 0.000 | -0.000 |
| | (1.17) | (0.66) | (-0.20) |
| *Female Prestige/Male Prestige* | -0.001 | 0.017 | 0.008 |
| | (-0.17) | (0.79) | (0.51) |
| *Prestige* | -0.000*** | -0.001** | -0.000* |
| | (-5.39) | (-2.91) | (-1.98) |
| *%Female Employees* | -0.001 | -0.001** | -0.003 |
| | (-1.16) | (-2.39) | (-1.46) |
| *Salary* | 0.000 | -0.000 | -0.002*** |
| | (0.43) | (-0.95) | (-3.40) |
| *%Female Executives* | -0.001* | -0.002** | -0.003*** |
| | (-1.89) | (-2.93) | (-4.33) |
| *%Female Directors* | 0.001 | 0.004* | 0.001 |
| | (1.12) | (2.07) | (0.23) |
| *Inst Ownership* | 0.001** | 0.003** | 0.003 |
| | (2.64) | (2.58) | (1.71) |
| *Ana Following* | 0.000* | 0.000 | 0.001** |
| | (1.87) | (1.45) | (2.92) |
| *Size* | 0.000 | 0.000 | 0.000 |
| | (1.59) | (0.72) | (0.73) |
| *FirmAge* | 0.000 | 0.000 | 0.000 |
| | (1.68) | (0.37) | (0.12) |
| *Leverage* | -0.001** | -0.002 | -0.002 |
| | (-2.64) | (-1.27) | (-0.68) |
| *BTM* | -0.000 | -0.001 | -0.001 |
| | (-1.09) | (-0.90) | (-0.89) |
| *SG&A Intensity* | -0.000 | -0.001* | 0.001 |
| | (-0.52) | (-2.14) | (0.51) |
| *R&D Intensity* | 0.000 | 0.003 | 0.000 |
| | (0.94) | (1.29) | (0.06) |
| Industry FE | Yes | Yes | Yes |
| Observations | 23,601 | 23,601 | 23,601 |
| Adjusted $R^2$ | 0.015 | 0.038 | 0.051 |

This table reports the results of estimating Equation (5), where the dependent variable $CAR_{t+1}[window]$ is the cumulative abnormal return around the four quarterly earnings announcements in the next year within the indicated announcement window. Appendix B contains definitions of all variables. The regressions include Fama–French 48-industry fixed effects. The coefficients are estimated using Fama–MacBeth (1973). Fama–MacBeth *t*-statistics, shown in parentheses, are corrected for serial correlation using the Newey–West (1987) adjustment. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, using two-tailed tests.