The Review of Financial Studies

# The Origins and Real Effects of the Gender Gap: Evidence from CEOs' Formative Years

**Ran Duchin**
Boston College

**Mikhail Simutin**
University of Toronto

**Denis Sosyura**
Arizona State University

Using individual census records, we provide novel evidence on CEOs' socioeconomic backgrounds and study their role in investment decisions. Male CEOs allocate more investment capital to male than female division managers. This gender gap is driven by CEOs who grew up in male-dominated families where the father was the only income earner and had more education than the mother. The gender gap also increases for CEOs who attended all-male high schools and grew up in neighborhoods with greater gender inequality. The effect of gender on capital budgeting introduces frictions and erodes investment efficiency. (*JEL* G30, G31, G40, J16, J71, D91)

Received May 27, 2018; editorial decision May 3, 2020 by Editor Stijn Van Nieuwerburgh. Authors have furnished an Internet Appendix, which is available on the Oxford University Press Web site next to the link to the final published paper online.

---

We thank Stijn Van Nieuwerburgh (the editor) and two anonymous referees for their valuable suggestions. For helpful comments, we also thank Tom Bates, Audra Boone, Patricia Boyallian, Oleg Chuprinin, Jonathan Cohn, Claudia Custodio, Henrik Cronqvist, Daniel Ferreira, Maria Guadalupe, Alex He, Simi Kedia, Sehoon Kim, Samuli Knüpfer, Yiqing Lu, Paola Sapienza, Geoffrey Tate, Edward Van Wesep, and Patrick Verwijmeren; and conference participants at the 2018 Drexel University Corporate Governance Conference, the 2018 Finance Cavalcade of the Society for Financial Studies, the 2018 Northeastern University Finance Conference, the 2018 Front Range Finance Seminar at the University of Colorado, the 2018 CEPR Spring Symposium in Financial Economics, the 2018 Corporate Finance Workshop at Lancaster University, the 2018 Annual Meeting of the European Finance Association (EFA), the 2018 Annual Meeting of the Northern Finance Association (NFA), the 2018 Endless Summer Finance Conference, the 2018 Principles of Responsible Investing Academic Network Conference, the 2018 Wellington Finance Summit, the 2018 Corporate Finance Conference at Washington University in St. Louis, the 2018 Conference on Board Diversity Quotas at Stockholm University, the 2018 EuroFidai Paris December Finance Meeting, the 2019 Annual Meeting of the American Finance Association (AFA), the 2019 Conference on Finance, Labor and Inequality in Capri, the 2019 International Centre for Pension Management discussion forum, the 2020 Annual Meeting of the American Economic Association (AEA), the 2020 Finance Down Under Conference, the 2020 Behavioral Economics Annual Meeting (BEAM); and seminar participants at Australian National University, Baruch College, Boston College, HEC Paris, Chinese University of Hong Kong, Hong Kong University of Science and Technology, Interdisciplinary Center Herzliya (IDC Herzliya), Maastricht University, State University of New York at Buffalo, Stockholm School of Economics, Tel Aviv University, University of Arkansas, University of California at Irvine, University of Delaware, University of New South Wales, University of Notre Dame, University of Sydney, University of Texas at Dallas, University of Technology at Sydney, University of Toronto, University of Queensland, and University of Washington. We gratefully acknowledge financial support from the Institute for Gender and the Economy at the University of Toronto, the Mitsui Life Financial Research Center at the University of Michigan, and the Social Sciences and Humanities Research Council of Canada. Send correspondence to Denis Sosyura, dsosyura@asu.edu.

*The Review of Financial Studies* 34 (2021) 700–762
© The Author(s) 2020. Published by Oxford University Press on behalf of The Society for Financial Studies. All rights reserved. For permissions, please e-mail: journals.permissions@oup.com.
doi:10.1093/rfs/hhaa068 Advance Access publication June 12, 2020

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

Optimal allocation of resources across agents is critical for economic outcomes, at the level of both an individual firm and the entire economy. An ongoing debate in the literature revolves around whether male managers obtain more resources, such as pay, capital, or promotion opportunities, than their female peers. If such a gender gap exists, it remains unclear whether it reflects a potential bias of the decision-makers or results from economic factors correlated with gender, such as productivity or risk aversion. Similarly, the real effects on economic outcomes are not fully understood.

We focus on these two open questions, namely, the origins and real effects of the gender gap. Many proposed policy responses aimed at narrowing the alleged gender gap assume that it reflects a bias of the decision-maker, such as the CEO, and introduces market frictions. Yet this premise is difficult to test because such a test would require eliciting CEO beliefs and connecting resource allocations to outcomes.

This paper makes a step toward addressing both challenges. We study capital allocations to male and female division managers at U.S. conglomerates. In this setting, the CEO holds the decision authority (Xuan 2009; Graham, Harvey, and Puri 2015), and division managers are peers with observable capital investments and subsequent outcomes. Since conglomerates account for over 60% of investment in the S&P 1500, this decision has important economic consequences.

To elicit CEO beliefs, we rely on the evidence in social economics that an individual's views on gender issues are shaped by familial, environmental, and educational factors experienced until early adulthood, a period called formative years (see Epstein and Ward 2011 for a review). In particular, individuals form an outlook on gender roles by observing their parents and the norms on gender equity in their community and at school (Mischel 1966; Bandura 1986; Leve and Fagot 1997).

To study CEOs' formative years, we obtain individual census records for the households where they grew up, offering the first descriptive evidence on the family descent of the CEOs of conglomerates. These CEOs come from well-to-do families, where the father is the primary earner with the median income at the 75th national percentile. About 71% of CEOs' fathers hold white-collar jobs, and 35% are managers or entrepreneurs. The median CEO father has 3–4 more years of education than the median adult male in the same income group or in the general population, respectively. As common for the spouses of high income earners, CEOs' mothers are more likely to stay at home (79%) than women nationwide (58%). When CEOs' mothers hold outside employment, their most common occupations are teachers (28%) and secretaries or clerks (21%), and their median income is at the 57th national percentile.

Our first result is that female division managers obtain 46–67 basis points less in annual capital expenditures (measured as a fraction of assets) than male

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

managers with the same observable characteristics. For the average division, this gap in capital allocations amounts to an economically important difference of 9%–13% of the annual investment or $13.2–$19.3 million per year.

By exploiting within-firm variation in CEOs, we find that the gender gap in capital allocations is related to the CEO's early-life exposure to gender inequity in the family, community, and school. Among these factors, the CEO's family has the strongest effect. The gender gap in capital allocations is driven by CEOs who grew up in male-dominated families where the father was the only income earner and had more education than the mother and where the CEO had no female children. Further, educational factors have important mediating effects. A significant fraction of CEOs attended all-male high schools (16.4%) and all-male colleges (9.9%), and the gender gap in capital budgets is greater for such CEOs compared with those from coeducational institutions. Finally, environmental factors—measures of gender equity in the CEO's home county—have meaningful effects, but they are subsumed by the familial and educational factors.

Taken together, the effect of familial, educational, and environmental factors from CEOs' formative years explains the majority of the economic gap in capital allocations. As an external validation of the factors extracted from CEOs' formative years, we show that these factors are strongly correlated with CEO policies on gender issues, such as promoting women and allocating contracts to female suppliers, measured by a research firm KLD Research & Analytics. Since our analysis exploits within-firm variation, these gender policies are specific to CEOs and cannot be explained by time-persistent firm attributes.

Our conclusions are also robust to accounting for the endogenous matching between CEOs and firms, using CEO * firm fixed effects. In addition, our results hold after absorbing time-invariant heterogeneity across managers and divisions, suggesting that the gender gap in capital allocations is unlikely to be explained by unobservable characteristics correlated with managers' gender or their divisions.

We identify two economic channels contributing to the gender gap in capital allocations: (1) appointment of female managers to capital-poor divisions (the appointment channel) and (2) lower capital allocations after the appointment (the capital allocation channel). We find that female managers are assigned to less profitable divisions, which historically receive less capital. To disentangle the capital allocation channel from the appointment channel, we exploit CEO turnovers for natural causes (death, illness, or retirement) and study the change in capital allocations when CEO characteristics change, but the assignment of managers to divisions remains constant. This approach controls for unobservable time-persistent characteristics of divisions (such as complexity and capital intensity) and division managers (such as risk aversion and skill). When a CEO with a more conservative background arrives after his

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

predecessor leaves for natural causes, the gender gap between the same division managers rises, and vice versa.

We consider several nonmutually exclusive explanations for the relation between CEOs' backgrounds and the gender gap in capital budgets: (1) information asymmetry, (2) favoritism, (3) childbirth, and (4) risk-taking. We find stronger evidence for the first two channels.

The information asymmetry hypothesis posits that CEOs with male-dominated backgrounds have less experience in dealing with women on the job and face greater information asymmetry when assessing female managers' ability, capital demands, or investment forecasts. Theory predicts that CEOs allocate less capital to managers in the face of information asymmetry (Antle and Eppen 1985; Harris and Raviv 1996). Consistent with this hypothesis, the relation between CEOs' backgrounds and the gender gap in capital allocations is stronger for external CEOs, those who are less familiar with the female managers at their new firm. Conversely, the effect of a CEO's formative experiences on capital allocations weakens as the CEO observes female division managers over longer periods at his firm, consistent with learning.

The favoritism hypothesis states that CEOs with male-dominated backgrounds find it easier—consciously or not—to invest with male division managers. This channel is consistent with theories of homophily, which predict a positive in-group gender tilt in resource allocations (surveyed in McPherson, Smith-Lovin, and Cook 2001 and Jackson 2008). Using data from KLD Research & Analytics, we adopt two independent measures of gender favoritism: (1) legal action against the management on gender and diversity issues and (2) significant tilt in the allocation of supply orders to male versus female contractors. Using both measures, we find that CEO favoritism contributes to the gender gap in capital budgeting.

According to the childbirth hypothesis, CEOs with conservative backgrounds expect female managers to interrupt their careers for childbirth. Thus, CEOs restrain long-term investments in female managers' divisions. The evidence on this channel is weaker. Directionally, CEOs with conservative backgrounds allocate less capital to female division managers of childbearing age (under 40) than to their older counterparts, but this relation is economically small and falls short of being statistically significant.

The risk-taking hypothesis postulates that CEOs with male-dominated backgrounds allocate less capital to female managers because of concerns about women's tolerance for risk. We find weak directional evidence that CEOs with more conservative backgrounds are less likely to appoint women to riskier divisions and, when they do, tend to allocate less capital to female division managers in riskier divisions.

If the link between CEOs' gender attitudes and capital allocations reflects an optimal policy, it should be magnified under strong governance. In contrast, if this effect reflects CEOs' subjective beliefs, it should be attenuated under



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

governance mechanisms unaffected by such beliefs. To distinguish between these views, we focus on two dimensions of governance: (1) internal (the board of directors) and (2) external (industry competition). We find that the relation between CEOs' gender attitudes and capital allocations is attenuated by up to 35% in the presence of a woman in the chief monitoring role as the chair of the board. The effect of CEOs' gender attitudes is also reduced in more competitive industries.

In our final analysis, we provide suggestive evidence on economic outcomes. In the analysis of labor flows, we find that female division managers are more likely to separate from and less likely to be promoted at firms run by CEOs with greater early-life exposure to gender imbalances. Under such CEOs, capital allocations across divisions become less responsive to growth opportunities (Tobin's q), and divisions run by female managers experience weaker growth and profitability. These patterns are negatively associated with firm operating performance and stock returns. Yet, we view our performance results as suggestive because these outcomes may also reflect other value-eroding practices beyond capital allocation.

In summary, the gender gap in resource allocation is related to the CEO's gender attitudes, whether conscious or subconscious, which can be traced to one's formative years. This effect has large implications for capital investment. While we focus on CEO beliefs, the gender gap is likely an outcome of a combination of factors, including institutional, cultural, and historical.

The main contribution of this paper is to provide novel evidence on the socioeconomic backgrounds of the CEOs of U.S. conglomerates and to show that the gender effects in financial policies are linked to CEOs' formative experiences. Our findings add to research on (1) the origins of managerial traits, (2) the effect of gender in capital allocation, and (3) the operation of internal capital markets.

Recent work underscores the role of early-life experiences in shaping CEOs' financial policies. Malmendier, Tate, and Yan (2011) find that CEOs who grew up during the Great Depression are averse to taking on debt and lean excessively on internal finance. Benmelech and Frydman (2015) show that CEOs with military experience adopt conservative policies. Cronqvist and Yu (2017) provide evidence that CEOs who experience the birth of a daughter increase spending on corporate social responsibility. Yonker (2017a) finds that CEOs who grew up near their firm are less likely to fire local employees. Guenzel and Malmendier (2019) highlight the role of CEOs' personal traits in corporate decisions throughout the phases of CEOs' careers. Yet, despite the importance of CEO characteristics, we know little about their personal backgrounds. Our study provides systematic evidence on CEOs' families, home communities, and early schooling and studies jointly the effects of familial, educational, and environmental factors.

We also extend the literature on gender effects in capital allocation, which has emerged in entrepreneurial finance. Prior work finds that female entrepreneurs

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

obtain less funding than their male peers (Coleman and Robb 2016) even if their investment ventures are identical (Brooks et al. 2014). Ewens and Townsend (2020) show that the lower funding of female entrepreneurs is driven by male investors, and Hebert (2020) finds that it is concentrated in male-dominated industries. Yet the mechanisms underlying the funding gap remain disputed. Some authors find that it reflects bias, such as homophily, that is, people's affinity for others with similar attributes (Gompers and Wang 2017), or investors' stereotypical beliefs that women are less capable than men at managing risk (Kanze et al. 2018). Others argue that the funding gap is a rational response to women's lower capital demand (Coleman and Robb 2009) and higher risk aversion (Morris et al. 2006). We provide evidence from internal capital markets that the funding gender gap persists even in repeated allocations to the same agents, but it is mitigated by learning from outcomes.

Finally, we contribute to the literature on the role of division managers in internal capital markets. In a survey of CEOs at S&P 500 firms, Graham, Harvey, and Puri (2015) find that the CEO's opinion of a division manager is the second most important factor in capital budgeting after the NPV rule. Cichello et al. (2009) investigate the determinants of division managers' careers inside conglomerates. Duchin and Sosyura (2013) study the role of division managers' characteristics in internal capital markets and find that managers connected to the CEO obtain more funds. Our paper extends this research by suggesting that CEOs' gender attitudes affect division managers' career trajectories and capital allocations.

## 1. Gender Influences in Formative Years: Theory, Evidence, and Measurement

### 1.1 The effect of early-life experiences on personal traits

Prior work in the social sciences shows that an individual's early-life experiences—from childhood through early parenthood—play a key role in shaping personal traits, including gender attitudes. The personal traits developed early in life remain remarkably consistent decades later. For example, in a survey of research on personal traits, McCrae and Costa (1994, p. 173) document that within-individual correlations between personal traits measured during (1) early adulthood and (2) late career (up to 30 years thereafter) range from 0.60 to 0.80 and conclude that "individual differences in personality traits … are essentially fixed by age 30." Similarly, in a survey of 152 empirical studies on personality traits, Roberts and DelVecchio (2000) conclude that an individual's personality traits are most actively shaped early in life, and personality traits acquired from early-life experiences predict an individual's behavior several decades later.

Research in finance shows that early-life experiences have a long-lasting effect on CEOs. Prior work has established significant relations between CEOs' formative experiences and corporate financial policies, such as risk-taking

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

(Graham and Narasimhan 2005), R&D (Benmelech and Frydman 2015), and capital structure (Bernile, Bhagwat, and Rau 2017). The effects of CEOs' formative experiences persist at large and closely monitored firms but need not be value-improving (Malmendier, Tate, and Yan 2011).

The effect of early-life experiences on gender attitudes has received less attention in finance despite its strong theoretical foundation and extensive validation in other fields. The role of early-life experiences in the formation of gender attitudes is formalized in the theory of social learning, introduced by Mischel (1966), developed in Bandura (1977, 1986), and expanded into the social-cognitive theory by Bussey and Bandura (1999). This theory posits that individuals form their gender attitudes at an early age by observing the behavior of men and women in their family, community, and school.

### 1.2 Family characteristics

Parents play a pivotal role in developing an individual's gender attitudes. The social learning theory posits that "parents are likely the most influential figures … when it comes to modeling gender through both implicit and explicit cues" (Halpern and Perry-Jenkins 2016, pp. 528–9). Children absorb subtle cues from their parents, such as their parents' relative social status, breadwinner rights, and division of labor in the home, and extrapolate these inferences from their family onto the roles of men and women in the labor force.

These predictions have received wide empirical support. For example, individuals brought up in families where the mother does not hold paid employment are more likely to develop stereotyped gender attitudes (e.g., Gold and Andres 1978; Cordua, McGraw, and Drabman 1979; Weinraub et al. 1984; Levy 1989; Huston and Alvarez 1990; Lerner 1994). In recent work on a large and nationally representative U.S. sample, Farre and Vella (2013) show that people born into families with a nonworking mother develop conservative gender attitudes, as measured by statements such as "a woman's place is in the home, not in the office" and "it is better for everyone concerned if the man is the achiever outside the home." Similarly, individuals brought up in families where the mother has less formal education than the father develop less egalitarian gender attitudes (Vanfossen 1977; Martin et al. 1980; Herzog and Bachman 1982; Thornton et al. 1983). More generally, gender attitudes developed within the home predict labor market outcomes, such as women's labor force participation (Fernández, Fogli, and Olivetti 2004) and compensation (Fortin 2005).

Motivated by prior evidence, we introduce three measures of the relative social status of a CEO's parents as a source of variation in the CEO's gender attitudes. First, *Nonworking mother* is an indicator that equals one if the CEO's mother does not work outside the home, and zero otherwise. Second, *Parents' education imbalance* is the difference between the number of education years for the CEO's father and mother, scaled by their average years of education. Third, *Parents' income imbalance* is the difference between the annual incomes



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

of the CEO's father and mother, scaled by their average income. We impute the income of zero for mothers working only at home. Appendix A defines the variables.

In addition to the well-established influence of parents, research also highlights an important role of siblings in shaping an individual's gender attitudes (for a review, see McHale, Updegraff, and Whiteman 2012). The social learning theory predicts that males with brothers adopt more conservative and more masculine gender norms than males with sisters. A large body of empirical work, dating back to at least Koch (1956), Brim (1958), and Sutton-Smith and Rosenberg (1970), supports these predictions. Later work confirms these patterns in large samples (Rust et al. 2000) and finds evidence of greater gender stereotyping among males with brothers than males with sisters (Stoneman, Brody, and MacKinnon 1986). To measure the gender composition of the CEO's siblings, we introduce the variable *Siblings' gender imbalance*, which equals the difference between the number of the CEO's brothers and sisters, scaled by the number of the CEO's siblings. For CEOs with no siblings, this variable is set to zero.

Prior work on familial factors also emphasizes the reciprocal effects in parent-child relations. While parents affect their children's gender views, the birth of a child itself shifts the gender attitudes of its parents. Research shows theoretically and empirically that the parenting of daughters (rather than sons) shifts one's gender attitudes toward more egalitarian views. Cronqvist and Yu (2017) develop a model where an agent internalizes his children's utility and show analytically that the parenting of a daughter leads him to adopt more egalitarian gender views. Warner (1991) and Warner and Steel (1999) present evidence consistent with these predictions. The effect of parenting daughters on gender attitudes is causal (Shafer and Malhotra 2011) and influences the decisions of sophisticated agents, such as politicians (Washington 2008), venture capitalists (Gompers and Wang 2017), and CEOs (Dahl, Dezso, and Ross 2012; Cronqvist and Yu 2017). To study the effect of parenting daughters, we define the variable *Children's gender imbalance* as the difference between the CEO's number of sons and daughters, normalized by the number of children.

In summary, our familial factors capture measurable and validated influences from all members in the CEO's immediate family, except for the spouse: parents, siblings, and children. For each CEO, our measures exploit exogenous variation in endowed factors, such as the characteristics of one's parents and the gender composition of siblings or children, which remain free from reverse causality. In contrast, we do not study the influence from the CEO's spouse because the choice of a spouse is bilateral and endogenous.

### 1.3 Community characteristics

The social learning theory postulates that gender attitudes are shaped by social norms in the community where people spend their formative years (Mischel 1966; Bandura 1977, 1986). Specifically, people develop

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

gender norms by inferring the relative social status of men and women in their community, extrapolating from such cues as labor force participation, traditional occupations, and representation in positions of authority. Empirical work has confirmed the causal effect of community norms on residents' gender attitudes and labor market outcomes (Alesina, Giuliano, and Nunn 2013). In a review of 58 empirical studies, Swim and Sanna (1996) conclude that when men are perceived to have a higher status in a society, the identical performance of male and female agents is more likely to be attributed to skill for men and luck for women, especially in male-dominated professions (Heilman, Block, and Martell 1995). If such a pattern extends to our setting, it could represent one mechanism through which a CEO's gender attitudes affect the allocation of resources to male and female division managers even if their performance is identical.

To measure the effect of community norms, we introduce three proxies for the relative economic status of men and women in the county where the CEO attended high school. First, *Labor force participation gender imbalance* is the difference in the labor force participation rate between men and women. Second, *Income gender imbalance* is the difference between the average annual income of employed men and women, scaled by their average income. Third, *Education gender imbalance* is the difference between the years of education for men and women, scaled by average education. These data are measured for county residents between ages 18 and 45 as of the national census year closest to the year when the CEO reaches age 18.

### 1.4 Educational characteristics

Our final set of attributes exploits variation in CEOs' early education, focusing on whether the CEOs attended coeducational or single-gender high schools and colleges. This focus is grounded in theories that demonstrate that single-gender schooling augments gender stereotypes and increases in-group biases by endorsing gender segregation. For example, the contact theory of Allport (1954) predicts that the segregation of groups on a salient characteristic, such as gender, reinforces in-group biases. Bigler and Liben (2006, 2007) show analytically that social factors that foster gender-based segregation increase gender stereotyping.

Empirical work confirms that single-gender schooling increases gender stereotypes among males (Delamont 1990; Brutsaert 2006). Recent work finds that the effect of gender segregation on in-group biases is causal (Dahl, Kotsadam, and Rooth 2018). In addition to the causal interpretation, it is also possible that students with gender stereotypes self-select into single-gender schools. Both interpretations are acceptable for our identification strategy, which aims to elicit a CEO's gender attitudes from early-life experiences.

To measure the effect of education characteristics, we introduce two variables. *All-male high school* is an indicator variable that equals one if the CEO attended a single-sex high school and zero otherwise. *University gender*



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

*imbalance* is the average fraction of male students in the CEO's undergraduate college. Both variables are measured as of the dates of the CEO's attendance.

In summary, we introduce a comprehensive set of 10 theoretically motivated and empirically validated determinants of gender attitudes from childhood through early parenthood. Our focus on these factors is guided by the ability to construct precise and replicable proxies for these experiences from historical data. In contrast to a focus on a single formative experience in prior work, we provide a joint analysis of familial, environmental, and educational factors and compare their relative importance.

## 2. Sample and Summary Statistics

### 2.1 Firms and divisions

We begin our sample construction with the universe of industrial conglomerates included in the S&P 1500 index in 2000–2008.[1] We focus on conglomerates because the U.S. accounting standards require them to report key financial data for each division, allowing us to study capital allocations across divisions and their outcomes.[2] Industrial conglomerates comprise firms that report at least two operating segments on Compustat and operate in industries other than utilities and financials (one-digit SIC codes 4 and 6, respectively).[3] The universe of conglomerates that meet these criteria comprises 806 firms.

We manually go through each firm's organization structure in quarterly and annual reports and proxy statements to identify firms with divisional organization structures where managers oversee specific operating segments. This filter ensures a one-to-one match between managers and divisions. Given this sample criterion, our inferences apply only to firms with such organization structures. We exclude firms with organization structures that lack a clear correspondence between managers and divisions (396 firms). The excluded firms usually use functional or geographic structures where managers are assigned on the basis of functional roles (e.g., vice president of manufacturing) or regional markets (e.g., vice president – Northwest), respectively, and thus oversee an entire functional area or market across all operating segments.

To identify the manager responsible for each operating segment, we read professional biographies of the firms' executives in annual reports, proxy statements, and firms' directories, following the algorithm in Duchin, Goldberg, and Sosyura (2017). We consider a manager to be in charge of a division if he or she is the highest-level executive responsible for the operating

[1] Our sample begins in 2000 because data coverage in BoardEx is sparse before 2000. Our sample ends at the end of 2008 because the hand-collected data on division managers are available for this period from Duchin, Goldberg, and Sosyura (2017).

[2] The reporting requirements for operating segments of U.S. conglomerates appear in the Accounting Standards Codification Topic 280, Segment Reporting, available from the Financial Accounting Standards Board at https://asc.fasb.org/topic&trid=2134510.

[3] Operating segments exclude corporate accounts, allocation adjustments, and divisions with zero or negative sales.



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

segment. We collect the starting and ending dates of each manager's tenure by supplementing said corporate disclosures with executive biographies from the Forbes Executive Directory, Reuters, Marquis's Who's Who, and Notable Names Database, as well as firms' press releases. We are able to identify all division managers for 91.5% of the firms that meet our sample criteria, and we exclude the remaining 35 firms with missing data on division managers.

In the resultant sample of 375 firms, nine are led by female CEOs. Such a small fraction of female-run firms limits our ability to exploit the variation in CEO gender, and we exclude these nine firms. However, we use female leadership as a source of variation in another context: by focusing on female chairs of the board, the position women are four times as likely to occupy as the post of CEO (8% of observations).

Finally, we exclude eight firms run by CEOs for whom no data about formative years can be reliably identified. After imposing this filter, we arrive at our main sample of 358 firms. Table B.1 in Appendix B shows the sequence of sample selection criteria and the number of observations retained after each filter.

Panel A in Table 1 reports summary statistics for our sample firms. The average (median) firm has a book value of assets of $13.5 ($3.6) billion, consists of 3.1 (3.0) divisions, earns an annual revenue of $8.0 ($3.4) billion, and generates an annual return on assets of 4.3% (5.3%). The firms in our sample account for over 70% of book assets and market equity of all industrial conglomerates in the S&P 1500.

Table B.2 in Appendix B compares our final sample with the rest of the industrial conglomerates in the S&P 1500. The top panel compares the main firm characteristics, including earnings per share, stock return, cash holdings, profitability, capital investment, market-to-book ratio, and firm size. This comparison reveals that our sample is statistically indistinguishable from the rest of the industrial conglomerates in the S&P 1500 across all characteristics examined, except for firm size. In particular, the average firm in our sample is significantly larger. This distinction arises because larger firms are more likely to adopt divisional organization structures, as a greater firm size justifies the assignment of dedicated managers to divisions.

The divisions in our sample are economically important operating units. The average (median) division operates assets with a book value of $3.2 ($0.86) billion, produces $3.2 ($1.1) billion in sales, and obtains $147.2 ($31.2) million in annual investment funds, an equivalent of 5.1% (3.7%) of its book assets.

### 2.2 CEOs, division managers, and directors

After linking divisions to managers, we collect data on the characteristics of CEOs and division managers. We retrieve appointment dates for CEOs and division managers from Execucomp and press releases, respectively. Next, we hand-match CEOs and managers to BoardEx, where we obtain information on their education, employment history, board memberships, and affiliations with



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table 1**
**Summary statistics**

*A. Firms and divisions*

| Variable | Mean | 25th percentile | Median | 75th percentile | SD | Number of observations |
|---|---|---|---|---|---|---|
| **Company level** | | | | | | |
| Market value, $millions | 14,914 | 1,203 | 3,474 | 11,064 | 38,867 | 1,631 |
| Book assets, $millions | 13,548 | 1,545 | 3,626 | 10,480 | 50,751 | 1,639 |
| Sales, $millions | 7,988 | 1,461 | 3,448 | 8,871 | 10,377 | 1,639 |
| Capital expenditure, $millions | 487.3 | 44.9 | 123.4 | 360.0 | 1,294 .0 | 1,634 |
| Capital expenditure/assets (%) | 4.242 | 2.207 | 3.321 | 5.078 | 3.271 | 1,634 |
| Number of divisions | 3.100 | 2.000 | 3.000 | 4.000 | 1.284 | 1,652 |
| Earnings per share (EPS) | 1.663 | 0.612 | 1.591 | 2.879 | 3.231 | 1,632 |
| Return on assets (ROA) | 0.043 | 0.020 | 0.053 | 0.087 | 0.113 | 1,639 |
| Tobin's q | 1.858 | 1.273 | 1.598 | 2.105 | 0.913 | 1,631 |
| HH Index | 0.221 | 0.157 | 0.193 | 0.251 | 0.152 | 1,644 |
| **Division level** | | | | | | |
| Book assets, $millions | 3,198 | 284 | 856 | 2,440 | 14,939 | 4,197 |
| Sales, $millions | 3,176 | 382 | 1,117 | 2,952 | 6,963 | 4,208 |
| Capital expenditure, $millions | 147.2 | 8.0 | 31.2 | 100.0 | 588.5 | 3,954 |
| Capital expenditure/assets (%) | 5.079 | 1.913 | 3.672 | 6.397 | 5.574 | 3,954 |
| Operating ROA | 0.147 | 0.070 | 0.128 | 0.206 | 0.163 | 3,941 |
| Industry Tobin's q | 1.593 | 1.245 | 1.480 | 1.845 | 0.475 | 4,208 |
| Core division indicator | 0.545 | 0.000 | 1.000 | 1.000 | 0.498 | 4,208 |

*B. CEOs, directors, and division managers*

| Variable | Mean | 25th percentile | Median | 75th percentile | SD | Number of observations |
|---|---|---|---|---|---|---|
| **CEOs** | | | | | | |
| Age, years | 55.91 | 51.00 | 56.00 | 60.00 | 6.51 | 1,635 |
| Male indicator | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1,635 |
| Tenure with the firm, years | 14.53 | 5.10 | 11.61 | 18.08 | 10.84 | 1,642 |
| Graduate degree indicator | 0.62 | 0.00 | 1.00 | 1.00 | 0.49 | 1,638 |
| MBA indicator | 0.41 | 0.00 | 0.00 | 1.00 | 0.49 | 1,629 |
| External board seats | 2.17 | 1.00 | 2.00 | 3.00 | 1.27 | 1,640 |
| Log network size | 6.35 | 5.83 | 6.55 | 7.15 | 1.23 | 1,632 |
| **Division managers** | | | | | | |
| Age, years | 50.57 | 48.00 | 50.36 | 54.00 | 5.54 | 4,049 |
| Male indicator | 0.92 | 1.00 | 1.00 | 1.00 | 0.26 | 4,049 |
| Tenure with the firm, years | 10.78 | 3.00 | 8.00 | 16.00 | 9.75 | 3,981 |
| Graduate degree indicator | 0.79 | 1.00 | 1.00 | 1.00 | 0.41 | 3,976 |
| MBA indicator | 0.39 | 0.00 | 0.00 | 1.00 | 0.49 | 3,976 |
| External board seats | 0.22 | 0.00 | 0.00 | 0.00 | 0.41 | 3,968 |
| Social connections to CEO | 0.01 | -0.16 | 0.00 | 0.14 | 0.34 | 4,011 |
| Performance record | 0.15 | 0.07 | 0.13 | 0.20 | 0.26 | 3,962 |
| **Directors** | | | | | | |
| Board size | 9.66 | 8.00 | 10.00 | 11.00 | 2.92 | 1,639 |
| Number of female directors | 1.27 | 1.00 | 1.00 | 2.00 | 0.93 | 1,639 |
| Fraction of female directors | 0.12 | 0.08 | 0.11 | 0.18 | 0.09 | 1,639 |
| Female board chair indicator | 0.08 | 0.00 | 0.00 | 0.00 | 0.28 | 1,639 |

This table reports summary statistics. The sample consists of industrial conglomerates in the S&P 1500 index with available data on capital expenditures, book assets, division managers, and CEO backgrounds. Variable definitions and sample selection criteria appear in Appendixes A and B, respectively. The number of observations for firm-level variables represents the number of firm-years, and the number of observations for division-level variables represents the number of division-years. The reported values are time-series averages over the sample period: January 2000 to December 2008.

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

nonprofits. We cross-check and supplement BoardEx data with managerial biographies and the executive databases discussed above. We also collect governance data from BoardEx and RiskMetrics, including information on individual directors.

We obtain demographic data (such as age and gender) for CEOs, division managers, and directors from the Lexis Nexis Public Records database (LNPR), which aggregates data on over 500 million U.S. individuals (alive and deceased) from sources such as birth and death records, property tax assessment records, and voting records. Prior work has used LNPR to obtain personal data on executives (Cronqvist, Makhija, and Yonker 2012; Yermack 2014), fund managers (Pool, Stoffman, and Yonker 2012; Chuprinin and Sosyura 2018), and financial journalists (Ahern and Sosyura 2015). Individuals in the database are assigned a unique ID linked to one's social security number and employment records.

Our sample comprises 587 CEOs, 1,788 division managers, and 3,222 directors. Panel B in Table 1 shows their summary statistics. As discussed, all CEOs in our sample are male, and, on average, they are 56 years old. About 62% of CEOs have graduate degrees, most of which are MBAs. The dominant majority of CEOs serve on the boards of other companies, and the median CEO holds two external board seats.

In comparison with CEOs, division managers are younger and more diverse. The average manager is 51 years old, and his tenure at the firm is 10.8 years. Women account for 136 division managers, or 7.6%, of the sample. Compared with CEOs, division managers are more likely to have graduate degrees (79%), but less likely to hold MBA degrees (39%) and serve on external boards (22%).

The average firm in our sample has a board of 10 directors, 12% of whom are female. The median and modal number of female directors is one, and the mean is 1.27. While 78% of firms have at least one female director, only 8.7% have more than two. The chair of the board is female in 8% of the observations.

To compare the executives between our sample and other industrial conglomerates in the S&P 1500, we collect demographic and professional data on CEOs and division managers for the firms excluded by our sample filters.[4] Table B.2 in Appendix B shows that CEOs in our sample are statistically indistinguishable from CEOs at other conglomerates on all of the examined attributes, such as age, gender, firm tenure, business education, and external board seats. Likewise, we do not find significant differences between division managers in our sample and their peers at other conglomerates, except that the managers in our sample are more likely to hold an MBA (39%) than their peers (34%), as expected for larger firms.

[4] For the excluded firms, we identify division managers by their job titles in BoardEx but don't match each manager to a division. In the comparison of CEOs' gender, we report our gender statistics before excluding the nine female CEOs in our sample.



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

Overall, women are no more likely to serve as CEOs, division managers, or top-5 paid executives (untabulated) at other conglomerates, suggesting that our questions about the origins of female representation in management are no less acute in the broader firm universe.

### 2.3 Family descent and formative years

We collect comprehensive data on the family, education, and home community for the CEOs in our sample. We focus on CEOs because they hold decision rights in the internal allocation of capital. Prior work validates this decision authority both analytically (Rajan, Servaes, and Zingales 2000; Scharfstein and Stein 2000) and empirically (Xuan 2009; Duchin and Sosyura 2013). Graham, Harvey, and Puri (2015) obtain survey evidence that CEOs are unlikely to delegate the capital allocation decision, and Bennedsen, Peréz-Gonzáles, and Wolfenzon (2020) demonstrate the causal effect of CEOs on firms' investment decisions.

**2.3.1 Family characteristics.** We obtain information on CEOs' families from multiple data sources, including federal and state census records, state records of birth, marriage and death, digital archives of city directories, and obituaries. We briefly describe these data here and offer comprehensive detail and examples in the Internet Appendix (IA).

We follow a three-step algorithm to identify the CEO's immediate family by sequentially checking three types of state records: birth, marriage, and death. To ensure a reliable match to the census, we use the unique combination of the full names of the CEO's parents and, in some cases, siblings to unambiguously identify their household in the census archive, following the approach in Chuprinin and Sosyura (2018).

We obtain the image file of the family's records in the federal and state censuses from the digital archive maintained by the U.S. National Archives and Records Administration. The federal census form in our sample provides 34 standardized variables on each member of the household, such as education (in years), occupation, employment status, annual income, and birthplace. The census form also provides many characteristics for the entire household, including the address, home ownership status (rent or own), and the estimated home value. Section 1 in the Internet Appendix explains how we identify the CEOs' households in the census and shows blank and completed census forms.

We emphasize an important data constraint. Access to personally identifiable census data is restricted by the U.S. public law, and the latest state and federal census records with personally identifiable data are available for 1945 and 1940, respectively, and for previous years. To overcome this constraint, we augment our census data with information from two other digital archives: (1) historical city directories (from the family search service Ancestry.com) and (2) state death records and obituaries (from the archive of state records on Ancestry.com and the newspaper archive Newspapers.com, respectively).

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

These records allow us to obtain the same information on the employment status, education, and occupations of the CEO's parents for younger CEOs born after 1945. For overlapping observations, we cross-check the information from city directories and obituaries against the data in the census and find that the two sources provide very similar information. Section 2 in the Internet Appendix discusses our cross-verification algorithm, shows examples of records, and replicates our main results using the data obtained only from the U.S. Census.

We collect information on CEOs' children from the personal background data compiled by the executive intelligence firm Boardroom Insiders and the personal background databases Prabook and Notable Names. We cross-check and augment these sources with data obtained from LNPR and obituaries for CEOs' parents, which list the CEO's children as the surviving family members.

**2.3.2 High school and college education.** We build the first data set of CEO high schools by using the archives of high school yearbooks compiled by Classmates.com. We confirm the high school matches by the location of the household where the CEO grew up. We also use data from Boardroom Insiders, CEO biographies, and high school publications that identify notable alumni. To verify ambiguous cases, we submit written disclosure requests for high school data to the registrar of the CEO's undergraduate college. For each high school, we obtain its address, gender status (same-gender or coed), religious affiliation, and private/public status for the years of the CEO's attendance. Figure 1 shows that the CEOs in our sample hail from high schools in every state in the continental United States, except for South Dakota. Forty-four high schools graduated multiple CEOs-to-be, with New Trier High School in Winnetka, Illinois, graduating five.

For each CEO, we also record the gender composition of the college where he earned his undergraduate degree by computing the average fraction of female students during the period of the CEO's attendance (ages 18–22). We obtain the gender composition data from the National Science Foundation.

**2.3.3 Community characteristics.** We proxy for the community where the CEO grew up by the county where he attended high school. We collect the following characteristics of adult male and female residents for each CEO's home county: the labor force participation rate, the annual income, and the number of years of education. We obtain these data from the Integrated Public Use Microdata Series (IPUMS) and measure these characteristics during the census year closest to the CEO's 18th birthday.

## 3. Descriptive Evidence: CEOs' Family Descent and Formative Years

This section provides the first systematic description of the family descent of the CEOs of large industrial firms, their early education, and home communities.

Panel A in Table 2 describes the immediate families of CEOs, focusing on their parents, siblings, and children. Three conclusions emerge from the data.



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

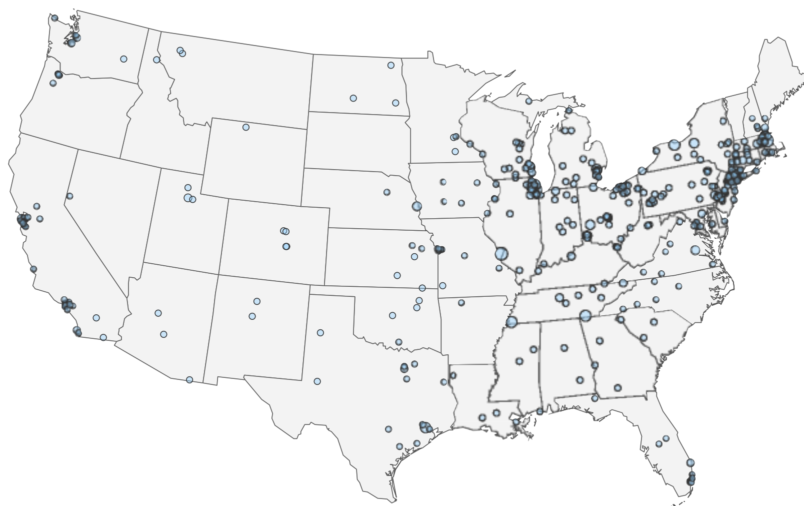


**Figure 1**
**CEOs' home communities**
This figure shows the geographical distribution of the communities where the CEOs in our sample grew up. The circles denote the locations of the CEOs' high schools. The sample consists of 587 CEOs of industrial conglomerates. The area of the circle increases proportionately with the number of CEOs who attended the corresponding school. Since no CEOs in the sample attended high schools in Alaska and Hawaii, these states are not shown.

First, CEOs' parents are well-educated. Figure 2 shows that the median CEO's parents have 12.5 years of education, about 2.5–3.5 years more than adults in the same income group or in the general population, respectively. About one-half of the CEOs' parents attended college (56% of fathers and 43% of mothers), a stark contrast with the fraction of college attendees among adults with the same income (14.4%) or adults in the general population in the same census (12.1%).

Second, CEOs come from well-to-do families with white-collar occupations. About 71% of CEOs' fathers hold white-collar jobs. Figure 3 summarizes professional occupations of CEOs' parents and shows that 35% of CEOs' fathers are managers or business owners. Other frequent professions among CEOs' fathers are sales (9%), engineering (8%), and academia (5%). These occupations put the median CEO father in the top quartile of the national income distribution. Moreover, a sizable fraction (16%) of CEOs grew up in ultrawealthy families with incomes in the top 1% of the national distribution. Figure 4 corroborates this evidence. According to two measures of wealth—home value and combined incomes of both parents—CEOs come from households that are considerably richer than the national average.

Third, CEOs' fathers typically have a higher economic status than CEOs' mothers. The father is the only income earner in the dominant majority of CEOs' families. About 79% of CEOs' mothers are homemakers, as common for



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table 2**
**CEO family characteristics and formative years**

*A. Family characteristics*

| Variable | Mean | 25th percentile | Median | 75th percentile | SD |
|---|---|---|---|---|---|
| **Parents** | | | | | |
| Father education, years | 13.32 | 12.00 | 13.00 | 16.00 | 3.18 |
| Father attended college, indicator | 0.56 | 0.00 | 1.00 | 1.00 | 0.50 |
| Mother education, years | 12.98 | 12.00 | 12.00 | 16.00 | 2.66 |
| Mother attended college, indicator | 0.43 | 0.00 | 0.00 | 1.00 | 0.50 |
| Parents' education imbalance | 0.03 | 0.00 | 0.00 | 0.15 | 0.19 |
| Father white-collar job, indicator | 0.71 | 0.00 | 1.00 | 1.00 | 0.45 |
| Nonworking mother, indicator | 0.79 | 1.00 | 1.00 | 1.00 | 0.41 |
| Mother income, US$(2016) | 40,155 | 23,616 | 35,817 | 51,167 | 25,635 |
| Father income, US$(2016) | 91,545 | 51,167 | 78,719 | 118,078 | 57,575 |
| Parents' income imbalance | 0.54 | 0.29 | 0.55 | 0.83 | 0.47 |
| **Siblings** | | | | | |
| Number of siblings | 3.590 | 2.000 | 3.000 | 4.000 | 2.221 |
| Number of brothers | 1.786 | 1.000 | 1.000 | 2.000 | 1.437 |
| Number of sisters | 1.803 | 1.000 | 1.000 | 2.000 | 1.366 |
| Siblings' gender imbalance | 0.007 | −0.398 | 0.000 | 0.398 | 0.682 |
| **Children** | | | | | |
| Number of children | 2.81 | 2.00 | 3.00 | 3.00 | 1.20 |
| Number of sons | 1.41 | 1.00 | 1.00 | 2.00 | 1.00 |
| Number of daughters | 1.39 | 1.00 | 1.00 | 2.00 | 0.89 |
| Children's gender imbalance | 0.01 | −0.33 | 0.00 | 0.33 | 0.52 |

*B. Education characteristics*

| Variable | Mean | 25th percentile | Median | 75th percentile | SD |
|---|---|---|---|---|---|
| **High school** | | | | | |
| Private indicator | 0.25 | 0.00 | 0.00 | 1.00 | 0.44 |
| All-male indicator | 0.16 | 0.00 | 0.00 | 0.00 | 0.37 |
| Religious indicator | 0.18 | 0.00 | 0.00 | 0.00 | 0.39 |
| **University** | | | | | |
| Private indicator | 0.49 | 0.00 | 0.00 | 1.00 | 0.50 |
| All-male indicator | 0.10 | 0.00 | 0.00 | 0.00 | 0.30 |
| University gender imbalance | 0.65 | 0.56 | 0.63 | 0.72 | 0.16 |

*C. Community characteristics*

| Variable | Mean | 25th percentile | Median | 75th percentile | SD |
|---|---|---|---|---|---|
| Labor force participation rate, males | 0.940 | 0.928 | 0.944 | 0.958 | 0.035 |
| Labor force participation rate, females | 0.419 | 0.360 | 0.413 | 0.452 | 0.106 |
| Labor force participation gender imbalance | 0.522 | 0.469 | 0.538 | 0.595 | 0.114 |
| Income for employed males, US$(2016) | 60,155 | 31,998 | 56,903 | 70,606 | 41,896 |
| Income for employed females, US$(2016) | 29,902 | 18,555 | 28,692 | 32,225 | 20,121 |
| Income gender imbalance | 0.678 | 0.345 | 0.634 | 0.829 | 0.464 |
| Male education, years | 11.31 | 10.59 | 11.37 | 12.13 | 1.33 |
| Female education, years | 11.14 | 10.62 | 11.27 | 11.80 | 1.09 |
| Education gender imbalance | 0.168 | 0.025 | 0.241 | 0.379 | 0.356 |

*D. Gender imbalance indexes*

| Variable | Mean | 25th percentile | Median | 75th percentile | SD |
|---|---|---|---|---|---|
| Family gender imbalance index | 0.506 | 0.373 | 0.599 | 0.620 | 0.179 |
| Education gender imbalance index | 0.503 | 0.340 | 0.487 | 0.644 | 0.203 |
| Community gender imbalance index | 0.501 | 0.408 | 0.503 | 0.583 | 0.134 |
| Gender imbalance index (aggregate) | 0.507 | 0.436 | 0.507 | 0.587 | 0.111 |

This table describes the personal backgrounds of the 587 CEOs in our sample, focusing on their immediate family (panel A), education (panel B), home community (panel C), and exposure to gender imbalances (panel D). Data sources and sample records used in collecting CEOs' personal data appear in the Internet Appendix. In panels A and C, personal incomes are scaled to US$(2016), using the ratio of the median household income in 2016 to the median household income reported in the corresponding census. In panel B, statistics on high schools and colleges are reported for the dates of the CEOs' attendance, using data from the U.S. Department of Education and high school archives. In panel C, community attributes are measured for the county where each CEO went to high school, and the measurement is as of the national census year closest to the year when the CEO reaches age 18. Variable definitions and sample selection criteria appear in Appendixes A and B, respectively.

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

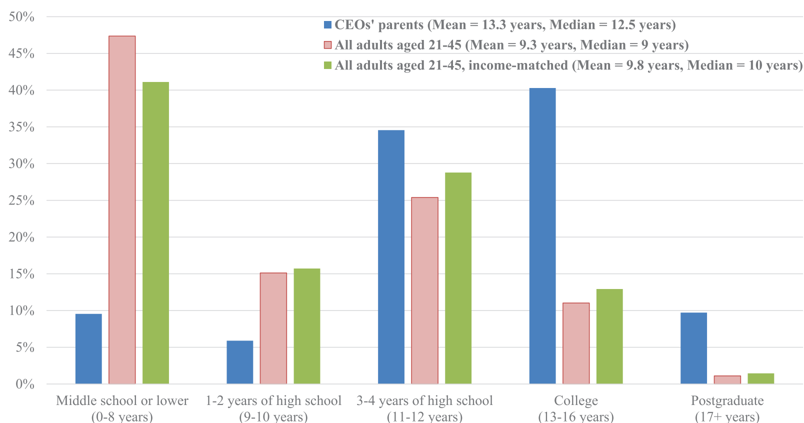



**Figure 2**
**Educational attainment of CEOs’ parents versus the general population**
This figure compares the educational attainment of the CEOs’ parents with two other groups in the general population: (1) adults in the same census between ages 21 and 45 and (2) men and women between ages 21 and 45 whose annual incomes match those of the CEOs’ fathers and mothers, respectively, to the nearest $5. The data come from decennial federal censuses and the Integrated Public Use Microdata Series.

the spouses of males with similar incomes (84%) and significantly more than women nationwide (58%). When CEOs’ mothers hold outside employment, their income is only 45% of their husband’s income, and the most common occupations for working mothers are nonmanagerial positions, such as teachers (27.6%) or secretaries and clerks (21.1%). For the median CEO, the father has one more year of education than the mother, while this difference is close to zero for other couples with similar incomes (0.19 years, untabulated).

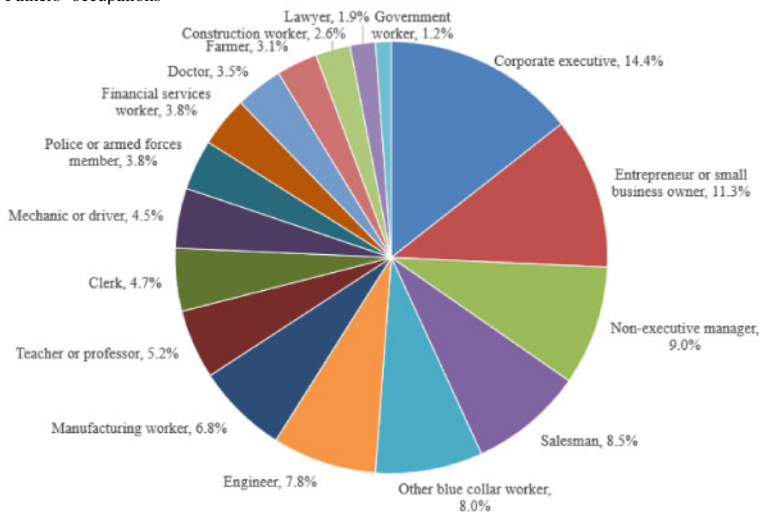
The bottom rows of panel A focus on CEOs’ siblings and children. The median CEO has three siblings and three children. The distribution of CEOs’ children aligns closely with that reported in Cronqvist and Yu (2017). As expected, the fractions of male and female children and siblings are approximately equal.

Panel B in Table 2 focuses on CEOs’ education. Compared with the general population, CEOs are more likely to attend private high schools (25%) and all-male high schools (16%). Similar patterns persist at the college level. Nearly one-half of the CEOs in our sample attend private colleges, and 10% attend colleges restricted to men at the time of attendance.

Panel C in Table 2 describes the neighborhoods where our sample CEOs grew up. As discussed, neighborhood characteristics are measured approximately when a CEO reaches age 18. The data reveal a large difference in the labor force participation rate between male residents (94%) and female residents of working age (42%) in the CEOs’ home communities. For working adults, the average annual income of men (US$(2016) $60,155) is more than twice as large as that of women ($29,902). These statistics suggest that CEOs spend their

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**A** Fathers' occupations




**B** Mothers' occupations

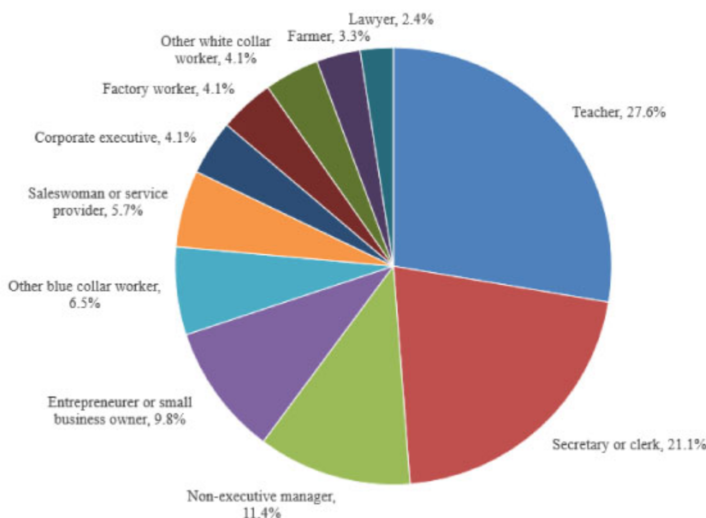



**Figure 3**
**Professional occupations of CEOs' parents**
This figure shows the occupations of CEOs' fathers (panel A) and mothers (panel B). Occupations are provided for mothers working outside the home. The data were obtained from the decennial federal census, state records, obituaries, and other public sources summarized in Section 2.3 and Sections 1 and 2 of the Internet Appendix.

formative years in communities where males are more likely to hold outside employment, and when they do, they earn higher incomes than do their female counterparts.



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

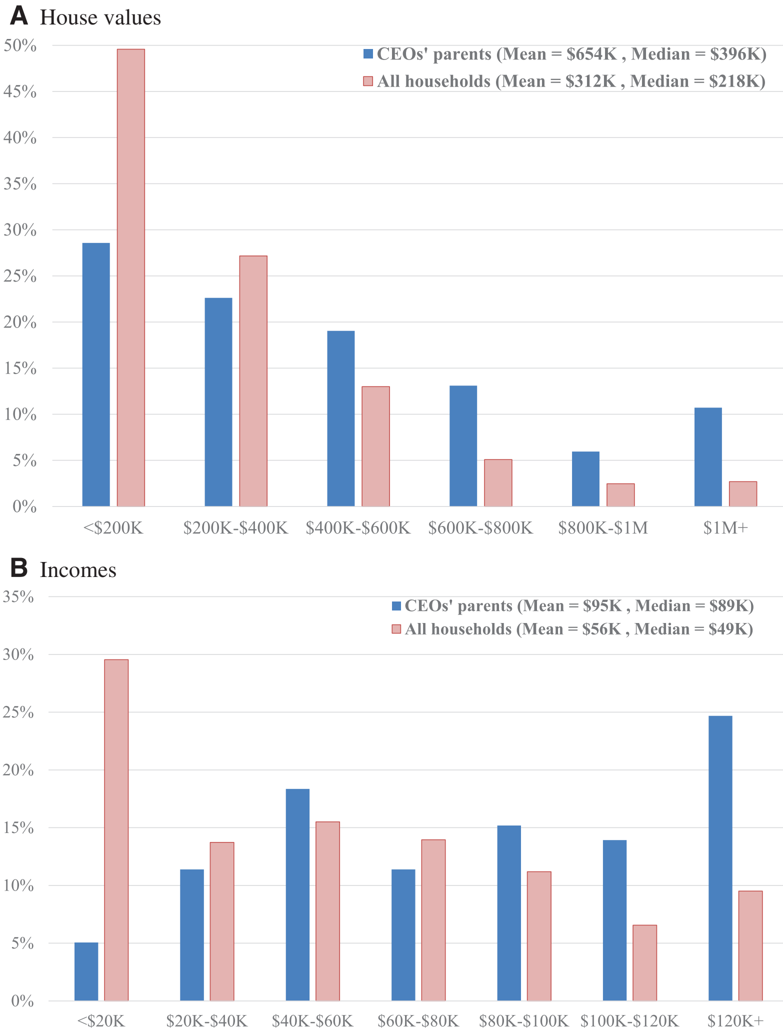



**Figure 4**
**House values and incomes of CEOs' parents versus the general population**
This figure compares the socioeconomic status between the families where CEOs grew up and the general population. Panel A compares the values of houses owned by CEOs' parents with the value of houses owned by adults between ages 21 and 45 in the general population. Panel B compares the annual incomes of the two groups. The data were obtained from the 1940 decennial federal census. House prices are scaled by the ratio of the median December 2016 house sale price reported by Zillow to the median house price in the 1940 census. Incomes are scaled by the ratio of the median household income in 2016 as reported by the Census Bureau to the median household income in the 1940 census.

To capture the overall effect of gender imbalances in CEOs' families, educational institutions, and communities, we construct three indexes and show their moments in panel D of Table 2. Each index is the average within-sample

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

percentile rank of the respective attributes, and it ranges from zero to one. Higher index values indicate early-life exposure to greater gender imbalances. For example, we calculate *Family gender imbalance index* as the average between the percentile rankings of each CEO's *Nonworking mother, Parents' education imbalance, Parents' income imbalance, Children's gender imbalance*, and *Siblings' gender imbalance*. All inputs in the indexes are equally weighted. If one of the index components is missing, the index is computed as an equally weighted average of the available inputs.

In summary, the CEOs in our sample come from white-collar, well-educated families in the top quartile of the national income distribution. In the majority of CEOs' families, the father is the only income earner and the more educated spouse. Our descriptive evidence on the CEOs' family descent and endowed social status extends prior work on CEOs' personal characteristics, such as wealth (Liu and Yermack 2012), personality (Kaplan and Sorensen 2017), and individual traits (Adams, Keloharju, and Knüpfer 2018). Our contribution to this research is to describe the formative years of CEOs and offer systematic evidence on the familial, educational, and environmental factors that shape CEOs' characteristics.

## 4. CEO Characteristics and the Allocation of Capital to Male and Female Managers

This section presents the main results. To motivate our empirical design and identify the correlates of division managers' gender, we first study the distribution of women among division managers across a variety of dimensions, including geographic regions, time periods, firms, industries, and divisions. We then develop an identification strategy that accounts for these patterns in the tests of capital allocation between male and female managers.

### 4.1 Female representation across regions, years, and firms

Panel A of Figure B.1 in Appendix B shows the representation of women among division managers across geographic regions in the United States. The regions are assigned by firms' headquarters. As expected, the fraction of women among division managers is the highest at firms headquartered in the traditionally liberal Northeastern states. In contrast, the fraction of women is the lowest in the more conservative Southwestern states, with the Western and Midwestern states in the middle of this range. These patterns resemble regional variation in female representation in the broader labor force documented in Fogli and Veldkamp (2011).

Panel B of Figure B.1 in Appendix B focuses on the time series. The fraction of female division managers in our sample does not show a clear time trend, fluctuating between 6.9% and 8.2% across the sample years (these differences are not statistically significant at common levels). This pattern is consistent with the evidence in Dezso and Ross (2012) that female representation among

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

top executives at S&P 1500 firms leveled off in the first decade of the new millennium after steadily increasing in the prior decades.

Panel A of Table B.3 in Appendix B studies how the fraction of female division managers is correlated with firm and CEO attributes. Across an array of firm characteristics, the most reliable pattern is that female managers are more prevalent at larger firms (correlation = 0.158), consistent with the findings on female representation in other contexts (Adams and Kirchmaier 2015). Correlations with other firm attributes are small: −0.012 to 0.051. The analysis of CEO attributes reveals that female division managers are more prevalent at firms led by CEOs with graduate degrees (correlation = 0.077) and larger social networks (correlation = 0.193). Correlations with other CEO attributes are below 0.05 in absolute value.

In summary, women are more likely to serve as division managers at larger firms, firms located in the Northeastern states, and firms led by CEOs with graduate degrees and wider networks. These patterns align well with prior evidence on female representation in the broader firm universe.

### 4.2 Female representation across industries, divisions, and managers

Panel C of Figure B.1 in Appendix B shows the distribution of female division managers across industries, defined at the level of divisions. Female managers are more likely to run divisions in healthcare products and nondurable consumer goods, and less likely to run divisions in energy and heavy manufacturing. These patterns are not unique to the conglomerate space. For example, Hebert (2020) shows that the cross-industry variation in female representation persists at startups and small private firms, with healthcare (energy and mining) among the sectors with the largest (smallest) fraction of women in leadership roles.

The top pane in Table B.3, panel B, in Appendix B investigates the attributes of divisions run by female managers, focusing on pairwise correlations. The only statistically significant correlation indicates that female-run divisions obtain less capital (correlation with CapEx = −0.044), even though female-run divisions do not face weaker investment opportunities (positive insignificant correlation with Tobin's q).

The bottom pane of panel B shows how the gender of division managers is associated with their professional characteristics. All pairwise correlations are modest. Female managers are slightly younger (correlation with age= −0.080), more educated (correlation with graduate degrees = 0.037), and more likely to hold external board seats (correlation = 0.209). The difference in board seats is consistent with an external demand for female directors in a recent push for board diversity (see Adams (2016) for a review).

Panel C of Table B.3 in Appendix B refines the comparisons of female division managers with their male peers after accounting for managers' selection into firms and industries (firm and industry fixed effects) and time-series variation in female representation (year fixed effects). We find that male and female division managers working in the same conglomerates are

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

statistically indistinguishable on measures of education, experience, external board seats, social ties, and skill. The only difference significant at 10% (coefficient on $\ln(Age) = -0.035$, $t$-statistic $= 1.83$) indicates that female managers are about a year younger than their male peers. In contrast, the small positive correlations of female gender with education and external board seats disappear after accounting for female managers' selection into industries and firms.

In summary, the fraction of women among division managers varies across industries and firms. After accounting for these patterns, female division managers are statistically indistinguishable from their male peers on all examined characteristics, except being slightly younger. Female-run divisions are similar to male-run divisions across a broad array of fundamentals, but receive less investment capital.

### 4.3 Baseline results: The effect of gender on capital allocation

Table 3 shows baseline tests for the effect of gender on capital allocation. The dependent variable is the ratio of division-level capital expenditure (CapEx) to book assets, expressed as a percentage. The unit of observation is a division-year, and CapEx is the realized capital allocation from Compustat, which does not permit the disaggregation into budgeted amounts and overage. The main variable of interest is the indicator *Female division manager*, which tests for the effect of a division manager's gender on capital allocation beyond the effect of other managerial attributes included as controls. These managerial controls include age, education, tenure with the firm, performance record, external board seats, internal board representation, and social connections to the CEO. Other controls include the attributes of the division, firm, and CEO (listed in Table 3 and defined in Appendix A) that have been shown to affect divisional investment (Rajan, Servaes, and Zingales 2000; Ozbas and Scharfstein 2010). Independent variables are lagged by 1 year. Here and henceforth, standard errors are clustered by firm to allow for time-series correlation in residuals.

In columns 1–4, we sequentially add four groups of fixed effects: (1) calendar year, (2) division's industry, (3) firm, and (4) CEO birth cohort. Calendar year fixed effects account for the time trend in capital availability in the economy and capture temporal variation in the overall female representation among division managers. Industry fixed effects account for the cross-sectional variation in female representation across industries and absorb cross-industry heterogeneity in capital intensity. Firm fixed effects account for selection of female managers into firms and absorb firm attributes that remain constant in our sample period, such as location and industry mix. CEO birth cohort fixed effects account for cross-generational variation in CEOs' investment policies, such as investment conservativism associated with a cohort's exposure to the Great Depression (Malmendier, Tate, and Yan 2011) or military draft (Benmelech and Frydman 2015). Birth cohorts are defined as 5-year bins, and the earliest cohort consists of CEOs born in 1930–1934.



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table 3**
**Allocation of capital between male and female division managers**

| Model | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Female division manager | −0.455** | −0.533*** | −0.668*** | −0.672*** | −0.637*** | −0.611** | −0.599** |
| | [2.072] | [3.434] | [3.866] | [3.778] | [3.651] | [2.318] | [2.286] |
| **Division manager controls** | | | | | | | |
| Age | 0.098 | 0.079 | 0.113 | 0.115 | 0.056 | 0.091 | 0.070 |
| | [1.049] | [0.026] | [1.004] | [1.005] | [0.999] | [1.572] | [1.530] |
| Graduate degree | 0.085 | 0.079 | 0.238 | 0.235 | 0.239 | 0.076 | −0.008 |
| | [0.045] | [0.174] | [0.708] | [0.753] | [0.691] | [0.186] | [0.157] |
| Tenure | 0.465*** | 0.371* | 0.219 | 0.215 | 0.286 | 0.158 | 0.075 |
| | [2.627] | [1.873] | [0.617] | [0.694] | [0.656] | [0.446] | [0.512] |
| Performance record | 0.371** | 0.211* | 0.415** | 0.415** | 0.517** | 0.139* | 0.136* |
| | [2.228] | [1.741] | [2.046] | [2.122] | [2.035] | [1.864] | [1.956] |
| Social connections to CEO | 0.898*** | 1.233*** | 1.131*** | 1.124*** | 1.206*** | 0.855** | 0.925** |
| | [3.066] | [2.750] | [2.848] | [2.816] | [2.790] | [2.473] | [2.494] |
| Board member | 0.368 | 0.152 | 0.067 | 0.062 | 0.022 | 0.043 | 0.058 |
| | [1.157] | [0.631] | [0.059] | [0.034] | [0.056] | [0.716] | [0.782] |
| External board seats | −0.287 | −0.309 | −0.639* | −0.639* | −0.581* | −0.181 | −0.090 |
| | [0.983] | [0.710] | [1.680] | [1.727] | [1.807] | [1.537] | [1.565] |
| **Division controls** | | | | | | | |
| Industry Tobin's q | 0.616*** | 0.618*** | 0.652*** | 0.656*** | 0.457*** | 0.408** | 0.362** |
| | [3.860] | [3.980] | [3.141] | [3.199] | [3.204] | [2.352] | [2.295] |
| Operating ROA | 4.207*** | 4.041*** | 2.505*** | 2.510*** | 2.684*** | 3.593*** | 3.549*** |
| | [7.131] | [7.380] | [4.226] | [4.123] | [4.189] | [4.609] | [4.640] |
| Size (log(assets)) | −0.096* | −0.199*** | −0.161 | −0.164 | −0.221 | −0.142 | −0.122 |
| | [1.670] | [4.446] | [1.465] | [1.511] | [1.569] | [1.762] | [1.507] |
| Core division | 0.307 | 0.113 | −0.070 | −0.066 | −0.035 | −0.035 | 0.008 |
| | [1.515] | [0.105] | [0.673] | [0.603] | [0.612] | [1.114] | [1.002] |
| **Firm controls** | | | | | | | |
| Earnings per share (EPS) | 0.087*** | 0.112*** | 0.140** | 0.137** | 0.104** | 0.275* | 0.244* |
| | [2.926] | [2.581] | [2.466] | [2.412] | [2.472] | [1.903] | [1.847] |
| Return on assets (ROA) | −1.208 | −1.478 | −2.028 | −2.022 | −2.190 | 0.394 | 0.358 |
| | [0.784] | [1.053] | [1.356] | [1.266] | [1.230] | [0.722] | [0.612] |
| Size (log(assets)) | −0.103 | −0.216** | −0.677* | −0.680* | −0.729* | 0.183 | 0.228 |
| | [1.118] | [2.223] | [1.808] | [1.782] | [1.694] | [1.296] | [1.393] |
| Number of divisions | −0.171** | −0.220** | −0.095 | −0.097 | −0.255 | 0.064 | 0.041 |
| | [2.375] | [2.279] | [0.558] | [0.523] | [0.481] | [0.796] | [0.914] |
| Tobin's q | 0.666*** | 0.807*** | 0.923*** | 0.921*** | 0.752*** | 0.665** | 0.669** |
| | [5.295] | [5.556] | [4.021] | [4.137] | [4.151] | [2.338] | [2.451] |
| **CEO controls** | | | | | | | |
| Graduate degree | −0.444* | −0.171 | 0.324 | 0.323 | 0.207 | −0.776 | −0.746 |
| | [1.916] | [1.169] | [0.794] | [0.786] | [0.752] | [0.184] | [0.168] |
| Tenure with the firm | 0.829*** | 0.668*** | 0.105 | 0.106 | 0.119 | 0.083 | 0.037 |
| | [7.766] | [6.984] | [1.109] | [1.081] | [1.143] | [0.674] | [0.575] |
| External board seats | −0.231** | −0.106 | 0.119 | 0.116 | 0.068 | 0.168 | 0.125 |
| | [2.446] | [1.619] | [0.027] | [0.021] | [0.081] | [1.429] | [1.486] |
| log(network size) | 0.224 | 0.170* | 0.483*** | 0.476*** | 0.326** | 0.031 | 0.044 |
| | [1.638] | [1.649] | [2.659] | [2.645] | [2.566] | [1.085] | [1.160] |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | No | Yes | Yes | Yes | Yes | No | No |
| Firm fixed effects | No | No | Yes | Yes | Yes | No | No |
| CEO birth cohort fixed effects | No | No | No | Yes | No | Yes | No |
| CEO fixed effects | No | No | No | No | Yes | No | Yes |
| Division fixed effects | No | No | No | No | No | Yes | Yes |
| $R^2$ | .058 | .283 | .554 | .579 | .614 | .652 | .682 |
| No._obs. | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 |

This table studies the allocation of investment capital between male and female division managers. The dependent variable is the ratio of the division-level capital expenditure to book assets, expressed as a percentage. All independent variables are measured at the beginning of the year for which the capital budget is determined and are therefore lagged by 1 year relative to the dependent variable. The sample consists of industrial conglomerates in the S&P 1500 index with available data on capital expenditures, book assets, division managers, and CEO backgrounds. The sample period is from 2000 to 2008. Variable definitions and sample selection criteria appear in Appendixes A and B, respectively. All the regressions include year fixed effects and alternate with respect to other fixed effects. The $t$-statistics (in brackets) are based on standard errors that are heteroscedasticity consistent and clustered at the firm level. Significance levels are shown as follows: * = 10%, ** = 5%, *** = 1%.



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

Columns 1–4 show that female division managers obtain less capital, as indicated by the negative and statistically significant coefficients on the indicator *Female division manager*. This conclusion holds robustly and with comparable magnitudes as the model is augmented with fixed effects. According to column 4, which includes all of the above fixed effects, female managers obtain 67 basis points (bps) less in annual capital than their male peers at the same firm. Given the average annual investment for a division of 5.1% of book assets (or \$147.2 million), this difference amounts to 13.1% of investment funds or \$19.3 million per year. This result is reliably significant at 1% ($t$-statistic = 3.78).

In columns 5–7 we further restrict the specification by absorbing time-invariant heterogeneity across CEOs and divisions, in addition to controlling for their time-varying characteristics. With the joint inclusion of CEO and division fixed effects, we test whether capital allocations differ between male and female managers with similar characteristics working at the same divisions of the same firm under the same CEO. The addition of division fixed effects absorbs industry and firm fixed effects, while the addition of CEO fixed effects replaces the fixed effects for CEO birth cohorts.

Columns 5–7, show that the gender effect in capital allocation is robust to using within-CEO and within-division variation in investment allocations. With the addition of CEO and division fixed effects, the coefficients on the indicator *Female division manager* remain persistently negative, statistically significant ($t$-statistics = 2.29 to 3.65), and economically important. According to column 7, which includes year, division, and CEO fixed effects, the same CEO allocates 60 bps less in capital funds to a division when it is managed by a woman rather than a man with similar professional characteristics. For the average division, this difference amounts to 11.8% of investment funds or \$17.3 million per year.

The results from control variables confirm that division managers' characteristics play an important role in capital allocation, consistent with survey evidence in Graham, Harvey, and Puri (2015). CEOs allocate more capital to managers with longer tenures and stronger performance records (manager's trailing operating ROA), confirming prior evidence on the importance of these indicators (Cichello et al. 2009). Also, CEOs provide more capital to managers with whom they share social ties, as previously shown in the United States (Duchin and Sosyura 2013) and abroad (Glaser, Lopez-de-Silanes, and Sautner 2013).

Finally, the evidence from firm and division control variables yields expected outcomes. Profitable firms with higher valuations tend to invest more, and a larger fraction of these funds goes to divisions with high trailing performance (operating ROA) and better investment opportunities (industry Tobin's q).

In summary, female division managers obtain less investment capital than their observably similar male counterparts across a variety of comparison benchmarks. This pattern holds when we compare managers working in the same firm, leading the same division, and reporting to the same CEO.



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

### 4.4 CEO characteristics and gender effects in capital budgeting

Table 4 studies the relation between CEOs' formative experiences and capital allocations to male and female division managers. The dependent variable is the ratio of division-level CapEx to book assets, expressed as a percentage. Panel A focuses on CEOs' early-life exposure to gender imbalances in the family (columns 1–5), school (columns 6 and 7), and community (columns 8–10). The variable of interest is the interaction term of gender-related CEOs' experiences and the indicator *Female division manager*. All regressions include the same controls for the attributes of the division manager, division, CEO, and firm, as in Table 3, as well as fixed effects for the year, division's industry, firm, and CEO cohort. In Sections 4.6–4.7, we also introduce alternative sets of fixed effects and their high-dimensional combinations.

Panel A shows that female division managers obtain less capital in firms run by CEOs with early-life exposure to gender imbalances. The coefficients on the interaction terms between these measures and the indicator *Female division manager* are negative across all specifications and statistically significant in 8 of the 10 columns. The effects of formative experiences are economically important. For example, the point estimate on the main interaction term in column 1 (coefficient $=-0.269$) indicates that CEOs brought up in families with a stay-at-home mother allocate 27 bps less in annual CapEx to female division managers than to their observationally similar male peers at the same firm. This estimate amounts to a reduction of 5.3% in annual CapEx. This result is consistent with prior evidence on the economically large effect of a stay-at-home mother on the development of gender norms. For example, in a survey of gender attitudes in a representative U.S. sample, Farre and Vella (2013, p. 225) identify the mother's employment status as one of the strongest predictors of gender norms, noting that "the difference between the attitudes of children with and without a working mother is similar to that for children born to the most and the least traditional individual in the sample." Among other factors, we find that the gender composition of a CEO's children has a stronger influence (coefficient $=-0.375$, $t$-statistic $=2.03$) than that of his siblings (coefficient $=-0.115$, $t$-statistic $=1.52$).[5] This result parallels prior evidence that an agent's children have a powerful effect on his gender-related decisions (Washington 2008; Gompers and Wang 2017).

Panel B in Table 4 shows the joint effect of formative experiences, focusing on the aggregate gender imbalance indexes from the CEO's family (columns 1 and 2), school (columns 3 and 4), and community (columns 5 and 6). Each index is computed as the average within-sample percentile rank of the respective attributes and ranges from zero to one, where higher values indicate exposure to gender imbalances. The even- and odd-numbered columns report regression estimates from specifications with and without firm fixed effects, respectively.

[5] In untabulated tests, we find that the point estimates on the interaction terms in columns 4 and 5 are statistically distinct at 10%.

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table 4**
**CEO background and capital allocations to female managers**

*A. Individual measures of gender imbalance*

| Background | Family | | | | | Education | | Community | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Measure of CEO gender imbalance | Non-working mother | Parents' education imbalance | Parents' income imbalance | Siblings' gender imbalance | Children's gender imbalance | All-male high school | University gender imbalance | Labor force participation gender imbalance | Income gender imbalance | Education gender imbalance |
| Model | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Female division manager | −0.276 | −0.381** | −0.370** | −0.385* | −0.185 | −0.317** | −0.514** | −0.499** | −0.209 | −0.566** |
| | [1.064] | [2.508] | [2.308] | [1.809] | [1.407] | [2.254] | [2.309] | [2.521] | [1.161] | [2.112] |
| CEO gender imbalance | 0.293* | 0.260** | 0.284* | 0.474** | 0.383* | 0.189** | 0.395* | 0.083** | 0.234** | 0.162** |
| | [1.819] | [2.566] | [1.877] | [2.336] | [1.880] | [2.257] | [1.722] | [2.223] | [2.441] | [2.261] |
| Female division manager x CEO gender imbalance | −0.269** | −0.236* | −0.187** | −0.115 | −0.375** | −0.506** | −0.261 | −0.112* | −0.195** | −0.185** |
| | [2.036] | [1.867] | [2.064] | [1.515] | [2.025] | [2.380] | [1.247] | [1.650] | [1.988] | [2.127] |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| CEO birth cohort fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | .587 | .583 | .627 | .618 | .589 | .585 | .582 | .581 | .586 | .584 |
| No. obs. | 3,904 | 3,904 | 980 | 1,125 | 1,619 | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 |

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table 4**
**Continued**

*B. Pooled indexes of gender imbalance*

| Model | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Female division manager | −0.220** | −0.303* | −0.235** | −0.283** | −0.359** | −0.373** | −0.255 | −0.270 |
| | [2.050] | [1.875] | [2.050] | [2.020] | [2.401] | [2.271] | [1.326] | [1.033] |
| CEO family index | 0.406** | 0.393*** | | | | | 0.311** | 0.368** |
| | [2.260] | [2.586] | | | | | [2.574] | [2.418] |
| Female division manager x | −0.632** | −0.477** | | | | | −0.373** | −0.437** |
| CEO family index | [2.357] | [2.156] | | | | | [2.307] | [2.226] |
| CEO education index | | | 0.419** | 0.404** | | | 0.289** | 0.264* |
| | | | [2.275] | [2.519] | | | [2.017] | [1.903] |
| Female division manager x | | | −0.740** | −0.468** | | | −0.361** | −0.531*** |
| CEO education index | | | [2.560] | [2.346] | | | [2.358] | [2.724] |
| CEO community index | | | | | 0.364* | 0.388** | 0.226 | 0.218 |
| | | | | | [1.927] | [2.050] | [1.363] | [1.443] |
| Female division manager x | | | | | −0.509* | −0.533* | −0.234 | −0.168 |
| CEO community index | | | | | [1.818] | [1.813] | [1.524] | [1.507] |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm fixed effects | No | Yes | No | Yes | No | Yes | No | Yes |
| CEO birth cohort fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | .343 | .592 | .337 | .587 | .334 | .586 | .346 | .592 |
| No. Obs. | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 |

This table studies how CEO characteristics affect the allocation of capital between male and female division managers. The dependent variable is the ratio of the division-level capital expenditure to book assets, expressed as a percentage. The sample consists of industrial conglomerates in the S&P 1500 index with available data on capital expenditures, book assets, division managers, and CEO backgrounds. The sample period is from 2000 to 2008. Variable definitions and sample selection criteria appear in Appendixes A and B, respectively. Control variables include the same characteristics of the firm, division, CEO, and division manager used in Table 3. All independent variables are measured at the beginning of the year for which the capital budget is determined and are therefore lagged by 1 year relative to the dependent variable. In panel A, all regressions include year, industry, firm, and CEO birth cohort fixed effects. In panel B, all regressions include year, industry, and CEO birth cohort fixed effects and alternate with respect to firm fixed effects. The $t$-statistics (in brackets) are based on standard errors that are heteroscedasticity consistent and clustered at the firm level. Significance levels are indicated as follows: * = 10%, ** = 5%, *** = 1%.



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

Columns 1–6 in panel B show that the interaction term *Female division manager * CEO index* is negative and statistically significant across all three indexes. The results suggest that female division managers obtain less capital at firms run by CEOs who spent their formative years in environments linked to less egalitarian gender attitudes. As an illustration of the economic magnitudes, consider a change of 0.5 (50 percentiles) in the community index, equivalent to a move from a county in the 25th percentile rank to the 75th percentile rank according to the gender gap in labor force participation, income, and education for working adults. According to the point estimate in column 5 on the term *Female division manager * CEO community index* (coefficient $=-0.509$), CEOs brought up in communities with more gender inequality (75th percentile) allocate 25 bps less in CapEx ($-0.509*0.5=-0.25$) to female managers than to their male peers, relative to CEOs who grew up in communities with less gender inequality (25th percentile).

Columns 7 and 8 include all indexes jointly in the same regression. In these specifications, the effect of family and education characteristics remains reliably negative and statistically significant. With the joint inclusion of all gender-related formative experiences, most of the economic magnitude of the gender gap identified in Table 3 is explained by the interaction terms of formative experiences with the female manager indicator. Further, the point estimate on the indicator *Female division manager* shrinks and becomes statistically indistinguishable from zero ($t$-statistic $=1.03$). This result suggests that the gender gap in capital budgets mostly disappears at firms run by CEOs with comprehensive exposure to gender equity.

Columns 7 and 8 also speak to the relative importance of the family, community, and education characteristics. In particular, the joint inclusion of family and education characteristics drives out the effect of community attributes. In columns 7 and 8, the point estimates on the interaction term of the community index with the female manager indicator remain negative, but become small and statistically insignificant. This suggests that community norms are captured by the gender norms in the family and local schools.

Finally, Table 4 also highlights another important aspect of investment policies for CEOs with male-dominated backgrounds, namely, larger annual CapEx. This can be seen by the positive and significant coefficients on the terms *CEO gender imbalance* in panel A and CEO indexes in panel B. This result aligns well with prior evidence that early-life exposure to masculinist gender norms is associated with more active and competitive economic behaviors. Gneezy, Leonard, and List (2009) find that men raised in a male-dominated, patriarchal environment behave more competitively. Using natural experiments, Baranov, De Haas, and Grosjean (2018) and Grosjean and Khattar (2019) show that exposure to male-dominated environments causes more aggressive economic and social behaviors, which persist in the long run. In our setting, a more active investment policy is consistent with a manifestation of traditional masculinity norms and what the management literature labels a "macho"

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

management style (Rutherford 2001). Overall, our evidence suggests that a CEO's early-life exposure to gender inequity is associated with a more masculinist management style, as reflected in total investment and its allocation across managers.

In summary, the gap in capital allocations between male and female managers is strongly related to the CEO's early-life exposure to gender imbalances in the family, community, and school. The joint effect of these factors explains most of the economic gap in capital allocations.

### 4.5 External validity

This section examines the external validity of our proxies for CEOs' gender attitudes constructed from formative years. First, we study how our proxies are correlated with external, out-of-sample assessments of CEOs' gender policies. Second, we investigate how the effect of our measures differs between young and old CEOs, thus exploiting cross-generational variation in CEOs' exposure to societal gender norms.

Panel A in Table 5 shows correlations between CEOs' formative experiences and independent assessments of CEOs' gender policies by the research firm KLD Research & Analytics (henceforth, KLD). The annual assessment scores by KLD are based on the analysis of corporate policies, employee interviews, and pending litigation. Prior work shows that KLD scores provide informative signals about CEO policies on employee relations, diversity, and social responsibility (Chatterji, Levine, and Toffel 2009; Cheng, I., H. Hong, and K. Shue 2016) and capture CEOs' liberal or conservative attitudes (Di Giuli and Kostovetsky 2014).

We focus on three categories of KLD scores that characterize the CEO's gender issues: (1) promotion of women and minorities, (2) work-life benefits, and (3) women and minority contracting. The first category evaluates promotion opportunities for women in positions with profit-and-loss responsibilities. The second category examines the CEO's policies in accommodating working mothers in terms of the provision of childcare and family benefits. The third category examines the allocation of a firm's purchasing contracts to businesses owned or operated by women and minorities.

Panel A in Table 5 shows that CEOs' exposure to gender imbalances during formative years is strongly correlated with their policies on gender issues in the firm. This relation is particularly strong for CEOs' family and community characteristics. In particular, the CEOs' family and community imbalance indexes are reliably negatively correlated (significant at least at 5%) with KLD assessment scores on all of the three categories of women-friendly policies: promotion, work-life benefits, and contracting. In other words, CEOs with exposure to gender imbalances in their family and community are significantly less likely to adopt women-friendly policies inside the firm. A directionally similar, but statistically weaker effect, arises for CEOs' exposure to gender imbalances at school (columns 2, 5, and 8).

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table 5**
**External validity**

*A. CEO background and firm polices toward women*

| Dependent variable | Promotion of women and minorities | | | Outstanding work-life benefits | | | Women & minority contracting | | |
|---|---|---|---|---|---|---|---|---|---|
| CEO imbalance index | Family | Education | Community | Family | Education | Community | Family | Education | Community |
| Model | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| CEO imbalance index | −0.375*** | −0.087 | −0.100** | −0.317** | −0.143 | −0.151** | −0.210** | −0.150* | −0.076** |
| | [2.840] | [1.029] | [2.167] | [2.496] | [1.173] | [2.157] | [2.053] | [1.749] | [2.422] |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| CEO birth cohort fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | .223 | .226 | .229 | .194 | .178 | .180 | .144 | .158 | .146 |
| No. obs. | 1,186 | 1,186 | 1,186 | 1,186 | 1,186 | 1,186 | 1,186 | 1,186 | 1,186 |



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table 5**
**Continued**

*B. CEO birth cohort*

| Model | (1) | (2) | (3) |
|---|---|---|---|
| Female division manager x CEO family index | −0.374** | | |
| | [2.027] | | |
| Female division manager x CEO family index x CEO early birth cohort | −0.105* | | |
| | [1.951] | | |
| Female division manager x CEO education index | | −0.283** | |
| | | [2.196] | |
| Female division manager x CEO education index x CEO early birth cohort | | −0.134* | |
| | | [1.919] | |
| Female division manager x CEO community index | | | −0.391 |
| | | | [1.327] |
| Female division manager x CEO community index x CEO early birth cohort | | | −0.117 |
| | | | [1.141] |
| Controls | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes |
| CEO birth cohort fixed effects | Yes | Yes | Yes |
| $R^2$ | .594 | .590 | .588 |
| No. obs. | 3,904 | 3,904 | 3,904 |

This tables tests the external validity of our proxies for CEOs' gender attitudes. Panel A shows correlations between CEOs' exposure to gender imbalances during formative years and external assessments of their firms' policies toward women. The dependent variable is an external audit score for one of the firm's policies toward women: promotion, work-life benefits, and contracting. The audit scores are from the research firm KLD Research & Analytics. Panel B studies how the relation between CEOs' formative experiences and capital allocations to male and female managers varies with the CEO's birth cohort. The dependent variable is the ratio of division-level capital expenditure to book assets, expressed as a percentage. The regression models enrich the baseline specification (Table 4, panel B) with the variable *CEO early birth cohort* and its interaction terms. *CEO early birth cohort* is a binary indicator that equals one if the CEO's birth cohort is earlier than the sample median cohort (1950–1954). The CEO's birth cohort is computed based on the birth year reported in Lexis Nexis Public Records. The CEO's birth cohort is defined as a 5-year period according to the year of birth, where the earliest cohort in the sample spans 1930–1934, and the latest cohort spans 1969–1974. For brevity, Panel B reports only the coefficients on the main variables of interest: the double interaction terms *Female division manager* x *CEO index* and the triple interaction terms *Female division manager* x *CEO index* x *CEO early birth cohort.* Unreported coefficients include *CEO imbalance indexes*, *Female division manager*, and *CEO birth cohort fixed effects* and the double interaction terms *CEO index x CEO early birth cohort* and *Female division manager x CEO early birth cohort*. In both panels, control variables include the characteristics of the firm, division, division manager, and CEO listed in Table 3. Variable definitions appear in Appendix A. The $t$-statistics (in brackets) are based on standard errors that are heteroscedasticity consistent and clustered at the firm level. Significance levels are indicated as follows: * = 10%, ** = 5%, *** = 1%.



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

As another validity check, we study how the relation between CEOs' formative experiences and capital allocations varies with CEO age. If our measures capture CEOs' gender attitudes, their effect should be stronger for older CEOs who grew up in the periods of greater gender inequality. This prediction is grounded in prior evidence that older birth cohorts in the United States hold more conservative gender views (Cichy, Lefkowitz, and Fingerman 2007). Recent work shows that these findings extend to CEOs. Newton and Simutin (2014) find that older male CEOs award smaller pay to female managers than do younger CEOs. Loughran and McDonald (2015) show that CEOs at older firms use male-centered language and attribute these effects to their cultural perceptions developed during periods of gender inequality.

Panel B in Table 5 studies how the relation between a CEO's formative experiences and capital allocations varies between old-generation CEOs and their younger counterparts. We introduce a binary indicator *CEO early birth cohort*, which is equal to one if the CEO's birth cohort is earlier than the sample median (i.e., if the CEO was born before 1950). This indicator is time invariant for each CEO, and it is based on the CEO's birth year from LNPR and state birth records. The dependent variable is the capital allocation to a division (as a percentage), and the main variable of interest is the triple interaction term *Female division manager * CEO index * CEO early birth cohort*. Here and henceforth, in specifications with triple interactions, we report the main interaction terms of interest: the double interaction terms *Female division manager * CEO early birth cohort* and the triple interaction terms *Female division manager * CEO index * CEO early birth cohort*. The unreported variables and interaction terms are listed in the table legends.

The results show that the relation between CEOs' gender attitudes and capital allocations is significantly stronger for CEOs from earlier birth cohorts. This amplifying effect is directionally consistent across all measures of CEOs' formative experiences and statistically significant at 10% for the familial factors ($t$-statistic $=1.95$) and educational factors ($t$-statistic $=1.92$). According to column 1, the effect of the CEO's familial factors on capital allocations is about 30% stronger for CEOs born before 1950 than for CEOs born in later cohorts. This estimate is derived by comparing the coefficients on the interaction terms *Female division manager * CEO family index* (coefficient $=-0.374$) and *Female division manager * CEO family index * CEO early birth cohort* (coefficient $=-0.105$). Overall, the results indicate that the gender gap in capital budgeting is related to an observable CEO attribute in a way consistent with prior research.

In summary, CEOs' early-life exposure to gender imbalances is strongly correlated with independent assessments of CEO policies in promoting female managers and allocating resources to female contractors. The effect of formative experiences is stronger for CEOs born before 1950, consistent with prior evidence on variation in gender attitudes between older and younger U.S. executives.



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

### 4.6 Omitted CEO characteristics and CEO-firm matching

We alert the reader to two sources of endogeneity in the relation between CEOs' attitudes and firm policies: (1) simultaneity (reverse causality) and (2) omitted variables, including the matching of CEOs to firms.

Simultaneity refers to the possibility that corporate policies affect CEOs' gender attitudes. Our research design shuts down this channel by using early-life experiences as a source of variation in CEOs' gender attitudes. Since these experiences long predate CEOs' professional tenures, our identification exploits the component of CEOs' backgrounds free from the influence of corporate policies.

Omitted variables may arise because a missing variable could drive the gender gap in capital allocations, while being correlated with CEOs' attributes. For example, suppose that firms located in more conservative states have less female-friendly policies, and CEOs with conservative gender attitudes are more likely to join firms located in conservative states. This possibility is consistent with the evidence in Yonker (2017b) that CEOs are more likely to join firms near their state of origin. In this case, the correlation between CEOs' gender attitudes and the gender gap in capital allocations would be explained by the matching of CEOs to firms based on an omitted firm attribute, such as geographic location.

Column 1 in Table 6 presents the results of panel regressions explaining division-level capital expenditure, which include fixed effects for the year, industry, firm, and CEO birth cohort. Because this specification relies on within-firm variation, the results indicate that the relation between CEOs' backgrounds and firm capital allocation policies cannot be explained by any firm characteristics that remain unchanged during our sample period, such as location, industry, complexity, or diversification.

Column 2 adds CEO fixed effects, which account for time-invariant differences across CEOs, such as innate ability, endowed wealth, or risk aversion. With the inclusion of CEO fixed effects, the term *CEO gender imbalance index* (an aggregate index across all family, education, and community measures of gender inequity) is absorbed. The results show that CEOs' exposure to gender imbalances continues to be strongly associated with the gender gap in capital allocations, as shown by the negative coefficient (significant at 5%) on the interaction term *CEO gender imbalance index* * *Female division manager*. Relative to column 1, the coefficient on the indicator *Female division manager* drops from −0.296 to −0.162, suggesting that unobservable CEO attributes explain an additional 45% of the remaining gender gap.

Column 3 replaces industry and firm fixed effects with the more granular division fixed effects, thus capturing time-invariant division attributes in addition to the dynamic division controls. After accounting for cross-division heterogeneity, our main results persist, as shown by the negative and significant term *Female division manager* * *CEO gender imbalance index*. This specification also validates our prior evidence that CEOs with male-dominated backgrounds tend to have a more aggressive investment style, as indicated by

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table 6**
**Unobservable managerial characteristics and the matching of CEOs to firms and managers to divisions**

| Model | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| Female division manager | −0.296* | −0.162* | −0.147* | −0.143* | −0.118* | −0.071 | | | |
| | [1.908] | [1.718] | [1.768] | [1.780] | [1.702] | [1.614] | | | |
| CEO gender imbalance index | 0.398** | | 0.335** | | | | | | |
| | [2.515] | | [2.407] | | | | | | |
| Female division manager x CEO gender imbalance index | −0.481** | −0.338** | −0.356** | −0.341** | −0.312** | −0.259** | −0.236** | −0.236** | −0.194* |
| | [2.089] | [2.041] | [2.242] | [2.206] | [2.025] | [2.128] | [2.105] | [2.099] | [1.851] |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Fixed effects | Year, Industry, Firm, CEO cohort | Year, Industry, Firm, CEO | Year, Division, CEO cohort | Year, Division, CEO | Year, Industry, CEO x firm | Year, Division, CEO x firm | Year, Division, DM, CEO | Year, Division, DM, CEO x firm | Year, Division x DM, CEO x firm |
| $R^2$ | .597 | .611 | .643 | .658 | .619 | .665 | .711 | .718 | .790 |
| No. obs. | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 |

This table studies the robustness of our main results to unobservable characteristics of CEOs and division managers and their matches to firms and divisions, respectively. The dependent variable is the ratio of the division-level capital expenditure to book assets, expressed as a percentage. *CEO gender imbalance index* aggregates each CEO's early-life exposure to gender imbalances in the family, school, and community by calculating the arithmetic average of three indexes: *Family gender imbalance index, Education gender imbalance index,* and *Community gender imbalance index*. The sample consists of industrial conglomerates in the S&P 1500 index with available data on capital expenditures, book assets, division managers, and CEO backgrounds. The sample period is from 2000 to 2008. Variable definitions and sample selection criteria appear in Appendixes A and B, respectively. Control variables include the same characteristics of the firm, division, CEO, and division manager used in Table 3. All independent variables are measured at the beginning of the year for which the capital budget is determined and are therefore lagged by 1 year relative to the dependent variable. All the regressions include year fixed effects and alternate with respect to other fixed effects. Fixed effects for the CEO birth cohort (columns 1 and 3) and division managers (columns 7–9) are denoted by *CEO cohort* and *DM*, respectively. The $t$-statistics (in brackets) are based on standard errors that are heteroscedasticity consistent and clustered at the firm level. Significance levels are indicated as follows: * = 10%, ** = 5%, *** = 1%.

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

the positive and significant coefficient on the term *CEO gender imbalance index*.

Column 4 jointly includes CEO, division, and year fixed effects. The results indicate that female managers working in the same division at the same firm obtain less capital from the same CEO if such a CEO comes from a more conservative background. This result is captured by the negative interaction term *Female division manager * CEO gender imbalance index*, significant at 5% ($t$-statistic =2.21).

Columns 5 and 6 replace CEO fixed effects with CEO * firm fixed effects. In these columns, the estimates are derived from the variation in capital allocations within CEO-firm pairs. By holding constant the CEO-firm pairs, this specification accounts for the matching between CEOs and firms. The coefficients on the interaction term *Female division manager * CEO gender imbalance index* are negative, significant at 5%, and retain most of their economic magnitudes. Moreover, after capturing time-invariant division and CEO attributes in addition to their dynamic controls, and after accounting for CEO-firm matching, the point estimate on the indicator *Female division manager* shrinks to −0.071 (compared with −0.296 in column 1) and becomes statistically indistinguishable from zero. This indicates that our sequential decomposition of the sources of variation explains nearly all of the economic magnitude of the gender gap.

In summary, our conclusions are robust to absorbing time-invariant CEO attributes that could be correlated with formative experiences. Our results also hold after accounting for the matching between CEOs and firms. This evidence raises a high bar for a possible omitted variable and appears most consistent with prior findings that CEOs' attributes influence firm policies (e.g., Bennedsen et al. 2007; Malmendier and Tate 2008; Cronqvist, Makhija, and Yonker 2012; Jenter and Lewellen 2015; Dai et al. 2020).

### 4.7 Omitted division manager characteristics and manager-division matching

While male and female division managers appear similar on observable attributes, they may vary on unobservables relevant for investment, such as leadership or risk aversion, and such characteristics could also drive the matching between managers and divisions. This section tests the robustness to these issues.

Column 7 in Table 6 adds division manager (DM) fixed effects, while also including fixed effects for the CEO, division, and year. Manager fixed effects capture time-invariant managerial differences that could be correlated with gender, such as innate ability, competitiveness, leadership, or risk aversion. These fixed effects absorb the term *Female division manager*. The interaction term *Female division manager * CEO gender imbalance index* remains negative and significant at 5%. After adding division manager fixed effects, the adjusted $R$-squared rises from 65.8% to 71.1% in otherwise equivalent specifications



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

(columns 4 to 7, respectively), suggesting that unobservable differences across managers explain an additional 5.3% of the variation in capital allocations over and above the effect of managers' gender, age, experience, education, social connections, and other personal characteristics included as control variables.

Column 8 further restricts the specification in column 7 by augmenting fixed effects for division managers, divisions, and years with CEO * firm fixed effects. The main results remain significant at 5% even in this restrictive specification. Since division manager fixed effects capture unobservable cross-manager heterogeneity, and CEO * firm fixed effects account for the endogenous matching between CEOs and firms, the relation between CEOs' formative experiences and capital allocations is unlikely to be fully explained by statistical discrimination, a theory that the differential treatment of male and female agents is driven by the characteristics correlated with gender and relevant for outcomes (Phelps 1972; Arrow 1973).

Column 9 replaces division manager and division fixed effects with division manager * division fixed effects. By locking in the manager-division pairs, this specification accounts for the matching between managers and divisions. The results show that CEOs with early-life exposure to gender inequity allocate less capital to female managers. The coefficient on the interaction term *CEO imbalance index * Female division manager* is negative and statistically significant at 10% ($t$-statistic $=1.85$). The point estimate on the interaction term (coefficient $=-0.194$ in column 9) represents about 60% of the point estimate on this interaction term in the specification without manager or division fixed effects (coefficient $=-0.338$ in column 2). Thus, the relation between CEO backgrounds and capital allocations remains economically important after accounting for the matching between managers and divisions.

In summary, our main conclusions are robust to controlling for time-invariant unobservable characteristics of division managers and the matching between managers and divisions, suggesting that the gender gap is unlikely to be explained by statistical discrimination alone.

## 5. Economic Mechanisms

This section studies two nonmutually exclusive mechanisms that may contribute to the gender gap in capital budgets: (1) the appointment channel and (2) the capital allocation channel. The first channel posits that female managers obtain less capital by being appointed to underfunded divisions. The second channel captures the incremental allocations to female managers, holding constant their assignment to divisions.

### 5.1 The appointment channel

Panel A in Table 7 estimates a linear probability model for the likelihood that a female (rather than male) manager is appointed to a division as a function of the



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

CEO's background and division's attributes in the year before the appointment. The dependent variable is an indicator equal to one for the appointment of a female manager and zero for a male manager. To isolate division managers' appointments, we focus on division-year observations in which the division manager has changed but the CEO has not.

Panel A shows that CEOs with conservative backgrounds are less likely to appoint women as division managers, as indicated by the negative and statistically significant coefficients on CEO gender imbalance indexes across all columns. Further, when CEOs with such backgrounds do appoint women as division managers, female managers join divisions with historically smaller capital allocations, as indicated by the negative coefficient on the term *CEO imbalance index * Lagged division CapEx*, significant at 1% in column 1 and at 5% in columns 2 and 3. There is also weaker evidence that CEOs with conservative backgrounds appoint women to historically less profitable divisions, as shown by the negative coefficient on the term *CEO imbalance index * Lagged division operating ROA*, significant at 10% in columns 1 and 2.

Panel B in Table 7 studies how a CEO's early-life exposure to gender imbalances is associated with promotions, demotions, and separations of female division managers, using a linear probability model with fixed effects for the year, industry, firm, and CEO birth cohort. In column 1, promotions are defined as transitions to larger divisions (with book assets of at least 20% greater) or transitions to the set of the top-five paid executives in the firm. In column 2, demotions are defined as transitions to smaller divisions (with book assets at least 20% smaller) or transitions out of the set of the top-five paid executives in the firm. In column 3, separations are defined as division managers' departures from the firm in a given year.

Panel B shows that CEOs with early-life exposure to gender imbalances are less likely to promote and more likely to demote female division managers. Also, female division managers are more likely to separate from firms run by such CEOs. Based on the coefficient on the term *CEO gender imbalance index * Female division manager* (coefficient $=0.115$; $t$-statistic $=2.27$), an increase in the CEO's comprehensive imbalance index of 0.5 (equivalent to a move from the 25th to the 75th percentile toward greater gender inequity) is associated with a 5.8 percentage point increase in the separations of female division managers. These results are consistent with the evidence in Bennedsen et al. (2020) that a significant gender pay gap at a firm is negatively associated with female recruitment and promotions.

In summary, CEOs with conservative backgrounds are less likely to appoint women as division managers or promote them, and are more likely to assign women to capital-poor divisions. Thus, the lower capital allocations to female managers are partially explained by their assignment to underfunded divisions.

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

## 5.2 The capital allocation channel

To capture the effect of the capital allocation channel incremental to the appointment channel, we focus on CEO turnovers, a setting where a manager's assignment to a division remains constant (the appointment channel is mute), but the CEO's background changes due to the CEO turnover. To select CEO turnovers that are unlikely to be driven by changes in divisions' investment

**Table 7**
**The appointment channel: Appointments, promotions, and separations of division managers**

*A. Appointments of female division managers*

| Dependent variable | Appointment of a female division manager | | |
|---|---|---|---|
| CEO imbalance index | Family | Education | Community |
| Model | (1) | (2) | (3) |
| CEO imbalance index | −0.227** | −0.169** | −0.244* |
| | [2.110] | [1.972] | [1.860] |
| Lagged division CapEx | −0.032 | −0.034 | −0.62 |
| | [0.653] | [0.803] | [0.225] |
| CEO imbalance index x Lagged division CapEx | −0.507*** | −0.340** | −0.407** |
| | [2.967] | [2.365] | [2.262] |
| Lagged division size | −0.014 | 0.003 | −0.036 |
| | [0.804] | [0.263] | [1.561] |
| CEO imbalance index x Lagged division size | −0.028 | −0.024 | −0.044 |
| | [1.268] | [0.976] | [1.157] |
| Lagged division operating ROA | 0.026 | 0.039 | 0.053 |
| | [1.440] | [1.205] | [1.217] |
| CEO imbalance index x Lagged division operating ROA | −0.076* | −0.103* | −0.062 |
| | [1.725] | [1.682] | [1.375] |
| Lagged core division indicator | −0.055 | −0.033 | −0.010 |
| | [1.025] | [0.861] | [1.098] |
| CEO imbalance index x Lagged core division indicator | −0.124 | −0.117 | −0.188 |
| | [1.267] | [1.049] | [1.540] |
| Lagged division cash flow volatility | 0.014 | 0.019 | 0.008 |
| | [0.558] | [0.804] | [0.411] |
| CEO imbalance index x Lagged division cash flow volatility | −0.023 | −0.018 | −0.032 |
| | [1.362] | [1.144] | [1.461] |
| Lagged industry beta | 0.006 | 0.004 | 0.008 |
| | [0.258] | [0.195] | [0.233] |
| CEO imbalance index x Lagged industry beta | −0.014 | −0.013 | −0.011 |
| | [0.846] | [0.793] | [0.750] |
| Controls | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes |
| CEO birth cohort fixed effects | Yes | Yes | Yes |
| $R^2$ | .286 | .293 | .285 |
| No. obs. | 372 | 372 | 372 |
| *B. Promotions, demotions, and separations of division managers* | | | |
| Female division manager | −0.022 | 0.037 | 0.082 |
| | [1.360] | [0.918] | [1.114] |
| CEO gender imbalance index | 0.058** | 0.016* | 0.029* |
| | [2.185] | [1.885] | [1.902] |
| CEO gender imbalance index x Female division manager | −0.046* | 0.073* | 0.115** |
| | [1.725] | [1.847] | [2.266] |



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table 7**
**Continued**

| Dependent variable | Promotion of division managers | Demotion of division managers | Separation of division managers |
|---|---|---|---|
| Model | (1) | (2) | (3) |
| Controls | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes |
| CEO birth cohort fixed effects | Yes | Yes | Yes |
| $R^2$ | .088 | .094 | .117 |
| No. obs | 3,904 | 3,904 | 3,904 |

Panel A studies how division and CEO characteristics are associated with the appointment of female managers to divisions. The dependent variable is the appointment of a female division manager. The sample includes all division manager turnovers in which the CEO does not change. The characteristics of divisions are measured in the year immediately preceding the year of division managers' appointments. Divisions' characteristics include *CapEx*, measured by the percentage ratio of division-level capital expenditure to book assets; *Size*, measured by the natural logarithm of book assets; *Operating ROA*, measured by the ratio of the division's operating profit to its book assets; the binary indicator *Core division*, which equals one if the division operates in the conglomerate's core industry, based on the three-digit SIC classification; *Division cash flow volatility*, measured as the volatility of a division's operating cash flows scaled by its book assets over the past 5 years; and *Industry beta*, measured as the weighted average beta of all publicly traded stand-alone firms in the division's industry, based on the three-digit SIC classification. Panel B studies the relation between CEOs' formative experiences and labor market outcomes for female division managers. In column 1, the dependent variable is *Promotion of division managers,* defined as an indicator variable that equals one if a division manager is assigned to a new division that is at least 20% larger in book assets than the division overseen in the previous year or if a division manager enters the list of the firm's five highest-paid executives, while not being on the list in the previous year. In column 2, the dependent variable is *Demotion of division managers,* defined as an indicator variable that equals one if a division manager is assigned to a new division that is at least 20% smaller in book assets than the division overseen in the previous year or if a division manager who appeared on the list of the firm's five highest-paid executives in the previous year is no longer on the top-five list (but remains with the firm). In column 3, the dependent variable is *Separation of division managers,* defined as an indicator variable that equals one if a division manager who worked at the firm in the previous year is no longer with the firm. *CEO gender imbalance index* is the average of *CEO family gender imbalance index*, *CEO education gender imbalance index*, and *CEO community gender imbalance index*. Control variables include the characteristics of the firm, division, division manager, and CEO listed in Table 3. Variable definitions appear in Appendix A. All regressions include year, industry, firm, and CEO birth cohort fixed effects. The $t$-statistics (in brackets) are based on standard errors that are heteroscedasticity consistent and clustered at the firm level. Significance levels are indicated as follows: * = 10%, ** = 5%, *** = 1%.

opportunities, we focus on turnovers due to natural causes, such as illness, death, retirement, or succession, as detailed in the legend of Table 8.

Table 8 reports estimates from first-difference regressions in which the dependent variable is the annual change in the division's CapEx for division-year observations in which the CEO has changed from the previous year, but the division manager has not. To minimize changes in divisions' and managers' characteristics over time, we compare the first capital allocations under the new CEO (the year after the turnover) with the last capital allocations under the prior CEO (the year before the turnover). We find that an increase in a CEO's exposure to gender imbalances is associated with lower capital allocations to female managers. This result is statistically significant at 5% for all indexes of gender imbalances ($t$-statistics of 1.99 to 2.44 for the interaction terms), despite the small sample of quasi-natural CEO turnovers. Since the division managers remain unchanged, and the new CEO is unlikely to have influenced



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table 8**
**The capital allocation channel: Evidence from CEO turnovers due to quasi-natural causes**

| Dependent variable | ΔCapEx | | |
|---|---|---|---|
| Model | (1) | (2) | (3) |
| Female division manager | −0.120 | −0.379 | −0.215 |
| | [0.570] | [0.644] | [0.229] |
| ΔCEO family index | 1.052* | | |
| | [1.754] | | |
| Female division manager x ΔCEO family index | −2.037** | | |
| | [1.985] | | |
| ΔCEO education index | | 1.456** | |
| | | [2.301] | |
| Female division manager x ΔCEO education index | | −2.670** | |
| | | [2.440] | |
| ΔCEO community index | | | 1.372* |
| | | | [1.692] |
| Female division manager x ΔCEO community index | | | −2.534** |
| | | | [2.054] |
| Controls | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes |
| $R^2$ | .698 | .712 | .704 |
| No. obs. | 254 | 254 | 254 |

This table studies the turnover of CEOs and division managers. The table examines how changes in CEO characteristics at the time of CEO turnover affect the allocation of capital to male and female managers, while holding constant managers' appointments to divisions. It presents estimates from first-difference regressions, in which the dependent variable is the change in the percentage ratio of division-level capital expenditure to book assets between the first capital allocations under the new CEO (the year after the turnover) and the last capital allocations under the prior CEO (the year immediately preceding the turnover). This analysis is restricted to division-year observations where the CEO has changed from the previous year, but the division manager has not changed. The CEO turnover events include CEO changes for natural causes, such as death, health issues, retirements, and succession plans. Such turnovers are identified on the basis of the information contained in the firm's press release or a *Wall Street Journal* article announcing the CEO's departure and must meet one of the following conditions: the departing CEO dies, departs due to health issues, retires at the age of 65 or older, reaches the prespecified age defined in the firm's succession plan, or the article states that the change is part of the firm's succession plan. Control variables include first differences in firm, division, division manager, and CEO characteristics listed in Table 3. Variable definitions appear in Appendix A. The $t$-statistics (in brackets) are based on standard errors that are heteroscedasticity consistent and clustered at the firm level. Significance levels are indicated as follows: * = 10%, ** = 5%, *** = 1%.

their appointment, these results indicate that the CEO's background affects capital allocation beyond the appointment channel.

In summary, the capital allocation channel contributes to the gender gap in capital budgeting. Holding constant the assignment of managers to divisions, an increase in a CEO's exposure to gender imbalances is associated with lower capital allocations to female managers. Since the division managers' attributes remain unchanged, these results provide further evidence that the gender gap in capital allocations is unlikely to be explained by omitted managerial characteristics correlated with gender.

## 6. Possible Explanations

This section reviews several nonmutually exclusive explanations for the relation between CEOs' early-life exposure to gender imbalances and capital



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

allocations to male and female division managers: (1) information asymmetry, (2) favoritism, (3) childbirth, and (4) risk-taking.

### 6.1 Information asymmetry and learning

The information asymmetry hypothesis posits that CEOs with male-dominated backgrounds have less experience in dealing with women in professional settings. For example, CEOs who attended all-male high schools and colleges or those who grew up in male-dominated environments are likely to develop male-centered professional networks. Thus, such CEOs may face greater information asymmetry when assessing female managers' ability, capital demands, or investment forecasts. Theory predicts that CEOs allocate less capital to managers in the face of information asymmetry (Antle and Eppen 1985; Harris and Raviv 1996).

We develop two proxies for information asymmetry between a CEO and a female division manager. The first is *External CEO*, an indicator equal to one for CEOs who were hired into their job from another firm rather than being promoted internally. We hypothesize that CEOs who come from the outside are likely to face greater information asymmetry about the "inherited" division managers at the firm they join. Our second proxy aims to capture the effect of a CEO's learning about a manager's skill and style via repeated interactions. As a proxy for repeated interactions, we use the trailing number of years that the CEO and division manager have worked at the same firm in their current roles, labeling this proxy *Temporal overlap*.

Columns 1 and 2 of Table 9 show that information asymmetry between CEOs and female division managers contributes to the gender gap in capital allocations. As in all specifications with triple interaction terms, we report the main variables of interest and state the unreported terms in the legend. Column 1 shows that the negative relation between a CEO's exposure to gender imbalances and capital allocations to female managers is stronger for external CEOs. This effect, significant at 10%, is captured by the negative coefficient on the triple interaction term *Female division manager * CEO gender imbalance index * External CEO*. Column 2 shows that the negative relation between a CEO's early-life exposure to gender imbalances and capital allocations to female managers is attenuated when the CEO can observe a division manager's performance for a longer period (longer temporal overlap), and this attenuation effect is statistically significant at 5%. Overall, our results support the information asymmetry hypothesis.

### 6.2 CEO favoritism

This hypothesis posits that CEOs with male-dominated backgrounds favor male over female managers for personal reasons. For example, such CEOs may find it easier (consciously or not) to deal with male division managers on large investment projects and thus allocate them more funds. Prior work has documented various forms of CEO favoritism in capital allocations, such

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table 9**
**Possible explanations**

| Explanation | Information asymmetry and learning | | Favoritism | | Career interruptions due to childbirth | Risk-taking | |
|---|---|---|---|---|---|---|---|
| V | External CEO | Temporal overlap | Lawsuits on gender & diversity | Contracting with women and minorities | Division manager under 40 | Division cash flow volatility | Industry beta |
| Model | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Female division manager | −0.272* | −0.304* | −0.309* | −0.217* | −0.315* | −0.166** | −0.248* |
| | [1.899] | [1.922] | [1.875] | [1.699] | [1.779] | [2.123] | [1.883] |
| CEO gender imbalance index | 0.427** | 0.351** | 0.423** | 0.172** | 0.425** | 0.293** | 0.382** |
| | [2.391] | [2.227] | [1.973] | [2.158] | [2.075] | [2.017] | [2.204] |
| V | −0.128 | −0.184 | −0.082 | −0.066 | −0.130 | −1.604 | −0.096 |
| | [0.835] | [1.018] | [1.053] | [0.947] | [0.975] | [1.202] | [1.007] |
| Female division manager x CEO gender imbalance index | −0.287** | −0.320** | −0.313** | −0.280** | −0.314** | −0.301** | −0.294** |
| | [2.334] | [2.285] | [2.213] | [2.096] | [2.130] | [2.219] | [2.177] |
| Female division manager x CEO gender imbalance index x V | −0.091* | 0.062** | −0.048** | −0.076* | −0.006 | −1.026 | −0.071 |
| | [1.695] | [2.303] | [2.201] | [1.672] | [1.155] | [1.150] | [1.335] |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| CEO birth cohort fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | .608 | .611 | .551 | .562 | .596 | .591 | .584 |
| No. obs. | 3,904 | 3,904 | 3,126 | 3,395 | 3,904 | 2,658 | 2,658 |

This table examines how the relation between CEOs' formative experiences and capital allocations to male and female managers varies with proxies for information asymmetry and learning (columns 1 and 2), favoritism (columns 3 and 4), career interruptions due to childbirth (column 5), and risk-taking (columns 6 and 7). The dependent variable is the ratio of division-level capital expenditure to book assets, expressed as a percentage. The regression models enrich the baseline specification (Table 4, panel B) with the following variables and their interaction terms: (1) *External CEO*, an indicator variable that equals one if the CEO's prior position immediately preceding his current CEO position was with another firm; (2) *Temporal overlap*, the number of years that the CEO and division manager have worked together in the company in their current roles; (3) *Lawsuits on gender & diversity*, an indicator variable that equals one if the external audit score indicates substantial fines or civil penalties paid as a result of gender and diversity policies (where the audit scores are from the research firm KLD Research & Analytics); (4) *Contracting with women and minorities*, an indicator variable that equals one if the external audit score indicates poor record in "purchasing from or contracting with women- and/or minority-owned businesses" (where the audit scores are from the research firm KLD Research & Analytics); (5) *Division manager under 40*, an indicator variable that equals one if the division manager's age is under 40 years; (6) *Division cash flow volatility*, the volatility of a division's operating cash flows scaled by its book assets over the past 5 years; (7) *Industry beta*, the weighted average beta of all publicly-traded standalone firms in the division's industry, based on the three-digit SIC classification. For brevity, the table reports only the coefficients on the main variables of interest: the double interaction terms *Female division manager* x *CEO gender imbalance index* and the triple interaction terms *Female division manager* x *CEO gender imbalance index* x $V$, where $V$ is one of the seven variables defined above. *CEO gender imbalance index* is the average of *CEO family gender imbalance index*, *CEO education gender imbalance index*, and *CEO community gender imbalance index*. The unreported coefficients include the double interaction terms *CEO gender imbalance index* x $V$ and *Female division manager* x $V$. Control variables include the characteristics of the firm, division, division manager, and CEO listed in Table 3. Variable definitions appear in Appendix A. All regressions include year, industry, firm, and CEO birth cohort fixed effects. The $t$-statistics (in brackets) are based on standard errors that are heteroscedasticity consistent and clustered at the firm level. Significance levels are indicated as follows: * = 10%, ** = 5%, *** = 1%.

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

as bridge building with division managers (Xuan 2009) and nepotism in the allocation of cash windfalls (Glaser, Lopez-de-Silanes, and Sautner 2013).

To construct an independent and replicable measure of unequal treatment of male and female agents, we rely on legal actions against the company's management on gender and diversity issues, using data from KLD. Our first proxy, *Lawsuits on gender & diversity*, is KLD's score (code: DIV-con-A) indicating involvement in discrimination-related litigation. KLD codes this score as a binary indicator which equals one for company-years with significant gender-related legal issues and controversies.

Our second proxy for favoritism in resource allocation, *Low contracting with women & minorities*, is based on KLD's assessment of a gender tilt in the allocation of procurement contracts. This measure captures the management's behavior in a closely related setting, namely, the allocation of purchase orders. KLD codes this score (code: DIV-str-E) as a binary indicator which equals one for company-years with significant contract allocations to women and minorities. We define *Low contracting with women & minorities* as an indicator which equals one if the respective KLD audit score denotes low allocations of contracts to women and minorities.

The results in columns 3 and 4 in Table 9 support the favoritism hypothesis. Column 3 shows that the negative relation between a CEO's early-life exposure to gender imbalances and capital allocations to female managers is amplified by our proxy for favoritism based on discrimination-related lawsuits. This effect is captured by the negative coefficient on the triple interaction term *Female division manager * CEO imbalance index * Lawsuits on gender & diversity*. This effect is statistically significant at 5%.

The results in column 4 yield a qualitatively similar conclusion. The negative relation between the CEO's exposure to gender imbalances and capital allocation to female managers is amplified by the favoritism proxy based on the gender tilt in the allocation of procurement contracts.

Overall, gender favoritism, as measured by discrimination-related litigation and a tilt in the allocation of contracts, contributes to the gap in capital allocations between male and female managers.

### 6.3 Career interruptions due to childbirth

This hypothesis posits that CEOs with conservative backgrounds restrain long-term investments in female managers' divisions because they expect female managers to interrupt their careers for childbirth. Consistent with this view, Keloharju, Knüpfer, and Tag (2019) provide evidence that during several years after childbirth, female executives work shorter hours, and their career progression slows down.

To test this hypothesis, we study whether capital allocations depend on the likelihood of female managers to have additional children. Using statistical data on female fertility (Martin et al. 2018), we exploit a sharp drop in the likelihood of childbirth for women at age 40. We introduce an indicator *Division manager*



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

*under 40* and test whether it affects the relation between CEO backgrounds and capital allocations.

Column 5 of Table 9 shows the results. The evidence in support of the childbirth hypothesis is weaker than for the first two channels. Directionally, the negative coefficient on the triple interaction term in column 5 indicates that CEOs with conservative backgrounds allocate less capital to female division managers of childbearing age than to their older counterparts who are unlikely to have more children. However, this relation falls short of being statistically significant ($t$-statistic = 1.16, $p$-value = 0.25).

### 6.4 Risk-taking

This hypothesis posits that CEOs with more conservative backgrounds allocate less capital to female managers because such CEOs have concerns about women's tolerance for and ability to take risks. For example, Kanze et al. (2018) find that female entrepreneurs obtain less venture capital funding because investors express concerns about women's ability to take risks.

Columns 6 and 7 of Table 9 study whether the relation between CEOs' backgrounds and capital allocations to female managers varies with the riskiness of the female managers' divisions, using two proxies: *Division cash flow volatility* and *Industry beta* for the division (defined in Appendix A). The results for both proxies show that directionally, CEOs with more conservative backgrounds allocate less capital to female division managers running riskier divisions, but these associations are weak. The point estimates on the triple interaction terms of interest are consistently negative, but noisy ($t$-statistics = 1.15 and 1.36).

In summary, the gender gap in capital budgeting is likely a result of a combined influence of several nonmutually exclusive economic mechanisms. Among the four explanations we examine, we find stronger evidence in support of information asymmetry and favoritism.

## 7. Governance, Investment Efficiency, and Value

This section studies the association between the effect of CEOs' formative experiences on capital budgeting and firm outcomes. We test whether the link between the CEO's experiences and capital allocations is positively or negatively associated with firm outcomes and whether such associations are amplified or attenuated by corporate governance characteristics. Since corporate outcomes are affected by a variety of correlated factors, these results should be viewed as associations without implying causality.

If the relation between CEOs' gender attitudes and capital allocations reflects a subjective or subconscious belief, it should be attenuated under governance mechanisms unaffected by similar subjective judgments. On the other hand, if this relation reflects an optimal firm policy, it should be magnified in the

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

presence of strong governance. To distinguish between these interpretations, we study two dimensions of governance: (1) internal (the board of directors), and (2) external (industry competition).

Since our primary focus is the role of gender inside the firm, we examine the presence of female leadership in the chief monitoring role as the chair of the board. Prior work shows that the presence of an out-of-group member with monitoring authority acts as a powerful control mechanism. Female directors allocate more effort to monitoring, and their presence increases the CEO's turnover-performance sensitivity (Adams and Ferreira 2009) and audit quality (Lai et al. 2017). Consistent with the monitoring role of female directors in gender policies, the announcement return to the appointment of female directors is higher than for male directors at firms that stand to benefit from gender diversity (Adams, Gray, and Nowland 2012).

Panel A in Table 10 studies whether the relation between CEOs' formative experiences and capital allocations to female managers varies in the presence of a female chair of the board. We focus on the chair of the board because it is arguably the most important monitoring position and because the cross-sectional variation in ordinary female directorships is small.

Panel A shows that the relation between CEOs' gender attitudes and capital allocations is attenuated in the presence of a female board chair. This effect, captured by the triple interaction terms *Female division manager * CEO index * Female board chair*, persists across all measures of CEOs' formative experiences. According to column 1, the effect of CEOs' family factors on capital allocations is reduced by 30% when the firm's board of directors is chaired by a woman. This can be seen by comparing the coefficients on the interaction terms *Female division manager * CEO family index* (coefficient $=-0.532$) and *Female division manager * CEO family index * Female board chair* (coefficient $=0.163$). Columns 2 and 3 show comparable attenuation effects for the education and community indexes: 23% and 35%, respectively.

These results parallel recent evidence in other settings. Tate and Yang (2015) show that the gender gap in employee compensation shrinks when the same workers move from a male-led to a female-led plant after an exogenous shock. Gompers and Wang (2017) find that the presence of women as senior venture capital partners narrows the gender gap in investment and hiring decisions, resulting in better performance.

Our next analysis focuses on an external governance mechanism, namely, industry competition. This analysis is grounded in the long-standing theoretical work in economics. Becker (1957, p. 11) formalizes the role of managerial attitudes in "whether to hire, work with, or buy from an individual or group." His key prediction is that industry competition curbs the effect of managerial attitudes on hiring and resource allocation. Arrow (1973) shows that if managerial biases impose costs on the firm, this behavior will be driven out in perfectly competitive markets. Empirical work confirms that industry competition improves investment productivity (Nickell 1996; Aghion et al.

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table 10**
**Corporate governance**

*A. Female chair of the board of directors*

| Model | (1) | (2) | (3) |
|---|---|---|---|
| Female division manager x CEO family index | −0.532** | | |
| | [2.238] | | |
| Female division manager x CEO family index x Female board chair | 0.163* | | |
| | [1.854] | | |
| Female division manager x CEO education index | | −0.724** | |
| | | [2.536] | |
| Female division manager x CEO education index x Female board chair | | 0.166* | |
| | | [1.898] | |
| Female division manager x CEO community index | | | −0.571** |
| | | | [1.982] |
| Female division manager x CEO community index x Female board chair | | | 0.198** |
| | | | [2.060] |
| Controls | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes |
| CEO birth cohort fixed effects | Yes | Yes | Yes |
| $R^2$ | .588 | .590 | .582 |
| No. Obs. | 3,904 | 3,904 | 3,904 |

*B. Product market competition*

| Model | (1) | (2) | (3) |
|---|---|---|---|
| Female division manager x CEO family index | −0.311** | | |
| | [2.144] | | |
| Female division manager x CEO family index x HHI | −0.708* | | |
| | [1.894] | | |
| Female division manager x CEO education index | | −0.278** | |
| | | [2.320] | |
| Female division manager x CEO education index x HHI | | −0.603* | |
| | | [1.837] | |
| Female division manager x CEO community index | | | −0.181* |
| | | | [1.758] |
| Female division manager x CEO community index x HHI | | | −0.498 |
| | | | [1.442] |
| Controls | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes |
| CEO birth cohort fixed effects | Yes | Yes | Yes |
| $R^2$ | .594 | .591 | .597 |
| No. Obs. | 3,904 | 3,904 | 3,904 |

This table studies how the relation between CEO characteristics and capital allocations to male and female managers varies with corporate governance, as measured by the gender of the chair of the board (panel A) and product market competition (panel B). The dependent variable is the ratio of division-level capital expenditure to book assets, expressed as a percentage. In panel A, *Female board chair* is a binary indicator that equals one when the chair of the board is a woman and zero otherwise. In panel B, *HHI* is the Herfindahl-Hirschman index, defined as the sum of squared market shares (based on sales) of publicly traded firms in a given three-digit SIC industry. For brevity, the table reports only the coefficients on the main variables of interest: the double interaction terms *Female division manager* x *CEO index* and the triple interaction terms *Female division manager* x *CEO index* x *Female board chair* (panel A) and *Female division manager* x *CEO index* x *HHI* (panel B). The unreported coefficients include *CEO indexes*, *Female division manager, Female board chair* (panel A), *HHI* (panel B), and the double interaction terms *CEO index* x *Female board chair* and *Female division manager* x *Female board chair* (panel A), and the double interaction terms *CEO index* x *HHI* and *Female division manager* x *HHI* (panel B). Control variables include the characteristics of the firm, division, division manager, and CEO listed in Table 3. Variable definitions appear in Appendix A. All regressions include year, industry, firm, and CEO birth cohort fixed effects. The $t$-statistics (in brackets) are based on standard errors that are heteroscedasticity consistent and clustered at the firm level. Significance levels are indicated as follows: * = 10%, ** = 5%, *** = 1%.



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

2009), cuts managerial slack, and serves as an alternative control mechanism when a firm's internal governance is weak (Giroud and Mueller 2010).

Panel B in Table 10 studies how the link between CEOs' formative experiences and capital allocations varies with the intensity of industry competition. Following Giroud and Mueller (2010), industry competition is defined as the Herfindahl-Hirschman index (HHI), computed as the sum of revenue-based squared market shares of all firms in the firm's core industry (three-digit SIC code), so that higher index values reflect weaker competition. The results show that the link between CEOs' formative experiences and capital allocation is stronger in less competitive industries. The coefficients on the interaction term *Female division manager * CEO index * HHI* are consistently negative for all measures of formative experiences, suggesting that female managers obtain fewer resources from CEOs with conservative backgrounds when firms operate in less competitive industries where CEOs are likely to have more slack in investment decisions. These estimates are significant at 10% for two of the three CEO indexes.

In our final analyses, we study how the relation between CEOs' formative experiences and the gender gap in capital budgeting is associated with firm outcomes. Table 11 examines investment efficiency. Following the literature on internal capital markets (Shin and Stulz 1998; Ozbas and Scharfstein 2010), we study the sensitivity of capital investment to its marginal product measured by Tobin's q of stand-alone firms in the division's industry. If the gender gap in capital allocations reflects optimal redistributions of capital, it should be associated with higher investment efficiency, as in the models of efficient redistribution across divisions (e.g., Stein 1997). Conversely, if the effect of CEOs' gender attitudes reflects personal beliefs, it will introduce frictions and weaken the link between investment and its marginal product, as in the models of CEOs' agency issues in capital budgeting (e.g., Rajan, Servaes, and Zingales 2000).

Table 11 shows that the effect of CEOs' formative experiences on the allocation of capital weakens the link between division investment and the marginal product of capital. This result is captured by the negative coefficient on the interaction terms of the CEO indexes of formative experiences and industry $q$ across all specifications. These effects are statistically significant at 10% for family and education characteristics. Overall, the evidence in Table 11 suggests that the effect of a division manager's gender on investment allocations reduces the sensitivity of investment to its marginal product.

Table 12 tests how the effect of CEOs' formative experiences on capital allocation is associated with economic outcomes. Panel A focuses on divisions' performance. Across columns 1–3, the dependent variable is division-level profitability, sales growth, and market share growth in the division's industry. To mitigate simultaneity concerns, the dependent variables are measured in the year following the measurement of capital allocations and controls. The results suggest that lower capital allocations to female managers under CEOs with

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table 11**
**Capital allocation efficiency**

| Index type | Family | Education | Community |
|---|---|---|---|
| Model | (1) | (2) | (3) |
| CEO imbalance index | 0.394*** | 0.412*** | 0.395** |
| | [2.627] | [2.615] | [1.962] |
| Tobin's q | 0.626*** | 0.620*** | 0.665*** |
| | [4.016] | [3.953] | [3.162] |
| CEO imbalance index x Tobin's q | −0.271* | −0.226* | −0.192 |
| | [1.697] | [1.900] | [1.489] |
| Controls | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes |
| CEO birth cohort fixed effects | Yes | Yes | Yes |
| $R^2$ | .592 | .597 | .586 |
| No. obs. | 3,904 | 3,904 | 3,904 |

This table studies how the CEO's early-life exposure to gender inequity is associated with investment efficiency in his firm's internal capital market. Investment efficiency is measured by the sensitivity of a division's capital investment to Tobin's q in the division's industry, defined according to a three-digit SIC code. Industry Tobin's q is the median market-to-book ratio across all publicly traded single-segment firms in the division's industry. The dependent variable is the ratio of division-level capital expenditure to book assets, expressed as a percentage. Control variables include the characteristics of the firm, division, division manager, and CEO listed in Table 3. Variable definitions appear in Appendix A. All regressions include year, industry, firm, and CEO birth cohort fixed effects. The $t$-statistics (in brackets) are based on standard errors that are heteroscedasticity consistent and clustered at the firm level. Significance levels are indicated as follows: * = 10%, ** = 5%, *** = 1%.

conservative backgrounds constrain divisions' growth and profitability. These effects, captured by the interaction term *CEO gender imbalance index * Female division manager*, are significant at 5% for the profitability measure and at 10% for the market share and growth measures.

Panel B focuses on firm performance. Columns 1–3 show a negative association between a CEO's exposure to gender imbalances and his firm's outcomes: ROA, Tobin's q, and stock returns. This result is consistent across all three measures, and it is statistically significant at 5%. Since these regressions include firm fixed effects, this result is driven by the variation in CEOs' characteristics for the same firm. In other words, a given firm appears to perform worse when it is run by a CEO with less egalitarian gender attitudes.

Columns 4–6 test whether the negative relation between a CEO's exposure to gender imbalances and firm outcomes is related to the gender composition of division managers. In these columns, we augment the regression specification with an indicator *Female division manager* and the interaction term *CEO imbalance index ∗ Female division manager*. In this specification, the indicator *Female division manager* is equal to one during firm-years when a firm employs at least one female division manager.

Columns 4–6 show that the negative association between a CEO's early-life exposure to gender imbalances and firm outcomes operates primarily via the interaction effect *CEO imbalance index * Female division manager*. The coefficients on this interaction term are consistently negative across all specifications, and all of them are statistically significant at 5%. This result



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table 12**
**Division and firm outcomes**

*A. Division performance*

| Performance measure | Profitability | Sales growth | Market share growth |
|---|---|---|---|
| Model | (1) | (2) | (3) |
| Female division manager | −0.018 | 0.042 | −0.059 |
| | [1.491] | [1.470] | [0.054] |
| CEO gender imbalance index | −0.032 | −0.084 | −0.965 |
| | [1.083] | [0.832] | [0.104] |
| CEO gender imbalance index x Female division manager | −0.009** | −0.032* | −0.299* |
| | [2.033] | [1.927] | [1.883] |
| Controls | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes |
| CEO birth cohort fixed effects | Yes | Yes | Yes |
| $R^2$ | .260 | .085 | .046 |
| No. obs. | 3,904 | 3,904 | 3,904 |

*B. Firm performance*

| Performance measure | ROA | Tobin’s q | Stock return | ROA | Tobin’s q | Stock return |
|---|---|---|---|---|---|---|
| Model number | (1) | (2) | (3) | (4) | (5) | (6) |
| CEO gender imbalance index | −0.003** | −0.121** | −0.010** | −0.001 | −0.033 | −0.004 |
| | [2.386] | [2.266] | [2.174] | [1.226] | [1.485] | [0.719] |
| Female division manager | | | | 0.008 | 0.020 | 0.002 |
| | | | | [0.993] | [1.118] | [0.881] |
| CEO gender imbalance index x Female division manager | | | | −0.004** | −0.106** | −0.008** |
| | | | | [2.293] | [2.317] | [2.064] |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| CEO birth cohort fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | .456 | .794 | .395 | .472 | .806 | .415 |
| No. obs. | 1,259 | 1,259 | 1,259 | 1,259 | 1,259 | 1,259 |

This table studies how the CEO’s early-life exposure to gender inequity is associated with division-level performance (panel A) and firm-level performance (panel B) in his firm. Division-level performance is measured by *Division profitability*, defined as the ratio of division operating cash flow to division sales as in Ozbas and Scharfstein (2010) (column 1), by *Sales growth*, defined as the annual percentage growth in division sales (column 2), and by *Market share growth*, defined as the annual percentage growth in market share, measured by the share of a division’s sales in the total sales in its industry, defined according to a three-digit SIC code (column 3). Firm-level performance is measured by the return on assets, *ROA*, defined as the ratio of net income to book assets at the beginning of the year (columns 1 and 4), by *Tobin’s q*, defined as the ratio of the market value of equity plus book value of debt to book value of assets (columns 2 and 5), and by *Stock return*, defined as the annual return on the firm’s stock (columns 3 and 6). All dependent variables are measured over the year immediately following the year over which the independent variables are measured. Control variables include the characteristics of the firm, division, division manager, and CEO listed in Table 3. *CEO gender imbalance index* is calculated as the average of *CEO family gender imbalance index*, *CEO education gender imbalance index*, and *CEO community gender imbalance index*. Variable definitions appear in Appendix A. All regressions include year, industry, firm, and CEO birth cohort fixed effects. The $t$-statistics (in brackets) are based on standard errors that are heteroscedasticity consistent and clustered at the firm level. Significance levels are indicated as follows: * = 10%, ** =5%, *** = 1%.

suggests that a CEO’s exposure to gender imbalances is more strongly related to firm outcomes when there is gender variation among division managers. In addition, with the inclusion of the interaction term *CEO imbalance index* * *Female division manager* in columns 4–6, the coefficients on *CEO imbalance*



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

*index* shrink and become statistically indistinguishable from zero. This pattern suggests that most of the negative relation between a CEO's exposure to gender imbalances and firm outcomes is captured by the interaction of the CEO's background and the gender variation across a firm's division managers.

In summary, the relation between CEOs' early-life exposure to gender imbalances and capital allocations weakens when women serve in the top monitoring role and when industry competition is more intense. The effect of a division manager's gender on capital allocations beyond the effect of economic fundamentals is associated with lower investment efficiency and weaker performance.

## 8. Conclusion

This paper has studied the origins and real effects of the gender gap in resource allocations in the context of U.S. conglomerates. We find that male managers obtain more investment capital than their female peers, and this pattern is strongly related to the CEO's exposure to gender imbalances during formative years.

Recent work suggests that our findings may extend to other settings. In particular, an agent's exposure to female socialization in the family has been shown to affect gender policies not only at the level of individual firms, as in venture capital financing (Gompers and Wang 2017), but also at the macro level, as in the national legislative process (Washington 2008) and federal courts (Glynn and Sen 2015). Beyond the decisions of individual agents across a variety of settings, the gender gap is also likely an outcome of historical, institutional, and societal factors.

Our paper makes a first step toward compiling systematic evidence on the family descent, early education, and home environments of U.S. CEOs of large industrial firms and understanding their role in financial policies. We hope that the growing interest in the role of agents' formative experiences will continue to yield novel insights into their decisions.

## Appendix A. Variable Definitions

This appendix defines the variables. Parenthetical entries refer to the annual Compustat item name.

### A.1 Firms

*Book assets*: Book value of total assets (at) in millions of dollars
*Earnings per share (EPS)*: Basic earnings per share, including extraordinary items (epspi)
*HH index*: The Herfindahl-Hirschman index, computed as the sum of squared market shares (based on sales) of all publicly traded firms in a given three-digit SIC industry
*Market value*: Market value of common equity (csho*prcc)
*Return on assets (ROA)*: Net income (ni) / total assets (at)
*Size*: The natural logarithm of book assets (at)
*Stock return*: The annual return on the firm's stock
*Tobin's q*: Market value of assets [book assets (at) + market value of common equity (csho*prcc) -

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

common equity (ceq) - deferred taxes (txdb)] / [0.9*book value of assets (at) + 0.1*market value of assets]

### A.2 Divisions

*Capital expenditure (CapEx)*: The ratio of division-level capital expenditure (capx) to identifiable book assets (at)
*Cash flow volatility*: The volatility of a division's operating cash flows (ops) scaled by its identifiable book assets (at) over the past 5 years
*Core division*: An indicator equal to one if the division operates in the same industry as the firm itself (based on the three-digit SIC code industry classification) and zero otherwise
*Industry beta*: The weighted average beta of all publicly traded stand-alone firms in the division's industry, based on the three-digit SIC classification. Beta is calculated using monthly returns over the previous 5 years with the CRSP value-weighted market index as a proxy for the market portfolio
*Industry Tobin's q*: The median market-to-book ratio across all stand-alone firms in the division's industry (based on the three-digit SIC code industry classification)
*Market share growth*: The annual percentage growth in market share, measured by the share of a division's sales in the total sales in its industry, defined according to a three-digit SIC classification
*Operating ROA*: Annual operating profit of a division (ops) divided by its book assets (at)
*Profitability*: The ratio of division operating cash flow (ops) to division sales (sale), following Ozbas and Scharfstein (2010)
*Sales growth*: The annual percentage growth in division sales (sale)
*Size*: The natural logarithm of the division's identifiable total assets (at)

### A.3 CEOs

*Age*: CEO's age in years
*CEO early birth cohort*: An indicator that equals one if the CEO's birth cohort is earlier than the sample median cohort (1950–1954). The CEO's birth cohort is defined as a 5-year period according to the year of birth, where the earliest cohort in the sample spans 1930–1934, and the latest cohort spans 1969–1974
*External board seats*: The number of directorships at other firms
*External CEO*: An indicator variable that equals one if the CEO's prior position immediately preceding his current CEO position was with another firm
*Graduate degree*: An indicator equal to one if the manager holds a graduate degree and zero otherwise
*log(network size)*: The natural logarithm of the number of connections between the CEO and other executives in BoardEx based on education, memberships in nonprofits, and prior employment
*Male*: An indicator equal to one if the manager is male and zero if the manager is female
*MBA*: An indicator equal to one if the manager holds an MBA degree and zero otherwise
*Tenure with the firm*: The number of years the manager has worked at the firm

### A.4 Directors

*Board size*: The number of board members
*Fraction of female directors*: The ratio of the number of female directors to the number of board members
*Female board chair*: An indicator equal to one if the board chair is female and zero if the chair is male

### A.5 Division Managers

*Age*: Manager's age in years
*Board member*: An indicator equal to one if the manager serves on his firm's board of directors and zero otherwise



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

*External board seats*: The number of directorships at other firms
*Graduate degree*: An indicator equal to one if the manager holds a graduate degree and zero otherwise
*Male*: An indicator equal to one if the manager is male and zero if the manager is female
*MBA*: An indicator equal to one if the manager holds an MBA degree and zero otherwise
*Tenure with the firm*: The number of years the manager has worked at the firm
*Social connections to CEO*: Summary measure of social connections of a division manager relative to other division managers in the same conglomerate, defined as in Duchin and Sosyura (2013). It is defined as the number of connections between the division manager and the CEO based on education history, nonprofit work, and prior employment, adjusted for the average number of connections between other division managers and the CEO within a firm
*Performance record*: The average *Operating ROA* of divisions run by the manager in previous years
*Separation of division managers*: An indicator that equals one if a division manager who worked at the firm in the previous year is no longer with the firm
*Temporal overlap*: the number of years that the CEO and division manager have worked together in the company in their current roles
*Demotion of division managers*: An indicator that equals one if a division manager is assigned to a new division that is at least 20% smaller in book assets than the division overseen in the previous year or if a division manager who appeared on the list of the firm's five highest-paid executives in the previous year is no longer on the top-five list (but remains with the firm)
*Promotion of division managers*: An indicator that equals one if a division manager is assigned to a new division that is at least 20% larger in book assets than the division overseen in the previous year or if a division manager enters the list of the firm's five highest-paid executives, while not being on the list in the previous year

### A.6 CEO Family Characteristics and Formative Years

**A.6.1 Family characteristics** *Father education, years*: The number of years of formal education for the CEO's father
*Father attended college*: An indicator equal to one if the CEO's father attended college and zero otherwise
*Mother education, years*: The number of years of formal education for the CEO's mother
*Mother attended college*: An indicator equal to one if the CEO's mother attended college and zero otherwise
*Parents' education imbalance*: Difference between *Father education* and *Mother education*, scaled by average education
*Father white-collar job*: An indicator equal to one if the CEO's father had a white-collar job and zero otherwise
*Nonworking mother*: An indicator equal to one if the CEO's mother did not work outside the house and zero otherwise
*Mother income*: The annual income in dollars of the CEO's mother. For stay-at-home mothers, this variable is set to zero
*Father income*: The annual income in dollars of the CEO's father
*Parents' income imbalance*: Difference between *Father income* and *Mother income*, scaled by their average income
*Number of children*: The total number of the CEO's children
*Number of sons*: The number of the CEO's sons
*Number of daughters*: The number of the CEO's daughters
*Children's gender imbalance*: The difference between *Number of sons* and *Number of daughters* scaled by *Number of children*. For CEOs with no children, this variable is set to zero
*Number of siblings*: The number of the CEO's siblings
*Number of brothers*: The number of the CEO's brothers
*Number of sisters*: The number of the CEO's sisters

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

*Siblings' gender imbalance*: The difference between the number of the CEO's brothers and sisters, scaled by the number of the CEO's siblings. For CEOs with no siblings, this variable is set to zero

**A.6.2 Education characteristics**

**A.6.2.1 High school** *Private*: An indicator equal to one if the CEO attended a private high school and zero otherwise
*All-male*: An indicator equal to one if the CEO attended an all-male high school and zero otherwise
*Religious*: An indicator equal to one if the CEO attended a religious high school and zero otherwise

**A.6.2.2 *University*** *Private*: An indicator equal to one if the CEO attended a private college and zero otherwise
*All-male*: An indicator equal to one if the CEO attended an all-male college and zero otherwise
*University gender imbalance*: The average ratio of male students to total students in the college the CEO attended, measured during the years of the CEO's attendance

**A.6.3 Community characteristics**
*Labor force participation rate, males*: The rate of male labor force participation in the county where the CEO attended high school, measured as of the decennial census year closest to the year when the CEO reached the age of 18
*Labor force participation rate, females*: The rate of female labor force participation in the county where the CEO attended high school, measured as of the decennial census year closest to the year when the CEO reached the age of 18
*Labor force participation gender imbalance*: The difference between male and female labor force participation rates in the county where the CEO attended high school, measured as of the decennial census year closest to the year when the CEO reached the age of 18
*Income for employed males, US$(2016)*: The average annual income (expressed in year 2016 dollars) for employed males in the county where the CEO attended high school, measured as of the decennial census year closest to the year when the CEO reached the age of 18
*Income for employed females, US$(2016)*: The average annual income for employed females (expressed in year 2016 dollars) in the county where the CEO attended high school, measured as of the decennial census year closest to the year when the CEO reached the age of 18
*Income gender imbalance*: The difference between *Income for employed males* and *Income for employed females*, scaled by the average income of males and females in the county
*Male education (years)*: The average number of years of formal education for adult males in the county where the CEO attended high school, measured as of the decennial census year closest to the year when the CEO reached the age of 18
*Female education (years)*: The average number of years of formal education for adult females in the county where the CEO attended high school, measured as of the decennial census year closest to the year when the CEO reached the age of 18
*Education gender imbalance*: The difference between *Male education* and *Female education*, scaled by the average number of years of education for males and females in the county

**A.6.4 Gender imbalance indexes** *Family gender imbalance index*: The average between the within-sample percentile rankings of each CEO's *Nonworking mother*, *Parents' education imbalance*, *Parents' income imbalance*, *Siblings' gender imbalance*, and *Children's gender imbalance*. The aggregation of the percentile rankings is done such that greater index values indicate exposure to more gender inequity. If an index component is missing, the index is computed as an equally weighted average of the available inputs. The index ranges from zero to one
*Education gender imbalance index*: The average between the within-sample percentile rankings of each CEO's *All-male high school indicator* and *University gender imbalance*. The aggregation of the percentile rankings is done such that greater values of the index indicate exposure to more gender inequity and less female socialization. If an index component is missing, the index is computed

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

based on the available data
*Community gender imbalance index*: The average between the within-sample percentile rankings of each CEO's *Labor force participation gender imbalance*, *Income gender imbalance*, and *Education gender imbalance*. The aggregation of the percentile rankings is done such that greater values of the index indicate exposure to more gender inequity. The index ranges from zero to one
*Gender imbalance index*: The average of each CEOs' indexes: *Family gender imbalance index, Education gender imbalance index*, and *Community gender imbalance index*. The index ranges from zero to one

**A.7 Firms' social ratings**
*Promotion of women and minorities*: An external audit score from the research firm KLD Research & Analytics that measures whether the company has made notable progress in the promotion of women and minorities, particularly to line positions with profit-and-loss responsibilities in the corporation
*Outstanding work-life benefits*: An external audit score from the research firm KLD Research & Analytics that measures whether the company has outstanding employee benefits or other programs addressing work-life concerns, for example, childcare, elder care, or flextime
*Women and Minority contracting*: An external audit score from the research firm KLD Research & Analytics that measures whether the company does at least 5% of its subcontracting, or otherwise has a demonstrably strong record on purchasing or contracting, with women- and/or minority-owned businesses
*Lawsuits on gender and diversity*: An indicator variable that equals one if an external audit score from the research firm KLD Research & Analytics indicates that the company has paid substantial fines or civil penalties as a result of gender or diversity issues, or has otherwise been involved in major controversies related to such issues
*Low contracting with women and minorities*: An indicator variable that equals one if an external audit score from the research firm KLD Research & Analytics indicates poor record in "purchasing from or contracting with women- and/or minority-owned businesses"

## Appendix B. Sample Construction and Selection

This appendix describes the construction of our sample and compares the characteristics of our sample firms with those of all other industrial conglomerates in the S&P 1500 index.

**Table B.1**
**Sample construction**

| Sample | Firms | Divisions | Observations |
|---|---|---|---|
| S&P 1500 industrial firms with at least two divisions | 806 | 3,024 | 12,282 |
| - Firms with nondivisional organizational structure | 396 | 1,706 | 7,491 |
| - Firms with incomplete data on all division managers | 35 | 127 | 566 |
| - Firms with female CEOs | 9 | 30 | 73 |
| - Firms with missing data on CEO background | 8 | 51 | 198 |
| **= Final sample** | **358** | **1,110** | **3,954** |

This table shows the sample selection criteria and the number of firms, divisions, and observations screened out by each sample filter. The sample consists of industrial conglomerates in the S&P 1500 index, excluding firms with nondivisional organizational structure and firms with missing data on division managers and CEO backgrounds. The sample period is from January 2000 to December 2008.



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

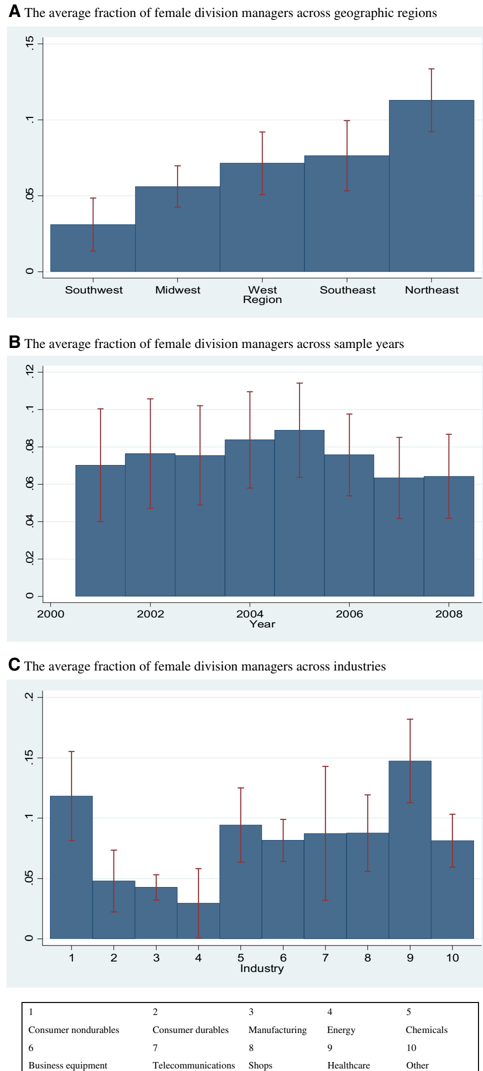



**Figure B.1**
**Female representation among division managers across regions, industries, and years**
Panel A shows the average fraction of female division managers at sample firms headquartered in different geographic regions. The five geographic regions in the U.S. are defined according to the classification by the National Geographic Society. The assignment of states into regions and the detailed regional maps are available from the website of the National Geographic Society: https://www.nationalgeographic.org/maps/united-states-regions/. The histogram bars correspond to the variable *Fraction of female division managers*, defined as the ratio of the number of female division managers to the total number of division managers in a firm. The values shown are the averages for all firms in the sample headquartered in a given geographic region. Panel B shows the average fraction of female division managers across sample years: 2000 to 2008. The histogram bars correspond to the variable *Fraction of female division managers*, defined as the ratio of the number of female division managers to the total number of division managers in a firm. The values shown are the averages across all firms in a given sample year. Panel C shows the average fraction of female division managers across industries. Industries are defined at the division level according to the Fama-French 10-industry classification. The values shown are the averages of the ratio of female division managers to the total number of division managers across all divisions in a given industry. In all panels the vertical error bars indicate 95% confidence intervals.



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table B.2**
**Sample selection**

| | Our sample | Other S&P 1500 conglomerates | Difference | $t$-statistics |
|---|---|---|---|---|
| **Firms** | | | | |
| Earnings per share (EPS) | 1.76 | 1.73 | 0.04 | 0.34 |
| Stock return | 0.07 | 0.06 | 0.01 | 0.89 |
| Cash holdings | 0.11 | 0.11 | 0.00 | 0.18 |
| Profitability | 0.04 | 0.04 | 0.00 | 0.39 |
| Capital expenditures | 0.04 | 0.04 | 0.00 | 1.11 |
| Market-to-book | 1.85 | 1.82 | 0.03 | 1.18 |
| Size (log(assets)) | 8.61 | 8.26 | 0.35 | 7.04*** |
| **CEOs** | | | | |
| Age, years | 55.91 | 56.51 | −0.60 | 0.73 |
| Male indicator | 0.98 | 0.98 | 0.00 | 0.17 |
| Tenure with the firm, years | 14.53 | 13.76 | 0.77 | 1.03 |
| MBA indicator | 0.41 | 0.36 | 0.05 | 0.99 |
| External board seats | 2.17 | 1.80 | 0.37 | 1.33 |
| **Division managers** | | | | |
| Age, years | 50.57 | 50.79 | −0.22 | 0.65 |
| Male indicator | 0.92 | 0.95 | −0.03 | 0.93 |
| Tenure with the firm, years | 10.78 | 11.91 | −1.13 | 1.50 |
| MBA indicator | 0.39 | 0.34 | 0.05 | 2.45** |
| External board seats | 0.22 | 0.19 | 0.03 | 1.51 |

This table compares the characteristics of firms, CEOs, and division managers in our main sample with those of other industrial conglomerates in the S&P 1500 index that are excluded by sample filters. The main sample consists of industrial conglomerates in the S&P 1500 index, excluding firms with nondivisional organizational structure and firms with missing data on division managers and CEO backgrounds. Sample selection criteria appear in Table B1. The sample period is from January 2000 to December 2008, and the values reported are time-series averages over this period. Statistical significance levels for the test of the difference in means are indicated as follows: *=10%, **=5%, ***=1%.

**Table B.3**
**Descriptive correlations: The gender of division managers**

*A. Firm and CEO attributes*

| | Correlation with *Fraction of female division managers* |
|---|---|
| **Firm** | |
| Capital expenditure | 0.047 |
| Return on assets (ROA) | 0.018 |
| Earnings per share (EPS) | −0.012 |
| Size (log(assets)) | 0.158* |
| Number of divisions | 0.013 |
| Tobin's q | 0.051* |
| **CEO** | |
| Age | 0.024 |
| Graduate degree | 0.077* |
| Tenure with the firm | 0.038 |
| External board seats | 0.045 |
| log(network size) | 0.193* |

*B. Division and manager attributes*

| | Correlation with indicator *Female division manager* |
|---|---|
| **Division** | |
| Capital expenditure | −0.044* |
| Operating ROA | 0.008 |
| Size (log(assets)) | −0.075 |
| Core division | −0.005 |
| Industry Tobin's q | 0.074 |
| **Division manager** | |
| Age | −0.080* |
| Graduate degree | 0.037* |
| Tenure with the firm | −0.021 |
| Performance record | −0.001 |
| Board member | −0.014 |
| External board seats | 0.209* |
| Social connections to the CEO | 0.182* |



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

**Table B.3**
**Continued**

*C. Comparisons of male and female division managers*

| Division manager attribute | Age | Graduate degree | Tenure with the firm | Performance record | Board member | External board seats | Social connections to CEO |
|---|---|---|---|---|---|---|---|
| Model | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Female division manager | −0.035* [1.831] | 0.031 [0.564] | −0.120 [0.936] | −0.022 [1.328] | −0.048 [1.209] | −0.003 [0.036] | −0.056 [1.448] |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | .317 | .328 | .403 | .184 | .491 | .491 | .833 |
| No._obs. | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 | 3,904 |

This table provides descriptive correlations between the gender of division managers and the characteristics of the managers, divisions, firms, and CEOs. Panel A shows the pairwise correlations between the fraction of female division managers in a firm and the characteristics of the firm (top pane) and its CEO (bottom pane). Panel B shows the pairwise correlations between the female gender of a division manager and the attributes of her division (top pane) and her professional characteristics (bottom pane). Panel C compares the characteristics of male and female division managers. In panel C, the dependent variable is one of division managers' characteristics, and all regressions include year, industry, and firm fixed effects. The variable *Female division manager* is an indicator that equals one if the manager's gender is female. The variable *Fraction of female division managers* is the ratio of the number of female division managers to the total number of division managers in a firm. Appendix A defines the variables. In panels A and B, significance levels for the correlation estimates are indicated as follows: * 5% or better. In panel C, the $t$-statistics (in brackets) are based on standard errors that are heteroscedasticity consistent and clustered at the firm level. Significance levels are indicated as follows: * = 10%, ** = 5%, *** = 1%.

## References


Adams, R. 2016. Women on boards: The superheroes of tomorrow? *Leadership Quarterly* 27:371–86.

Adams, R., and D. Ferreira. 2009. Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics* 94:291–309.

Adams, R., S. Gray, and J. Nowland. 2012. Does gender matter in the boardroom? Evidence from the market reaction to mandatory new director announcements. Working Paper, University of Oxford.

Adams, R., M. Keloharju, and S. Knüpfer. 2018. Are CEOs born leaders? Lessons from traits of a million individuals. *Journal of Financial Economics* 130:392–408.

Adams, R., and T. Kirchmaier. 2015. Barriers to boardrooms. Working Paper, University of Oxford.

Antle, R., and G. Eppen. 1985. Capital rationing and organizational slack in capital budgeting. *Management Science* 3:163–74.

Aghion, P., R. Blundell, R. Griffith, P. Howitt, and S. Prantl. 2009. The effects of entry on incumbent innovation and productivity. *Review of Economics and Statistics* 91:20–32.

Alesina, A., P. Giuliano, and N. Nunn. 2013. On the origins of gender roles: Women and the plough. *Quarterly Journal of Economics* 128:469–530.

Ahern, K., and D. Sosyura. 2015. Rumor has it: Sensationalism in financial media. *Review of Financial Studies* 28:2050–93.

Allport, G. 1954. *The nature of prejudice*. Boston: Addison-Wesley.

Arrow, K. 1973. The theory of discrimination. In *Discrimination in labor markets*, eds. O. Ashenfelter and A. Rees, 3–33. Princeton, NJ: Princeton University Press..

Bandura, A. 1977. *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.


Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

———. 1986. *Social foundations of thought and action: A social-cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.

Baranov, V., R., De Haas, and P. A. Grosjean. 2018. Men. Roots and consequences of masculinity norms. Working Paper, University of Melbourne.

Bennedsen, M., K. Nielsen, F. Pérez-González, and D. Wolfenzon. 2007. Inside the family firm: The role of families in succession decisions and performance. *Quarterly Journal of Economics* 122:647–91.

Bennedsen, M., F. Peréz-Gonzáles, and D. Wolfenzon. 2020. Do CEOs matter? Evidence from CEO hospitalization events. *Journal of Finance*. Advance Access published March 3, 2020, 10.1111/jofi.12897.

Bennedsen, M., E. Simintzi, M. Tsoutsoura, and D. Wolfenzon. 2020. Do firms respond to gender pay gap transparency? Working Paper, INSEAD.

Bigler, R., and L. Liben 2006. A developmental intergroup theory of social stereotypes and prejudice. *Advances in Child Development and Behavior* 34:39–89.

———. 2007. Developmental intergroup theory: Explaining and reducing children's stereotyping and prejudice. *Current Directions in Psychological Science* 16:162–6.

Becker, G. 1957. *The economics of discrimination*, 2nd ed. Chicago: University of Chicago Press.

Benmelech, E., and C. Frydman. 2015. Military CEOs. *Journal of Financial Economics* 117:43–59.

Bernile, G., V. Bhagwat, and R. Rau. 2017. What doesn't kill you will only make you more risk-loving: Early-life disasters and CEO behavior. *Journal of Finance* 72:167–206.

Brim, O. 1958. Family structure and sex role learning by children: A further analysis of Helen Koch's data. *Sociometry* 21:1–16.

Brooks, A., L. Huang, S. Kearney, and F. Murray. 2014. Investors prefer entrepreneurial ventures pitched by attractive men. *Proceedings of the National Academy of Sciences* 111:4427–31.

Brutsaert, H. 2006. Gender-role identity and perceived peer group acceptance among early adolescents in Belgian mixed and single-sex schools. *Gender and Education* 18:635–49.

Bussey, K., and A. Bandura. 1999. Social–cognitive theory of gender development and differentiation. *Psychological Review* 106:676–713.

Chatterji, A., D. Levine, and M. Toffel. 2009. How well do social ratings actually measure corporate social responsibility? *Journal of Economics & Management Strategy* 18:125–69.

Cheng, I., H. Hong, and K. Shue. 2016. Do managers do good with other people's money? Working Paper, Dartmouth College.

Chuprinin, O., and D. Sosyura. 2018. Family descent as a signal of managerial quality: Evidence from mutual funds. *Review of Financial Studies* 31:3756–820.

Cichello, M., C. E. Fee, C. Hadlock, and R. Sonti. 2009. Promotions, turnover, and performance evaluation: Evidence from the careers of division managers. *Accounting Review* 84:1119–43.

Cichy, K., E. Lefkowitz, and K. Fingerman. 2007. Generational differences in gender attitudes between parents and grown offspring. *Sex Roles* 57:825–36.

Coleman, S., and A. Robb. 2009. A comparison of new firm financing by gender: Evidence from the Kauffman firm survey data. *Small Business Economics* 33:397–411.

———. 2016. The next wave: Financing women's growth-oriented firms. Stanford University Press.

Cordua, G., K. McGraw, and R. Drabman. 1979. Doctor or nurse: Children's perception of sex typed occupations. *Child Development* 50:590–3.

Cronqvist, H., A. Makhija, and S. Yonker. 2012. Behavioral consistency in corporate finance: CEO personal and corporate leverage. *Journal of Financial Economics* 103:20–40.

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

Cronqvist, H., and F. Yu. 2017. Shaped by their daughters: Executives, female socialization, and corporate social responsibility. *Journal of Financial Economics* 126:543–62.

Dahl, M., C. Dezso, and D. Ross. 2012. Fatherhood and managerial style: How a male CEO's children affect the wages of his employees. *Administrative Science Quarterly* 57:669–93.

Dahl, G., A. Kotsadam, and D. Rooth. 2018. Does integration change gender attitudes? The effect of randomly assigning women to traditionally male teams. Working Paper, University of California, San Diego.

Dai, Y., P. R. Rau, A. Stouraitis, and W. Tan. 2020. An ill wind? Terrorist attacks and CEO compensation. *Journal of Financial Economics* 135:379–98.

Delamont, S. 1990. *Sex roles and the school*. London: Routledge.

Dezso, C., and D. Ross. 2012. Does female representation in top management improve firm performance? A panel data investigation. *Strategic Management Journal* 33:1072–89.

Di Giuli, A., and L. Kostovetsky. 2014. Are red or blue companies more likely to go green? Politics and corporate social responsibility. *Journal of Financial Economics* 111:158–80.

Duchin, R., A. Goldberg, and D. Sosyura. 2017. Spillovers inside conglomerates: Incentives and capital. *Review of Financial Studies* 30:1696–743.

Duchin, R., and D. Sosyura. 2013. Divisional managers and internal capital markets, *Journal of Finance* 68:387–429.

Epstein, M., and L. Ward. 2011. Exploring parent-adolescent communication about gender: Results from adolescent and emerging adult samples. *Sex Roles* 65:108–18.

Ewens, M., and R. Townsend. 2020. Are early stage investors biased against women? *Journal of Financial Economics* 135:653–77.

Farre, L., and F. Vella. 2013. The intergenerational transmission of gender role attitudes and its implications for female labor force participation. *Economica* 80:219–47.

Fernández, R., A. Fogli, and C. Olivetti. 2004. Mothers and sons: Preference formation and female labor force dynamics. *Quarterly Journal of Economics* 119:1249–99.

Fogli, A., and L. Veldkamp. 2011. Nature or nurture? Learning and the geography of female labor force participation. *Econometrica* 79:1103–38.

Fortin, N. 2005. Gender role attitudes and the labor-market outcomes of women across OECD countries. *Oxford Review of Economic Policy* 21:416–38.

Giroud, X., and H. Mueller. 2010. Does corporate governance matter in competitive industries? *Journal of Financial Economics* 95:312–31.

Glaser, M., F. Lopez-de-Silanes, and Z. Sautner. 2013. Opening the black box: Internal capital markets and managerial power. *Journal of Finance* 68:1577–631.

Glynn, A., and M. Sen. 2015. Identifying judicial empathy: Does having daughters cause judges to rule for women's issues? *American Journal of Political Science* 59:37–54.

Gneezy, U., K. Leonard, and J. List. 2009. Gender differences in competition: Evidence from a matrilineal and a patriarchal society. *Econometrica* 77:1637–64.

Gompers, P., and S. Wang. 2017. And the children shall lead: Gender diversity and performance in venture capital. Working Paper, Harvard Business School.

Gold, D., and D. Andres. 1978. Developmental comparisons between ten-year-old children with employed and nonemployed mothers. *Child Development* 49:75–84.

Graham, J., C. Harvey, and M. Puri. 2015. Capital allocation and delegation of decision-making authority within firms. *Journal of Financial Economics* 115:449–70.

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

Graham, J., and K. Narasimhan. 2005. Corporate survival and managerial experiences during the Great Depression. Working Paper, Duke University.

Grosjean, P., and R. Khattar. 2019. It's raining men! Hallelujah? The long-run consequences of male-biased sex ratios. *Review of Economic Studies* 86:723–54.

Guenzel, M., and U. Malmendier. 2019. Behavioral corporate finance: The life cycle of a CEO career. Working Paper, UC Berkeley.

Halpern, H., and M. Perry-Jenkins. 2016. Parents' gender ideology and gendered behavior as predictors of children's gender-role attitudes: A longitudinal exploration. *Sex Roles* 74:527–42.

Harris, M., and A. Raviv. 1996. The capital budgeting process: Incentives and information. *Journal of Finance* 51:1139–74.

Hebert, C. 2020. Gender stereotypes and entrepreneur financing. Working Paper, University of Toronto.

Heilman, M., C. Block, and R. Martell. 1995. Sex stereotypes: Do they influence perceptions of managers? *Journal of Social Behavior and Personality* 10:237–52.

Herzog, A., and J. Bachman. 1982. *Sex role attitudes among high school seniors: Views about work and family roles*. Ann Arbor, MI: University of Michigan, Institute for Social Research.

Huston, A., and M. Alvarez. 1990. The socialization context of gender role development in early adolescence. In *From childhood to adolescence: A transitional period?*, eds. R. Montemayor, G. R. Adams, and T. P. Gullotta, 156–79. Newbury Park, CA: Sage.

Jackson, M. 2008. *Social and economic networks*. Princeton, NJ: Princeton University Press.

Jenter, D., and K. Lewellen. 2015. CEO preferences and acquisitions. *Journal of Finance* 70:2813–52.

Kanze, D., L. Huang, M. Conley, and E. Higgins. 2018. We ask men to win and women not to lose: Closing the gender gap in startup funding. *Academy of Management Journal 61*:586–614.

Kaplan, S., and M. Sorensen. 2017. Are CEOs different? Characteristics of top managers. Working Paper, University of Chicago.

Keloharju, M., S. Knüpfer, and J. Tag. 2019. What prevents women from reaching the top? Working Paper, Aalto University School of Business.

Koch, H. 1956. Sissiness and tomboyishness in relation to sibling characteristics. *Journal of Genetic Psychology* 88:231–44.

Lai, K., B. Srinidhi, F. Gul, and J. Tsui. 2017. Board gender diversity, auditor fees, and auditor choice. *Contemporary Accounting Research* 34:1681–714.

Leve, L., and B. Fagot. 1997. Gender-role socialization and discipline processes in one- and two-parent families. *Sex Roles* 36:1–21.

Lerner, J. 1994. Maternal employment and children's socioemotional development. In *Working women and their families*, ed. J. V. Lerner, 54–86. Thousand Oaks, CA: Sage.

Levy, G. 1989. Relations among aspects of children's social environments, gender schematization, gender role knowledge, and flexibility. *Sex Roles* 21:803–23.

Liu, C., and D. Yermack. 2012. Where are the shareholders' mansions? CEOs' home purchases, stock sales, and subsequent company performance. In *Corporate governance: Recent developments and new trends*, eds. D. K. Nguyen and S. Boubaker. New York: Springer-Verlag.

Loughran, T., and B. McDonald. 2015. Old glass ceilings are hard to break: Gender usage trends in annual reports. *Studies in Communication Sciences* 15:5–11.

Malmendier, U., and G. Tate. 2008. Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of Financial Economics* 89:20–43.



Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

Malmendier, U., G. Tate, and J. Yan. 2011. Overconfidence and early-life experiences: The effect of managerial traits on corporate financial policies. *Journal of Finance* 66:1687–733.

Martin, J., B. Hamilton, M. Osterman, A. Driscoll, and P. Drake. 2018. Births: Final data for 2016. *National Vital Statistics Reports* 67. Available at https://www.cdc.gov/nchs/data/nvsr/nvsr67/nvsr67_01.pdf

Martin, P., M. Withersosmond, S. Hesselbart, and M. Wood. 1980. The significance of gender as a social and demographic correlate of sex role attitudes. *Sociological Focus* 13:383–96.

McCrae, R., and P. Costa. 1994. The stability of personality: Observations and evaluations. *Current Directions in Psychological Science* 3:173–5.

McHale, S., K. Updegraff, and S. Whiteman. 2012. Sibling relationships and influences in childhood and adolescence. *Journal of Marriage and Family* 74:913–30.

McPherson, M., L. Smith-Lovin, and J. M. Cook. 2001. Birds of a feather: Homophily in social networks. *Annual Review of Sociology* 27:415–44.

Mischel, W. 1966. A social-learning view of sex differences in behavior. In *The development of sex differences*, ed. E. E. Maccoby, 57–81. Stanford, CA: Stanford University Press.

Morris, M., N. Miyasaki, C. Watters, and S. Coombes. 2006. The dilemma of growth: Understanding venture size choices of women entrepreneurs. *Journal of Small Business Management* 44:221–44.

Newton, D., and M. Simutin. 2014. Of age, sex, and money: Insights from corporate officer compensation on the wage inequality between genders. *Management Science* 61:2355–75.

Nickell, S. 1996. Competition and corporate performance. *Journal of Political Economy* 104:724–46.

Ozbas, O., and D. Scharfstein. 2010. Evidence on the dark side of internal capital markets. *Review of Financial Studies* 23:581–99.

Phelps, E. 1972. The statistical theory of racism and sexism. *American Economic Review* 62:659–61.

Pool, V., N. Stoffman, and S. Yonker. 2012. No place like home: Familiarity in mutual fund manager portfolio choice. *Review of Financial Studies* 25:2563–99.

Rajan, R., H. Servaes, and L. Zingales. 2000. The cost of diversity: The diversification discount and inefficient investment. *Journal of Finance* 55:35–80.

Roberts, B., and W. DelVecchio. 2000. The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin* 126:3–25.

Rust, J., S. Golombok, M. Hines, K. Johnston, J. Golding, and the ALSPAC Study Team. 2000. The role of brothers and sisters in the gender development of preschool children. *Journal of Experimental Child Psychology* 77:292–303.

Rutherford, S. 2001. Organizational cultures, women managers and exclusion. *Women in Management Review* 16:371–82.

Scharfstein, D., and J. Stein. 2000. The dark side of internal capital markets: Division rent-seeking and inefficient investment. *Journal of Finance* 55:2537–64.

Shafer, E., and N. Malhotra. 2011. The effect of a child's sex on support for traditional gender roles. *Social Forces* 90:209–22.

Shin, H., and R. Stulz. 1998. Are internal capital markets efficient? *Quarterly Journal of Economics* 113:531–52.

Stein, J. 1997. Internal capital markets and the competition for corporate resources. *Journal of Finance* 52:111–33.

Stoneman, Z., G. Brody, and C. MacKinnon. 1986. Same-sex and cross-sex siblings: Activity choices, roles, behavior, and gender stereotypes. *Sex Roles* 15:495–511.

Sutton-Smith, B., and B. Rosenberg. 1970. *The sibling*. New York: Holt, Rinehart & Winston.

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022

Swim, J., and L. Sanna. 1996. He's skilled, she's lucky: A meta-analysis of observer's attributions for women's and men's successes and failures. *Personality & Social Psychology Bulletin* 22:507–19.

Tate, G., and L. Yang. 2015. Female leadership and gender equity: Evidence from plant closure. *Journal of Financial Economics* 117:77–97.

Thornton, A., D. Alwin, and D. Camburn. 1983. Causes and consequences of sex-role attitudes and attitude change. *American Sociological Review* 48:211–27.

Vanfossen, B. 1977. Sexual stratification and sex role socialization. *Journal of Marriage and the Family* 39:563–74.

Warner, R. 1991. Does the sex of your children matter? Support for feminism among women and men in the United States and Canada. *Journal of Marriage and the Family* 53:1051–56.

Warner, R., and B. Steel. 1999. Child rearing as a mechanism for social change: The relationship of child gender to parents' commitment to gender equity. *Gender and Society* 13:503–17.

Washington, E. 2008. Female socialization: How daughters affect their legislator fathers' voting on women's issues. *American Economic Review* 98:311–32.

Weinraub, M., L. Clemens, A. Sockloff, R. Ethridge, E. Gracely, and M. Myers. 1984. The development of sex role stereotypes in the third year: Relationships to gender labeling, gender identity, sex-typed toy preferences, and family characteristics. *Child Development* 55:1493–503.

Xuan, Y. 2009. Empire-building or bridge-building? Evidence from new CEOs' internal capital allocation decisions. *Review of Financial Studies* 22:4919–48.

Yermack, D. 2014. Tailspotting: Identifying and profiting from CEO vacation trips. *Journal of Financial Economics* 113:252–69.

Yonker, S. 2017a. Do managers give hometown labor an edge? *Review of Financial Studies* 30:3581–604.

———. 2017b. Geography and the market for CEOs. *Management Science* 63:609–30.

Downloaded from https://academic.oup.com/rfs/article/34/2/700/5856754 by Arizona State University user on 18 May 2022