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Board Gender Diversity, CEO Turnover, and Firm Performance in Entrepreneurial Firms

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Abstract: This article examines recent literature on corporate boards and the interplay between director gender and CEO turnover and how it affects firm performance after CEO turnover. The primary focus of this study is on the relationship between board gender diversity and CEO job embeddedness in entrepreneurial firms. This article discusses potential explanations for the association between board gender diversity and the frequency of CEO turnover. Next, we examine the interplay between board gender diversity, CEO Turnover, and subsequent firm performance. This paper finds that board gender diversity is associated with lower CEO involuntary turnovers and better overall performance in entrepreneurial firms. The article highlights how board gender diversity, especially in small firms, provides a unique pathway to create firm value and examines recent evidence on how gender diverse board decreases the likelihood of CEO turnover, thus saving small firms from costly CEO replacement and poor firm performance after the CEO turnover.

Keywords: Boards, Directors; Board Effectiveness; Diversity; Gender; CEO Turnover; Entrepreneurship

1. Introduction

In this paper, we examine whether the presence of gender diversity on corporate boards enhances firm performance in the years after a CEO turnover event. There has been a rapid and voluntary increase in female directors serving on corporate boards in the United States over the last ten years. This suggests that female participation on boards is increasingly viewed as beneficial. To this end, some countries have considered enacting policy changes to establish minimum requirements for gender diversity among board directors. However, little empirical evidence exists to support the legislation. More recently, female participation on the board has been viewed as beneficial. Nevertheless, women hold relatively few corporate board seats (Adams & Ferreira, 2009). Whether or not gender diversity on boards influences better firm performance remains inconclusive (Post & Byron, 2015; Klein, 2017).

Most legislative initiatives are based on the notion that the presence of women on boards could affect the governance of firms in significant ways. Several proposals in the U.K., Norway, Spain, and Sweden have emerged that would otherwise compel firms to expand gender diversity among boards. Only recently has there been some evidence that female directors provide better oversight over managers than male directors do (Adams & Ferreira, 2009). That finding suggests that by better oversight of managers' reporting, female participation in boards could improve firm performance. One argument is that boards can enhance their effectiveness by tapping into a broader talent pool for their directors. Another argument is that female directors, not belonging to the "good old boys" network, are typically more independent and thus engage in a higher degree of monitoring. This study seeks to contribute empirical evidence on whether a link exists between gender diversity on corporate boards and CEO turnover and how gender-diverse boards affect firm performance in small firms.

In this study, we provide new evidence relevant to this debate by investigating a new channel by which board structure might affect corporate governance. Specifically, we explore whether gender diversity on corporate boards impacts CEO turnover and subsequent firm performance following the departure of a CEO. There is abundant literature in other fields from psychology and management that find women to be more risk-averse (Arfken, Bellar, & Helms, 2004) and have a greater environmental connection (Terjesen & Singh, 2008). Therefore, we rationalize that the divergent interests between male and female directors, in turn, increase the likelihood that firms will terminate corporate managers who underperform. As such, we posit that in the case of underperforming firms, the divergence of interests between male and female directors increases the likelihood that the board will terminate the CEO's employment, resulting in a higher incidence of CEO turnover. If so, we anticipate that the presence of gender diversity on corporate boards that have terminated their CEO will improve subsequent firm performance as the firm transitions to new executive leadership.

Our study focuses on entrepreneurial firms which we define as firms with 500 employees or less. These small firms provide a relevant context for our study for two reasons. First, small firm boards are characterized by fewer directors and less gender diversity. Over half of the firm-year observations in our sample are all-male boards. Female directors in our sample occupy just 8.1% of all board seats compared to 13.6% of seats at larger firms. The average board in our sample contains seven directors rather than the typical 9-12 at larger firms. Consequently, the effect of gender board diversity on CEO turnover and subsequent performance may be more pronounced in this setting than in samples populated by larger firms.

Second, CEOs in this sample are considerably less entrenched than large firm CEOs. The CEOs in this sample are younger, own lower percentages of their company's equity, and have more independent boards than CEOs at larger firms. Small firm CEOs also face a greater risk of corporate takeovers than large firm CEOs. Consequently, CEO turnover is more common in small firms (4%)

than in large firms (3.2%). This finding implies that entrepreneurial firms are an ideal setting to study the impact of board gender diversity on turnover and firm performance.

Using a sample of 2,722 firm-year observations from 468 industrial firms, we find evidence that gender diversity on corporate boards is associated with lower CEO involuntary turnover in small firms. Additionally, our study finds that gender-diverse boards do not necessarily increase the likelihood that firms will terminate corporate managers who underperform. Poor past performance increases the likelihood of CEO turnover, but having a diverse board does not increase the likelihood of CEO turnover beyond the past performance in small firms. In the case of small firms, retaining capable CEOs could be crucial given the young age of firms, the volatile nature of performance in small firms, and the independent board. Our analysis indicates that gender-diverse boards are less likely to dismiss CEOs than all-male boards in small firms, thus providing more stability and avoiding poor performance related to CEO turnover.

Our results also indicate that in the event of CEO termination, gender diversity on boards does not lead to superior firm performance in subsequent years for small firms. Overall, CEO turnover is followed by lower profitability in subsequent years for small firms. However, the presence of gender diversity on boards does not affect the lower profitability after CEO turnover. The insignificant interaction effect between CEO termination and gender board diversity suggests that following a CEO turnover event, firms with gender-diverse boards do not realize any higher ROA than firms with all-male directors. However, firms with gender-diverse boards realize higher ROA than all-male directors in small firms.

In summary, this paper finds that gender-diverse boards decrease the likelihood of CEO involuntary turnover, thus avoiding bad future performance associated with CEO turnover. Although gender-diverse boards in small firms does not lead to better future firm performance after CEO turnover, the gender-diverse board is associated with better firm performance in small firms. Given the independent nature of the board in small firms and the high takeover threat small firms face, the entrenchment of the CEO is less of a concern. Hence, gender diversity plays a vital and unique role by reducing costly CEO involuntary turnovers and thus supporting the overall better performance of small firms in the long run. Our findings underscore how gender-diverse boards play a unique but essential role in small firms. These results suggest that gender-diverse boards wield meaningful long-term influence on the profitability of small companies by reducing costly CEO turnover, thus providing more stable profits over time.

Gender-Diversity

More recently, gender diversity has become a tool of the firm to structure corporate boards to bounce back after a crisis. The general case that gender-diverse corporate boards can have a profound impact on a firm's governance has been documented in the literature (Arfken, Bellar, & Helms, 2004; Croson & Gneezy, 2009; Ford & Rohini, 2011; European Commission, 2012). Following the global financial crisis, a public outcry for global corporate transparency led to an overhaul of existing accounting standards and regulation reform, including Sarbanes Oxley, Dodd-Frank Wall Street Reform and Consumer Protection Act, and the 2012 Whistle-Blower protections. These reforms of U.S. Congress were targeted to recover shareholder sentiment following accounting scandals such as WorldCom and Enron.

Perhaps the most innovative of reforms involves using gender as a tool for firms to structure newly assembled boards to enhance transparency, performance, and efficiency following the recent global financial crisis. Diversely structured boards are considered more productive, innovative, and effective. Diverse boards may represent the interests of public investors and stakeholders. Innovative solutions flow more spontaneously when fresh ideas come from differing viewpoints at board

meetings. Diverse members are less likely to participate in group thinking and more likely to oppose bad policies.

For example, more gender-diverse boards are associated with a higher quantity and quality of public disclosures. Adams and Ferreir (2009) find that women are more likely to join boards with monitoring roles, such as audit and corporate governance committees, which are directly involved in increasing the firm's transparency. They are more likely to enhance information and disclosure to public shareholders (Larkin, Bernardi, & Bosco, 2013) and increase the diffusion and the quality of value-relevant firm-specific information (Nalikka, 2009). Also, greater gender diversity reduces information risk in capital markets and, consequently, the market's average level of information asymmetry.

While gender diversity is inherent to board composition and structure (Milliken & Martins, 1996), gender diversity is among the issues widely debated regarding its influence in the boardroom and performance. In addition, the effect of gender diversity on the manager's reporting decisions and a firm's information environment has been considered widely in various academic fields (See Coles, Daniels, & Naveen, 2014; Chen, Ni, & Tong, 2016).

However, empirical research is mixed and lacks a complete or comprehensive framework for how gender diversity leads to expected improvement (Post & Byron, 2015; Pletzer, Nikolova, Kedzior, & Voelpel, 2015). Some research suggests that gender diversity provides a stable calming effect in the boardroom, previously dominated by alpha males (Konrad, Kramer, & Erkut, 2008). Other research suggests that gender diversity on boards heightens risk because directors become emotional over the gender dynamic, which can become real and personal in the boardroom (Klein, 2017). Other research highlights challenges that women face because boards are "slow to change" (Arfken, Bellar, & Helms, 2004; Kogut, Colomer, & Belinky, 2014).

A study by the International Monetary Fund (2019) disagrees. The progressive case argues greater efficiency through gender diversity, while the latter suggests no empirical relationship (Post & Byron, 2015). According to Klein (2017), there is overwhelming evidence in practitioner-based literature and from the field to support the value of having women in senior leadership positions. She suggests that a growing body of research - including the McKinsey and Company studies - has found that companies with women in senior executive and board roles have advantages over their peers. Evidence from the field suggests that women on boards can connect (or form trust) with their counterparts in management. Nevertheless, current media touts women's significant gains in the boardroom. However, female chairs are still relatively uncommon. (Adams & Ferreira, 2009).

Hence, empirical evidence remains a black box to offer the complete framework and mechanism whereby gender-diverse boards influence better future firm performance. In addition, little research exists on human resource management practices whereby gender diversity and turnover should be managed to optimize newly structured boards to promote better future firm performance (Shaw, Delery, Jenkins & Gupta, 1998). Implications could also be significant for risk management, corporate social responsibility, and sustainability (Chen, Ni, & Tong, 2016). Moreover, previous research lacks how gender-diverse boards influence CEO turnover and firm performance in small firms. Therefore, the main finding of this study is that gender diverse board plays a unique role by reducing unnecessary costly CEO turnovers, thus providing more stable, better performance for small firms since stagnation and job-embeddedness of CEOs are less of a concern for small firms.

CEO turnover involves the process of a CEO exiting the company and a firm's search for a suitable replacement for the executive position (Jenter & Kanaan, 2015). CEO turnover has been at a record high in the last decade because of disruption and the global pandemic. CEO turnover occurs through either voluntary or involuntary turnover. Involuntary employee turnover occurs when an employee separates from a company because they were terminated or (discharged) laid off. Involuntary

turnover is more common among CEOs because senior executives perform poorly, break the rules, or misbehave.

In contrast, voluntary turnover, such as a quit, reflects the lower attractiveness of a current job with potential alternatives. However, involuntary turnover has consequences, causes, and costs that are entirely different from voluntary turnover. A termination reflects an employment decision that must be corrected. The costs of poor hiring decisions have been estimated to be high (Hacker, 1997). However, an employee may be involuntarily terminated from a position for different reasons, such as the closure of the department or the position no longer being needed. Budget cuts, company restructuring, or any reason may trigger involuntary employee turnover. We focus on both types of turnover driven by female directors when their firms perform poorly for any of the reasons above.

To the extent that a poor hiring decision was made, how does an organization identify and correct it? Presumably, the better an organization can monitor its employees, the better information it will have to assess job performance. Performance appraisals are one of the best ways to track the value provided by an employee. A firm should terminate an employee when its investments (pay, benefits, and training) exceed an employee's contributions. Therefore, performance appraisals should be positively related to turnover. Employee monitoring provides the board with better information about management. Performance evaluations should document poor choices and management behaviors that become more obvious to the board, increasing the likelihood of turnover.

Our study considers the turnover of CEOs in the context of a rising level of female directors breaking the glass ceiling, and this should matter. The question our research seeks to establish, which other research is inconclusive still, is that if abundant evidence from the field and practitioner literature suggests that companies with a greater presence of females perform even slightly better, then why would we not see greater gender representation on corporate boards? A greater emphasis on women in senior roles may signal the end of gender exclusivity in firm leadership and, hence, greater opportunity. Female directors may be less likely to react with bias in a job appraisal. Suppose there are greater consequences for firm performance as women enter the higher echelon and begin to drive higher/lower turnover that benefits performance. This paper calls for researchers to examine when, how, and why.

Governance & Board of Directors

A fundamental characteristic of publicly held firms is the separation of ownership and control. This concept captures that managers have operating control of the firm, but ownership belongs to the shareholders. The separation entails some conflict of interest between managers and shareholders. Conflicts impact firms at every decision-making level and may ultimately erode firm value. Agency theory and principal/agent models have long been a focus of firm literature. Over time, several approaches have been developed to mitigate potential conflicts of interest, where the tactics used by a board fall under the respective preview of corporate governance. Ultimately, any corporate board's primary responsibility is to provide guidance and represent shareholders, creditors, suppliers, and partners of a firm through effective monitoring and oversight. The tools employed by a board differ across each firm. Effective corporate governance mechanisms improve a firm's access to external financing, lowering the cost of capital and increasing market value.

Corporate governance mechanisms can be categorized into two broad categories: internal and external. External governance mechanisms include competition in various market settings (including capital, product, and labor markets), scrutiny of financial analysts and rating agencies, and rules, regulations, and standard practices. External mechanisms are generally determined exogenously. External corporate governance mechanisms are associated with the market for corporate control, the

product market, the securities and capital markets, and managerial and directorship labor markets. These markets exert pressure on the firm and influence its stock price. In contrast, internal governance mechanisms are selected at the corporate level. Also, internal mechanisms are firm-specific and (endogenous).

There are four primary internal governance mechanisms. These four mechanisms of corporate governance include the board of directors, structure of executive compensation, body of shareholders (rights and structure), and creditors (rights and structure). The most important is the board of directors, given their expansive powers and direct influence over a firm. Boards approve every major decision. They hire and fire a firm's CEO. They determine the level and structure of CEO compensation and approve employment contracts. For these reasons, a firm's governance and proactive oversight impact the level of CEO turnover, particularly in seasons of poor performance. Therefore, we expect that firms with gender-diverse boards enjoy broader transparency, better governance, monitoring, and oversight, all of which facilitate the turnover of CEOs in poorly performing firms and subsequently improve performance. Our study uniquely fits within the literature on board diversity and efficiency, where we strive to determine whether gender diversity would lead to a higher level of CEO turnover that could significantly improve a firm's future financial performance, such as accounting returns.

In recent decades, gender diversity on corporate boards has come to the foreground of corporate governance (Arfken, Bellar, & Helms, 2004; Croson & Gneezy, 2009; Ford & Rohini, 2011; European Commission, 2012; Imes & Bazel-Shoham, 2021). While boards have become more diverse in the 21st century, some research suggests that gender diversity in top management positions is slow to change (Kogut, Colomer, & Belinky, 2014). As a result, ten governments, including Norway, have adopted resolutions to mandate gender quotas on corporate boards, while fifteen other countries have introduced non-binding gender quotes in publicly traded companies (Francoeur, Labelle, & Sinclair-Desgagne, 2008; Ahern & Dittmar, 2012). Many studies have studied the effect of gender diversity on firm outcomes (Tiessen, 2004; Muzio & Tomlinson 2012; Bendl and Schmidt, 2013; Ben-Amar, Chang, & McIlkenny, 2017; Shaukat, Qiu, & Trojanowski, 2016; Li, Zhao, Chen, Jiang, Liu, & Shi, 2017; Imes, John, Shoham, & Xu, 2023). One stream of literature assesses how country characteristics and institutions impact female board representation (Terjesen & Singh, 2008; Grosvold & Brammer, 2011; Seierstad & Opsahl, 2011; Mateos de Cabo, Gimeno, & Nieto, 2012; Terjesen, Aguilera, & Lorenz, 2014). Another stream of literature finds that gender diversity positively affects onboard performance (Arfken, Bellar, & Helms, 2004; Van der Walt, Ingley, Shergill, & Townsend, 2006). Our study focuses on how gender-diverse boards affect major corporate events such as CEO turnovers and firm performance after turnover in small firms, thus highlighting the importance of board gender diversity in small firms. Our study is unique because we study how gender diversity impacts CEO turnover and firm performance, specifically in small firms where board gender diversity is less common and CEOs are less likely to be entrenched.

CEO Turnover and Gender Diversity

The role of boards of directors in removing poorly performing CEOs is considered one of the most critical oversight responsibilities. This paper studies how board gender diversity affects CEO turnover, thus contributing to the existing literature on the role of the board of directors in replacing CEOs. There have been some studies focusing on the role of the board of directors in monitoring and replacing CEOs. Weisbach (1988) finds that CEO turnover is more sensitive to prior performance for companies with outsider-dominated boards than those with insider-dominated boards. Additionally, other studies focused on how managerial ownership (Denis, Denis, & Sarin 1997) ties to the central bank in Japan (Kang & Shivdasani, 1995), competitive industries (Defond & Park, 1999),

and combining the CEOs and chairman positions (Goyal and park, 2002) affect the sensitivity of CEO turnover to firm performance. Coles, Daniel, and Naveen (2014) show that as co-option (the fraction of the board composed of directors appointed after the CEO assumed office) increases, the board monitoring role diminishes, including turnover-performance sensitivity.

Hermalin and Weisbach (1998) argue that directors have a distaste for monitoring, leading to a lack of independence in their behavior and a subsequent agency problem. However, Females wield a powerful influence on corporate boards and may mitigate this conflict. Adams and Ferreira (2009) indicate that gender diversity on boards improves monitoring commitment. They support this finding with evidence that females have better attendance records than male directors and that males are more likely to attend board meetings when females are on the board. They also find that CEO turnover is more sensitive to stock return performance in firms with gender-diverse boards. Our sample period shows that CEO turnover is not associated with greater sensitivity to stock return performance with gender-diverse boards in small firms. This paper focuses on how gender-diverse boards affect CEO turnovers and finds evidence that gender diversity on corporate boards is associated with fewer CEO turnovers in small firms. To our knowledge, this is the first paper to find the negative relationship between Gender diverse boards and CEO turnovers in small firms, thus contributing to the CEO turnover literature within the context of gender diversity.

Board Diversity and Performance/Value

Prior literature indicates a negative relation between firm performance and the likelihood of CEO turnover (Fee and Hadlock, 2003). CEOs time their retirement to coincide with strong, firm performance in an attempt to receive a larger bonus payment (Murphy & Zimmerman, 1993) or lucrative post-retirement board seats (Brickley, Linck, & Coles, 1999; Reitenga & Tearney, 2003). Often, CEOs who perform poorly are forced to leave. However, Dikolli, Mayew, & Nanda, (2014) find that the sensitivity of CEO dismissal to poor firm performance diminishes with tenure. In this paper, we focus more on firm performance following CEO turnover.

The related firm performance following turnover literature is limited. Some research relates to changes in firm performance surrounding executive turnover. For example, Denis and Denis (1995) find that significant improvements follow forced resignations of top managers in industry-adjusted operating income. In contrast, voluntary retirements are followed by small improvements in profitability. Huson, Malatesta, & Parrino (2004) also find that accounting measures of performance relative to other firms improve after CEO turnover, and the post-turnover performance improvement tends to be in firms with a higher level of institutional holdings, outsider-dominated boards, and CEOs hired from outside the firm.

Studying CEO turnover from 1981 to 1992, Blackwell, Dudney, and Farrell (2007) find that the percentage of compensation in the form of new stock grants for the new CEO is associated with better future firm performance in the total sample and when analyzing forced and voluntary turnover separately. Our paper complements these earlier works on CEO turnover and post-turnover performance by examining the relationship between the presence of female directors on the board and CEO turnover and further relating the gender diversity of the board to the post-turnover performance.

More recently, Adams and Ferreira (2009) found that CEO turnover is more sensitive to stock performance with more gender-diverse boards. Our study focuses on how gender-diverse boards affect CEO turnover and the firm performance following turnover. If board gender diversity effectively removes incompetent CEOs and selects capable new CEOs, then we should see improvement in firm performance following CEO turnover. This paper finds a significant negative relationship between gender-diverse boards and CEO turnover, implying the role of gender-diverse

boards in keeping CEOs in small firms. Moreover, we also find that CEO turnover in gender-diverse boards is not followed by better firm performance in small firms, which is different than what we expected. Although we do not find a better firm performance after CEO turnover with gender diverse board, we find overall better firm performance with gender diverse board. Our findings underscore how gender-diverse boards benefit small firms by avoiding costly CEO turnovers, thus providing stable performance over time. Firm performance after CEO turnover has not been studied in context with gender diversity on corporate boards, and this paper highlights the vital and unique role gender-diverse boards play in small firms.

The remainder of this paper is organized into the following sections: Section 2 presents the data and empirical methods, followed by the empirical results in Section 3. In the final section, we conclude the paper.

2. Data

2.1 Sample Selection

Our primary analysis employs data drawn from the BoardEx Summary dataset, which contains information on the board members and executives of both U.S. and non-U.S. companies. However, our analysis focuses on US-based companies. This information includes director identification, age, gender, time on the board, and compensation information. We collapse the BoardEx dataset to the firm-year level, thus drawing firm-level aggregated director information. To control for the influence of the executive and corporate characteristics, we merge the Compustat, CRSP, and Execucomp datasets with the BoardEx dataset. ExecuComp contains top executives' compensation information, including the CEO's tenure, compensation, and age information. We construct CEO turnover from ExecuComp. Corporate financial variables are from Compustat. Stock return and volatility information come from CRSP. Because our research question sits at the nexus of entrepreneurship and governance, we restrict our sample to companies with 500 employees or less. Our final sample comprises 2,722 firm-year observations from 468 firms covering 2000-2020. To avoid survivorship bias, we allow the panel to be unbalanced.

2.2 Measuring CEO Turnover and Board Gender Diversity

We follow the existing literature in our variable construction. CEO turnover is the dummy variable for CEO turnover in the following year, one if there is a CEO turnover and 0 otherwise. We measure board gender diversity through two different measures. Female Board Ratio is the ratio of female board members to the total number of board members. Female Board D.Y. is the dummy variable, one if there is at least one female board director, 0 otherwise.

Our analysis also employs several control variables that capture board and firm characteristics. ROA is the return on assets, which is calculated as the net income over total assets. ROA 3 years is the average ROA in the following three years. Stock excess return is the stock return less the S&P500 return. CEO age is the age of the CEO. Stock ownership is the CEO's stock ownership. CEO gender is a dummy variable capturing the gender of the CEO: 1 is female, and 0 is male. CEO chair dummy is one if the CEO and chair of the board are the same person, and 0 otherwise. CEO tenure is the number of years serving as CEO. Number of directors is the number of the board directors. The number of independent directors is the number of independent directors. Size of the log size of the firm assets. Size of the log size of the firm assets. Volatility is the stock return volatility over the past five years.

2.3 Figures and summary statistics

Figure 1 shows the average number of female directors on boards by year. Gender diversity on corporate boards has steadily increased over time, reaching approximately one female director per board in 2020.

Figure 2 presents the industry-average female director representation on boards—most industries average between 0.2 and 1 female director per board.

Table 2 shows our sample's descriptive statistics for firm, board, and director characteristics. CEO Turnover occurs in 4% of our firm-year observations, with a standard deviation of 19.5%. The typical firm-year observation generated a return on assets of 1.4% while averaging 1.8% per year in the three years following each firm-year observation. Female directors occupy 8.1% of all board seats in our sample, while 46.3% of firm-year observations have at least one female director on the board. Firms in our sample earn an excess stock return of 20.6% above the S&P 500 returns with a standard deviation of 95.5%. The average CEO in our sample is 54.9 years old, with a standard deviation of 7.86 years. About 3% of our CEOs are female. Within our sample, 20.9% of our CEOs also serve as the chairman of the board. Our CEOs own 3.25% of the outstanding shares in their respective companies, with a standard deviation of 6.65%. The average CEO tenure is 7.76 years, with a standard deviation of 7.12 years. A typical board in our sample has between 6 and 9 directors and about 79.5% are independent. The average firm size in our sample is about \$305 million in assets. The average number of business segments is 1.84, with a standard deviation of 1.53. The average stock volatility over the past five years is 16.2%, with a standard deviation of 10.2%. Next, we take a closer look at the summary statistics.

Table 3 presents detailed summary statistics for our sample, including the 25th, 50th, and 75th percentile data points. CEO turnover is rare, occurring in only 4% of all firm-year observations. The median firm earns a return on assets of 6.4%, while 25% of firms in our sample earn 14.9% annually. The median annual Stock Excess Returns is 4.6%, while the top 25% of firm-year observations earn an excess stock return of 41.1% per year, and the bottom 25% of firm-year observations experience returns of -25.3% per year. Consistent with Bessembinder (2018), this result implies that a small number of firms generate positive stock returns. The median CEO in our sample owns 1.175 % of his or her firm's outstanding stock, while CEOs in the 75th percentile own 3.25% of outstanding shares. The average CEO owns 3.25% of firms' outstanding, which suggests that CEO ownership is skewed towards a few CEOs who hold relatively large percentages of their company's equity. This result is consistent with the presence of CEO founders in our sample. The median board in our sample has seven directors, while the 75th percentile contains eight directors, which is consistent with the notion that small firms have smaller boards than large firms. The median firm-year observation in our sample has \$246 million in assets, while firms at the 75th percentile have \$776 million in assets. The median firm has one business segment, while firms at the 75th percentile have two business segments. The median firm in our sample has an average stock volatility over the past five years of 14.7%, while firms in the 75th percentile have an average stock volatility of 19.5%. To examine the impact of board gender diversity on CEO turnover and firm performance, we conduct a multivariate analysis, as described in the next section. Next, we take a look at the correlation matrix.

Table 4 displays a correlation matrix for board diversity, CEO Turnover, profitability, and CEO characteristics. CEO Turnover is negatively correlated with Stock Excess Returns, indicating that poor stock performance is usually associated with CEO Turnover. CEO Turnover is also negatively associated with ROA and ROA 3 Year, indicating that subsequent performance deteriorates after CEO Turnover events. Not surprisingly, CEO Turnover is positively associated with age,

indicating that older CEOs are more likely to leave the CEO post. Profitability is positively associated with the two measures of board gender diversity (Female Board Ratio and Female Board D.Y.), indicating that gender-diverse boards tend to be more profitable. Profitability is also correlated with Excess Stock Returns. Exceptionally profitable stocks typically have high stock returns. Female Board Ratio and Female Board D.Y. are positively correlated with CEO Gender and CEO Duality and negatively correlated with CEO Age and stock ownership. We continue our study in the next section by examining a multivariate analysis we performed to account for the impact of firm and board-specific control variables and industry and time-fixed effects.

3. Empirical Results

Our multivariate analysis employs a Probit model on our pooled cross-sectional data to evaluate the impact of board gender diversity on CEO turnover. We use a linear-linear regression specification, which indicates that a 1-unit change in board diversity results in a 100% * coefficient change in the probability that the CEO leaves the company the following year. All regressions include industry and year-fixed effects based on the FF48 industry classification. Heteroscedastic standard errors are employed to control for serial correlation. The primary independent variable used in the analysis is board gender diversity, which we measure through the Female Board Ratio or Female Board D.Y. We also control for excess stock return and the interaction between Board Gender Diversity and excess stock return. The control variables include CEO Age, Stock Ownership, CEO Gender, CEO Chair Dummy, CEO Tenure, Number of Directors, Number of Independent Directors, Size, Business Segments, and Volatility. Our principal concern in the analysis is the coefficient on the board gender diversity measures and the coefficient estimate on the interaction term between excess stock return and board gender diversity. When the firm's stock price falls, CEOs are more likely to depart the following year. A positive coefficient estimate on the board gender diversity measures and the interaction term would support our hypothesis that board gender diversity impacts CEO Turnover beyond the impact of past stock price performance. The regression specification is:

$$1. \text{ CEO Turnover} = \beta_0 + \beta_1 (\text{Gender Diversity on Board}) + \beta_2 (\text{Excess Stock Return}) + \beta_3 (\text{Gender Diversity} * \text{Excess Stock Return}) + \beta_4 (\text{Controls}) + \text{Fixed Effects} + \text{error}$$

Table 5 presents the regression coefficient estimates from the relationship between board gender diversity and CEO turnover. Adams and Ferreira (2009) provide evidence that CEO turnover is more sensitive to performance when boards have a large fraction of female directors. CEO turnover is defined as a dummy variable that equals one if the CEO leaves the CEO position the following year. Our measure of excess stock return is the stock return less the S&P500 return. Standard firm-level controls include the size of the firm assets, the number of business segments, and volatility. In addition to standard firm-level controls, we control for CEO characteristics that could affect CEO Turnover, such as age, stock ownership, gender, CEO-chairman duality, and CEO tenure. We also control for the year and industry-fixed effects.

In all Columns of Table 5, we find that, as expected, poor stock return performance increases the likelihood of CEO turnover. In Columns 1 and 3 of Table 4, we find that neither the fraction of female directors nor having a female director on board increases the likelihood of CEO turnover. In Column 2, we interact stock excess return with the fraction of female directors. We find that the sensitivity of turnover to performance is not higher in firms with more female directors. In Column 4, we interact stock excess return with the dummy variable for a female director on board. We still find that the sensitivity of turnover to performance is not higher in firms with one or more female directors on board. Our results suggest that board gender diversity, when measured with a fraction of

female directors on board, is not associated with higher CEO turnovers beyond the impact of past stock price performance, which is consistent with the findings of Adams and Ferreira (2009). We also find that CEO turnover is not more sensitive to performance when boards are gender diverse for entrepreneurial firms. Our findings differ from Adams and Ferreira's (2009) findings as they report higher sensitivity of turnover to performance in firms with more female directors. The difference in findings could be due to our sample selection, sample size, and sample years, as we include entrepreneurial firms from 2000 to 2020.

Table 6 presents the regression coefficient estimates from the relationship between board gender diversity and CEO involuntary turnover. CEO involuntary turnover is the dummy variable for CEO turnover where the CEO is less than 60 the following year of turnover. We wanted to see if gender diversity on the board has any different association with CEO involuntary turnover.

Consistent with our findings in Table 5, poor stock return performance increases the likelihood of CEO turnover. Interestingly, in Columns 1 and 3 of Table 6, we find that both the fraction of female directors and having a female director on board decrease the likelihood of CEO involuntary turnover. When we interact stock excess return with our two gender diversity measures of the board, the interaction terms are not significant for both gender diversity measures. Our results suggest that board gender diversity is associated with lower CEO involuntary turnovers beyond the impact of past stock price performance. CEO involuntary turnover is not more sensitive to performance when boards are gender diverse for entrepreneurial firms. Our finding implies that gender-diverse boards tend to retain CEOs better when CEOs are younger than 60. If the boards are not effectively replacing incumbent CEOs despite the bad performance, it could be detrimental to the company. However, if the gender-diverse boards retain talented CEOs, it could benefit the company in the long run. Given the nature of entrepreneurial firms, the volatility of performance, and the importance of consistent leadership, gender-diverse boards may be helping firms by retaining younger CEOs. In Table 6, the number of independent directors also had a negative significant relationship with involuntary CEO turnover, implying that board independence is associated with fewer involuntary CEO turnovers.

Overall, we find some evidence that gender-diverse boards measured as both a fraction of females on board and having at least one female on board are associated with fewer CEO involuntary turnovers beyond the impact of past stock performance.

We find that having more female directors on board leads to fewer CEO involuntary turnovers beyond the impact of past stock performance in Table 6. Is having fewer CEO involuntary turnovers in firms with gender-diverse boards beneficial for the company? To answer this question, we test how a firm with a gender-diverse board performs after involuntary CEO turnover. The literature on whether gender diversity on boards influences better firm performance has inconclusive predictions (Post & Byron, 2015; Klein, 2017). Our multivariate analysis employs OLS regressions on our pooled cross-sectional data to evaluate the impact of board gender diversity on firm performance after CEO turnover. All regressions include industry and year-fixed effects based on the FF48 industry classification. Heteroscedastic standard errors are employed to control for serial correlation. The primary independent variable used in the analysis is board gender diversity, which we measure through the Female Board Ratio or Female Board D.Y. We also control for excess stock return and the CEO turnover. The control variables include CEO Age, Stock Ownership, CEO Gender, CEO Chair Dummy, CEO Tenure, Number of Directors, Number of Independent Directors, Size, Business Segments, and Volatility. Our principal concern in the analysis is the coefficient on the board gender diversity measures and the coefficient estimate on the interaction term between CEO turnover and board gender diversity. CEO turnover is associated with poor firm performance. A positive coefficient estimate on the board gender diversity measures and the interaction term would support our

hypothesis that board gender diversity positively impacts firm performance beyond the impact of CEO turnover. The regression specification is:

$$2. \text{ROA} = \beta_0 + \beta_1 (\text{Gender Diversity on Board}) + \beta_2 (\text{CEO Turnover}) + \beta_3 (\text{Gender Diversity} * \text{CEO Turnover}) + \beta_4 (\text{Controls}) + \text{Fixed Effects} + \text{error}$$

All Columns of Table 7 find that involuntary CEO turnover is associated with lower firm performance. Additionally, we find that both the fraction of female directors and having at least one female director on board are positively associated with firm performance. Our finding is consistent with previous studies which find a positive relationship between board gender diversity and firm performance. For Entrepreneurial companies with fewer than 500 employees, we still find a positive relationship between gender diversity and performance.

In Column 2, we interact involuntary CEO turnover with the fraction of female directors. Firm performance measured by return on asset and a 3-year average return on assets is not significantly higher for the firms with more female directors after CEO turnover in Columns 1 and 2. In Columns 3 and 4, we interact CEO turnover with the dummy variable for a female director on board. For both measures of firm performance, we find the same insignificant interaction term, which implies that having at least one female on board is also not associated with better future firm performance after involuntary CEO turnover.

Overall, we find some evidence that gender-diverse boards are associated with fewer involuntary CEO turnovers and better firm performance for entrepreneurial firms. However, we do not find a positive significant relationship between gender-diverse boards and firm performance after involuntary CEO turnovers, which implies that having gender-diverse boards is not associated with better firm performance after involuntary CEO turnovers. Our study focuses on entrepreneurial firms and provides valuable insight into how gender-diverse boards affect involuntary CEO turnovers and firm performance after CEO turnover for entrepreneurial firms.

In general, our finding underscores the importance of gender diversity on involuntary CEO turnover and firm performance in entrepreneurial firms. Our study is the first to find that gender diversity on board decreases the likelihood of involuntary CEO turnover for entrepreneurial firms. Moreover, we also find that board gender diversity positively correlates with overall firm performance when measured with a one-year and three-year return on assets, underscoring the critical role gender diverse board plays in retaining capable CEOs for entrepreneurship firms and maintaining good firm performance with fewer CEO turnovers.

4. Conclusion

In this paper, we examine how female participation on the board of directors (boards with gender diversity) affects CEO turnovers and firm financial accounting performance after CEO turnovers. Several theories credit the very existence of women serving on boards with screening or monitoring advantages relative to firms run traditionally by their all-male peers.

We ask two related questions: 1) Regarding CEO turnover, does gender diversity on the board of directors lead to a higher or lower CEO turnover rate? 2) Are these decisions justified by ex-post-performance? With detailed data on approximately 2,722 firm-year observations from 468 U.S. public firms that previously experienced CEO turnover, we find that compared with traditional firms led by "all-male" run boards, firms with gender-diverse boards encountered fewer CEO turnovers, and they are not associated with a higher level of financial accounting return afterward. In the case of small firms, retaining capable CEOs can be very important given the young age of firms and the volatile nature of performance in small firms. Additionally, an entrenched CEO is less of a concern for small

firms, given the high takeover threat and the independent board. Therefore, gender-diverse boards retain CEOs to a greater extent than all-male boards in small firms, thus providing more stability and avoiding poor performance associated with CEO turnover.

Our results also indicate that in the event of CEO termination, gender diversity on boards does not lead to greater firm performance in subsequent years for small firms. The insignificant interaction effect between CEO termination and gender board diversity suggests that following a CEO turnover event, firms with gender-diverse boards do not realize any higher ROA than firms with all-male directors. It could be due to the volatile nature of performance in small firms and how negatively CEO turnover affects small firms.

In conclusion, this paper finds that gender-diverse boards decrease the likelihood of CEO involuntary turnover, thus avoiding bad future performance associated with CEO turnover. Although gender-diverse boards in small firms do not lead to better future firm performance after CEO turnover, gender-diverse boards are associated with better firm performance in small firms. Given the independent nature of the board in small firms and the high takeover threat small firms face, the entrenchment of the CEO is less of a concern. Hence, gender diversity plays a crucial and unique role by reducing costly CEO involuntary turnovers and thus supporting the overall better performance of small firms in the long run. Our findings underscore how gender-diverse boards play a different but essential role in small firms. These results suggest that gender-diverse boards have meaningful long-term effects on the firm performance of small companies by reducing costly CEO turnover, thus providing more stable firm performance over time.

By studying the role of gender-diverse boards on CEO turnover and firm performance after CEO turnover, we provide additional insights on the importance of gender-diverse boards in reducing costly CEO turnover by retaining CEOs, thus leading to better firm performance for small firms. Furthermore, the firms with board gender diversity demonstrated better attendance, lower absenteeism, lower remote work, higher productivity, and better screening and monitoring in previous literature. Thus, it appears that the concessions that small firms with gender-diverse boards experience are offset by lower CEO turnovers and better firm performance.

It is difficult to posit a plausible, alternative interpretation of the role gender diversity seems to play on boards, especially in the context of CEO turnover and firm performance for small firms. More recently, countries across the globe are installing new legislation that mandates a significant level of gender diversity for their firms. We focus exclusively on the existence of females participating on these boards (and the lack thereof), firms impacted by CEO turnover, and the interplay between gender diversity and firm performance in small firms. Because gender diversity is expected to substantially impact the personal relationships of the collective group and its ensuing performance, we exclude the possibility that such kinds of personal relationships are already present on "all-male" boards or the product of existing or anticipated personal relationships. In other words, there is something special that females participating as directors bring to the table for small firms.

The topic of gender diversity has been well-documented in other research domains. However, how gender diversity in corporate boards affects CEO turnover and performance after CEO turnover in small firms has never been studied. How gender diverse board affects CEO turnover and performance differs for small firms due to high takeover threats, rare CEO entrenchment, and volatile firm performance. Gender diverse board decreases the likelihood of CEO turnover, thus saving small firms from costly CEO replacement and poor firm performance after the CEO turnover. Taken together, we provide evidence that gender diversity creates value by reducing costly CEO turnover, thus promoting long-term stable firm performance in small firms.

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Figure 1 Average Female Board Members by Year

In this chart, we report the bar chart of the average number of female board directors by year. The female board member is identified from the BoardEx dataset.

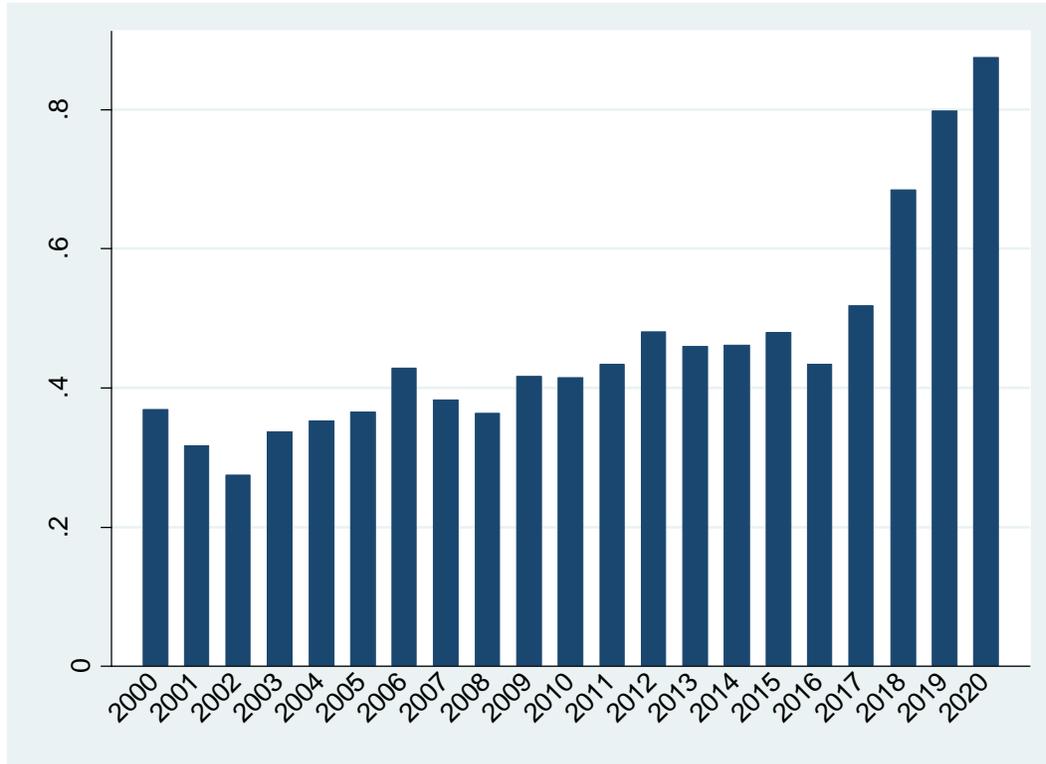


Figure 2 Average Female Board Members by Industry

In this chart, we report the bar chart of the average number of female board directors by each Fama-French 49 industry. The female board member is identified from the BoardEx dataset. Fama French 49 industry definition has followed the classifications from Professor Ken French's website.

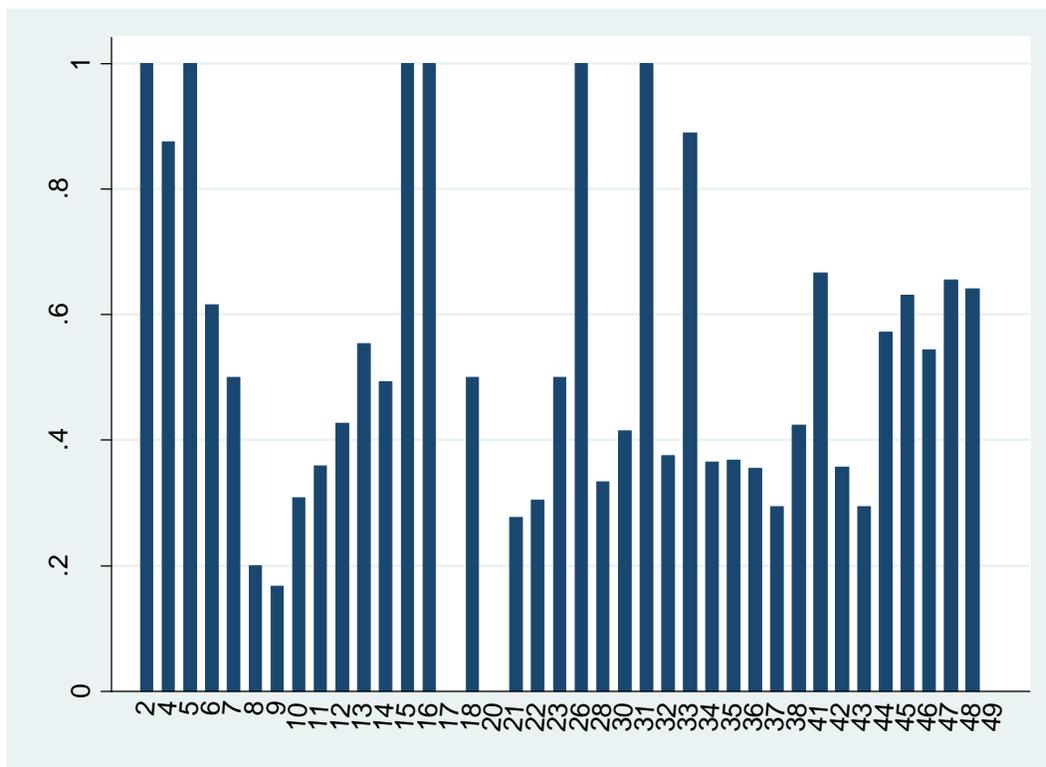


Table 1 Variable Definition

In this table, we report the variable definitions for our regression analysis.

Variable	Definition
CEO turnover	dummy variable for CEO turnover the following year, one if there is turnover and 0 otherwise.
CEO Involuntary turnover	dummy variable for CEO involuntary turnover in the following year, one if there is turnover and CEO age is less than 60, 0 otherwise.
ROA 3 year	ROA 3 years is the average ROA in the subsequent three years
Female Board Ratio	the number of female board members to the total number of board members
Female Board D.Y.	the dummy variable, one if there is at least one female board director on the board, 0 otherwise
Stock Excess return	stock return less the SP500 return
CEO age	age of the CEO
Stock ownership	CEO's stock ownership percentage
CEO gender	the gender of the CEO; 1 is female, 0 otherwise
CEO Chair dummy	A dummy is one if the CEO and chair of the board are the same person; otherwise, it is 0.
CEO tenure	the number of years serving as CEO
Number of directors	number of the board directors
Number independent directors	the number of independent directors
Size	the log size of the firm assets
Business segments	The number of business segments
Volatility	the stock return volatility over the past five years

Table 2 Summary Statistics

In this table, we report the summary statistics of the main variables. CEO turnover is the dummy variable for CEO turnover in the following year, one if there is turnover and 0 otherwise. ROA is the return on assets. ROA 3 years is the average ROA in the subsequent three years. Female Board Ratio is the number of female board members to the total number of board members. Female Board D.Y. is the dummy variable, one if there is at least one female board director in the board, 0 otherwise. Stock excess return is the stock return less the SP500 return. CEO age is the age of the CEO. Stock ownership is the CEO's stock ownership. CEO gender is the gender of the CEO; 1 is female, 0 otherwise. CEO chair dummy is one if the CEO and chair of the board are the same person, 0 otherwise. CEO tenure is the number of years serving as CEO. Number of directors is the number of the board directors. The number of independent directors is the number of independent directors. Size of the log size of the firm assets. Business Segments is the number of business segments. Volatility is the stock return volatility over the past five years.

Variable	Obs	Mean	Std. Dev.
CEO turnover	2722	0.040	0.195
CEO involuntary turnover	2722	0.027	0.162
ROA	2660	0.014	0.290
ROA 3 year	2665	0.018	0.257
Female Board Ratio	2722	0.081	0.101
Female Board DY	2722	0.463	0.499
Stock Excess return	2722	0.206	0.955
CEO age	2722	54.907	7.856
Stock ownership	2722	3.247	6.645
CEO gender	2722	0.030	0.171
CEO Chair dummy	2722	0.209	0.407
CEO tenure	2722	7.758	7.116
Number of directors	2722	7.382	1.739
Number independent directors	2722	0.795	0.433
Size	2722	5.720	1.450
Business segments	2722	1.835	1.528
Volatility	2722	0.162	0.102

Table 3 Detailed Summary Statistics

In this table, we report the detailed summary statistics of the main variables. We report the mean, median, standard deviation, and first and third quartile of the sample. CEO turnover is the dummy variable for CEO turnover in the following year, one if there is turnover and 0 otherwise. ROA is the return on assets. ROA 3 years is the average ROA in the following three years. Female Board Ratio is the number of female board members to the total number of board members. Female Board D.Y. is the dummy variable, one if there is at least one female board director in the board, 0 otherwise. Stock excess return is the stock return less the SP500 return. CEO age is the age of the CEO. Stock ownership is the CEO's stock ownership. CEO gender is the gender of the CEO; 1 is female, 0 otherwise. CEO chair dummy is one if the CEO and chair of the board are the same person, 0 otherwise. CEO tenure is the number of years serving as CEO. Number of directors is the number of the board directors. The number of independent directors is the number of independent directors. Size of the log size of the firm assets. Business segments is the number of business segments. Volatility is the stock return volatility over the past five years.

Stats	N	mean	sd	p25	p50	p75
CEO turnover	2722	0.040	0.195	0.000	0.000	0.000
CEO involuntary turnover	2722	0.027	0.162	0.000	0.000	0.000
ROA	2660	0.014	0.290	-0.029	0.064	0.149
ROA 3 year	2665	0.018	0.257	-0.023	0.063	0.138
Female Board Ratio	2722	0.081	0.101	0.000	0.000	0.143
Female Board DY	2722	0.463	0.499	0.000	0.000	1.000
Stock Excess return	2722	0.206	0.955	-0.253	0.046	0.411
CEO age	2722	54.907	7.856	50.000	55.000	60.000
Stock ownership	2722	3.247	6.645	0.076	1.175	3.251
CEO gender	2722	0.030	0.171	0.000	0.000	0.000
CEO Chair dummy	2722	0.209	0.407	0.000	0.000	0.000
CEO tenure	2722	7.758	7.116	2.000	6.000	11.000
Number of directors	2722	7.382	1.739	6.000	7.000	8.000
Number independent directors	2722	0.795	0.433	1.000	1.000	1.000
Size	2722	5.720	1.450	4.766	5.507	6.654
Business segments	2722	1.835	1.528	1.000	1.000	2.000
Volatility	2722	0.162	0.102	0.111	0.147	0.195

Table 4 Correlation Table

In this table, we report the correlation coefficient of the main variables. CEO turnover is the dummy variable for CEO turnover in the following year, one if there is turnover and 0 otherwise. ROA 3 years is the average ROA in the following three years. Female Board Ratio is the number of female board members to the total number of board members. Female Board D.Y. is the dummy variable, one if there is at least one female board director in the board, 0 otherwise. Stock excess return is the stock return less the SP500 return. CEO age is the age of the CEO. Stock ownership is the CEO's stock ownership. CEO gender is the gender of the CEO; 1 is female, 0 otherwise. CEO chair dummy is one if the CEO and chair of the board are the same person, 0 otherwise. CEO tenure is the number of years serving as CEO.

CEO turnover	1													
CEO involuntary turnover	0.8167*	1												
ROA	-	0.072												
	0.0606*	7*	1											
ROA 3 year	-	0.055	0.895											
	0.0574*	1*	0*	1										
Female Board Ratio	-0.019	-0.017	5*	0.073	0.075									
Female Board DY	-0.03	-0.035	5*	0.071	0.071	0.864								
				2*	7*	7*	1							
Stock Excess return	-	0.052	0.115	0.120										
	0.0543*	3*	8*	7*	-0.016	-0.016	1							
CEO age	0.0542*	0.046	-0.003	-0.021	-0.004	-0.003	0.028	1						
		4*												
Stock ownership	-	0.058	0.043	0.037	0.054	0.073	-	0.066						
	0.0419*	1*	4*	6	3*	7*	0.006	3*	1					
CEO gender	-0.025	-0.016	0.002	0.218	0.155	-	-	0.045						
			1	0.009	4*	5*	0.007	-0.015	4*	1				
CEO Chair dummy	-	0.040	0.032	0.044	0.016	0.250	0.264	0.059						
	-0.017	7*	0.036	5	0.034	1*	5	5*	1*	0*	1			
CEO tenure	-	0.073	0.034	0.035	0.083	0.068	-	0.362	0.308	0.051	0.305			
	-0.035	6*	8	6	8*	8*	0.007	7*	2*	4*	1*	1		

*** p<0.01, ** p<0.05, * p<0.1

Table 5 Probit Regressions of Turnover and Female Board

In this table, we report the probit regression results of the CEO turnover and the presence of female board members. The dependent variable is the CEO's turnover. CEO turnover is the dummy variable for CEO turnover in the following year, one if there is turnover and 0 otherwise. Female Board Ratio is the number of female board members to the total number of board members. Female Board D.Y. is the dummy variable, one if there is at least one female board director in the board, 0 otherwise. Stock excess return is the stock return less the SP500 return. Female Board Ratio_X Excess Return is the product of Female Board Ratio and Stock Excess Return. Female Board DY X Excess return is the product of Female Board D.Y. and Stock excess return. CEO age is the age of the CEO. Stock ownership is the CEO's stock ownership. CEO gender is the gender of the CEO; 1 is female, 0 otherwise. CEO chair dummy is one if the CEO and chair of the board are the same person, 0 otherwise. CEO tenure is the number of years serving as CEO. Number of directors is the number of the board directors. The number of independent directors is the number of independent directors. Size of the log size of the firm assets. Business segments is the number of business segments. Volatility is the stock return volatility over the past five years. We also control for the year and industry Fixed Effects.

VARIABLES	(1) CEO turnover	(2) CEO turnover	(3) CEO turnover	(4) CEO turnover
Female Board Ratio	-0.793 (0.645)	-0.802 (0.646)		
Stock Excess return	-0.215** (0.093)	-0.312** (0.131)	-0.214** (0.093)	-0.338** (0.141)
Female Board Ratio_X Excess Return		1.131 (0.985)		
Female Board DY			-0.177 (0.124)	-0.178 (0.124)
Female Board DY X Excess return				0.232 (0.177)
CEO age	0.028*** (0.009)	0.028*** (0.009)	0.028*** (0.009)	0.028*** (0.009)
Stock ownership	-0.021 (0.015)	-0.020 (0.015)	-0.021 (0.015)	-0.020 (0.015)
CEO gender	-0.269 (0.467)	-0.260 (0.464)	-0.300 (0.461)	-0.290 (0.459)
CEO Chair dummy	-0.145 (0.162)	-0.150 (0.163)	-0.150 (0.162)	-0.157 (0.163)
CEO tenure	-0.023** (0.010)	-0.023** (0.010)	-0.023** (0.010)	-0.023** (0.010)
Number of directors	0.102*** (0.040)	0.102*** (0.040)	0.108*** (0.040)	0.108*** (0.040)
Number independent directors	-0.214* (0.124)	-0.219* (0.125)	-0.212* (0.124)	-0.217* (0.125)
Size	-0.150** (0.060)	-0.145** (0.061)	-0.146** (0.061)	-0.140** (0.061)
Business segments	0.051 (0.037)	0.051 (0.037)	0.052 (0.037)	0.051 (0.037)
Volatility	-0.383 (0.879)	-0.398 (0.886)	-0.378 (0.872)	-0.390 (0.879)
Industry F.E.	Y	Y	Y	Y

Year F.E.	Y	Y	Y	Y
Constant	-2.992*** (0.957)	-3.051*** (0.962)	-3.026*** (0.953)	-3.091*** (0.958)
Observations	2,088	2,088	2,088	2,088

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6 Probit Regressions of CEO Involuntary Turnover and Female Board

In this table, we report the probit regression results of the CEO's involuntary turnover and female board members' presence. The dependent variable is the CEO's involuntary turnover. CEO involuntary turnover is the dummy variable for CEO turnover, and the CEO's age is less than 60 in the following year, one if there is turnover and 0 otherwise. Female Board Ratio is the number of female board members to the total number of board members. Female Board D.Y. is the dummy variable, one if there is at least one female board director in the board, 0 otherwise. Stock excess return is the stock return less the SP500 return. Female Board Ratio_X Excess Return is the product of Female Board Ratio and Stock Excess Return. Female Board DY X Excess return is the product of Female Board D.Y. and Stock excess return. CEO age is the age of the CEO. Stock ownership is the CEO's stock ownership. CEO gender is the gender of the CEO; 1 is female, 0 otherwise. CEO chair dummy is one if the CEO and chair of the board are the same person, 0 otherwise. CEO tenure is the number of years serving as CEO. Number of directors is the number of the board directors. The number of independent directors is the number of independent directors. Size of the log size of the firm assets. Business segments is the number of business segments. Volatility is the stock return volatility over the past five years. We also control for the year and industry Fixed Effects.

VARIABLES	(1) CEO Involuntary Turnover	(2) CEO Involuntary Turnover	(3) CEO Involuntary Turnover	(4) CEO Involuntary Turnover
Female Board Ratio	-1.626** (0.820)	-1.556* (0.823)		
Stock Excess return	-0.358*** (0.130)	-0.429** (0.173)	-0.354*** (0.130)	-0.464** (0.182)
Female Board Ratio_X Excess Return		0.934 (1.386)		
Female Board D.Y.			-0.337** (0.155)	-0.323** (0.156)
Female Board DY X Excess return				0.244 (0.251)
CEO age	-0.007 (0.011)	-0.007 (0.011)	-0.006 (0.011)	-0.007 (0.011)
Stock ownership	-0.063* (0.036)	-0.063* (0.036)	-0.066* (0.037)	-0.066* (0.037)
CEO gender	0.023 (0.504)	0.027 (0.501)	-0.059 (0.495)	-0.050 (0.492)
CEO Chair dummy	-0.130 (0.211)	-0.140 (0.213)	-0.133 (0.211)	-0.145 (0.213)
CEO tenure	-0.032* (0.017)	-0.031* (0.017)	-0.031* (0.017)	-0.031* (0.017)
Number of directors	0.111** (0.049)	0.112** (0.049)	0.118** (0.050)	0.119** (0.050)
Number independent directors	-0.283* (0.154)	-0.283* (0.154)	-0.281* (0.153)	-0.280* (0.154)
Size	-0.138* (0.073)	-0.133* (0.073)	-0.130* (0.073)	-0.124* (0.073)
Business segments	0.088* (0.045)	0.087* (0.045)	0.088* (0.045)	0.086* (0.045)

Volatility	-0.454 (0.997)	-0.441 (0.986)	-0.450 (0.983)	-0.441 (0.972)
Industry F.E.	Y	Y	Y	Y
Year F.E.	Y	Y	Y	Y
Constant	-0.804 (0.972)	-0.856 (0.977)	-0.924 (0.974)	-0.998 (0.980)
Observations	1,862	1,862	1,862	1,862

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7 Regression of Firm Performance and Female Board Members

In this table, we report the regression results of firm performance and female board; the dependent variables are firm performance. The dependent variable is firm performance measured by ROA, return on assets in one year, columns 1 and 3, and three years in, columns 2 and 4, after the CEO involuntary turnover event. Female Board Ratio is the number of female board members to the total number of board members. CEO turnover is the dummy variable for CEO turnover in the following year, one if there is turnover and 0 otherwise. Female Board Ratio X turnover is the product of the Female Board Ratio and CEO turnover dummy. Stock excess return is the stock return less the SP500 return. Female Board D.Y. is the dummy variable, one if there is at least one female board director in the board, 0 otherwise. Female DY X turnover is the product of the Female board dummy and CEO turnover dummy. CEO age is the age of the CEO. Stock ownership is the CEO's stock ownership. CEO gender is the gender of the CEO; 1 is female, 0 otherwise. CEO chair dummy is one if the CEO and chair of the board are the same person, 0 otherwise. CEO tenure is the number of years serving as CEO. Number of directors is the number of the board directors. The number of independent directors is the number of independent directors. Size of the log size of the firm assets. Business segments is the number of business segments. Volatility is the stock return volatility over the past five years. We also control for the year and industry Fixed Effects.

VARIABLES	(1) ROA	(2) ROA 3 year	(3) ROA	(4) ROA 3 year
Female Board Ratio	0.188*** (0.062)	0.156*** (0.055)		
CEO involuntary turnover	-0.080* (0.044)	-0.095** (0.039)	-0.096** (0.041)	-0.101*** (0.037)
Female Board Ratio X CEO Involuntary Turnover	0.106 (0.386)	0.117 (0.344)		
Female Board DY			0.021* (0.012)	0.016 (0.011)
Female DY X CEO Involuntary Turnover			0.055 (0.053)	0.032 (0.047)
Stock Excess return	0.053*** (0.006)	0.048*** (0.005)	0.053*** (0.006)	0.048*** (0.005)
CEO age	-0.001 (0.001)	-0.001* (0.001)	-0.001 (0.001)	-0.001** (0.001)
Stock ownership	0.004*** (0.001)	0.003*** (0.001)	0.004*** (0.001)	0.003*** (0.001)
CEO gender	-0.012 (0.034)	0.005 (0.030)	0.004 (0.033)	0.019 (0.030)
CEO Chair dummy	-0.012 (0.016)	-0.015 (0.014)	-0.011 (0.016)	-0.014 (0.014)
CEO tenure	-0.000 (0.001)	0.000 (0.001)	-0.000 (0.001)	0.000 (0.001)
Number of directors	0.001 (0.004)	0.004 (0.003)	0.001 (0.004)	0.005 (0.003)
Number independent directors	-0.021* (0.013)	-0.028** (0.011)	-0.023* (0.013)	-0.030*** (0.011)
Size	0.088*** (0.006)	0.072*** (0.005)	0.088*** (0.006)	0.073*** (0.005)
Business segments	0.003 (0.004)	0.005 (0.003)	0.003 (0.004)	0.005 (0.003)

Volatility	-0.406***	-0.415***	-0.413***	-0.420***
	(0.057)	(0.051)	(0.057)	(0.051)
Industry F.E.	Y	Y	Y	Y
Year F.E.	Y	Y	Y	Y
Observations	2,464	2,469	2,464	2,469
Constant	-0.139	-0.064	-0.122	-0.049
R-squared	0.248	0.247	0.246	0.246

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$