Organizational Barriers to Career Advancements of Women Managers: Role of Internal Structure

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ABSTRACT

This study examines how internal organizational structure can influence the promotion rates of women executives to CEO positions. We leverage an organizational design framework that categorizes organizational structure into centralized and decentralized types, each requiring distinct managerial skills and abilities. We hypothesize that women executives in centralized structures are less likely to be promoted than their counterparts in decentralized structures, driven by differences in performance visibility and transferable skills required, such as social relationships and networks. We contend that decentralized structures provide less opportunity for gender bias owing to greater transferrable skills and visibility. We find empirical support for these predictions using the data on over 596,000 managers in 15,200 firms. The results suggest that organizational structures can shape the career trajectories of women managers.

1. Introduction

Understanding the factors contributing to the underrepresentation of women in upper management ranks is important, as women managers constitute a significant managerial talent pool (Dezső and Ross, 2012; Siegel et al., 2019; Tsolmon, 2024). Even though internal organizational dynamics greatly influence managerial career progressions, the literature has been limited in specifying how organizational structure specifically influences the gender gap (Hurst et al., 2024). This research gap is particularly intriguing because organizational structure forms the basis for the internal division of labor and social processes that govern managerial career opportunities and promotion decisions (Joseph and Gaba, 2020; Karim and Williams, 2012; Kogut and Zander, 1992; Nelson and Winter, 1982b; Winter, 1987). Understanding how organizational structure systematically contributes to or mitigates the gender gap is crucial, given that workplace discrimination occurs in a social context. This knowledge can be instrumental in shaping corporate policies to address disparities in opportunities and assist individual managers in navigating the constraints imposed by organizational structure.

In this study, we ask how formal organizational structure influences the promotion rates of women executives. We propose that organizational structure can create systematic patterns of opportunities and constraints that can differentially affect the likelihood of promotions of women managers. We propose two mechanisms by which organizational design may drive the differences in managerial promotions. First, we suggest that specific organizational structures can be more conducive to perpetuating biases against women. Second, we propose that some organizational structures can affect the visibility and transferability of managerial competencies, which can limit the career opportunities of women managers. We focus our study on a key dimension of organizational design—the degree of centralization and decentralization in multi-unit firms—to

analyze how structure can shape systematic disparities in promotion opportunities for women. Specifically, we propose that women managers in organizations characterized by higher levels of centralization are likely to encounter fewer promotion opportunities due to the limited nature of skills transferability, attribution of performance, and visibility compared to their counterparts in more decentralized organizations.

We test our hypothesis using data on the employment histories of over 596,000 managers in 15,200 U.S. firms between 1993 and 2017. Consistent with our expectations, we find that women managers are more likely to be promoted to CEO positions in decentralized firms than their counterparts in centralized firms. We explore the theorized mechanisms in our additional analyses. Our results indicate that these patterns are driven by the promotions of women managers with more transferrable skills and visibility. Overall, our findings suggest that decentralized organizational structure seems more conducive to reducing the gender gap than centralized structures.

This study makes the following contributions. First, we contribute to understanding how organizational factors can influence the career advancement of women managers. Extant literature in this area is limited, with recent research primarily focusing on how organizational vertical structure, specifically its flatness, attracts potential women employees (Hurst et al., 2024). Our study adds to this work by documenting differential promotion rates of women managers in different organizational structures and providing empirical support for skill transferability and visibility mechanisms. Our results can inform how firm policies addressing the gender gap should pay attention to structural constraints imposed by internal organizational design.

Additionally, we contribute to the literature that underscores the relationship between organizational design and the development of structure-specific managerial talent and capabilities

(Du and Tsolmon, 2023). Our results suggest that distinct structure-specific managerial competencies and skills can influence career trajectories and opportunities available to them.

2 Theory and Hypothesis

2.1 Organizational structure and managerial skills

The design of an organizational structure serves as a basis for dividing the labor needed for an organization's mission into distinct tasks and then coordinating these tasks to accomplish the mission in a cohesive way (Joseph and Gaba, 2020; Mintzberg, 1979). Structure establishes the processes and routines by which work gets done (Fiedler and Welpe, 2010; Gulati and Puranam, 2009; Mintzberg, 1979; Nadler and Tushman, 1997; Nelson and Winter, 1982). Hence, organizational structure provides the foundation for communication patterns and social interactions inside a firm (Joseph and Gaba, 2020; Karim and Williams, 2012; Kogut and Zander, 1992; Nelson and Winter, 1982; Winter, 1987). Different organizational structures have corresponding processes, incentives, goal framing, attention, coordination levels, information flow, decision rules, and delegation of authority (Joseph and Gaba, 2020; Williamson, 1985).

Managers operating in different organizational structures acquire knowledge, social capital, and know-how that resides in specialized relationships among individuals and groups, as well as in ways of making decisions that shape their dealings with each other (Joseph and Gaba, 2020; Kogut and Zander, 1992; Nelson and Winter, 1982; Winter, 1987). Managers develop different competencies for managing the coordination mechanisms that "deal with workflows between distinct yet interdependent units" in organizations (Nadler and Tushman, 1997: 92). As specific coordination mechanisms and processes are used repeatedly, they become routinized and sticky and form the organization's memory (Fiedler and Welpe, 2010; Gulati and Puranam, 2009; Nelson

and Winter, 1982). These routines establish the organization's accepted “ways of doing things” (Burton et al., 2006).

To be successful in a given organizational structure, managers develop specific skills and competencies based on these routines and processes. Specifically, managerial competencies and skills diverge due to organizational differences along the following dimensions: performance measurement, evaluation criteria, the importance of social capital and bargaining skills, and managerial cognition and attention (Joseph and Gaba, 2020; Karim and Williams, 2012).

The literature has specified four “ideal-type” hierarchical forms (simple hierarchy, unitary (U-form), multidivisional (M-form), and project matrix) as the main ways firms organize their internal activities (Chandler, 1962; Foss and Weber, 2016; Gaba and Joseph, 2013; Williamson, 1985). In this study, we focus on the degree of centralization as the primary facet of organizational design to illustrate and examine the differences in managerial skills and competencies required in different organizational structures (Chandler, 1962; Gaba and Joseph, 2013; Williamson, 1985).

Multidivisional firms (M-form) are decentralized as units are organized around product markets or regions, each responsible for their own profit and loss (P&L) statements. The decentralized M-form firms feature corporate allocation of resources, and business units have the authority and responsibility for implementation and operations (Chandler 1962, Williamson 1975). The unit performance is measured by financial metrics, such as unit-level profitability and growth. As a result, the performance evaluation of unit managers is primarily based on tangible and measurable outcomes on how well the unit does financially. Because financial performance is more directly tied to managers’ actions, managers develop a strong commitment to profitability and focus on tangible results, which requires them to invest in skills that help them monitor and improve the performance of their divisions at a more competitive level (Foss and Weber, 2016;

Gaba and Joseph, 2013; Qian et al., 2006; Williamson, 1964, 1975). Moreover, units in decentralized firms are competing not only in the product market but also internally with one another for corporate resources (Weber et al., 2023). As a result, in decentralized firms, managerial skills, attention, and cognitive models are tied closely to the financial performance of their units in external and internal competition. Hence, managers in decentralized structures develop and practice competencies guided by processes, incentives, and cognitive frames directed toward achieving unit financial performance goals.

In centralized (U-form) firms, different functional units are organized around specialized functions, the units must coordinate to integrate different tasks, and the locus of authority and decision-making is concentrated at the top (Galbraith, 1977; Williamson, 1985). Performance is assessed using an organization's overall performance rather than an individual unit's performance (Joseph et al., 2016). Hence, the contribution of each functional department to corporate performance is less directly observable and measurable (Williamson, 1964, 1975). Because centralized structures emphasize coordination between units, performance measurement of unit managers is based more on effort and "soft" information, such as hard-to-quantify, tacit, and context-specific information about their ability to cooperate and contribute rather than "hard" quantifiable and standardized information on unit performance outcomes (Liberti and Petersen, 2019). As a result, managers in centralized structures must be skilled at internal bargaining, which may involve investing in political capital, networks, and social relationships to perform well internally (Hill et al., 1992; Hoskisson et al., 1993; Williamson, 1970). Hence, managers in centralized structures develop competencies guided by processes, incentives, and cognitive frames directed toward managing relationships, coordination, and information.

In sum, managers develop different skills and cognitive models in different organizational structures. A summary of managerial skills and competencies by organizational form is in Figure 1. Next, we examine how these differences may impact the career advancement opportunities of managers and how these opportunities may differ for women managers.

2.2 The effect of organizational structure on the gender gap in promotions

Organizational structure can shape career advancement opportunities of managers in ways that can affect the gender gap. First, the type of competencies managers develop and criteria for promotions that differ by organizational structure can limit opportunities for advancement of women managers. Second, different structures may create differential exposure of managers to the external labor market, which can affect their career advancement opportunities.

Internal promotion criteria

In organizations, managerial skills and competencies combined with their performance can determine managerial career advancements. In centralized organizations, managerial performance is based more on the perceived contribution of the unit to firm performance rather than quantifiable unit performance information. In addition, managerial performance depends more on the ability to coordinate across units, in which informal networks and social connections are important. Managers perceived to exert the most effort in these coordination activities are more likely to be promoted. Decentralized firms, on the other hand, offer more quantifiable and measurable information about managerial contributions, making it easier to assess managerial quality. Managers are not expected to coordinate across different units, instead focusing on the performance of their own units. Managers who are able to achieve unit-level goals are most likely to be rewarded and promoted.

The gender gap may be more prevalent in structures where there is more reliance on subjective judgment and the greater importance of social networks. Research suggests that bias can manifest more readily in settings where social and informal networks play a crucial role because these settings often leave room for subjective judgments (Eagly and Karau, 1991). For example, in structures where subjective judgment is more prevalent, the dominant group (in this case, male managers) may allocate high-promotability tasks among themselves and filter information to advantage themselves (Babcock et al., 2017; Wynn, 2020). Women may be less inclined to compete over career advancement opportunities based on social networking and politicking (Babcock and Laschever, 2003; Exley and Kessler, 2019; Lerchenmueller et al., 2019; Niederle and Vesterlund, 2011). Furthermore, studies have shown that women often face career difficulties not primarily due to formal obstacles but limited access to informal and political opportunities within influential circles (Chang, 2018; Kanter, 1977; Kleinbaum et al., 2013). This can be particularly challenging in centralized organizations, where male managers may establish exclusive networks that women struggle to join. In contrast, decentralized organizations, where managerial quality relies more on financial performance, may offer women managers a more level playing field.

Therefore, in centralized firms, where it is challenging to isolate and attribute individual contributions clearly, the gender gap may be pronounced more systematically than in decentralized firms. A scarcity of quantifiable and objective information and subjective judgment can limit advancement opportunities for women managers.

External opportunities

The availability of external opportunities plays a crucial role in managerial promotions (Bidwell and Mollick, 2015). The ability to transfer managerial skills to other firms can determine

external career opportunities (Wang et al., 2009). For example, firm-specificity of skills can severely limit the mobility of managers because the value of their skills is higher in the focal firm than in other firms (Campbell et al., 2012). Moreover, having external options can increase the bargaining power of managers in the focal firm to negotiate higher wages and internal promotions (Wang et al., 2009). In centralized firms, managerial competencies are more firm-specific than in decentralized firms. Social networks and the ability to coordinate across internal units require firm-specific knowledge and relationships (Levin and Cross, 2004; Uzzi, 1997; Wang et al., 2009). Furthermore, the difficulty of attributing unit and firm performance to individual managers limits the external labor market's ability to assess managers' quality and contributions. In contrast, skills obtained in decentralized firms are more generic and transferrable across firms, and unit performance is more readily attributable to individual managers. Hence, the greater transferability of skills combined with the increased visibility of managers suggest that managers in decentralized firms will have more external options than managers in centralized firms.

The organizational differences in external options for managers can perpetuate the gender gap. For example, a lack of performance information can hamper women managers' promotion rates (Tsolmon, 2024). In organizations where performance is less observable to the external markets and less attributable to managers, women may face challenges showcasing their skills and achievements. Limited external labor market options for women, in turn, reduce their bargaining power internally. Hence, women managers in centralized structures will have more opportunity constraints than their counterparts in decentralized structures.

Moreover, the transferability of managerial skills and managers' visibility can cause greater churn in decentralized firms. This increased mobility and churn in decentralized firms creates more frequent opportunities for managerial positions, including CEO roles, to open up. Consequently,

this dynamic environment can inadvertently benefit women in these organizations, increasing opportunities for internal promotion to top executive positions. As such, women managers may have more opportunities for advancement in decentralized firms due to the higher turnover rate among managers.

In sum, we propose two mechanisms through which structure can hamper women's promotion opportunities. First, the structure can create more opportunities for bias through lower attributability of individual contributions to firm performance and greater reliance on subjective performance criteria. Second, the structure can limit external career opportunities for women managers through lower transferability of managerial skills and lower visibility of women managers, which can reduce their internal bargaining power. We summarize our theoretical model in Figure 2.

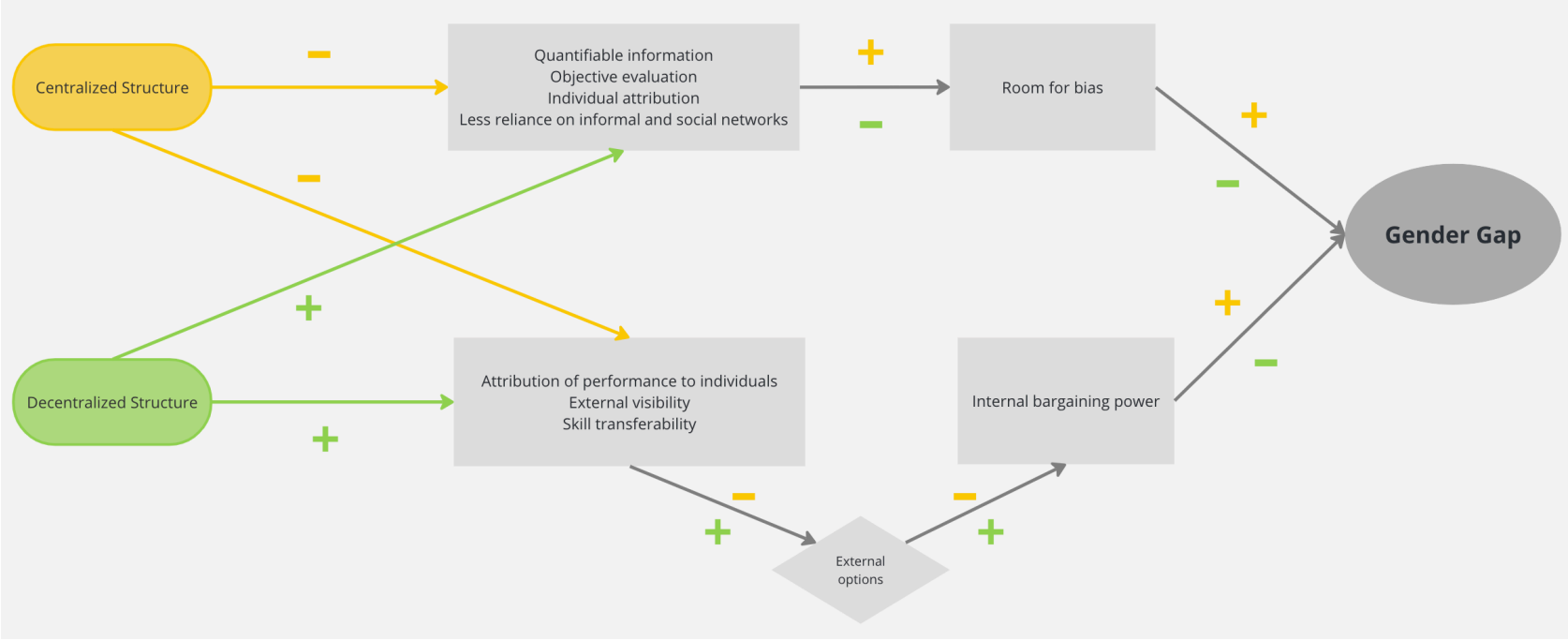
Thus, we predict that:

Hypothesis 1. *Women managers in decentralized firms are more likely to be promoted internally to CEO positions than their counterparts in centralized firms.*

Figure 1: Managerial skills and competencies by organizational form

	Centralized Structure	**Decentralized Structure**
Level of authority	Corporate-level	Unit-level
Measurement of performance	Unit contribution to firm-level performance (less observable, less directly attributable to managers)	Unit-level financial performance (more observable, more directly attributable to managers)
Evaluation criteria	Effort-based	Outcome-based
Firm-level coordination	High	Low

Figure 2: Factors contributing to the gender gap in centralized vs. decentralized organizational structures



3 Data and Methodology

3.1 Data and variables

Sample

To examine the impact of organization structure on individual career attainment, we constructed manager-position-year level data and gathered information on the organizational structures of companies from the Directory of Corporate Affiliations of LexisNexis (DCA). This database provides company profiles and the hierarchical structures of more than 228,000 parent companies and their various units, including branches, affiliates, subsidiaries, and divisions, up to the seventh level of corporate connections. Covering the period from 1993 to 2017, the DCA provides detailed annual data on corporate structure for firms with over 300 employees and revenues exceeding $10 million. LexisNexis compiles this data from various sources, including direct company inputs, annual reports, and business publications within its database. In addition, each company is contacted to confirm the accuracy of the information. The analysts at LexisNexis undertake rigorous editing and validation to minimize errors before the data is entered into the database. The DCA also details the business segments of each subsidiary using four-digit Standard Industrial Classification (SIC) codes and provides comprehensive street addresses for most entities (Zhou, 2015).

DCA reports up to fifty managers per company year, in which they are ranked in order of hierarchy, which allows us to track and analyze the career trajectories of managers. Functions range from higher ranked positions, such as CEO and President, to lower ranked positions that are more functional or regional such as Marketing Communications Specialist and Managing Director at Philadelphia. The data also standardizes each managerial position, making them comparable across units and firms. We exclude companies that do not report any managers. Our final sample

consists of over 596k managers across 15,200 multi-unit firms and 137k subsidiaries from 1993 to 2017.

Dependent Variable

Manager-level CEO promotion indicator. Our dependent variable is an indicator variable of whether a manager ascends to the CEO position of a parent company in a given year (year *t*), provided that in the preceding year (year *t-1*) the individual did not hold the CEO position at the parent company. DCA defines a parent company as the highest-level firm in a corporate hierarchy, indicated by a company level of zero.

Independent Variables

Firm-level decentralization. We follow the extant literature to construct the variable for organizational structure (e.g., Zhou, 2013). This is a continuous variable that represents the degree of a firm's decentralized organizational structure. It is determined by taking the natural logarithm of the number of base units within the multi-unit firm, lagging by one year.

We differentiate between two primary types of organizational structures by using a standard categorization widely applied in the organizational design literature - centralized and decentralized (Chandler, 1986; Joseph and Gaba, 2020; Mintzberg, 1980; Williamson, 1975, 1985). To measure organizational centralization, we adopt established methodologies from previous studies to quantify organizational structure for firms across industries systematically. The degree of centralization is captured by the number of divisions and majority-owned subsidiaries with no subordinate divisions or subsidiaries (i.e., the number of base subsidiaries of the ultimate parent firm) (Zhou, 2013). These base divisions and subsidiaries indicate the lowest profit-center accountability and allow for comparative analysis across different organizations (Argyres, 1996;

Rajan and Wulf, 2006). A firm is considered more divisionalized or decentralized as the count of these units increases.

Woman Manager. This is an indicator variable of whether the manager is a woman manager. This determination is made based on the manager's first name. We use an algorithm to categorize the first names into predominantly male or female.

Control Variables

We follow prior studies to include controls that could affect the propensity of an individual to be promoted to CEO (Berns and Klarner, 2017; Guthrie and Datta, 1997). Our estimations include controls at the parent firm, subsidiary, manager, and industry levels. All variables are lagged by one year to account for the time it takes for these characteristics to influence CEO succession.

Firm-level controls. At the parent firm level, we control for *Firm Size,* as larger firms face higher bureaucratization, leading to more mandatory retirements and a higher rate of CEO turnover (e.g., Dalton and Kesner, 1983; Guthrie and Datta, 1997; Helmich and Brown, 1972; Lauterbach et al., 1999; Naveen, 2006). This is measured as the natural logarithm of the number of employees at the parent firm. Additionally, we control for *Firm Age*, computed as the natural logarithm of the number of years since the parent firm's founding, acknowledging that older firms might have more established practices and potentially different criteria for CEO selection compared to younger firms (Bennedsen et al., 2007; Cucculelli and Micucci, 2008; Karaevli, 2007). We also include the *Public Status* of the parent firm, measured as a dummy variable equal to one for listed firms (Magnusson and Boggs, 2006; Minichilli et al., 2014).

Unit-level controls. At the unit/subsidiary level, we control for a similar set of variables as the parent firm-level controls. These include *Unit Size*, computed as the natural logarithm of the

number of employees at the subsidiary. *Unit Public Status* is measured as a dummy variable equal to one for listed units, mirroring the parent firm's control for public status. Additionally, we include *Unit Foreign Status* to account for an individual's international experience, calculated as a dummy variable equal to one if the unit and the parent firm are located in different countries (Georgakakis and Ruigrok, 2017).

Manager-level controls. At the manager level, we control for the *Rank Order* of position, computed as the natural logarithm of the individual's ranking at the firm. This serves as a proxy for the manager's functional background, reflecting the hierarchical position within the organization. The lower the rank number, the higher the position. We also include *Tenure* as a control variable, measured as the natural logarithm of the number of years the individual has been at the firm. This captures the duration of the manager's exposure to the parent firm's culture, processes, and strategic direction (e.g., Georgakakis and Ruigrok, 2017; Hambrick and Mason, 1984; Shen and Cannella, 2002; Wiersema et al., 2018). For functional background, we follow prior research to categorize managers into nine functional categories: production operations, R&D and engineering, finance, accounting, marketing and sales, law, personnel and labor relations (HR), management and administration, and general (Bantel and Jackson 1989, Carpenter and Fredrickson 2001, Michel and Hambrick 1992, Wiersema and Bantel 1992). These functional categories are represented in our model as dummy variables to control for differences in managerial functions. For the purposes of regression analysis, the general management category is used as the reference group.

For further analysis, we followed prior literature to include industry-level fixed effects, categorized by the first two digits of the SIC code (Datta and Rajagopalan, 1998). This approach allows us to control for industry-specific characteristics and trends that could influence CEO

succession patterns. To absorb the effect of unspecified time-specific factors, such as economic fluctuations or regulatory changes, we also include year dummies (Karaevli, 2007). Additionally, we incorporate state-level fixed effects to control for geographic location, as regional factors like economic conditions and local corporate governance norms can have a significant impact on firm strategies and leadership decisions.

Summary Statistics

Table 1 presents the summary statistics and correlation of the key variables derived from the manager-year level data. On average, a manager has a 0.36% chance of being promoted to the CEO position at the parent firm in a given year. Women represent approximately 18.65% of the sample population of managers. The median number of base unit count is 4. The correlation matrix suggests that women managers are less likely to be promoted to CEO, consistent with previous research that women have fewer promotion opportunities than men. Women managers are more likely to work in decentralized firms, which is consistent with our prediction that there might be more opportunities for women managers than men in decentralized firms.

We further decompose the proportion of women managers in centralized and decentralized firms among CEOs, C-suite managers, and middle managers. Table 2 presents the raw percentage of women and men CEOs in centralized and decentralized firms. 5.54% of CEOs in decentralized firms are women versus 4.33% in centralized firms. A two-sample test of proportions indicates a statistically significant difference in the proportion of women CEOs between centralized and decentralized firms (z-value = -1.98; p-value<0.005). Table 3 details the proportions of C-suite managers by gender in both firm structures. In decentralized firms, 11.4% of these C-suite managers are women, compared to 9.94% in centralized firms. The difference in the proportion of women C-suite managers between centralized and decentralized firms is statistically significant

(z-value = -9.31; p-value<0.001). This aligns with the trend observed in CEO distribution. Table 4 represents the proportions of middle managers by gender in both firm structures, showing that 19.39% of middle managers in decentralized firms are women versus 20.59% in centralized firms. This difference is statistically significant (z-value = 17.74; p-value<0.001). These findings suggest a higher representation of women in CEO and C-suite roles in decentralized firms than centralized firms, and lower representation of women in middle management in decentralized firms than centralized firms. The higher representation of women in top roles suggests that decentralized structures might offer more pathways for women to obtain high-level positions. However, there may be barriers that prevent women from entering or advancing through the middle management ranks.

Table 1: Summary statistics and correlations

	Variables	Mean	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1)	Manager-level CEO promotion indicator	0.004	0.033	1										
(2)	Firm-level decentralization (number of base units)	2.639	1.451	-0.027	1									
(3)	Indicator for woman manager	0.187	0.390	-0.021	0.016	1								
(4)	Firm size (number of employees)	8.011	2.455	-0.013	0.600	-0.003	1							
(5)	Firm age (number of years since the parent's founding)	3.919	0.780	-0.005	0.224	-0.024	0.340	1						
(6)	Firm public status	0.660	0.474	0.000	0.336	-0.019	0.521	0.151	1					
(7)	Unit size	6.622	2.478	0.011	0.204	-0.034	0.504	0.176	0.301	1				
(8)	Unit public status	0.612	0.487	0.000	0.336	-0.019	0.521	0.151	0.984	0.300	1			
(9)	Unit foreign status	0.102	0.302	-0.016	0.225	-0.027	0.137	0.058	0.097	-0.039	0.096	1		
(10)	Manager position rank	5.327	7.138	-0.030	-0.124	0.139	0.000	-0.017	0.041	0.218	0.041	-0.269	1	
(11)	Manager tenure	3.682	3.130	0.026	-0.069	-0.046	-0.032	0.081	-0.050	-0.022	-0.048	-0.039	-0.051	1

Notes: This table presents summary statistics and correlation between the main variables. N=2,090,151.

Table 2: Proportion of women in decentralized vs. centralized firms (CEOs)

		Organizational structure		
		Decentralized	Centralized	
Gender	Woman	**5.54%**	**4.33%**	*5.03%*
	Man	**94.46%**	**95.67%**	*94.97%*

Notes: This table shows the percentage of CEOs by gender and organizational structure. Decentralized structure denotes the firm having more than 4 base units (median of the base unit count at the firm level), and centralized structure denotes the firm having less than 4 base units. The difference in the proportion of women CEOs between centralized and decentralized firms is not statistically significant. The difference in the proportion of women CEOs between centralized and decentralized firms is statistically significant ($z = -1.98$, $p < 0.05$, difference = -0.012).

Table 3: Proportion of women in decentralized vs. centralized firms (C-suite managers)

		Organizational structure		
		Decentralized	Centralized	
Gender	Woman	**11.40%**	**9.94%**	*10.78%*
	Man	**88.60%**	**90.06%**	*89.22%*

Notes: This table shows the percentage of C-suite managers by gender and organizational structure. Decentralized structure denotes the firm having more than 4 base units (median of the base unit count at the firm level), and centralized structure denotes the firm having less than 4 base units. The difference in the proportion of women C-suite managers between centralized and decentralized firms is statistically significant ($z = -9.31$, $p < 0.001$, difference = -0.015).

Table 4: Proportion of women in decentralized vs. centralized firms (middle managers)

		Organizational structure		
		Decentralized	Centralized	
Gender	Woman	**19.39%**	**20.59%**	*19.69%*
	Man	**80.61%**	**79.41%**	*80.31%*

Notes: This table shows the percentage of middle managers by gender and organizational structure. Decentralized structure denotes the firm having more than 4 base units (median of the base unit count at the firm level), and centralized structure denotes the firm having less than 4 base units. The difference in the proportion of female middle managers (CEO candidates) between centralized and decentralized firms is statistically significant ($z = 17.74$, $p < 0.001$, difference = 0.012).

3.2 Methodology

To examine the relationship between firm structure and the propensity of women managers to be promoted internally to parent firm CEO (Hypothesis 1), we employ the following empirical specification for an OLS regression:

$$Promotion_{ijt} = \alpha_0 + \alpha_1 Decentralized_{j(i)t} + \alpha_2 Woman_i + \alpha_3 Decentralized_{j(i)t} \times Woman_i + \gamma_j + \chi_m + \delta_i + \phi_k + \tau_t + \epsilon_{ijt} \quad (1)$$

where i denotes a manager, and j denotes the parent firm that manager i is in, m denotes the unit/subsidiary the manager is in. t denotes year; k the industry the manager is in; γ_j is a vector of parent firm-level controls; χ_m is a vector of unit-level controls; δ_i is a vector of manager-level controls. ϕ_k and τ_t are complete sets of industry and year dummies, respectively. ϵ_{ijt} is an independent and identically distributed (i.i.d.) error term. The standard errors are clustered at the ultimate parent firm level.

$Promotion$ is the manager-level promotion indicator, which equals one if the manager is promoted to the CEO position of a parent company in a given year. $Decentralized$ denotes the firm level decentralization, which is computed in two ways to capture different aspects of decentralization. The first method involves the natural logarithm of the number of base unit counts within the multi-unit firm. This logarithmic transformation is used to normalize the data and provide a scalable measure of decentralization. The second method uses an indicator variable to distinguish between types of firms, where the variable is set to 1 for multi-unit firms and 0 for stand-alone firms. This binary approach allows for a straightforward comparison between decentralized multi-unit firms and centralized stand-alone firms. We expect $\alpha_3 > 0$ if decentralized firm structure has a positive relationship with the likelihood of a woman manager being promoted to the ultimate parent firm CEO.

4 Results

4.1 Main results

Table 5 reports the results of the estimations testing the relationship between decentralized firm structure and CEO promotions for woman managers. We start building the main model by including the woman indicator and the continuous decentralization variable along with the year, industry, and state fixed effects to estimate the relationship with the manager-year level promotion likelihood (Column 1, Table 5). The estimated coefficient on the woman manager indicator is negative and significant, which aligns with our expectation that, in general, women managers are less likely to be promoted to CEO than their counterparts. The estimated coefficient on the decentralization variable is negative and significant, which suggests that managers are less likely to be promoted to CEO in decentralized firms. Decentralized firms often have more autonomous units or divisions, each with its own managers. This leads to a larger pool of potential candidates for the CEO position, making the competition stiffer compared to centralized firms where there might be a smaller pool of candidates. To account for variations in firm size, we included the total number of employees in each firm as a control variable in our analysis (see Column 3). We conduct additional tests, detailed in Appendix Table 2, to control for the number of units within each firm and use an indicator for decentralization based on whether a firm's base unit count is above or below the sample median (4).

In Table 5 Column 2, we include an interaction term between the woman manager indicator and the continuous decentralization variable. The estimated coefficient on the interaction term is positive and statistically significant, which suggests that women managers in decentralized organizational structures are more likely to be promoted to CEOs than their counterparts in centralized structures. In Column 3, we report the results from the full model, which includes all

relevant controls at the firm-, unit-, and manager levels. The estimated coefficient on the interaction term remains of the same magnitude and statistical significance. The estimated coefficient suggests an increase in the likelihood of becoming a CEO for women managers in decentralized structures to be approximately 30.5% greater than for women managers in centralized firms.

4.2 Analysis of mechanisms

Managerial Skills

In a given company, managers may have different levels of experience in decentralized firms depending on their tenure and prior experience, which can affect their skills transferability. To examine the relationship between manager-level skills and promotions, we examine whether women managers with more experience managing unit-level financial performance *within decentralized firms* have higher likelihood of being promoted to the CEO. We use the following empirical specification to estimate an OLS regression at the manager-year level:

$$Promotion_{ijt} = \beta_0 + \beta_1 Experience_{it} + \beta_2 WomanManager_i + \beta_3 Experience_{it} \times WomanManager_i + \gamma_j + \chi_m + \delta_i + \phi_k + \tau_t + \epsilon_{ijt} \quad (2)$$

$Experience$ denotes the manager-level experience in decentralized firms and is computed using two distinct measures. For each manager, we create an index of decentralization based on the percentage of years the manager has worked at a decentralized firm in their previous seven consecutive years of work. Our decentralization metric assigns a firm as decentralized if it has more than the median number of base unit counts (4 for multi-unit firms), and zero otherwise. For example, a manager who spent five years working at a decentralized firm and two years working at a centralized firm would have a decentralization index of 71.4%. The proposed mechanism is that women managers with more decentralized firm experience are more likely to be promoted

internally to CEO than women managers with less decentralized experience. The average score for individual-level decentralization is 0.643. This is not perfectly correlated with tenure: the correlation between individual level decentralization and tenure in their current firm is -0.066, which suggests that there is non-trivial variation in the decentralized experiences of these individuals, indicating a diverse range of firm types in their professional history. The individual-level decentralization indicates managers' prior experience across different firms.

As a second measure, we develop an indicator variable to denote whether a manager has served as the *Head of a Subsidiary* in their previous seven consecutive years of work. Serving as the head of a subsidiary is indicative of decentralized management experience and directly measures managerial skills associated with a decentralized structure. This role typically involves significant autonomy in decision-making, akin to operating within a decentralized structure. It requires managing distinct operational strategies, mirroring the independence of units in decentralized organizations. The rationale is that women managers with head of subsidiary experience are more likely to be promoted to CEO than women managers who have not held such roles.

This variable is set to one if the person held such a position at any point in the past (from *t-1* backward to their earlier tenure at *t-7*), within the same parent company where they are employed at time *t*. Conversely, if the individual has never been the head of a subsidiary within the same parent entity but has occupied a top-five senior role within the parent firm, we assign a value of zero to the variable. The construction of this variable was limited to a subset of data that included information on succession, head of subsidiary experience, and gender, amounting to 833k observations. Within this sample, 62.5% have the manager-level subsidiary head experience variable marked as one, indicating the head of the subsidiary experience, while the remaining 37.5%

are marked as zero, indicating no such experience. We expect $\beta_3 > 0$ if experience in decentralized firms or equivalent positions has a positive relationship with the likelihood of a woman manager being promoted to the ultimate parent firm's CEO.

The results from the estimation of the relationship between the probability of an individual manager being promoted to CEO and their individual-level decentralized human capital is presented in Table 6. The estimations are limited to a sample of multi-unit firms. We note that manager-level results are very similar to the firm-level results: women managers are more likely to be promoted to parent CEO if they have greater experience working with more decentralized firms (the estimated coefficients on the interaction terms are positive and statistically significant in columns 2 and 3). The results suggest that women who have more decentralized firm experience are more likely to become CEOs compared to women managers without such experience.

Columns 5 and 6 present the results of using the *Head of Subsidiary* to measure manager-level decentralization experience. The estimated coefficients on the interaction are positive and statistically significant at 1% level. The effect size of the interaction term suggests that women managers who have been subsidiary heads are 84.5% more likely to become CEOs. Overall, the results suggest that the negative relationship between women managers and the chance of getting promoted to the parent CEO is attenuated by working in decentralized organizations.

External labor market opportunities

Next, we examine the proposed mechanism of stronger internal bargaining for women managers due to greater external options in decentralized firms. We use a difference-in-differences approach, focusing on an exogenous shock in the external labor market. Specifically, we analyze the likelihood of internal and external promotions for women managers with decentralized experience following a decrease in external labor market frictions. Our analysis exploits the

rejection of the inevitable disclosure doctrine (IDD) by U.S. states between 1993 and 2017. This rejection serves as an exogenous increase in managers' outside opportunities and a decrease in labor market constraints (e.g., Flammer and Kacperczyk, 2019; Klasa et al., 2018).

The IDD, by prohibiting employees with valuable know-how from working for competitors due to the risk of trade secret disclosure, represents a significant mobility restriction. Its rejection, therefore, removes a major barrier, facilitating greater ease of movement between firms. We predict that the reduction of these external labor market frictions will increase the likelihood of both internal and external promotions for managers, particularly those with extensive experience in decentralized firms.

In decentralized organizations, managers often have clearer accountability for their units' performance, making their achievements more recognizable both internally and externally. This increased visibility enhances their promotion prospects. Additionally, the skill set acquired in decentralized settings is typically more diverse and transferable, making these managers attractive candidates in a more dynamic external job market. Furthermore, the awareness of enhanced external opportunities empowers women managers to negotiate and bargain better positions within their current firms. The potential loss of valuable employees to external competition may incentivize employers to offer internal promotions as a retention strategy, thereby potentially increasing the rate of internal promotions for women managers in decentralized firms compared to their counterparts in centralized firms.

To test this mechanism, we perform the following OLS regression on the sample of women managers, with the dependent variable as promotion and independent variables as rejection of IDD, decentralized experience (the percentage of years that the individual has worked in a decentralized firm), and their interaction:

$$Promotion_{ijt} = \eta_0 + \eta_1 IDD\ rejection_{jt} + \eta_2 Experience_{it} + \eta_3 + IDD\ rejection_{jt} \times$$
$$Experience_{it} + \gamma_j + \chi_m + \delta_i + \phi_k + \tau_t + \epsilon_{ijt} \quad (3)$$

Promotion denotes both internal and external promotions. *Internal Promotion* is identified when the manager is promoted from within the company (either promoted to a higher ranking within its unit or moving up from the subsidiary to the ultimate parent firm); and *External Promotion* is identified when the manager ends up with a better job at a different firm (either through promotions to a higher rank or by transitioning to a larger firm, in terms of employee size, while retaining the same job level).

Table 7 Columns 1-3 report the results from OLS regressions on the sample of female managers, with the dependent variable as whether the manager was promoted, either internally or externally. The interaction coefficient between the individual level decentralization and rejection of IDD is positive and significant, which is consistent with our prediction that women managers with more decentralized experience are more likely to have better career opportunities when there is less labor market friction than women with more centralized experience.

We further split the results between internal and external promotions. The results reported in Column 4, focusing on internal promotion as the dependent variable, indicate that reduced external labor market frictions are associated with increased career advancement opportunities within the organization for women managers with decentralized experience. In the analysis of external promotions, presented in Column 5, the interaction term is consistently positive, although its significance decreases. There is an observable trend where decentralized experience could be potentially advantageous in external career mobility when the labor market friction decreases. Still, the effect is more significant for internal career advancement.

Table 5: Likelihood of promotion to CEO by gender and organizational structure

	(1)	(2)	(3)
Hypothesis:		H1	
		OLS models	
Dependent variable:		Indicator of CEO this year	
Indicator for woman manager, interacted with:			
Firm-level decentralization (continuous base unit count, multi-unit only)		0.108***	0.110***
standard error		(0.005)	(0.006)
Indicator for woman manager	-0.328***	-0.616***	-0.482***
	(0.009)	(0.018)	(0.018)
Firm-level decentralization	-0.109***	-0.130***	-0.141***
	(0.004)	(0.005)	(0.006)
Firm size (number of employees)			-0.034***
			(0.004)
Firm age (number of years since the parent's founding)			-0.008
			(0.008)
Firm public status			0.325***
			(0.068)
Unit size			0.072***
			(0.003)
Unit public status			-0.157**
			(0.068)
Unit foreign status			-0.398***
			(0.018)
Manager position rank			-0.064***
			(0.003)
Manager tenure			0.160***
			(0.008)
Manager position type - accounting			0.016
			(0.017)
Manager position type - management and administration			0.456***
			(0.014)
Manager position type - finance			0.181***
			(0.015)
Manager position type - HR			0.020*
			(0.010)
Manager position type - law			-0.042**
			(0.017)
Manager position type - marketing and sales			0.052***
			(0.010)
Manager position type - production-operations			0.015
			(0.012)
Manager position type - R&D and engineering			-0.034**
			(0.016)
Constant	0.546***	0.601***	0.134
	(0.132)	(0.133)	(0.139)
Manager-level controls	No	No	Yes
Firm-level controls	No	No	Yes
Unit-level controls	No	No	Yes
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes
Cluster SE (ultimate parent)	Yes	Yes	Yes
Observations	2,090,151	2,090,151	2,090,151
R-squared	0.002	0.002	0.005

Notes: This table presents the results from OLS models estimating the likelihood of a manager being promoted to CEO by gender and firm-level decentralization. The sample is restricted to multi-unit firms with at least one subsidiary. Unit of observation is manager-year level. Standard errors in the parentheses are clustered by ultimate parent firm. The estimated coefficients have been scaled by 100. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table 6: Test of mechanism: Managerial skills and experience

	(1)	(2)	(3)	(4)	(5)	(6)
	Individual-level decentralization			Individual-level head of sub experience		
	OLS models			OLS models		
Dependent variable:	Indicator of CEO this year			Indicator of CEO this year		
Indicator for woman manager, interacted with:						
Individual-level decentralization		0.298***	0.315***			
standard error		(0.072)	(0.073)			
Indicator for head of sub experience					0.499***	0.551***
					(0.042)	(0.043)
Indicator for woman manager	-0.561***	-0.752***	-0.482***	-0.526***	-0.809***	-0.645***
	(0.033)	(0.058)	(0.059)	(0.021)	(0.036)	(0.036)
Individual-level decentralization	-0.236***	-0.281***	-0.333***			
	(0.042)	(0.048)	(0.054)			
Indicator for head of sub experience				-0.615***	-0.678***	-1.125***
				(0.024)	(0.026)	(0.081)
Manager-level controls	No	No	Yes	No	No	Yes
Firm-level controls	No	No	Yes	No	No	Yes
Unit-level controls	No	No	Yes	No	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Cluster SE (ultimate parent)	Yes	Yes	Yes	Yes	Yes	Yes
Observations	312,209	312,209	312,209	833,047	833,047	833,047
R-squared	0.003	0.003	0.009	0.003	0.003	0.008

Notes: Columns 1-3 present the results from OLS models estimating the likelihood of a manager being promoted to CEO by gender and individual-level decentralization. Unit observation is manager-year level. Individual-level decentralization is measured by the percentage of years the manager has worked at a decentralized firm in their previous seven consecutive years of work. Our decentralization metric assigns a firm as decentralized if it has more than the sample median number of base unit counts (4 for multi-unit firms), and zero otherwise. Columns 4-6 present the results from OLS models estimating the likelihood of a manager being promoted to CEO by gender and individual-level head of subsidiary experience. Unit observation is manager-year level. Individual-level head of subsidiary experience is an indicator variable of whether a manager has served as the head of a subsidiary in their previous seven consecutive years of work. Standard errors in the parentheses are clustered by ultimate parent firm in all regressions. The estimated coefficients have been scaled by 100. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Table 7: Test of mechanism: External labor market

	(1)	(2)	(3)	(4)	(5)
		IDD		IDD	IDD
		OLS models		OLS models	OLS models
Dependent variable:		Indicator of promotion (internal and external)		Indicator of internal promotion	Indicator of external promotion
Individual-level decentralization, interacted with:					
Indicator for IDD rejection		0.188**	0.171**	0.184**	0.010
standard error		(0.074)	(0.080)	(0.080)	(0.015)
Indicator for IDD rejection	0.023	-0.019	-0.035	-0.036	0.002
	(0.025)	(0.026)	(0.025)	(0.025)	(0.004)
Individual-level decentralization	0.452***	0.371***	-0.156**	-0.057	-0.118***
	(0.042)	(0.057)	(0.074)	(0.074)	(0.015)
Manager-level controls	No	No	Yes	Yes	Yes
Firm-level controls	No	No	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes
Cluster SE (ultimate parent)	Yes	Yes	Yes	Yes	Yes
Observations	131,614	131,614	131,614	131,137	122,013
R-squared	0.021	0.021	0.047	0.045	0.205

Notes: Columns 1-3 presents the results from OLS models estimating the likelihood of internal and external promotions for women managers with decentralized experience following a decrease in external labor market frictions. The sample is restricted to woman managers in multi-unit firms. We further split the sample by internal and external promotions: Column 4 presents the results with the dependent variable is an indicator of internal promotion, which is equal to one if the manager is promoted to a higher rank within its unit or moving up from the subsidiary to the ultimate parent firm, and zero if no promotion. Column 5 presents the results with the dependent variable is an indicator of external promotion, which is equal to one if the manager is promoted to a higher rank at a different company or to a larger firm, in terms of employee size, while retaining the same job level, and zero if no promotion. The estimated coefficients have been scaled by 100.*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

4.3 Robustness checks

Stand-alone vs. Multi-unit firms

As an alternative measure of firm-level decentralization, we analyze the promotion rate of women managers in stand-alone versus multi-unit firms. We use an indicator variable to distinguish between the two, assigning a value of one to firms with at least one subsidiary, as defined by the presence of a separate Profit and Loss (P&L) statement, indicative of a decentralized structure. A value of zero represents stand-alone firms without subsidiaries, suggesting a centralized setup.

Appendix Table 1 presents our findings. The estimated coefficient on the interaction term is positive and statistically significant. This indicates that the probability of women managers being promoted to CEO is higher in multi-unit firms compared to stand-alone firms. Women managers in multi-unit firms are 83% more likely to become CEOs than their counterparts in stand-alone firms. These results are consistent with our main results.

Control for number of units

We ran our main analyses using a binary indicator for firm-level decentralization and controlling for the number of units. We aimed to address the concern that the sheer number of candidates in decentralized firms may drive our main results. When we categorize a firm's decentralization by whether a firm is multi-unit and control for the number of units, we obtain results consistent with our main results (Appendix Table 2).

Logit models

We ran additional logistic regression analyses to estimate the likelihood of a manager being promoted to CEO by gender and firm-level decentralization. The results are presented in Appendix Table 3 and are consistent with the main analyses in Table 5.

C-suite promotions

In addition to examining promotions to CEO positions, our analysis also considers promotions to C-suite roles beyond CEO positions. Specifically, we define C-suite succession as the promotion of managers to C-suite positions within the parent company in year *t* (e.g., CEO, CFO, CTO, CHRO etc.). This definition is contingent on the manager not holding a C-suite position within the parent firm in the previous year (Year *t-1*). By focusing on promotions to these high-level executive roles, we aim to comprehensively assess upward mobility within the organization's top leadership tier. On average, a manager has an 1.18% chance of being promoted to a C-suite position at the parent firm in a given year. Appendix Table 4 reports the results for C-suite promotions, and the results provide additional support for our hypothesis. The estimated coefficients on the interaction are positive and statistically significant at 1% level, suggesting that women managers in decentralized firms are more likely to become C-suite managers than their counterparts in centralized firms.

Propensity score matching

One possible concern is that there might be factors that influence both managerial decentralized experience and the likelihood of being promoted to CEO. We employed a propensity score matching (PSM) model, and the analysis is restricted to female managers. Column 1 in Appendix Table 5 presents a probit regression used to estimate the propensity scores, based on an array of factors including firm size, firm age, number of base unit, unit size, unit foreign status, year, industry and state-level indicators. Column 2 details the outcomes after applying the matched propensity scores, revealing a positive average treatment effect on the treated (ATT) of 0.0019. This finding indicates that female managers with decentralized experience are indeed more likely to be promoted to CEO roles compared to their peers without such experience. The statistical

significance of this effect is supported by a t-statistic of 2.04, confirming its robustness at the 5% significance level.

5 Discussion and Conclusion

In this study, we examine the relationship between organizational structure and the career advancement of women managers, specifically in the context of promotions to CEO positions within multi-unit firms. Our findings reveal that women managers in decentralized firms have a higher likelihood of being promoted to CEO roles compared to their counterparts in centralized firms. We find evidence consistent with the theorized mechanisms relating to managerial skills and the role of the external labor market. Our findings suggest that organizational design can shape career trajectories for women.

Our study contributes to understanding the organizational factors that may drive the gender gap in firms. In particular, we point to specific mechanisms by which the gender gap may be mitigated. For example, designing internal environments less conducive to biases can be an important way for firms to address the gender gap. Specifically, firms may consider utilizing more quantifiable and objective performance measures and facilitating greater opportunities for women to build informal networks, for instance, through mentoring programs. Hence, for organizations seeking to address gender disparities in leadership, the factors relating to the structure of the firm itself may be a crucial area for intervention.

Appendix

Appendix Table 1: Robustness check: Standalone vs. Multi-unit firms

	(1)	(2)	(3)
	OLS models		
Dependent variable:	Indicator of CEO this year		
Indicator for woman manager, interacted with:			
Firm-level decentralization (Indicator for multi-unit vs. stand-alone)		0.315***	0.322***
standard error		(0.012)	(0.013)
Indicator for woman manager	-0.316***	-0.442***	-0.289***
	(0.008)	(0.011)	(0.011)
Firm-level decentralization	-0.541***	-0.604***	-0.731***
	(0.009)	(0.010)	(0.013)
Manager-level controls	No	No	Yes
Firm-level controls	No	No	Yes
Unit-level controls	No	No	Yes
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes
Cluster SE (ultimate parent)	Yes	Yes	Yes
Observations	3,211,423	3,211,423	3,211,423
R-squared	0.004	0.004	0.007

Notes: This table presents the results from OLS models estimating the likelihood of a manager being promoted to CEO by gender and firm-level decentralization. Firm-level decentralization is based on whether or not the firm is a multi-unit firm or a stand-alone firm. Unit of observation is manager-year level. Standard errors in the parentheses are clustered by ultimate parent firm. The estimated coefficients have been scaled by 100. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Appendix Table 2: Binary firm-level decentralization, controlled for number of base units

	(1)	(2)	(3)
	OLS models		
Dependent variable:	Indicator of CEO this year		
Indicator for woman manager, interacted with:			
Firm-level decentralization (binary indicator, multi-unit only)		0.298***	0.309***
standard error		(0.019)	(0.020)
Indicator for woman manager	-0.331***	-0.550***	-0.416***
	(0.009)	(0.018)	(0.018)
Firm-level decentralization	-0.267***	-0.323***	-0.142***
	(0.013)	(0.015)	(0.020)
Number of base unit (natural log of base unit count)			-0.101***
			(0.007)
Manager-level controls	No	No	Yes
Firm-level controls	No	No	Yes
Unit-level controls	No	No	Yes
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes
Cluster SE (ultimate parent)	Yes	Yes	Yes
Observations	2,090,151	2,090,151	2,090,151
R-squared	0.002	0.002	0.005

Notes: This table presents the results from OLS models estimating the likelihood of a manager being promoted to CEO by gender and firm-level decentralization. Firm-level decentralization is an indicator variable of whether or not the firm has more than the sample median number of base units (>4). Column 3 control for the number of base unit. Unit of observation is manager-year level. Standard errors in the parentheses are clustered by ultimate parent firm. The estimated coefficients have been scaled by 100. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Appendix Table 3: Likelihood of promotion to CEO by gender and organizational structure (logit regression)

	(1)	(2)	(3)
		Logistic models	
Dependent variable:		Indicator of CEO this year	
Indicator for woman manager, interacted with:			
Firm-level decentralization (continuous base unit count, multi-unit only)		0.134***	0.219***
standard error		(0.037)	(0.033)
Indicator for woman manager	-1.412***	-1.697***	-1.334***
	(0.054)	(0.102)	(0.096)
Firm-level decentralization	-0.343***	-0.341***	-0.398***
	(0.014)	(0.015)	(0.016)
Manager-level controls	No	No	Yes
Firm-level controls	No	No	Yes
Unit-level controls	No	No	Yes
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes
Cluster SE (ultimate parent)	Yes	Yes	Yes
Observations	2,090,151	2,090,151	2,090,151
Pseudo R-squared	0.041	0.0409	0.1227

Notes: This table presents the results from logistic models estimating the likelihood of a manager being promoted to CEO by gender and firm-level decentralization. The sample is restricted to multi-unit firms with at least one subsidiary. Unit of observation is manager-year level. Standard errors in the parentheses are clustered by ultimate parent firm. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Appendix Table 4: Likelihood of promotion to a C-suite position by gender and organizational structure

	(1)	(2)	(3)
		OLS models	
Dependent variable:		Indicator of C-suite promotion this year	
Indicator for woman manager, interacted with:			
Firm-level decentralization (continuous base unit count, multi-unit only)		0.201***	0.222***
standard error		(0.012)	(0.012)
Indicator for woman manager	-0.706***	-1.250***	-1.130***
	(0.022)	(0.041)	(0.041)
Firm-level decentralization	-0.266***	-0.307***	-0.331***
	(0.009)	(0.010)	(0.014)
Manager-level controls	No	No	Yes
Firm-level controls	No	No	Yes
Unit-level controls	No	No	Yes
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes
Cluster SE (ultimate parent)	Yes	Yes	Yes
Observations	1,905,632	1,905,632	1,905,632
R-squared	0.005	0.005	0.011

Notes: This table presents the results from OLS models estimating the likelihood of a manager being promoted to a C-suite position (e.g., CEO, COO, CFO of the parent firm) by gender and firm-level decentralization. The sample is restricted to multi-unit firms with at least one subsidiary. Unit of observation is manager-year level. Standard errors in the parentheses are clustered by ultimate parent firm. The estimated coefficients have been scaled by 100. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Appendix Table 5: Propensity score matching results

	(1)	(2)					
	Probit model	PSM-based promotion outcomes analysis					
Dependent variable:	Indicator for decentralized experience	Variable	Sample	Treated	Controls	Difference	Standard Error	T-stat
		CEO promotion indicator	Unmatched	0.0022	0.0025	-0.0004	0.0005	-0.7900
ln(employee) of ultimate parent	0.462***		ATT	0.0022	0.0003	0.0019	0.0009	2.0400
	(0.010)							
ln(firm age) of ultimate parent	0.140***							
	(0.009)							
Number of base unit	0.0112***							
	(0.000)							
Unit size	0.092***							
	(0.009)							
Unit foreign status	0.934***							
	(0.057)							
Year fixed effects	Yes							
Industry fixed effects	Yes							
State fixed effects	Yes							
Observations	44,103							
Pseudo R-squared	0.2231							

Notes: Column 1 displays a probit regression used to estimate the propensity scores as part of a Propensity Score Matching (PSM) process. This is to estimate the probability (propensity) of a treatment, i.e., an individual has decentralized experience (based on the number of years that the individual has worked at a decentralized firm in the previous seven consecutive years - the individual has decentralized experience if one had spent more than 50% of his or her tenure at a decentralized firm). The sample is limited to female managers only, and this approach allows us to examine the effect of individual-level decentralization on women's promotion to CEO positions. Column 2 shows the matched propensity score matching results. The positive ATT (average treatment effect on the treated, 0.0019) indicates that female managers with decentralized experience have a higher rate of promotion to CEO positions than those without, after matching based on propensity scores. The t-statistic of 2.04 suggests that the observed effect is statistically significant at the 5% level. $*p < 0.1$; $**p < 0.05$; $***p < 0.01$.

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