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Essays on Managerial Labor Markets, Multi-Unit Structure, and Firm Strategy

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy in Management

by

Tingyu Du

2024

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ABSTRACT OF THE DISSERTATION

Essays on Managerial Labor Markets, Multi-Unit Structure,

and Firm Strategy

by

Tingyu Du

Doctor of Philosophy in Management

University of California, Los Angeles, 2024

Professor Marvin B. Lieberman, Chair

This dissertation examines how managerial labor markets and organizational structures shape firm strategies and outcomes. Chapter 1 focuses on the firm's decision to hire a CEO from within or outside the company and suggests a different way to approach the CEO selection process in multi-unit firms. Chapter 2 investigates the post-merger and acquisition (post-M&A) retention strategies of target managers and how their structural knowledge plays a role in such decisions. Chapter 3 examines internal organizational structures as barriers to the promotion of women managers.

This dissertation of Tingyu Du is approved.

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2024

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Cal Poly SLO Orfalea College of Business, April 2024
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Consortium for Competitiveness and Cooperation, St. Gallen, June 2023

Du, T., Lieberman, M. "Round Number Bidding as an M&A Strategy"
Academy of Management Annual Meeting, Virtual, August 2020
Strategic Management Society Annual Conference, Minneapolis, October 2019

Du, T., Tsolmon, U. "Post-M&A Reallocation of Top Managers: The Role of Structural Knowledge"
Academy of Management Annual Meeting, Boston, August 2023

Du, T., Tsolmon, U. "Do Divestitures Hurt the Career Prospects of Managers? Examining Post-Divestiture Reallocation of Managers"
People and Organizations Conference, Philadelphia, October 2022

Introduction

According to the resource-based view, firms are collections of unique resources and capabilities, with human capital—specifically managerial human resources—identified as a crucial asset (Penrose, 1959; Barney, 1991; Castanias and Helfat, 1991, 2001). The upper echelons theory suggests that senior managers significantly impact a variety of firm outcomes (Hambrick and Mason, 1984). Firms seeking competitive advantage should create capabilities to effectively mobilize, coordinate, and deploy their key resources (Sirmon et al., 2007). This dissertation advances prior research on strategic human capital by examining the nuanced interactions between managerial labor markets, organizational structure, and firm strategy. It focuses on the dynamics of managerial mobility, its role in mergers and acquisitions integration, the appointment of different types of CEOs, and their subsequent effects on firm behavior and performance.

Three separate research studies comprise this dissertation. The first chapter examines the advantages of appointing hybrid CEOs from subsidiaries in multi-unit firms, showing that such CEOs are better suited for turbulent environments requiring adaptation. The second chapter investigates the impact of organizational structure similarity on the retention of managerial talent post-acquisition, finding that the retention of managers with structural knowledge similarity improves post-acquisition integration and performance. The third chapter explores how decentralized organizational structures can increase the promotion rates of women to CEO positions by reducing opportunities for gender bias.

With regard to top management, one of the most critical practical challenges for firms and their boards of directors is selecting their next CEO. In the first chapter, I examine the conditions and performance consequences of appointing a "hybrid" CEO: executives who have run their companies' subsidiaries. I propose that hybrid CEOs are especially beneficial under certain

conditions, e.g., when the firm needs significant change but not radical restructuring. This is because hybrid CEOs possess firm-specific knowledge (like insiders) but are less socially embedded in the company (like outsiders). Using data from 1,431 multi-unit US firms between 1993 and 2017, I find that hybrid CEOs are very common, accounting for a third of CEO transitions in multi-unit firms.

Moreover, firms are more likely to appoint hybrid CEOs in turbulent industry environments. When firms operating in turbulent environments appoint hybrid CEOs, they implement appropriate aggressive changes in their strategies, such as layoffs and capital expenditure cuts, and achieve higher post-succession performance. In addition, firms led by hybrid CEOs demonstrate greater resilience to external shocks, such as financial crises. The findings suggest an advantage to having a robust pool of internal candidates who have developed with an outsider's perspective, preferably from the company's subsidiaries, because they could be especially useful in turbulent environments and for adaptation.

The second chapter, co-authored with Ulya Tsolmon, examines how the combination of the acquirer's resource bases and the target firm's managerial human capital shapes managerial retention post-acquisition. We found that in related acquisitions, the retention rate of target managers post-M&A is higher when the organizational structure between the acquiring and target firms is similar. In addition, individual managers with structural knowledge similar to the acquirer's are more likely to be retained. The results indicate that managers' structural knowledge (experience in specific organizational structures) matters. Consistent with the notion that managers are critical to post-acquisition integration and success, deals between firms with greater structural similarity, and hence greater retention of target managers, exhibit greater post-acquisition performance, especially in the long run. This paper adds to the strategic human capital literature

by examining how managers' structural knowledge can drive executive retention and be a source of valuable human capital. It also contributes to the M&A integration and post-acquisition performance literature by providing a structural knowledge perspective to understanding post-acquisition turnover and performance, as well as emphasizing the role of structural knowledge in facilitating integration in related acquisitions.

In the third chapter, we explore how internal organizational structure can influence the promotion rates of women executives to CEO positions. This paper leverages 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. Using the data on over 596,000 managers in 15,200 firms, we find empirical support for these predictions. The results suggest that organizational structures can shape the career trajectories of women managers.

This dissertation emphasizes the strategic importance of managerial human capital and the need for firms to thoughtfully design their organizational structures and leadership transition strategies to harness the full potential of their human resources and gain competitive advantages. It also has practical implications for corporate succession planning, post-merger integration, and gender diversity in leadership, highlighting the benefits of hybrid CEOs, the importance of structural compatibility in retaining managerial talent, and how decentralized structures can promote women to top executive roles.

CHAPTER 1

Best of Both Worlds: The Advantages of Hybrid CEOs in Multi-Unit Firms

Tingyu Du, *UCLA Anderson School of Management*

1.1 Introduction

A central challenge facing most companies today is selecting their next CEO. Firms face trade-offs in appointing CEOs from within the ranks of the firm (insiders) versus from another firm (outsiders) (Cummings and Knott, 2018; Howard, 2001; Quigley et al., 2019). On the one hand, insiders are often chosen to maintain continuity and stability with their firm-specific knowledge and established social networks (Harris and Helfat, 1997; Zajac, 1990; Zhang and Rajagopalan, 2004). They may, however, lack external perspectives, and their existing networks can prevent them from making necessary changes (Fondas and Wiersema, 1997; Shen and Cannella, 2002; Shleifer and Summers, 1988). On the other hand, outsiders are selected to transform the company because they are more innovative and have fewer social constraints (Grossman, 2007; Karaevli and Zajac, 2012; Virany et al., 1992). However, they possess less insider knowledge of the firm and may face resistance to change due to a lack of internal networks (Karaevli, 2007; Zhang and Rajagopalan, 2010).

Previous research typically classifies CEO types as insiders or outsiders based on firm boundaries. However, this binary distinction overlooks considerable heterogeneity in the backgrounds and experiences of chief executives (Finkelstein et al., 2009). Different experiences can lead executives to perceive and interpret objectively similar situations differently, resulting in substantially varied decisions (Crossland et al., 2014). In fact, there are degrees of "outsiderness", and CEOs are likely to fall along a continuum of outsiderness varying by their degrees of firm-

specific knowledge and social embeddedness within the focal firm (Finkelstein and Hambrick, 1996; Finkelstein et al., 2009; Karaevli, 2007). CEOs across this continuum can meld the advantages and disadvantages typically associated with insiders and outsiders (Cheng, 2019). Conceptualizing CEO origin as a continuum facilitates a more nuanced understanding of the benefits, costs, and outcomes of appointing different types of CEO (Karaevli, 2007; Shen and Cannella, 2003).

This study focuses on CEOs promoted from the subsidiaries of multi-unit firms rather than from the parent organization. I use the term "hybrid" to describe this specific type of CEO on the outsiderness continuum. Past research has introduced the concept of "inside-outsiders" to describe a specific type of internal candidate possessing an insider's knowledge of the firm but maintaining enough detachment from the firm (Bower, 2007). Nonetheless, empirical evidence on the prevalence and the effects of this type of CEO appointment remains relatively sparse (Finkelstein and Hambrick, 1996; Karaevli, 2007; Zajac and Westphal, 1996). In light of this, I empirically investigate the conditions, the mechanism, and the outcomes of appointing these CEOs, extending previous research to examine how, when, why, and where firms find and appoint them.

I argue that hybrid CEOs are more likely to be appointed under high environmental turbulence, characterized by uncertainty and volatility in the external business environment. Past literature has shown that when firms want continuity and minor changes, they typically choose insider candidates, whereas when firms seek transformation and significant shifts, an outsider is a better choice (Finkelstein and Hambrick, 1996; Finkelstein et al., 2009). In turbulent environments, where firms need significant change but not radical restructuring, hybrid CEOs might implement strategies to adapt and more effectively navigate these challenges. This is because hybrid CEOs possess firm-specific knowledge (like insiders) but are less socially embedded in the company

(like outsiders). Their limited social constraints foster a greater willingness to initiate strategic changes, and their firm-specific knowledge equips them to identify problems and implement solutions promptly.

Using data from 1,450 multi-unit US public firms spanning 1993 to 2017, I find that a significant one-third of CEO transitions are hybrid CEOs. Firms are more likely to appoint hybrid CEOs in turbulent industry environments. When firms operating in turbulent environments appoint hybrid CEOs, they implement aggressive changes in their strategies, such as layoffs and capital expenditure cuts, and achieve higher post-succession performance. In addition, firms led by hybrid CEOs demonstrate greater resilience to external shocks, such as financial crises. Specifically, hybrid CEOs tend to lay off more employees than insiders and cut more capital expenditures than insiders and outsiders. However, hybrid CEOs do not significantly reduce investments in research and development (R&D). These findings imply that hybrid CEOs have a dual focus on immediate financial health (e.g., short-term cost-cutting) and future growth (e.g., long-term investments in innovation). The distinct actions of hybrid CEOs might stem from their unique position of understanding the organization from an insider's perspective (hence the hesitancy to cut R&D) while also having enough detachment to make hard decisions (like layoffs and capital expenditure cuts) that a pure insider might be more reluctant to make.

This study builds upon and extends previous research that explored the outsiderness continuum conceptually and comes up a way to empirically define an intermediate point in the continuum. It also examines the conditions and mechanisms through which firms identify and appoint hybrid CEOs and investigates their strategic decisions compared to insiders and outsiders. In addition, this study emphasizes the significance of contextual factors in assessing the implications of CEO succession (e.g., Chen and Hambrick, 2012; Finkelstein et al., 2009; Karaevli,

2007). The findings suggest that, in general, the appointment of a hybrid CEO does not lead to significant differences in post-succession strategies and performance. Distinct effects emerge when the unique attributes of hybrid CEOs match the firm's needs in specific strategic situations. Lastly, this paper highlights the benefits of having a robust pool of internal candidates, particularly those cultivated with an outsider's perspective from the company's subsidiaries. With a robust pool of qualified internal candidates, companies can get the leadership they need - when needed.

1.2 Theory and Hypotheses

1.2.1 CEO succession beyond insiders and outsiders

Previous research predominantly categorizes CEOs into two distinct types - insiders or outsiders, based on a firm's boundary. Insiders are those who have been promoted from within the firm's existing ranks, while outsiders are those who have been externally recruited from another organization. However, recent studies suggest this strict dichotomy is overly simplistic and does not reflect the reality of degrees of "outsiderness" (Finkelstein and Hambrick, 1996; Zajac and Westphal, 1996). Many CEOs may not be easily classified into the two distinct categories of insiders and outsiders. Prior studies suggest that the insider/outsider dichotomy should be broken down into finer categories, as they can fall along a continuum of outsiderness based on their knowledge, background, prior experiences, tenure with the firm, and other factors (Finkelstein and Hambrick, 1996; Finkelstein et al., 2009; Karaevli, 2007). Based on their diverse backgrounds and experiences, executives are likely to have different perceptions and interpretations when faced with objectively similar situations, leading to substantially different decisions (Crossland et al., 2014). Therefore, the focus should not solely be on whether someone is an outsider or insider but on their level of knowledge, networks, and commitment to the organization.

The conventional way of operationalizing the outsiderness continuum is based on the firm tenure of the new CEO (Finkelstein et al., 2009; Karaevli, 2007). Research suggests that long-tenured executives are more likely to have narrow perspectives, psychological commitment to the status quo, and entrenched social relationships within firms (Hambrick et al., 1993; March and March, 1977; Katz, 1982). However, the outsiderness continuum appears to be a multi-dimensional continuum that encompasses various aspects of an executive's background and experience. Using tenure as a measure of a CEO's outsiderness is rather unidimensional because it may not reflect the CEO's total experience as a member of top management within a focal firm (Weng and Lin, 2014). It typically assesses a single aspect of their experience: the length of time they have spent within the firm or industry. This approach assumes that the primary, or even sole, factor that influences a CEO's perspective, cognitive openness, and commitment to the status quo is the duration of their tenure. It simplifies the complex nature of executive experience and influence into a linear scale based on time, without accounting for the nuances of different types of experiences or roles they may have had. For example, two executives with the same tenure at a company might have had very different experiences. One might have spent a significant portion of their tenure at a subsidiary or in roles that kept them detached from the main political dynamics of the parent company, while another might have been deeply involved in core decision-making processes from early on. Given that job demands and responsibilities vary across different levels of top management positions (Hambrick et al., 2005), the knowledge and experiences associated with top management positions may deserve further theoretical exploration.

In this study, I create a way to empirically define an intermediate point in the continuum by considering the unique trajectory of executives who have been promoted from a subsidiary to the parent company. This approach recognizes that such individuals may possess a blend of insider

knowledge and outsider objectivity. While they have firm-specific experience, their time within a subsidiary—which may have its own distinct culture and strategic priorities—could equip them with a different set of perspectives and social ties compared to those who have climbed the ranks within the parent company alone. By incorporating this additional layer into the analysis of CEO outsiderness, the study aims to provide a more nuanced understanding of how different career paths within the corporate structure can influence leadership effectiveness and firm outcomes.

Furthermore, one primary reason for inconsistent findings concerning the performance consequences of CEO origin is the lack of agreement regarding what has been captured by the insider vs. outsider dichotomy (Karaevli, 2007). There has been an ongoing debate of whether an insider or outsider is the best CEO choice (e.g., Cummings and Knott, 2018; Finkelstein et al., 2009; Howard, 2001; Quigley et al., 2019). Recognizing a continuum of outsiderness rather than adhering to a rigid binary classification may help us further our understanding of the benefits and costs of different types of CEO selection decisions and shed light on the nuances of their strategic choices. This broader perspective can potentially resolve some of the inconsistencies in the existing literature and provide a clearer insight into how different CEOs navigate their strategic roles based on their unique backgrounds (Guthrie and Datta, 1997; Karaevli, 2007; Shen and Cannella, 2003; Zhang and Rajagopalan, 2004).

While the shift from a binary distinction to recognizing a continuum of outsiderness has been highlighted as vital for a nuanced understanding of CEO selection, only a few studies have explored this continuum. In his book The CEO Within (2007), Joseph Bower introduced the concept of "inside-outsiders" to describe a specific type of internal candidate. These CEOs embody different managerial skills from traditional insiders and outsiders, combining firm-specific knowledge of insiders with a political detachment of outsiders. Drawing on years of formal and

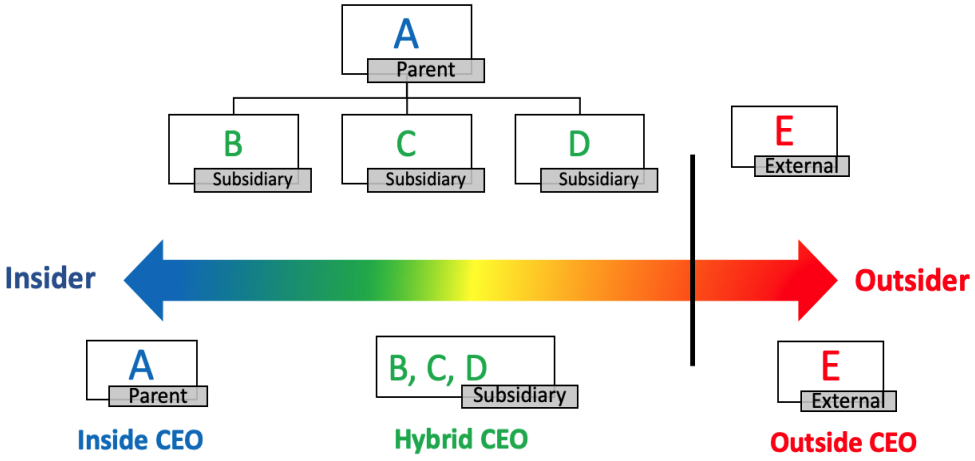
informal research into how corporations work, Bower believes that "the best leaders are people from inside the company who somehow have maintained enough detachment from the local traditions, ideology, and shibboleths that they have retained the objectivity of an outsider" (Bower, 2007, p. 8). Bower's book provides practical examples and offers advice on building inside-outsiders and succession planning. For instance, he considers a leader who left the company ten years ago and returned as an inside-outsider. In a related vein, a recent study by Cheng (2019) examined "leapfrog" CEOs or quick-rise internal CEOs who bypass more senior executives to be appointed CEO. However, this study was limited to high-performing firms. While these studies offer intriguing perspectives beyond the dichotomy of insider versus outsider, empirical evidence on the prevalence and effects of this type of CEO appointment remains relatively sparse.

In this study, I focus on CEOs promoted from their firms' subsidiaries rather than the parent organization, a category I term "hybrid" CEOs. These CEOs are insiders with more outsiderness, embodying the characteristics of both an insider and an outsider - that is, they possess an insider's knowledge of the firm, coupled with an outsider's relative detachment from internal social ties. Building on the idea of "inside-outsiders" (Bower, 2007) and the "outsiderness" continuum (Finkelstein et al., 2009), I empirically investigate the conditions and the outcomes of appointing these CEOs, extending previous research to examine how, when, why, and where firms find and appoint them. This study suggests an advantage of having a pipeline of hybrid candidates within the subsidiaries and that a plausible context for appointing these hybrid CEOs is during periods of turbulence when the firm needs significant change, but not radical restructuring.

Figure 1.1 illustrates parent firm A, with three subsidiaries, each with separate profit and loss (P&L) statements, and an external firm E. CEOs promoted from parent firm A are defined as “insiders”; Those promoted from the subsidiaries are “hybrid” CEOs; “Outsider” CEOs are

individuals hired away from the external firm E. Conventional frameworks classify all candidates within the firm boundary, whether from the parent firm or subsidiaries, as insiders. This includes hybrid leaders, who often have diverse experiences inside and outside the organization. By lumping these hybrid leaders in with traditional insiders, we might overlook key differences in expertise, network, or strategic perspective. This can result in companies failing to recognize valuable internal talent possessing unique skills well-suited for specific challenges or contexts. In fact, a significant one-third of CEO transitions in my sample are hybrid CEOs, a substantial portion that past research might have overlooked and classified as binary insiders.

Figure 1.1: An illustrative example of multi-unit firm



1.2.2 Hypotheses

In this study, I propose that hybrid CEOs meld the characteristics of both insiders and outsiders. Similar to insiders, hybrid CEOs draw from firm-specific knowledge and internal networks, equipping them to make well-informed decisions and tackle potential resistance to change among stakeholders. Similar to outsiders, these individuals often possess a degree of autonomy and unique networks and are less entangled in the parent firm's internal politics due to their operational distance.

This resonates with the "inside-outsider" concept, as Bower (2007) described. He defines such a person as being "both inside and outside the company"; that is, "the successful CEO from inside must be able to look at his or her corporate inheritance as if he or she had just bought the company" (Bower, 2007, p. 16). A great inside-outsider must possess "a deep understanding of how the business actually works" (Bower, 2007, p. 60), including industry and product knowledge and administrative inheritance encompassing both interpersonal and organizational relationships. He terms this the "plugged-in" insider, who knows how to work with and through the organization - skills that are vital when the organization needs to change (such as knowing which functional specialists to engage, how to seek assistance, and how to coordinate among key organizational members).

Another attribute of the inside-outsider, arguably the most important, is the ability to "see the need for change" (Bower, 2007, p. 74), an advantage typically associated with outsiders. Although many insiders possess deep knowledge of the company and social networks, they often fail to recognize the extent of necessary change. Even those who identify promising opportunities may find their visions often overwhelmed by the status quo and social constraints. An inside-outsider can and should leverage their knowledge of the company and its people, gained over years of experience within the organization while drawing substantially on their understanding of the new world to which the company must respond. They must do this without the cognitive and emotional baggage often tied to a long organizational tenure.

The value of an inside-outsider's attributes (or any specific skills or traits) must also be considered in the context of the specific challenges and opportunities that exist at that moment (Chen and Hambrick, 2012; Carpenter et al., 2001; Gupta and Govindarajan, 1984; Henderson et al., 2006; Miller and Shamsie, 2001). Prior literature suggests that an insider candidate is often

appointed to ensure organizational continuity and stability (Lauterbach et al., 1999). In contrast, outsiders are often selected when firms seek transformation or reorientation (e.g., Bailey and Helfat, 2003; Karaevli and Zajac, 2013; Zhang and Rajagopalan, 2010). "By definition, inside-outsiders are not run of the mill … whether a particular skill set is important at the time of succession will have a lot to do with technology, markets, and the world at that time." (Bower, 2007: 85). This aligns with my argument that the benefits of hybrid CEO depends on the environment - although hybrid CEOs may offer potential benefits, their effectiveness may be enhanced or reduced depending on the circumstances.

In this study, I posit that hybrid CEOs are appointed more often during periods of turbulence, i.e., when a company needs to change but does not need a radical restructuring that an outsider might implement. Turbulence refers to instability or hard-to-predict environmental changes heightening uncertainty for key organizational members (Aldrich, 1979; Dess and Beard, 1984; Wholey and Brittain, 1989). It is typically associated with shifting external demands such as high industry growth rates, changing demand for products and services, financial crises, and other unpredictable exogenous developments that create uncertainty and volatility (Haleblian and Finkelstein, 1993; Kraatz, 1998; Wiersema and Bantel, 1993). In turbulent environments, firms commonly need incremental or gradual change but not radical restructuring (Grant, 2003). It is usually temporary and therefore would not require long-term reprogramming of the company (Garcia-Sanchez et al., 2014; Smart and Vertinsky, 1984). Flexibility to adjust to the changing environment and the ability to assess a situation quickly and implement the right decisions under conditions of uncertainty are crucial success factors (Ulrich and Wiersema, 1989). The critical challenge for managers is "the constant need to adapt one's perception of the environment to fit its current reality" (Wiersema and Bantel, 1993, p.488).

Unprecedented changes in the external environment often require organizational adaptation to better fit the external environment (Cyert and March, 1963; Levinthal, 1991). In such contexts, managers must change their routine problem-solving habits and be vigilant in environmental scanning (Ancona, 1990; Eisenhardt, 1989). They need "an extensive, multidimensional collection of capabilities" (Volberda, 1996, p.361) and abilities to envision and implement new courses of action (Carpenter and Westphal, 2001; March, 1991; McGrath, 2001). The new CEO should be able to leverage as well as continue to use existing assets and resources (Kogut and Zander, 1992; Song et al., 2005). They must also possess firm-specific knowledge and a good understanding of organizational history and competencies to respond promptly and appropriately (Schepker et al., 2017). Moreover, higher task and environmental uncertainty levels require more extensive coordination and cooperation (Argote, 1982; Galbraith, 1977; Thompson, 1967). It is essential to have a certain degree of social networks within the organization that facilitate coordination, communication, and implementation of strategic changes, especially when the external environment is unstable. That is, the new CEO needs to have a vision which encompasses the current assets and situations and be willing to initiate and implement the appropriate actions.

Hybrids possess skills that are vital in turbulence when firms need to adapt quickly. As Bower (2007) suggested, an inside-outsider, or a hybrid candidate in my setting, is uniquely positioned within an organization. They possess a deep understanding of the company and connections with key internal stakeholders, characteristics typical of a "plugged-in" insider, enabling them to make informed decisions and smoothly implement changes. Simultaneously, with fewer social constraints and experience gained outside their parent company, they are equipped to "see the need for change" and are not afraid to implement it. They will likely explore various

strategic options, introduce new management perspectives, and initiate necessary changes. Therefore, in situations demanding insight into the organization and a swift adaptation, these hybrid CEOs can respond without panic, improvise without undermining the existing structure, and maintain the strategic vision essential for guiding the organization forward. Their unique blend of insider's expertise and outsider's perspective equips them to recognize the need for change and execute those changes efficiently. Consequently, companies operating in turbulent environments, where adaptability and resilience are essential, will be more likely to appoint hybrid CEOs over purely insider or outsider CEOs.

Hence, I propose the following:

Hypothesis (H1): *Companies operating in turbulent environments will be more likely to appoint hybrid CEOs over insider or outsider CEOs.*

In this study, I posit that the benefits of a hybrid CEO depend on the environmental contexts. Hybrid CEOs do not systematically lead to higher organizational performance. I expect their effectiveness only when a hybrid CEO's unique characteristics align with the firm's strategic needs in the specific environmental context, that is, when the firm needs significant change to meet the shifts in the environment, but not a radical restructuring. These findings are consistent with prior studies that highlight the importance of contingencies when analyzing the differential effects of CEO types (Chen and Hambrick, 2012; Finkelstein et al., 2009; Karaevli and Zajac, 2013; Khurana and Nohria, 2000).

I argue that hybrid CEOs are particularly valuable in turbulent environments, where organizations must swiftly respond and adapt to changes. Their firm-specific knowledge enables them to allocate existing resources more efficiently during changes; Their strategies may be better aligned with the firm's existing capabilities; Their experience gained outside the parent company

equips them with the ability to identify new strategic alternatives. Moreover, their social capital facilitates internal coordination without hindering the initiation and implementation of necessary changes.

Hypothesis (H2): *Companies with hybrid CEOs achieve greater performance than those with insider or outsider CEOs in turbulent environments.*

1.3 Data and Methodology

1.3.1 Sample

To test these hypotheses, I compiled a list of CEO transitions within multi-unit U.S. firms between 1993 and 2017. I then developed a panel dataset linking each of these transitions to data on the characteristics of the incoming CEO and financial data for the focal firm and its external industry environment for three years preceding the transition and the three years following the succession.

I began building the estimation sample using the Directory of Corporate Affiliations (DCA) offered by LexisNexis, which provides company profiles and hierarchies for over 54,000 global (U.S. and international) multi-unit parent companies. Of these, around 30,000 are parent companies in the US. The data also includes units (e.g., affiliates, subsidiaries, and divisions) down to the seventh level of corporate linkage. The database reports detailed company structure annually from 1993 to 2017 for firms with more than 300 employees, exceeding $10 million in revenue, and indicating four-digit SICs for each unit. The source of the data is a combination of public filings and independent research undertaken by LexisNexis.

Each parent company and its respective units are assigned unique, permanent firm identifiers, enabling consistent tracking over time. For each of these units, the database records up to the top 50 managers and their corresponding positions, enabling me to compile the work history

for each person. I identified a CEO transition as an instance where the CEO recorded for the ultimate parent firm at time 't' differed from the CEO recorded at time 't-1'. This approach allowed me to systematically track and analyze changes in CEO appointments across the dataset.

To measure the pre- and post-transition performance and a set of corporate strategies, I obtain financial information on the ultimate parent firm from Compustat. The data sets were matched to the DCA by parent company names first using a matching algorithm and then by extensive manual checks. The performance estimation data is limited to public firms due to data availability.

I start with public and private multi-unit firms in the US that have information on executives (about 30,000 parent companies). I further limit the sample to firms with at least one CEO turnover that can be categorized into one of three categories: insider, outsider, or hybrid CEO transition, by tracking their historical positions in DCA. This results in around 8,000 parent companies. Next, I refine the sample to include only those firms with available financial data from Compustat. Following prior research, I excluded financial firms (SIC 6000-6999) and utilities firms (SIC 4900-4999) from the data set. The rationale for this exclusion is that these sectors are subject to heavy regulation and specific accounting rules, limiting their comparability to firms in other industries (Fama and French, 2001; Hadlock and Pierce, 2010; Malmendier et al., 2011). The final sample includes 2,071 CEO transitions that occurred within 1,450 multi-unit companies.

1.3.2 Construction of main variables

Dependent Variables

New CEO origin. I divided all CEO transitions into three categories: insider CEOs, hybrid CEOs, and outsider CEOs. All CEOs referred to here are the CEOs of the ultimate parent company. Using employment history compiled from DCA data, I distinguished *hybrid* CEOs as those who,

in the year prior to their appointment, worked within a subsidiary of the parent company rather than at the parent company itself. DCA defines *subsidiaries* as a business owned by the company 50% or more, having separate profit and loss statements. *Insider* CEOs are those employed at the ultimate parent company before they were appointed CEO. *Outsider* CEOs are hired from outside the company.

Financial performance. I measured firm performance using each firm's return on assets (ROA), averaged over three years preceding and following the CEO transition, excluding the CEO transition year. A firm's ROA is computed by dividing its net income by its total assets.

Independent Variables

External environmental uncertainty. There are several environmental dimensions considered in the business literature (Aldrich, 1979). In this study, I focus on the degree of turbulence or stability of the external environment, identified as among the most critical in affecting the firm's strategic decision-making and ensuring the firm's survival (Dess and Beard, 1984; Sharfman and Dean, 1991; Wiersema and Bantel, 1993).

I measured external environmental turbulence or instability in two ways. First, I constructed environmental turbulence at the industry level by assessing changes in the industry concentration ratio, a standard approach employed in previous research (e.g., Carpenter and Westphal, 2001; Karaevli, 2007). Environmental turbulence or instability is "the rate of change in factors relevant to strategic decision-making" (Duncan, 1972; Wiersema and Bantel, 1993). It is mainly influenced by changes in the industry's economic structure; such competitive dynamics represent a critical element of the environment (Sharfman and Dean, 1991). One key aspect of an industry's structure is the number and size distribution of the firms, which, according to economic theory, directly influences the intensity of competition (Bain, 1968). The change in the industry's

concentration ratio is the primary way of quantifying this aspect, as it depicts "the shift in market share due to factors such as new entrants, consolidations, exits, or erosion of market share, thereby capturing the dynamic nature of a firm's industrial environment" (Wiersema and Bantel, 1993, p.493).

The industry concentration ratio is the percentage of an industry's sales, categorized by the four-digit SIC level, attributed to the four largest companies. I computed the annual absolute changes in the concentration ratio for each focal firm's industry. Subsequently, I created an indicator variable to represent high environmental instability, which is assigned the value of one if there are significant absolute changes (exceeding the sample median) in the year before the CEO transition and zero otherwise.

There may be concerns that firms anticipating a shift in the external environment might choose a hybrid CEO while concurrently preparing for the industry shift in other ways. This potentially confounding factor might mean that any observed effect on performance cannot be directly attributed to the hybrid CEO appointment. Also, past literature suggests that turbulence in the external environment is difficult to predict (Aldrich, 1979; Dess and Beard, 1984; Wholey and Brittain, 1989). To overcome this identification challenge, I conducted a natural experiment using an external shock - the sharp increase in borrowing costs following the credit crunch of August 2007. By leveraging this unanticipated event, it is possible to isolate the impact of the hybrid CEO appointment on a company's performance more clearly (Flammer and Ioannou, 2021).

The credit crunch was sparked by the abrupt collapse of the mortgage-backed securities (MBS) market, leading to a sharp reassessment of credit risk. This resulted in a substantial surge in the cost of credit and allowed me to obtain (quasi-)random variation in the extent to which companies were hit by higher borrowing costs (Flammer and Ioannou, 2021). I categorize

companies into treatment and control categories. The control group includes companies whose long-term debt was due to mature six months before August 2007, and as a result, they experienced a minimal impact from the financial crisis. The treatment group encompasses companies whose long-term debt matured six months after August 2007 and were thus heavily impacted by the crisis.

It can be argued that the timing of a firm's debt agreement—whether it was made before or after August 2007—was essentially random. Companies with debt maturing just before August 2007 had the advantage of rolling over their debt under pre-crisis conditions. In contrast, companies with debt maturing shortly after August 2007 faced significantly higher refinancing costs. Loan information was collected from the Thomson Reuters Loan Pricing Corporation's (LPC) Dealscan. This database contains details about loans provided by financial institutions to U.S. corporations.

Controls

I control for a set of firm- and manager-level characteristics that could affect the propensity of appointing different types of CEO and subsequent firm performance.

Firm-level controls. Firm fixed effects are included to account for time-invariant, unobservable firm-specific characteristics. Year fixed effects are included in all specifications to account for economy-wide year-to-year changes. As robustness checks, I ran separate regressions with firm-level controls (in place of firm fixed effects), including parent firm sales (natural log of total annual sales of the parent firm), firm size (natural log of the total number of employees of the parent firm), pre-succession firm performance (ROA), subsidiary count (number of divisions and majority-owned subsidiaries that have no subordinate divisions or subsidiaries, i.e., number of base subsidiaries of the ultimate parent firm) (Zhou, 2013), and industry-fixed effects (a full set of two-digit SIC indicators of the parent firm). Note that firm size and all financial controls are average values for three years prior to CEO succession. I further controlled for regional factors (a complete

set of indicators of the state where the parent company's headquarters is located) that may be correlated with the propensity of different types of CEO to be appointed and firm performance.

Manager-level controls. When performing regressions on the firms' tendency to appoint various types of CEOs, I incorporated a control for the manager's gender, which was identified by their first name and indicated whether the individual is female. I included an indicator variable of whether or not the individual was on the board of directors in the year before the CEO succession. In the regression testing the propensity of appointing different CEO types, I accounted for the number of years that the individual had spent at the parent firm before CEO succession.

1.3.3 Methodology

Propensity of appointing a hybrid CEO

To examine the likelihood of appointing hybrid CEOs in turbulent environments, I constructed a dataset in which each observation represents one CEO transition. I used the following empirical specification to estimate a logistic regression at the transition level.

$$\Pr\left(Hybrid_{it} = 1\right) = F(\beta_1 \, High\ Turbulence_{it-1} + \delta' X_{it} + \tau_t + \gamma_j + \epsilon_i) \qquad (1.1)$$

for firm i in industry j *i*n year t. X_{it} is a vector of firm-level controls, τ_t are year fixed effects, and γ_j are industry fixed effects. $Hybrid_{it}$ is an indicator for the type of transition of firm i in year t, which equals one if the new CEO is a hybrid candidate (i.e., promoted from one of its subsidiaries) and equals zero if the new CEO is an insider or outsider candidate. $High\ Turbulence_{it-1}$ indicates industry-level environmental instability, assessed by changes in the industry concentration ratio in the year preceding CEO succession. I expect $\beta_1 > 0$ if external environmental uncertainty has a positive relationship with the probability that a hybrid CEO will be appointed.

Performance implications of appointing a hybrid CEO

Industry-level turbulence. I used an ordinary least squares model and a difference-in-difference (DID) approach to examine the performance implications of appointing a hybrid CEO relative to an insider or outsider CEO in turbulent environments:

$$ROA_{it} = \beta_1 Post_{it} \times Hybrid_{it} + \beta_2 Post \times Outsider_{it} + \beta_3 Post \times Turbulence_{it-1}$$
$$+\beta_4 Post \times Hybrid \times Turbulence + \beta_5 Post \times Outsider \times Turbulence + \delta_i + \tau_t + \epsilon_i \quad (1.2)$$

for firm i in year t. δ_i denotes firm fixed effect, and τ_t denotes year fixed effect. The data is a panel set of CEO succession events, which emcompasses the three years before and the three years following each succession, excluding the year in which the transition took place (illustrated in Figure 1.2). This time window aligns with previous studies examining the outcomes of CEO transitions (e.g., Bennedsen et al., 2007; Chen and Hambrick, 2012; Karaevli, 2007; Shen and Cannella, 2002). The *Post* variable in equation 1.2 denotes an indicator for the post-succession period. The *Hybrid* variable captures whether the appointed CEO is a hybrid CEO, i.e., appointed from the subsidiary of the firm. The *Outsider* variable denotes whether the CEO succession is from outside the firm. The omitted variable is an indicator for *Insider* CEOs, making insider CEO transitions the reference category by default. I also conducted my analysis using outsider CEO transitions as the reference group.

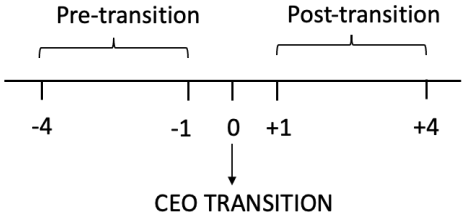
The inclusion of firm fixed effects allows me to focus on the within-firm performance difference of firms that appoint hybrid CEOs relative to firms that appoint insider CEOs (or outsider CEOs when using outsider as the reference category). This empirical approach mitigates the potential concern that the effect of hybrid CEO on firm performance might be attributable to unobservable firm-level characteristics. By focusing on within-firm changes, I compare the performance of the same firm under difference scenarios, such as before and after appointing different types of CEOs and under varying degrees of environmental turbulence. The treatment group are firms that had a hybrid CEO transition at time *t,* and the control group are firms that had

an insider CEO transition at time *t* (or outsider CEO transition when using outsider as the reference category). The DID model tests whether the appointment of a hybrid CEO has a significant impact on the firms' ROA in the post-succession period compared to firms that appoint an insider CEO (or an outsider CEO) in turbulent environments.

The level of environmental turbulence at the industry level is also accounted for, represented as a binary variable (*High Turbulence*). A value of one indicates a high industry-level turbulence in the year prior to CEO succession, while a zero indicates a low level of turbulence. This data structure allows us to analyze the impacts of different types of CEO succession on firm performance, and how these impacts vary under different environmental conditions.

I used the interaction terms to compare the within-firm change in average ROA pre- versus post-succession of hybrid CEOs relative to pre- versus post-succession of insider CEOs in equation 1.2 (and separately relative to outsider CEOs if the baseline category is an outsider). Specifically, β_1 captures the additional change in ROA between the pre-succession and post-succession periods for firms with hybrid CEOs, compared to those with insider CEOs, in *non-turbulent environments*. The coefficient on the triple interaction term between *Post, Hybrid*, and *Turbulence* (β_4) captures the additional change in ROA for hybrid vs. insider from the pre- to post-succession period and from non-turbulent to turbulent industry. I expect $\beta_1 + \beta_4 > 0$, because their sum captures the change in ROA following CEO transitions for firms that appoint hybrid CEOs relative to firms that appoint an insider CEO *under turbulent environments.*

Figure 1.2: Illustration of data construction for industry-level turbulence



Firm-level credit crunch (external shocks to uncertainty). In order to address concerns of endogeneity, whereby firms may anticipate a shift in the external environment and choose a hybrid CEO while concurrently making other strategic adjustments, I utilize a natural experiment framework. Past literature suggests that turbulence in the external environment is difficult to predict (Aldrich, 1979; Dess and Beard, 1984; Wholey and Brittain, 1989), and by using an exogenous shock, we can isolate the impact of the hybrid CEO appointment on a company's performance.

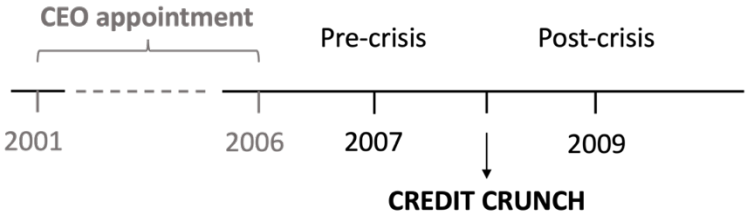
The exogenous shock I leverage is the sharp increase in borrowing costs following the credit crunch of August 2007 (Flammer and Ioannou, 2021). I focus on a subset of firms where a CEO transition occurred between 2001 and 2006, five years before the credit crunch. This exogenous shock is an unpredictable change in the firm's external environment. Firms are then categorized into treatment and control groups based on their exposure to the credit crunch.

The dataset structure mirrors the prior triple difference-in-differences design (illustrated in Figure 1.3). Each firm is recorded with a pre-crisis observation and a post-crisis observation, noting changes in firm performance measured by a three-year average return on assets. The binary variable *Strongly Affected* is introduced to indicate the extent to which a firm was affected by the credit crunch, with one indicating intense exposure and zero indicating weak exposure. CEO succession type is also captured for each firm, categorized as hybrid, insider, or outsider. The empirical specification is the following:

$$ROA_{it} = \beta_1 Post_{it} \times Hybrid_{it} + \beta_2 Post \times Outsider_{it} + \beta_3 Post \times Strongly\ Affected_{it} + \beta_4 Post \times Hybrid \times Strongly\ Affected + \beta_5 Post \times Outsider \times Strongly\ Affected + \delta_i + \tau_t + \epsilon_i \quad (1.3)$$

for firm i in year t. I expect that the firms most severely affected by the credit crunch but had appointed a hybrid CEO prior to the crisis would exhibit greater performance levels compared to firms led by other types of CEO. This reinforces the argument that hybrid CEOs have an inherent capability to deal with environmental uncertainties, irrespective of the original premise behind their appointment.

Figure 1.3: Illustration of data construction for firm-level turbulence



1.4 Results

1.4.1 Propensity of appointing a hybrid CEO

Table 1.1 presents the summary statistics of the main variables. 33% of the CEO transitions in my sample are categorized as hybrid successions, 54% as insider successions, and 13% as outsider successions. The mean workforce size across these companies is 8,125 employees, with an average of 16 subsidiaries and an average revenue of $5.6 billion. These are large and established multi-unit firms. The mean tenure spent within the parent organization preceding the appointment to the ultimate CEO is five years. 73% of these managers served on the parent company's board of directors in the year preceding their transition to the CEO position. Women represent a small percentage of these CEOs, accounting for just 4%.

Table 1.1: Summary statistics of the main variables

	Variables	Mean	Std. Dev.
(1)	Hybrid	0.332	0.471
(2)	Insider	0.543	0.498
(3)	Outsider	0.125	0.331
(4)	Industry-level turbulence	0.537	0.499

(5)	Firm-level credit crunch	0.428	0.495
(6)	Increase in Chinese import	0.468	0.499
(7)	ln(employees)	1.186	1.868
(8)	ln(sales)	6.534	2.122
(9)	ROA	0.036	0.118
(10)	ROA change, avg 3-year	-0.001	0.164
(11)	Base unit count	16.744	32.805
(12)	Prior board position	0.728	0.445
(13)	Female	0.038	0.191
(14)	Tenure at the parent firm	5.055	3.926

Notes: Hybrid, Insider, and Outsider are indicators of whether or not the appointment of CEO at time t=0 is a hybrid, insider, or outsider CEO. Industry-level turbulence is an indicator of the whether or not the external environment is turbulent. Firm-level credit crunch is an indicator of the whether or not the firm is strongly affected by the financial crisis (i.e., firms with long-term debt matures six months before the credit crunch of August 2007). Increase in Chinese import is an indicator of whether there is a rise in Chinese import penetration. Ln(employees) is the natural log of total number of employees of the parent firm, averaged over three years prior to CEO succession (t=-1 to t=-3). Ln(sales) is the natural log of total annual sales of the parent firm, averaged over three years prior to CEO succession (t=-1 to t=-3). ROA is the parent firm return on assets, computed by dividing its net income by its total assets. ROA change is the difference between averaged 3 year ROA pre- and post-transition. Base unit count is the number of base subsidiaries of the ultimate parent firm. Prior board position is an indicator of whether or not the individual was on the board of directors in the year prior to CEO succession. Female is an indicator of whether or not the individual is a woman. Tenure is the number of years that the individual has spent in the parent firm prior to CEO succession.

Table 1.2 presents the correlation between the key variables in my sample. Note that the correlation between hybrid CEO appointment and industry-level turbulence is positive and significant at the 5% level, which is consistent with my prediction that hybrid CEO appointments are more likely when firms are experiencing turbulence or instability in the external environment.

Table 1.2: Correlations

	Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1)	Hybrid	1										
(2)	Insider	**-0.769**	1									
(3)	Outsider	**-0.267**	**-0.412**	1								
(4)	Industry-level high turbulence	**0.038**	-0.028	-0.013	1							
(5)	Increase in Chinese Import	-0.008	0.042	**-0.052**	-0.008	1						
(6)	ln(employees)	**0.127**	**-0.082**	**-0.058**	**0.054**	**0.059**	1					
(7)	ln(sales)	**0.136**	**-0.098**	**-0.047**	**0.049**	0.040	**0.908**	1				
(8)	ROA change, avg 3-year	0.019	-0.001	-0.025	-0.014	**-0.058**	**-0.053**	**-0.072**	1			
(9)	Base unit count	**0.079**	-0.020	**-0.083**	0.026	**0.073**	**0.467**	**0.465**	-0.006	1		

(10)	Prior board position	-0.033	**0.060**	**-0.043**	-0.019	-0.009	-0.012	0.002	-0.023	-0.009	1
(11)	Female	0.031	**-0.040**	0.016	0.013	-0.015	-0.007	-0.002	-0.016	-0.007	-0.014	1

Notes: This table reports the correlations between the main variables. Bolded figures are significant at 5% level.

Table 1.3 compares the frequency of different types of CEO appointments (hybrid, insider, and outsider) after periods of high and low industry-level turbulence. It provides the number of appointments and their corresponding percentages for each type and turbulence level. Hybrid CEO appointments are more common in high turbulence environments (34.9%) compared to low turbulence environments (30.9%). Insider CEO appointments are more common overall but show a decrease in high turbulence environments compared to low turbulence environments. Outsider CEO appointments are the least common and their frequency slightly decreases in high turbulence environments. This table suggests that when the external environmental turbulence is high, organizations appoint relatively fewer insider and outsider CEOs and more hybrid CEOs compared to periods of low turbulence. Conversely, when the industry is more stable (low turbulence), there is a slight preference towards appointing CEOs from inside the company.

Table 1.3: Proportion of CEO appointments under high vs. low turbulence

		CEO Appointment Type			
		Hybrid	Insider	Outsider	
Industry-level turbulence	Low	296 (30.9%)	538 (56.2%)	124 (12.9%)	*958*
	High	388 (34.9%)	590 (53%)	135 (12.1%)	*1,113*
		684	*1,120*	*259*	*2,071*

Notes: This table shows compares the frequency of different types of CEO appointments (Hybrid, Inside, Outside) one year after periods of high and low industry-level turbulence. It provides the number of appointments and their corresponding percentages for each type and turbulence level.

Table 1.4 reports the estimation results for the propensity of appointing different CEO types. I conducted a logistic regression with the dependent variable as the appointment of hybrid CEO, and the independent variable of interest is industry-level turbulence, while incorporating

firm- and manager-level controls as well as year and industry fixed effects (column 2). The estimated coefficient on *turbulence* is positive and statistically significant, suggesting a higher likelihood of appointing a hybrid CEO when a firm faces a turbulent external environment in the year before the CEO transition. The likelihood of appointing a hybrid CEO rises by 3.5 percentage points in a turbulent environment, holding all other factors constant. This is consistent with Hypothesis 1, that external environmental turbulence is associated with a greater chance of appointing a hybrid CEO. The estimated coefficient on *base unit count* is positive and significant. Firms with more base subsidiaries may have a wider array of qualified internal candidates, thus, are more likely to appoint hybrid CEOs than firms with fewer subsidiaries.

Columns 1 and 3 show the likelihood of appointing insider and outsider CEOs. The estimated coefficients on turbulence are negative and statistically insignificant. The likelihood of appointing an insider CEO or an outsider does not differ significantly with respect to external industry uncertainty.

These results indicate a slight tendency for firms to appoint a hybrid CEO in turbulent environments. In the following analysis, I will further show that if they do appoint a hybrid CEO in such environments, these appointments have a strong effect on ROA.

Table 1.4: Propensity of each type of CEO appointment

	(1)	(2)	(3)
Hypothesis:		H1	
		Logit models	
Dependent variable:	Insider	Hybrid	Outsider
Indicator for industry-level turbulence	-0.128	0.169*	-0.029
standard error	(0.093)	(0.100)	(0.142)
Pre-transition parent company ROA	0.032	0.324	-0.500
	(0.279)	(0.331)	(0.373)
ln(number of employees)	0.055	-0.036	-0.077
	(0.075)	(0.081)	(0.113)
ln(sales)	-0.140**	0.089	0.160
	(0.067)	(0.073)	(0.099)
ln(number of base subsidiaries)	-0.011	0.173***	-0.371***
	(0.055)	(0.059)	(0.088)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	2,071	2,071	2,071
Pseudo R-squared	0.041	0.062	0.089

Notes: This table presents the results from logit models estimating the propensity of firms appointing insider, outsider or hybrid CEOs by a set of firm, industry and manager-level characteristics. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

1.4.2 Performance implications of appointing a hybrid CEO

In Table 1.5, I examine post-succession changes in ROA by comparing the average ROA for the three years before the transition relative to the three years following the transition (excluding the year of the transition). The dependent variable in each of these regressions is three-year averaged ROA. I examine the effect of hybrid CEOs relative to the effect of outsider CEOs (columns 1 and 3), and, separately examine the effect of hybrid CEOs relative to the effect of

insider CEOs (columns 2 and 4), with year fixed effects and firm fixed effects to account for time-invariant, unobservable firm-specific characteristics.

The coefficient for the interaction term between *Post* and *Hybrid* captures the additional change in ROA from pre- to post-succession for companies with hybrid CEO appointments compared to those with outsider CEO appointments (column 1) or insider CEO appointments (column 2). This essentially compares the pre- versus post-succession performance of hybrid CEOs relative to the pre- versus post-succession performance of outsider CEOs (column 1) and, separately, to insider CEOs (column 2).

In columns 1 and 2, the estimated coefficients for the interaction variable between *Post* and *Hybrid* are not statistically significant (p-values of 0.322 and 0.516, respectively), which implies that in general, appointing a hybrid CEO does not make a significant difference in ROA. That is, I do not find that post-succession performance following the appointment of a hybrid CEO systematically differs from post-succession performance.

To test Hypothesis 2, I focus on a subset of firms that experienced turbulence in the external industry environment in the year before the CEO transition by adding an indicator for industry-level turbulence and interactions between this indicator and CEO type (columns 3 and 4). In column 3, the coefficient for the interaction between *Post*, *Hybrid*, and *High turbulence* is positive and significant (p-value = 0.042). The estimated coefficients imply that it is only among firms that experienced environmental turbulence, the appointment of a hybrid CEO is associated with a 3.3 percentage points increase in post-succession ROA relative to firms that appoint an outsider CEO (the effect is calculated by adding up the coefficients on *Post x Hybrid*, and *Post x Hybrid x High turbulence,* i.e., -0.013+0.046=0.033). Since the mean ROA in the pre-succession period is 0.038, the 3.3 percentage points increase represents approximately 87% increase in ROA ((0.033/0.038)

*100=86.8%). Similarly, among firms that experienced environmental turbulence, the appointment of hybrid CEO is associated with a 1.7 percentage points increase in post-succession ROA relative to firms that appoint an *insider* CEO (see column 4: -0.009+0.026=0.017).

Table 1.5: Firm performance of hybrid CEOs in response to industry-level turbulence

	(1)	(2)	(3)	(4)
Hypothesis:			H2	
			OLS models	
Dependent variable:			ROA, 3-year average	
	Outsider as baseline	Insider as baseline	Outsider as baseline	Insider as baseline
Indicator for post, interacted with:				
Insider CEO	0.006		-0.004	
standard error	(0.011)		(0.015)	
Hybrid CEO	0.011	0.005	-0.013	-0.009
	(0.011)	(0.007)	(0.016)	(0.011)
Outsider CEO		-0.006		0.004
		(0.011)		(0.015)
Industry turbulence			-0.035*	-0.015*
			(0.019)	(0.009)
Insider CEO, interacted with industry turbulence			0.019	
			(0.021)	
Hybrid CEO, interacted with industry turbulence			0.046**	0.026*
			(0.022)	(0.015)
Outsider CEO, interacted with industry turbulence				-0.019
				(0.021)
Indicator for prior board position	0.008	0.008	0.007	0.007
	(0.007)	(0.007)	(0.007)	(0.007)
Indicator for woman manager	0.010	0.010	0.010	0.010
	(0.017)	(0.017)	(0.017)	(0.017)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Manager-level controls	Yes	Yes	Yes	Yes
Observations	4,240	4,240	4,240	4,240
R-squared	0.774	0.774	0.775	0.775

Notes: Columns 1 presents the results from an OLS model estimating the performance effect of hybrid CEO appointments relative to outsider CEO appointments in general. Column 2 presents the results from hybrid relative to

insiders. Columns 3 and 4 include the interaction with industry-level turbulence, aiming to see if it is under turbulent environments, firms led by hybrid CEOs are significantly more successful. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

I ran a similar set of regressions with firm-level credit crunch as an exogenous shock to the external environment, where firms cannot anticipate a change in the external environment. I focus on the subset of firms in which the appointment of CEO took place before the credit crunch (between 2001 to 2006). Table 1.6 shows that among firms strongly affected by the financial crisis, those that had appointed a hybrid CEO prior to the credit crunch outperformed those that had appointed an insider or outsider CEO (columns 3 and 4). Among firms that experienced greater external shock, firms with hybrid CEOs are associated with a 3.4 to 3.7 percentage points increase in post-succession ROA relative to firms with an outsider or insider CEO, which provides additional support for Hypothesis 2.

Table 1.6: Performance of firms led by hybrid CEOs in response to firm-level credit crunch

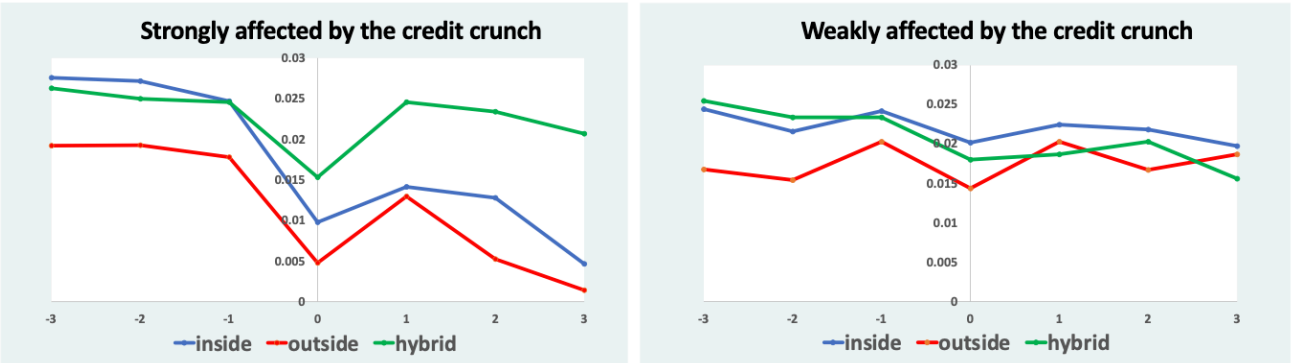
	(1)	(2)	(3)	(4)
Hypothesis:			H2	
			OLS models	
Dependent variable:			ROA, 3-year average	
	Outsider as baseline	Insider as baseline	Outsider as baseline	Insider as baseline
Indicator for post, interacted with:				
Insider CEO	-0.022		-0.032*	
standard error	(0.014)		(0.019)	
Hybrid CEO	-0.001	0.019	-0.029	-0.001
	(0.015)	(0.012)	(0.020)	(0.015)
Outsider CEO		0.021		0.032*
		(0.014)		(0.019)
Strongly affected by the credit crunch			-0.037	-0.012
			(0.027)	(0.012)
Insider CEO, interacted with strongly affected			0.025	
			(0.029)	
Hybrid CEO, interacted with strongly affected			0.063**	0.038**
			(0.030)	(0.019)
Outsider CEO, interacted with strongly affected				-0.020
				(0.029)

Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Manager-level controls	Yes	Yes	Yes	Yes
Observations	520	520	520	520
R-squared	0.750	0.750	0.756	0.756

Notes: Columns 1 presents the results from an OLS model estimating the performance effect of hybrid CEO appointments relative to outsider CEO appointments in general. Column 2 presents the results from hybrid relative to insiders. Columns 3 and 4 include the interaction with firm-level credit crunch (strongly or weakly affected by debt maturity date), aiming to see if it is among firms that experienced greater external shock, firms led by hybrid CEOs are significantly more successful. The sample is restricted to the subset of firms in which the appointment of CEO took place before the credit crunch (between 2001 to 2006) and have debt maturity date information from Dealscan. $*p < 0.1$; $**p < 0.05$; $***p < 0.01$.

Figure 1.4 represents an event study on the subset of firms that were *strongly* affected by the credit crunch on the left, and those that were *weakly* affected by the credit crunch on the right. The X-axis represents the time relative to the credit crunch, and the Y-axis shows the average return on assets (ROA). Before the credit crunch, the three types of firms appear to have somewhat parallel ROA trends. After the credit crunch, the *hybrid* group shows a rapid recovery and improvement in ROA. The *insider* and *outsider* groups suffered a decrease. For the subset of firms that were *weakly* affected by the credit crunch, there is no significant gap in performance differences between hybrid versus. other types of CEOs. The adaptive advantages of hybrid CEOs seem to come into play more effectively when faced with stronger adversity.

Figure 1.4: Average ROA surrounding the credit crunch (strongly and weakly affected)



1.4.3 Drivers of change in financial performance

Results in the previous section suggest that firms with hybrid CEOs performed better in the post-crisis years, especially for those most affected by the crisis. To examine the potential mechanisms underlying the increase in financial performance post-succession among firms with hybrid CEOs, I investigated how companies adjusted their investments in key strategic resources in response to the financial crisis. Following Flammer and Ioannou (2021), I ran the main regression with the dependent variable as the change in the firm's investment strategies, including their workforce, capital expenditures, R&D, and sales. Workforce is computed by taking the natural logarithm of the number of employees. To measure investments in physical capital, I measured capital expenditure as the ratio of capital expenditures to property, plant, and equipment. To measure R&D investments, I calculated the ratio of R&D expenses to total assets. Sales is computed by taking the natural logarithm of the gross sales. All measures are computed in the years 2007 and 2009 (Flammer and Ioannou, 2021).

Results show that among firms strongly affected by the financial crisis, hybrid CEOs responded by laying off more employees than insider CEOs, closer to what outsider CEOs are doing. From Table 1.7, the negative and significant coefficient for the interaction between *Post*, *Hybrid*, and *Firm-level credit crunch* in column 2 (p-value = 0.041) suggests that in response to the increase in borrowing costs during the credit crunch (i.e., for the treatment group), firms with hybrid CEOs in the period after the CEO appointment reduced their workforce by 6.8% more than firms with insider CEOs. However, there is no statistically significant difference in workforce reduction between firms with hybrid CEOs and those with outsider CEOs during this period.

Columns 3 and 4 suggest virtually no significant difference in R&D spending between hybrid and other types of CEOs. Both coefficients on the triple interaction term are small in economic terms and statistically insignificant (p-values of 0.674 and 0.953, respectively).

In columns 5 and 6, I find that hybrid CEOs cut capital expenditures more aggressively than insider CEOs and outsider CEOs when faced with crises. Specifically, the coefficient of the triple interaction term implies that hybrid CEOs, in response to the financial crisis, reduced their capital expenditure ratio by 0.05 more than outsider CEOs. This corresponds to a decrease of 26% over the sample average. They also reduced their capital expenditure ratio by 0.06 more than insider CEOs, representing a 30% decrease over the sample average.

I find that hybrid CEOs increased sales more than both insider and outsider CEOs. Columns 7 and 8 suggest that, in response to the credit crunch, firms with hybrid CEOs increased their sales by 6.7% more than firms with outsider CEOs and 9.8% more than firms with insider CEOs.

Overall, the findings indicate that companies led by hybrid CEOs responded to the financial crisis by laying off more employees and significantly reducing capital expenditures but sustaining their investments in R&D. This suggests that hybrid CEOs tend to focus on immediate rather than long-term strategies in the face of a crisis. This approach could play a key role in preserving their firms' competitiveness, which may, in part, account for the superior performance observed in the years following the crisis. This is consistent with the mechanism I propose – hybrid CEOs are taking bold actions like the outsiders but also seem to be retaining long-term strategies like the insiders. This is also consistent with the findings of Flammer and Ioannou (2021), which suggest that firms that were adversely affected by the credit crunch followed a "two-pronged" approach of curtailing their workforce and capital expenditures while maintaining their R&D investments. They further document that firms following this approach achieved greater performance post-crisis.

Table 1.7: Drivers of ROA increase – corporate strategy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS models							
Dependent variable:	Ln(employment)		R&D		Capital expenditure		Ln(sales)	
	Outsider as baseline	Insider as baseline	Outsider as baseline	Insider as baseline	Outsider as baseline	Insider as baseline	Outsider as baseline	Insider as baseline
Indicator for post, interacted with:								
Insider CEO	-0.055		0.001		0.072*		-0.070	
standard error	(0.049)		(0.013)		(0.042)		(0.078)	
Hybrid CEO	-0.025	0.030	0.004	0.003	0.072*	-0.001	-0.162*	-0.091*
	(0.051)	(0.031)	(0.014)	(0.009)	(0.043)	(0.023)	(0.084)	(0.052)
Outsider CEO		0.055		-0.001		-0.072*		0.070
		(0.049)		(0.013)		(0.042)		(0.077)
Strongly affected by credit crunch	-0.027	0.016	0.002	-0.006	0.073	0.008	-0.148	-0.107**
	(0.068)	(0.033)	(0.016)	(0.008)	(0.051)	(0.024)	(0.117)	(0.049)
Insider CEO, interacted with strongly affected	0.043		-0.009		-0.065		0.041	
	(0.075)		(0.018)		(0.056)		(0.126)	
Hybrid CEO, interacted with strongly affected	-0.055	-0.098**	-0.008	0.001	-0.122**	-0.058*	0.229*	0.189**
	(0.076)	(0.048)	(0.019)	(0.012)	(0.057)	(0.034)	(0.131)	(0.077)
Outsider CEO, interacted with strongly affected		-0.043		0.009		0.065		-0.041
		(0.075)		(0.018)		(0.056)		(0.127)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Manager-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	454	454	272	272	463	463	520	520
R-squared	0.997	0.997	0.933	0.933	0.811	0.811	0.989	0.989

Note: This table shows the changes in corporate strategy for firms led by different type of CEO in response to firm-level credit crunch. Columns 1 and 2 report changes in workforce; columns 3 and 4 report changes in R&D investments; columns 5 and 6 report changes in capital expenditures; columns 7 and 8 report changes in sales. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

1.4.4 Inverted U-shape relationship and continuous measures of outsiderness

I investigate the potential of an inverted U-shaped relationship between outsiderness and expected performance in turbulent environments. This suggests that both pure insiders and complete outsiders might yield lower expected performance in turbulent environments, whereas

a balanced mix of the two can lead to enhanced outcomes. I construct a continuous "outsiderness" variable that equals zero for insiders, one for outsiders, and ranges between zero to one for hybrids, based on the relatedness index between the parent firm and the subsidiary. I use the Fan-Lang (2000) indices based on US input-output commodity flow data from the Bureau of Economic Analysis to create two distinct relatedness indices: one reflecting vertical relatedness (degree to which one industry can employ the other′s products and services as inputs for its own production or supply output as the other′s input) and the other indicating complementarity (whether two industries can procure inputs jointly or share marketing and distribution networks).

To test the inverted-U shape relationship, I perform the following quadratic equation conditional on firms that had experienced external environmental turbulence in the year prior to CEO transition.

$$\Delta ROA_{pre-post,it} = \beta_1 Outsiderness_{it} + \beta_2 Outsiderness_{it}^2 + \delta_i + \tau_t + \epsilon_i \quad (1.4)$$

The dependent variable is the difference in the three-year averaged ROA post- and pre-succession. The independent variable is the continuous outsiderness variable. Table 1.8 presents the estimation result. The first column presents the results when using vertical integration to measure outsiderness, while the second column displays the results when using complementarity to measure outsiderness. I followed Lind and Mehlum (2010)'s three-step procedure to test the inverted U-shape relationship. It is highly recommended by past literature to follow this three-step testing procedure before concluding that there truly exists a U-shaped curve over the data range (Haans et al., 2016). First, β_2 needs to be significant and negative, which is supported by the coefficients on the quadratic term in both columns of Table 1.8. Second, the slope must be sufficiently steep at both ends of the data range. Both slope tests are significant in my specification. Third, the turning point

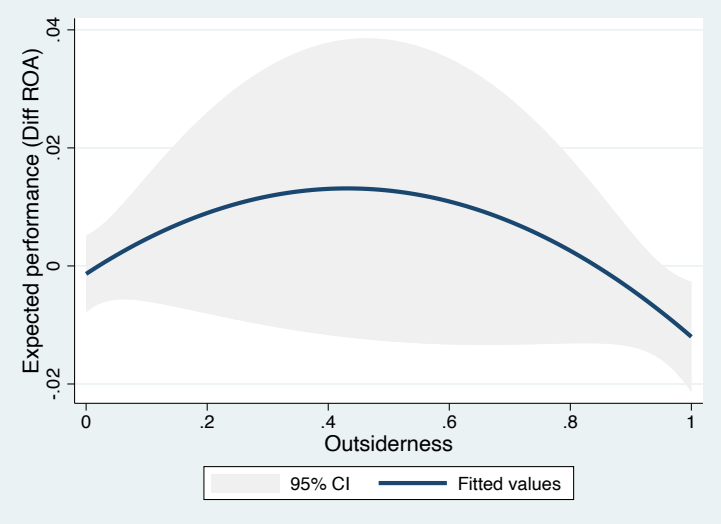
needs to be located well within the data range. Taking the first derivative of the quadratic equation and setting it to zero yields the turning point at 0.51 and 0.48 (for specifications 1 and 2 respectively). I also plot my results from specification 1 to visualize the U-shape relationship in Figure 1.5, with the X-axis as the degree of outsiderness and the Y-axis as the expected performance (i.e., change in average ROA three years before and after the CEO transition). The shaded area represents the 95 percent confidence interval of the inverted U-shape curve. The three-step testing procedure implies an inverted U-shape relationship between outsiderness and expected performance in turbulent environments.

Table 1.8: Hybrid CEO performance – Inverted U-shape relationship

	(1)	(2)
	OLS models	
Dependent variable:	Change in 3-year average ROA	
Outsiderness	0.193*	0.146*
standard error	(0.104)	(0.087)
Outsiderness^2	-0.189*	-0.151*
	(0.105)	(0.086)
Year fixed effects	Yes	Yes
Firm fixed effects	Yes	Yes
Manager-level controls	Yes	Yes
Observations	1,265	1,241
R-squared	0.952	0.952

Note: To test the inverted U, I performed a quadratic equation on the subset of firms that experienced turbulence in the year prior to a CEO transition. I used the standard industry-level turbulence measure to determine whether or not the firm had experienced turbulence, and this allows me to capture more observations than the credit crunch sample. The dependent variable is the difference in the three-year averaged ROA post- and pre-succession for each firm. The independent variable is the continuous outsiderness measure. Since I have two measures of outsiderness, Column 1 shows the regression results of using vertical relatedness to measure outsiderness, Column 2 shows the results of using complementarity to measure outsiderness. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Figure 1.5: Plot of the inverted U-shape relationship



1.4.5 Robustness Checks

Coarsened exact matching (CEM)

A potential concern about our sample is that firms appointing hybrid CEOs are fundamentally different from firms appointing either insider or outsider CEOs, which could lead to biased estimates when comparing their performance. That is, firms that select hybrid CEOs might differ from firms that select other CEO types in ways that could influence post-succession financial performance. To address this concern, I employ coarsened exact matching (CEM) to balance the observed covariates between these groups, ensuring a more robust comparison and minimizing confounding effects.

I create "treatment" and "control" groups that share similar pre-transition features, including pre-succession firm performance, number of subsidiaries, number of employees, firm revenue, firm age, industry, and transition year. Firms with hybrid and non-hybrid CEO transitions are now generally comparable in firm-level characteristics. Using the matched sample, I estimate the hypothesized hybrid CEO appointment effect on the post-succession performance and the

moderating effects of industry-level turbulence. Results are reported in Appendix Table A1, which is consistent with the results of my main analyses.

Alternative measures of turbulence – Chinese import penetration

In addition to the industry-level turbulence and firm-level financial crisis measure, I use changes in the industry level of imports from China to the US as an exogenous trigger of turbulence and examine the effect of hybrid CEO appointment on subsequent firm performance when the Chinese import increases for the focal parent company in the year prior to CEO appointment. I calculate the level of Chinese import penetration as the share of the value of imports originating from China of total imports in an industry from 1999 to 2006 and computed the year-over-year change in the share of Chinese imports for each industry (Belenzon and Tsolmon, 2016; Bloom et al., 2016). When this growth exceeds the industry's median value, I categorize it as an indication of rise in Chinese imports or turbulence for that specific industry.

Appendix Table A2 presents the estimation results. Consistent with the main predictions, in general, there are no significant differences in post-transition performance between firms that appoint a hybrid vs. a non-hybrid CEO. It is among firms that experienced Chinese import increase in the year prior to the CEO transition, the appointment of hybrid CEOs is associated with 2.8 to 4.6 percentage points increase in post-succession ROA compared to insider or outsider CEO appointments.

Dominant subsidiaries

There are scenarios where the parent company essentially functions as a holding entity, and the subsidiaries dominate in terms of size and operations. For instance, Alphabet acts as the holding company for Google, which is responsible for most of Alphabet's operational activities and revenue. In such instances, a CEO who is promoted from a dominant subsidiary could be

perceived as an insider due to their significant influence and familiarity with the corporate structure. To address this, I identify subsidiaries that represent the majority of the firm—specifically, those that employ 50% or more of the total workforce—and I treat these dominant subsidiaries as equivalent to the parent company. The results remain consistent with the main analysis after excluding these companies. Additionally, I reclassify CEOs who are promoted from dominant subsidiaries as insiders instead of hybrid CEOs. The results are presented in Appendix Table A3: the first two columns exclude dominant subsidiaries, while the last two columns consider CEO promotions from these subsidiaries as pure insider promotions. The findings are consistent with my prior results.

1.5 Discussion and Conclusion

The choice between appointing an insider or an outsider CEO is a complex decision that firms continuously navigate. Previous studies simplifying CEOs into these two categories overlook the complexity of CEO career trajectories and experiences. Recognizing CEOs as existing along an "outsiderness" continuum allows a more nuanced understanding of the advantages and drawbacks of different CEO appointments (Bower, 2007; Finkelstein et al., 2009).

Responding to the call for more theory and empirical research on the continuum of outsiderness, I introduce an additional category of CEOs along the continuum - the "hybrid" CEOs - who are essentially insiders with more outsiderness. These CEOs originate from the subsidiaries of multi-unit firms, possessing an insider's knowledge of the firm coupled with an outsider's relative detachment from internal social ties. These traits are especially valuable in turbulent environments or crisis situations that require a firm to respond and adapt to the changing environment appropriately and quickly.

Previous studies suggest that insider CEOs, equipped with firm-specific knowledge and established internal networks, are beneficial for ensuring continuity and stability, making them preferable when minimal change is required. Outsider CEOs, characterized by their innovative approach and relative immunity to internal politics, are more suitable when a company seeks transformation or significant changes. I argue that hybrid CEOs, a category that combines elements from both ends of the spectrum, provide a balanced blend of firm-specific knowledge and willingness for change without being overly entrenched in internal politics. These leaders can be precious in turbulent environments that call for adaptability, offering the right mix of continuity and change. Therefore, when moderate changes are needed, particularly in turbulent scenarios, companies are more likely to opt for a hybrid CEO, enhancing firm performance.

Utilizing data from over 1,400 multi-unit US public firms over 24 years, I discovered that one-third of CEO transitions involved hybrid CEOs. Consistent with my hypotheses, firms are more likely to appoint a hybrid CEO when the external environment is turbulent, and such appointments often lead to superior post-succession performance. Hybrid CEOs also exhibit greater resilience to external crises by taking appropriate, aggressive actions, such as layoffs or cutting capital expenditures. These findings support the theory that hybrid CEOs are willing to initiate changes and make appropriate adaptations under high environmental uncertainty due to their unique blend of firm-specific knowledge and less social embeddedness.

This study contributes to the strategic human capital and CEO succession literature by identifying a unique category of CEO on the outsiderness continuum. I have defined and operationalized hybrid CEOs utilizing the distinct organizational structure of multi-unit firms. This method goes beyond the traditional unidimensional focus on firm and industry tenure and allows for a more granular analysis of executive backgrounds. This research extends beyond existing

studies that focus on conceptualizing the characteristics of "inside-outsiders" (Bower, 2007) and practical examples of successful hybrid CEOs in prominent corporations (e.g., General Electric, Volkswagen, Yum Brands, etc.), by empirically examining the preferable conditions and performance implications of appointing hybrid CEOs.

The findings contribute to previous research underscoring the role of contingencies when analyzing the effects of different CEO types (Chen and Hambrick, 2012; Finkelstein et al., 2009; Karaevli and Zajac, 2013; Khurana and Nohria, 2000). Specifically, this study suggests that hybrid CEOs do not universally contribute to superior organizational performance. Their effectiveness significantly depends on the congruence between their distinct characteristics and the firm's strategic requirements within the specific environmental context. This study also advances our understanding of how CEO transitions serve as a vehicle for organizational change and a mechanism through which organizations adapt to shifts in the external environment (Romanelli and Tushman, 1994; Virany et al., 1992).

Finally, this study emphasizes the importance of maintaining a robust internal managerial labor market. The development of hybrid leaders, embodying insider knowledge and outsider perspectives, becomes viable with a robust internal labor market. Firms should think broadly at their internal managerial labor market and have a pipeline of hybrid candidates groomed within the organization, because they could be especially useful under turbulent environments and adaptation. This suggests a need for firms to invest substantially in internal talent cultivation, developing potential leaders who can navigate the complexities of environmental turbulence and disruptive events.

CHAPTER 2

Post-M&A Retention of Top Managers: The Role of Structural Knowledge

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2.1 Introduction

Mergers and acquisitions (M&As) are a common strategy firms use to grow and acquire resources and capabilities (Ahuja and Katila, 2001; Boyacıoğlu et al., 2024; Graebner, 2004; Feldman and Hernandez, 2022; Karim and Capron, 2016; Karim and Mitchell, 2000; Kaul and Wu, 2016; Puranam et al., 2009). The success of M&As depends on how well the post-acquisition integration (PAI) is managed (Graebner et al., 2017). *Structural integration* is a critical element of PAI, as it combines the acquired and acquiring firms' organizational units within unified firm boundaries (Barkema and Schijven, 2008; Bodner and Capron, 2018; Haspeslagh and Jemison, 1991; Puranam et al., 2009). Target firm's top managers play an important role in structural integration, as they facilitate coordination and communication between the firms (Agarwal et al., 2012; Graebner, 2004; Krug and Nigh, 1998; Ranft and Lord, 2002; Zollo and Singh, 2004). Accordingly, the retention of target top managers has been identified as one of the most significant factors in successful post-acquisition performance (e.g., Bilgili et al., 2016; Buchholtz et al., 2003; Ranft and Lord, 2002; Walsh, 1988).

Despite their importance, the role of target top managers in structural integration is not well-documented in the literature, leading to inconsistent findings and theories. For example, while high managerial turnover from target firms post-M&As is often seen as detrimental to M&A performance, studies have documented large-scale top managerial turnover from target firms post-

M&A (Bilgili et al., 2017; Butler et al., 2012; Cannella and Hambrick, 1993; Krishnan et al., 1997; Puranam et al., 2009; Ranft and Lord, 2002; Zollo and Singh, 2004). Therefore, the question of under what conditions target managers are important for structural integration remains (Bodner and Capron, 2018).

The literature has offered conflicting explanations of the conditions under which retention of target top managers is valuable post-acquisition (e.g., Krug et al., 2014; Lubatkin et al., 1999). On the one hand, the key explanation for the high post-M&A turnover of target managers is that acquiring firms are likely to view target top managers as redundant in related acquisitions where the acquired knowledge is similar to their own, and replacing them improves efficiency (Anand, 2004; Conyon et al., 2002; Krishnan et al., 1997; O'Shaughnessy and Flanagan, 1998; Park et al., 2018). However, this efficiency argument contradicts the negative association between post-acquisition managerial turnover and performance.

On the other hand, the resource-based view (RBV) and strategic human capital (SHC) literatures would suggest it is more advantageous for acquirers to retain valuable managerial resources, especially if the target managers possess knowledge, capabilities, and routines critical to post-acquisition integration (Bergh, 2001; Graebner, 2004; Ranft and Lord, 2002; Tang and Zhao, 2023; Zollo and Singh, 2004). Because human capital is a non-scale-free resource with capacity constraints and opportunity costs, managers cannot be deployed simultaneously across units (Levinthal and Wu, 2010). When target managers depart, the acquiring firm needs to deploy its own managers to the target at non-trivial costs. Indeed, Tang and Zhao (2023) find that a greater share of target managers are retained in cross-border acquisitions where the geographical and knowledge distance between the acquirer and the target is large. Hence, retention of target managers may be more important for acquisition performance under certain conditions.

In this study, we aim to reconcile these conflicting streams by examining how target top managers are retained in acquisitions, under what conditions, and with what outcomes. We focus on the role of managerial knowledge in PAI and ask how the similarity between the acquiring firm's organizational characteristics and target managers' human capital shapes managerial retention post-acquisition. Specifically, we draw from the literature that highlights structural knowledge as an important component of managerial human capital to distinguish between managers' technical knowledge and structural knowledge (Karim, 2012; Karim and Williams, 2012; Nelson and Winter, 1982). Technical knowledge is knowledge of *what* to do, such as industry and product knowledge transferred in acquisitions (e.g., Ahuja and Katila, 2001; Finkelstein and Haleblian, 2002; Kogut and Zander, 1992). In related acquisitions, the acquirer and target firms' technical knowledge is similar. Structural knowledge is knowledge of *how* to accomplish goals and *ways of doing* that capture managers' knowledge and ability to function well within a particular organizational structure (Burton et al., 2006; Karim, 2012; Karim and Williams, 2012; Joseph and Gaba, 2020; Nelson and Winter, 1982). Structural knowledge encompasses unique managerial processes and cognitive frames directed toward managing decision-making, coordination, and communications processes specific to organizational structures that can vary in their locus of authority, information flow, and incentives (Joseph and Gaba, 2020; Junge et al., 2023; Ocasio, 1997).

Our research examines two fundamental archetypical organizational designs: centralized, functional (U-form) and decentralized, multidivisional (M-form) structures, as the literature has demonstrated that top managers develop specific skills and capabilities aligned with their operating structure (Albert, 2023; Galbraith, 1977; Joseph and Gaba, 2020; Junge et al., 2023; Williamson, 1964, 1975). In centralized U-form structures, the contributions of functional departments to

corporate performance are less observable and quantifiable. Consequently, managers in these structures must excel in internal negotiation and invest in political capital, creating networks and social relationships vital for internal performance (Hill et al.,1992; Hoskisson et al., 1993; Junge et al., 2023; Williamson, 1970). Conversely, in decentralized M-form structures, there is a clearer link between managers' actions and the financial performance of their units, which also spurs competition among units for resources. Therefore, managers in these structures focus on developing skills that enable them to effectively monitor the external environment and enhance their divisions' competitive performance (Gaba and Joseph, 2013; Qian et al., 2006; Williamson, 1964, 1975). As a result, top managers operating within centralized organizational structures tend to concentrate on internal management tasks such as fostering relationships, ensuring coordination, and overseeing the flow of information. In contrast, those in decentralized structures are more engaged with the external aspects of the business, such as responding to competitive market forces to achieve the performance objectives of their respective units. This distinction in managerial focus and required skill sets is particularly pronounced at the top levels of management relative to those in lower-level managerial roles (Junge et al., 2023).

Because related acquisitions typically require high levels of post-acquisition structural integration and coordination (Haspeslagh and Jemison, 1991; Larsson and Finkelstein, 1999; Puranam et al., 2009), we propose that structural knowledge is an important factor in facilitating post-acquisition integration and success, especially in related, absorption-type deals where post-acquisition integration needs are greater. Target managers who understand the acquirer’s decision-making and communication processes may play an important role in creating buy-in and facilitating coordination activities between the two firms. Specifically, we predict that in related acquisitions, top managers with similar structural knowledge to the acquirer are more likely to be

retained by the acquirer than managers with less similar structural knowledge. We also predict that with similar structural knowledge, target managers can leverage their relevant know-how to facilitate the integration process and, ultimately, increase the performance of related acquisitions.

To test our hypotheses, we collected data on global M&A deals with multi-unit firms to create a novel data set that incorporates M&A activities, manager movements, managerial work history, firm characteristics, organizational structure, and performance. Our data consist of 616 deals and the mobility of 1,339 top managers in target firms in 2001-2017. We focus on top managers for primarily two reasons. First, the significance of structural knowledge is more critical at higher management levels (Joseph et al., 2016; Karim and Williams, 2012). Second, it is these top managers who are instrumental in driving PAI, making their skill sets and actions key to successful structural integration (Agarwal et al., 2012; Graebner, 2004; Tang and Zhao, 2023). We find that in related acquisitions, the retention rate of target managers post-M&A is greater where there is greater structural similarity between the acquiring and target firms. To examine the mechanism more closely, we constructed for each individual top manager their level of structural knowledge based on their work history across different organizational structures. We find that target executives with structural knowledge more similar to the acquiring firm's structure are more likely to be retained post-acquisition than executives with less similar structural knowledge. Consistent with our expectations that the retention of managers with structural knowledge similarity improves post-acquisition integration, we find that in related deals, greater structural knowledge similarity is associated with greater post-acquisition performance, especially in the long run.

Our research contributes to several literature streams. First, it contributes to the M&A integration and post-acquisition performance literature by providing a structural knowledge

perspective to understanding post-acquisition turnover and performance, as well as emphasizing the role of structural knowledge in facilitating integration in related acquisitions (Bauer and Matzler, 2014; Bodner and Capron, 2018; Feldman and Hernandez, 2022; Graebner et al., 2017; King et al., 2021). With this study, we answer the call for more research on "how managers' human capital affects post-merger reconfiguration and structural integration choices and their outcomes" (Bodner and Capron, 2018, p. 17). Second, it contributes to the resource reconfiguration literature by examining in greater depth how managers are reallocated based on the similarity of structural knowledge between acquired human capital and the firm's existing resource base (Karim and Capron, 2016). By tracking managers across firms and time, we contribute with empirical research to document the reconfiguration of human resources and knowledge (Folta et al., 2016). Lastly, we contribute to the strategic human capital literature by examining how managers' structural knowledge can drive executive mobility and be a source of valuable human capital (Coff, 2002).

2.2 Background and Hypotheses

2.2.1 Managerial retention post-M&A

M&As offer an important way for companies to grow and acquire resources and capabilities (Ahuja and Katila, 2001; Graebner, 2004; Karim and Mitchell, 2000; Kaul and Wu, 2016; Puranam et al., 2009; Ranft and Lord, 2002). However, most acquisitions fail to create value (King et al., 2004, Kim and Finkelstein 2009), and much of the success of M&As has been attributed to effective post-acquisition integration (Graebner et al., 2017). Among the many factors affecting post-acquisition integration, the role of target managers has been argued to be the most significant (e.g., Bilgili et al., 2016; Buchholtz et al., 2003; Ranft and Lord, 2002; Tang and Zhao, 2023). We focus on executive-level top managers, as target top managers have been viewed as critical for post-M&A integration and performance (Agarwal et al., 2012; Graebner, 2004; Krug

and Nigh, 1998; Ranft, 2006; Ranft and Lord, 2002; Schweiger and Weber, 1989; Zollo and Singh, 2004).

Past research has documented a high rate of turnover among target firms' executives after M&As (e.g., Conyon et al., 2002; Datta, 1991; Datta and Grant, 1990; Krishnan et al., 1997; Krishnan et al., 2007; Zollo and Singh, 2004). For example, up to 60% of the top management teams (TMT) in target firms were found to have been replaced post-acquisition (Hambrick and Cannella, 1993; Krug, 2009; Krug et al., 2014; Krug and Hegarty, 1997). Despite consistent documentation of this phenomenon, the literature on how managers are allocated after M&As remains fragmented and underdeveloped.

The literature has proposed two types of drivers to elucidate this phenomenon: manager-driven (voluntary) and acquirer-driven (involuntary) turnover. First, target executives may leave voluntarily due to increased dissatisfaction with the loss of their relative status and autonomy post-M&A, which may increase with higher levels of integration, relative firm size, and performance differences (e.g., Buchholtz et al., 2003; Bilgili et al., 2017; Hambrick and Cannella, 1993; Ranft and Lord, 2002). Second, the acquirers may let managers go due to redundancies in knowledge and positions or a lack of confidence in managers' ability to perform, especially if the target was not performing well prior to the acquisition (e.g., Buchholtz et al., 2003; Capron, 1999).

Irrespective of the drivers of executive departures, losing target managers has been consistently found to be associated with negative post-acquisition performance (Bilgili et al., 2017; Butler et al., 2012; Cannella and Hambrick, 1993; Krishnan et al., 1997). For example, Bergh (2001) found that acquired firms were more likely to be divested five years after acquisitions when the most experienced and longest-tenured executives left shortly after the M&A. In this study, we

focus on the managerial retention mechanism that presumes that both target top managers and acquiring firms choose to continue the employment post-acquisition.

The negative effect of executive turnover on post-acquisition performance is consistent with the idea that losing managers with scarce and valuable resources can erode firms' competitive advantage (Castanias and Helfat, 1991, 2001; Finkelstein et al., 2009; Penrose, 1959; Wernerfelt 1984). When target executives leave, industry- and firm-specific knowledge, nontransferable capabilities, and social capital may be lost (Bergh, 2001; Hitt and Ireland, 2002). Executives may possess skills and knowledge key to the realization of synergies post-acquisition (Schweiger and Very, 2003), and they may take with them established relationships with vendors and customers that the acquiring firms find difficult to replicate (Barney, 1991).

In unrelated acquisitions, in which the acquiring firm and the target's businesses are in different markets and technical areas, target managers' industry- and firm-specific knowledge and capabilities are valuable to the acquiring firm, which may lack expertise in the target's industry and technology. In such cases, retention of target managers for their technical knowledge and capabilities would be very important. In addition, the acquirer may choose to keep the target firm more autonomous (Datta and Grant, 1990), making it even more critical to retain the target's managers.

For related acquisitions, in which the acquiring firm and the target's businesses are in similar industries, retaining target managers for their technical expertise and capabilities is less important (Capron, 1999; Makri et al., 2010). Due to knowledge redundancy, the acquiring firm may let target managers go (Buchholtz et al., 2003; Krishnan et al., 1997). The acquiring firm's management may be well equipped to make major decisions concerning the acquired firm in related industries and less dependent on the target's management team (Datta, 1991; Datta and

Grant, 1990). Accordingly, the literature notes that many related acquisitions are made to achieve efficiencies, cost savings, or industry consolidation by eliminating redundant staff and executives (Anand, 2004; Conyon et al., 2002; Krishnan et al., 1997; O'Shaughnessy and Flanagan, 1998; Park et al., 2018). However, this argument relies on the assumption that managers' knowledge and human capital are only based on industry and technical expertise and overlooks the significance of managerial knowledge related to post-acquisition structural integration and performance.

In related acquisitions, post-acquisition integration may be more important than in unrelated acquisitions (Datta, 1991; Datta and Grant, 1990; Larsson and Finkelstein, 1999; Zollo and Singh, 2004). As such, the literature has shown that executives play a central role in managing and implementing the integration strategy and facilitating coordination (Agarwal et al., 2012; Graebner, 2004; Krug and Nigh, 1998; Ranft, 2006; Ranft and Lord, 2002; Schweiger and Weber, 1989; Zollo and Singh, 2004). Target executives may hold valuable firm-specific knowledge and social capital for facilitating successful reorganization and integration processes (Krug et al., 2014). Hence, losing the acquired firm's executives can create challenges to effectively integrating the target firm and improving firm performance (Cascio, 2002; Krishnan et al., 1997; Krishnan et al., 2007; Krishnan and Park, 2002). Thus, higher needs for structural integration needs bring into question whether industry and market knowledge redundancy alone shapes the acquiring firm's propensity to retain or let go of the target firm's managers.

According to a recent 2021 McKinsey analysis of over 200 large deals in the past ten years and a corresponding survey of executives involved in these deals, post-acquisition integration is a multi-year deliberate effort that can determine the success of the deal. The researchers note, "Our survey showed that executives find integrating acquired companies to be the hardest stage in a deal" and "Even with all the right planning before a deal's close, a merger's success is not assured

without a well-executed integration. The first 12 to 18 months serve as a test of the acquirer's ability to execute on the deal's promise." In these critical first two years post-acquisition, the acquirer cannot risk losing key managers who can help with the integration process because: "A multiyear transformation requires significant management attention throughout its duration to deliver the anticipated benefits" and "Business-unit and department heads must commit to their synergy targets. While the integration management office plays a vital role preclose, making the integration plans stick requires ownership from the accountable executive."

Moreover, according to resource allocation theory, managers are valuable non-scale free resources that cannot be allocated contemporaneously across businesses without incurring opportunity costs (Levinthal and Wu, 2010). Specifically, the acquirer would have to redeploy its own manager to the target or hire a new manager if the target manager leaves. Given these tradeoffs, a deeper understanding is needed of how managers are allocated within and across organizational boundaries post-M&A.

In sum, the extant literature offers a fragmented and incomplete explanation of how target managers are allocated post-M&A, under what conditions, and with what outcomes. In this study, we examine the allocation of target managers in related acquisitions, in which technical knowledge may be redundant, but structural integration needs are higher and may dictate the success of a deal.

2.2.2 The role of structural knowledge in managerial retention

Target firms' managerial knowledge is important in acquisitions (Biligli et al., 2017; Capron et al., 1998; Hambrick and Cannella, 1993; Ranft and Lord, 2002). The extant research has focused on technical expertise and capabilities as the primary motivation for acquiring human capital and knowledge in acquisitions (Ahuja and Katila, 2001; Coff, 2002; Finkelstein and Haleblian, 2002; Younge et al., 2015). This type of knowledge reflects *what* to do and includes

industry, product, and technological knowledge. However, research also suggests that a target firm's valuable managerial knowledge and skills are distinct from the technical knowledge that typically resides elsewhere in the organization—for instance, with technical staff, engineers, mid- and low-level managers (Ranft and Lord, 2002). This type of knowledge encompasses *how* to do things and can comprise critical organizational competencies embedded in socially complex relationships among different units, or it can reside in a firm's social fabric and organizational structure, which connect and integrate separate organization members (Barney, 1991; Huber, 1991; Joseph et al., 2023; Karim and Williams, 2012; Kogut and Zander, 1992; Ranft and Lord, 2002). As such, top management may offer a different set of skills and competencies to create value for the acquirer.

We focus on a specific managerial competency by drawing from the literature that highlights *structural knowledge* as an important component of managerial knowledge that facilitates internal coordination. *Structural knowledge* is the structural component of executives' knowledge (Joseph and Gaba, 2020; Karim, 2012; Karim and Williams, 2012), or *how* they accomplish goals, including the organizational knowledge that encompasses politics and relationships. Structural knowledge is primarily tacit 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 structural knowledge from functioning within specific organizational structures (Karim, 2012; Karim and Williams, 2012). 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 cohesively (Mintzberg, 1979). These

coordination mechanisms "deal with workflows between distinct yet interdependent units" (Nadler and Tushman, 1997, p. 92). As organizations use coordination mechanisms and processes repeatedly, they become routinized and sticky, forming the organization's memory (Fiedler and Welpe, 2010; Gulati and Puranam, 2009; Nelson and Winter, 1982) and teaching managers the accepted "ways of doing things" in the organization (Burton et al., 2006). Organizational structure can influence managerial decision-making processes (Joseph et al., 2016), focus and segment managerial attention (Ocasio, 1997), and can shape the managers' cognitive strategies for identifying problems and formulating solutions (Gavetti, 2005).

Managers operating in different organizational structures can develop structural knowledge that varies significantly (Joseph and Gaba, 2020). For example, managers' performance focus and corresponding activities can vary between centralized and decentralized structures. In decentralized firms (M-form), where 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 more transferable skills that help them monitor and improve the performance of their divisions at a more competitive level (Gaba and Joseph, 2013; Qian et al., 2006; Williamson, 1964, 1975). As a result, their careers, identities, and cognitive models are tied more closely to the performance of their units. Hence, managers in decentralized structures are guided by processes, incentives, and cognitive frames directed toward achieving unit performance goals.

In centralized (U-form) firms, the contribution of each functional department to corporate performance is less directly observable and measurable (Williamson, 1964, 1975). Performance assessments are made using an organization's overall performance rather than an individual unit's performance (Joseph et al., 2016). In centralized organizations, the locus of authority and decision-

making is concentrated at the top (Galbraith, 1977). Because centralized structures emphasize vertical information flow, managers may engage in screening the information to "sugarcoat" negative news or curate the information favorably in order to manage their careers (Fang et al., 2014). Hence, managers in centralized structures are guided by processes, incentives, and cognitive frames directed toward managing relationships, coordination, and information. Accordingly, 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).

Structural knowledge is particularly important for top managers whose primary responsibility is to manage their functional areas and business units (Gaba and Joseph, 2013). For instance, in a U-form organization, when a new product is launched, the leaders of various functional areas—such as marketing, finance, and operations—must collaborate to align their activities. Functional area leaders are responsible for steering and overseeing this collaboration. In an M-form organization, division leaders are responsible for financial outcomes from the new product launch, which focuses their attention and effort towards reaching performance targets.

Due to its relative specificity to particular organizational structures and limited transferability to other organizational structures, structural knowledge is related to the concept of firm-specific knowledge (e.g., Wang et al., 2009). Managers make specialized human capital investments in a particular organizational structure that cannot be easily redeployed to other structures. However, unlike firm-specific knowledge, which is typically more valuable in a specific firm, the transferability and value of structural knowledge is broader and thus can be transferred more easily across firms to its corresponding organizational structures.

Given that structural knowledge is specific to certain structural compositions and distinct from technical knowledge, it is an important capability that determines managers' ability to function well in a particular organizational structure. We propose that, similarly, structural knowledge is an important managerial competency in related acquisitions that will shape managers' retention by acquiring firms.

2.2.3 Hypotheses

In related acquisitions, technical knowledge similarity between two businesses enables acquirers to improve acquisition performance through high integration (Finkelstein and Haleblian, 2002; Larsson and Finkelstein, 1999; Pablo, 1994; Puranam et al., 2006; Zollo and Singh, 2004). With greater knowledge about the target firm's industry, acquirers are more likely to impose their own practices and standards on the acquired unit, and to redeploy more resources between firms, which in turn requires more extensive interaction among the managers of the two firms (Coff, 2002; Datta, 1991; Datta and Grant, 1990). As such, post-acquisition integration is defined as "the multifaceted, dynamic process through which the acquirer and acquired firm or their components are combined to form a new organization" (Graebner et al., 2017, p. 2).

Post-acquisition integration involves *structural integration*—a combination of acquired organizational units into the same set of organizational boundaries (Barkema and Schijven, 2008; Bodner and Capron, 2018; Haspeslagh and Jemison, 1991; Puranam et al., 2009). Structural integration involves efforts to coordinate interaction, systems, processes, communication, alignment, and standardization activities between two firms (Graebner et al., 2017; Larsson and Finkelstein, 1999). Target managers play an important role in structural integration, as they facilitate coordination and communication between the firms (Agarwal et al., 2012; Graebner, 2004; Krug and Nigh, 1998; Ranft and Lord, 2002; Zollo and Singh, 2004). Moreover, post-

acquisition integration may be a multistage process (Haspeslagh and Jemison, 1991) that involves target managers to differing degrees over time (Birkinshaw et al., 2000). As such, target managers may be important not only for the initial integration processes but for the long-term functioning of the target firm.

Specifically, prior literature suggests that structural knowledge aids integration and coordination by preserving ties and coordination mechanisms (Karim, 2012; Karim and Williams, 2012; Puranam et al., 2009). For example, a survey study by Datta (1991) found that similarities in managerial styles between acquirer and target firms were associated with higher acquisition performance, which suggests the importance of certain types of managers in post-acquisition integration. We propose that when firms have a similar structural composition, target managers can leverage their relevant structural knowledge and achieve better integration and coordination in related acquisitions. Thus, in related acquisitions, target managers can create value through their structural knowledge. In related acquisitions, the technical knowledge base between firms is similar, making the technical knowledge of target managers less central than in unrelated acquisitions (Capron et al., 1998; Buchholtz et al., 2003; Krishnan et al., 1997; Makri et al., 2010). With greater integration, target managers may play an important role in creating buy-in and facilitating the coordination activities between two firms. As the 2021 McKinsey study notes that in the integration process, "You can build a new structure, but if you don't run water through those pipes in terms of how the work is actually done, it can cause destabilization after the deal closes."

Previous literature also noted that post-acquisition structural integration can be largely driven by the acquirer firm's preference for their own ways of doing business. For example, Barkema and Schjiven note that "…in an attempt to establish adequate organizational fit, an acquirer will satisfice by mainly considering organizational changes within the acquired firm itself,

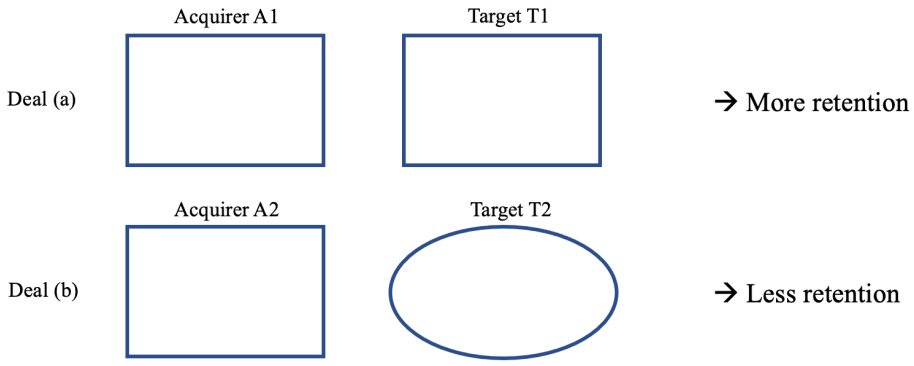
regarding its own existing organizational structure as exogenous to the issue" (2008, p. 699). Likewise, Haspeslagh and Jemison found that acquirers often pursue integration with a "make them like us" attitude (1991, p. 151). Also, Graebner et al., (2017) note that acquirers tend to impose their own processes and knowledge onto the target firms regardless of applicability. Such imposition of the acquirer's structure and processes on a target firm can generate more frictions in the integration process, as differences between the acquirer and the target's structure may reduce the integrative "absorptive capacity" (Cohen and Levinthal, 1990). Consistent with this notion, Empson's longitudinal research on post-acquisition integration in six professional services companies found that "individuals will resist knowledge transfer when they perceive fundamental differences in the form of the knowledge base and the organizational image of the combining firms" (2001, p. 857). As such, structural differences can impede not only the integration of organizational processes but also the transfer of technical knowledge as well. The similarity in structure between the acquirer and target can help ease these frictions in the post-acquisition integration.

Additionally, managers are a valuable, scarce, and non-scale-free resource that entails capacity constraints and opportunity costs, which means that managers cannot be deployed simultaneously across units (Levinthal and Wu, 2010). With target managers departing, the acquiring firm would need to deploy its own managers to the target at non-trivial costs. Thus, structural similarity may increase the propensity of acquirers to retain target managers.

In sum, we expect that in related acquisitions, acquirers are more likely to retain target managers if there is a structural similarity between the two firms as it facilitates structural integration between the two firms. We illustrate this logic in Figure 2.1. Stated formally, our first hypothesis is:

Hypothesis (H1): *In related acquisitions, target managers are more likely to be retained by the acquirer when the two firms have similar structures.*

Figure 2.1: Illustration of Hypothesis 1

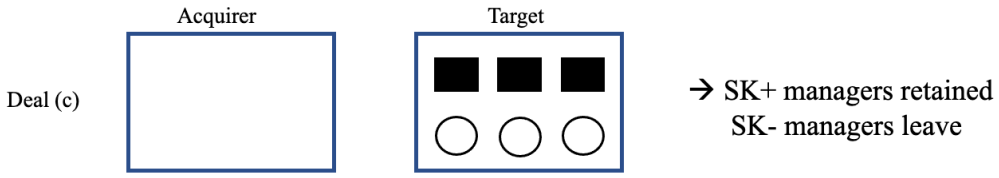


Notes: In deal (a), acquirer A1 and target T1 have similar structures, as indicated by their similar shapes. In deal (b), acquirer A2 and target T2 have dissimilar structures, as indicated by different shapes. Both deals are related deals. H1 predicts that there will be a greater rate of target manager retention post-acquisition in deal (a).

Examining the mechanism more closely, we note that not all target managers may have the relevant structural knowledge required, some may have more experience in a particular structure than others. Thus, within a given related deal, target managers can have different types of structural knowledge. If structural knowledge is important, target managers with the most relevant structural knowledge should be retained over target managers with less relevant structural knowledge. Moreover, structural knowledge similarity may also increase target managers' willingness to stay, as their skills are valued, and they may play an important role in the acquisition and integration processes (Karim, 2012; Kogut and Zander, 1992; Ranft and Lord, 2002). Thus, relevant structural knowledge may moderate the voluntary turnover of target managers. We illustrate this mechanism in Figure 2.2. Our second hypothesis is:

Hypothesis (H2): *In related acquisitions, target managers with more structural knowledge similarity with the acquiring firm are more likely to be retained by the acquiring firm than target managers with less structural knowledge similarity.*

Figure 2.2: Illustration of Hypothesis 2



Notes: In a related deal between firms with similar structures, as in deal(c), target managers can have different types of structural knowledge (SK). In the target firm, there can be individual managers with a similar SK as the acquirer (SK+), denoted by smaller rectangles. The managers in the target firm with dissimilar SK as the acquirer (SK-) are denoted by circles. H2 predicts that target managers with more similar structural knowledge to the acquirer are more likely to be retained compared to managers with less similar knowledge.

Figure 2.3 demonstrates the scope of this study and summarizes our predictions. While prior work has established large top management turnover post-M&A in related deals, this study proposes that this turnover is driven by deals that involve firms and managers coming from dissimilar structures.

Figure 2.3: Focus of this study

	Acquisition Type	
	Related Deals	**Unrelated Deals**
Similar Structure	**Retain (H1 and H2)**	
Dissimilar Structure	Replace	
	Replace (prior work)	

Notes: Our focus in this study is on related deals. Prior literature predicts lower levels of retention of target managers. We examine the extent to which structural similarity between the acquirer and target may be driving these patterns. Our hypotheses predict that target manager retention will be higher when there is a structural similarity between firms.

2.3 Data and Methodology

2.3.1 Data and variables

Sample

We begin building our estimation sample by identifying all M&A deals completed between 1987 and 2017 from the S&P Capital IQ transaction data. We start with all completed transactions between multi-unit firms to allow variation in their organizational structure (about 115,000 deals). We construct our sample by following standard practice in M&A studies (e.g., Netter et al., 2011). We include deals indicated by Capital IQ as a merger or an acquisition of a majority of interest. We also exclude deals classified as a repurchase, recapitalization, restructuring, or joint venture. The M&A transaction data provide deal-level information, such as deal characteristics and (ultimate) acquirer and target firm information.

To capture the managerial mobility of target firm managers post-acquisition, we use the Capital IQ Professional database to identify and track managers' career history for all target firms. The database provides profiles of public and private company executives operating in all major markets and across the globe. It maintains a single record for any one person, such that all the former job positions, board relationships, and employment dates on record as associated with that person are retained under one unique ID. We collect manager-level data for all the target firms using the Capital IQ's assigned company ID, which bridges the Capital IQ transaction data. We identify managers in the top management team using their job position and rank the year of the deal announcement. Then, we use their employment record to track mobility post-acquisition. Upon matching the managers for each deal and tracking each manager's mobility post-acquisition, we get a sample of about 2,172 deals and 4,001 managers.

For each acquirer and target firm in our sample, we collected data on their organizational structure using the Directory of Corporate Affiliations (DCA) offered by LexisNexis. The DCA

data provide company profiles and hierarchies for over 228,000 global (U.S. and international) parent companies and their units (e.g., affiliates, subsidiaries, and divisions) down to the seventh level of corporate linkage. The database reports detailed company structure on an annual basis from 2001 to 2017 for firms that have more than 300 employees, exceed $10 million in revenue, and indicate four-digit SICs for each unit. Capital IQ transaction and the DCA data provide the historical list of parent, ultimate parent, and subsidiary firms of the buyer and seller, which allows us to construct organizational structure measures for a given time in the sample period. The DCA data has been used to study the role of organizational structures on interdependencies and coordination in multi-unit firms, diversification choices, and top management mobility (e.g., Tang and Zhao, 2023; Zhou, 2011, 2013). We follow these prior studies to construct the organizational structure measures for the acquirer and target firms in our sample. Our sample includes deals involving firms for which organizational structure information is available. As a result, our estimation sample data cover 616 deals involving 562 acquirer firms, 611 target firms, and 1,339 target managers.

Dependent Variables

Firm-level retention rate. Our first dependent variable is the TMT retention rate in the target firm. Following prior work, we measure the retention rate post-acquisition as the ratio of the retained target TMT two years after the transaction completion to the pre-transaction TMT (e.g., Krug and Aguilera, 2004). For example, if a target firm has five people on its TMT in the year prior to the transaction, but only three of the five people remain in the target TMT two years after the transaction, the target firm would have a retention rate of 0.60. The mean TMT retention rate in our sample is 51%, which is comparable to the mean retention rates found in the two empirical studies on post-acquisition turnover: 55% in Hambrick and Cannella (1993), who examined 109

acquisitions from 1980 to 1984, and 59.4% in Krug and Hegarty (1997), who examined 207 acquisitions of U.S. firms by both domestic and foreign acquirers from 1986 to 1988.

Manager-level retention indicator. Our second dependent variable is an indicator variable of whether a target manager was retained by the acquiring firm two years after deal completion. The indicator equals 1 if a manager identified in the target firm prior to the acquisition is observed in the acquiring firm two years after the acquisition completion date and equals 0 otherwise. Target managers who are retained by the acquiring firm may stay in the acquired unit or be observed in another unit of the acquiring firm. Target managers who are not retained by the acquirer are observed in the seller firm or in a completely different firm. Forty-eight percent of target managers were retained in our sample. The summary figure for all types of post-acquisition managerial mobility is in Appendix Figure B1.

Independent Variables

Related deal. We measured technical knowledge relatedness between the target and the acquiring firms following the previous literature, which categorized related and unrelated acquisitions based on the primary two-digit SIC category (Harrison et al., 1991; Krishnan et al., 1997; Robins and Wiersema, 2003). *Related Deal* is an indicator variable that equals one if the target and the ultimate acquirer are in the same two-digit SIC and equals zero otherwise. Of the deals in our sample, 48.5% are related deals. In robustness checks, we use the four-digit SIC category as an alternative measure of relatedness (e.g., Chakrabarti and Mitchell, 2016) and Robins and Wiersema (1995) technological relatedness index, which is a measure of technological similarity between paired industries.

Firm-level SK similarity (SK+/SK-). We measure structural knowledge (SK) similarity at the firm level and construct a binary variable of whether the target and the buyer come from ultimate parent firms with similar organizational structures.

We distinguish between two fundamental organizational structures, which require different types of managerial structural knowledge and capability, by using a standard categorization of organization structure widely applied in the organizational design literature: centralized and decentralized (Chandler, 1986; Joseph and Gaba, 2020; Mintzberg, 1980; Williamson, 1975, 1985). This literature suggests that managers develop and use different knowledge and skills in centralized and decentralized firms. Specifically, centralized firms feature a highly hierarchical administrative structure in which the contribution of each functional department or executive to corporate performance is neither directly observable nor measurable (Williamson, 1964, 1975). The key skillsets and capabilities for managers in centralized firms that determine their success are bargaining, investing in political capital, networks, and social relationships (Williamson, 1970).

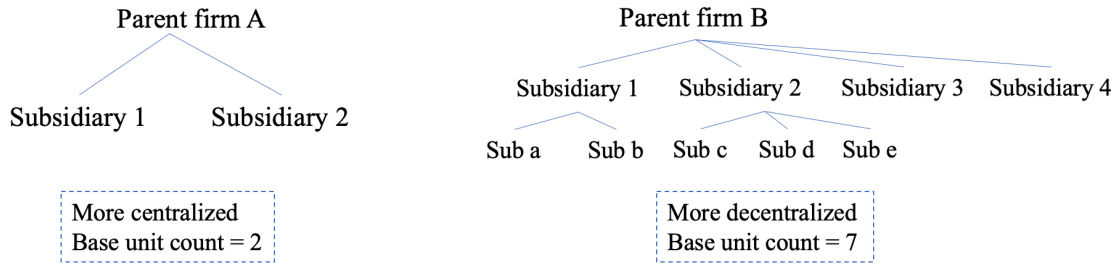
In a decentralized structure, on the other hand, the responsibility for operating decisions is assigned to functionally self-contained operating divisions that perform as autonomous profit centers and compete with each other for resources based on profit performance (Armour and Teece, 1978; Gaba and Joseph, 2013; Qian et al., 2006; Williamson, 1964, 1975). The contributions of each division to corporate profits are both directly observable and attributable to their executives, making the executives more visible based on information about their performance and its implications for managerial quality, rather than on their political competency (Williamson, 1970, 1975). Thus, managers in decentralized firms are more inclined to invest in transferable skills that help them obtain superior operating performance for their divisions, while managers in centralized

firms are more likely to invest in bargaining skills to help them navigate bureaucracy and hierarchy (Hill et al., 1992; Hoskisson et al., 1993; Williamson, 1985).

In constructing the measure of organizational centralization, we follow prior studies that systematically quantify organizational structure for firms across industries. We measure the degree of centralization as the number of divisions and majority-owned subsidiaries that have no subordinate divisions or subsidiaries (i.e., the number of base subsidiaries of the ultimate parent firm) (Zhou 2013). These base divisions and subsidiaries represent the lowest level of profit-center responsibility and therefore can be compared across firms (Argyres, 1996; Rajan and Wulf, 2006). The larger the number of divisions, the more divisionalized or decentralized the firm is. Our centralization measure equals one if a firm has less than or the same median number of base unit counts (6 for acquirers and 11 for sellers) and equals 0 otherwise. We also use continuous measures of centralization based on the base unit counts, which we use as alternative measures in the robustness checks (see Appendix Table B5).

Firm-level SK similarity is a binary variable that equals one if the target and the acquirer are both centralized or both decentralized and equals zero otherwise. SK+ refers to a match, and SK- refers to a non-match. Figure 2.4 shows an example of different types of organizational structures and their corresponding measures.

Figure 2.4: Examples of organizational structures



Notes: Firm A has two base units (i.e., Sub 1 and 2) and Firm B has seven base units (i.e., Sub a, b, c, d, e, 3, and 4). The structure in firm A has fewer base units than the structure in firm B. According to our definition, Firm A is more centralized than firm B.

Manager-level SK similarity (SK+/SK-). We construct a measure of a manager-specific SK similarity to exploit the variation of manager SK similarity within a deal. In a given deal, target managers may carry different levels of structural knowledge similarity, depending on their tenure and prior experience. For each target manager, we create an index of SK based on the percentage of years the target manager has worked in a centralized company in their previous seven years of work. If the manager spent more than 50% of this time working in a centralized firm, then the target manager is classified as having centralized SK and is classified as decentralized SK otherwise. For example, a manager who spent five years working at a centralized firm and two years working at a decentralized firm prior to the acquisition would have a centralization SK index of 71.4%, and the manager would be classified as having centralized SK. The manager-level SK similarity indicator is a binary variable that equals one if the *target manager* and the ultimate buyer have similar structural knowledge—i.e., both centralized or decentralized—and zero otherwise. The correlation between the manager-level centralization measure and the firm-level centralization measure of the target is 0.55, which suggests that there is non-trivial variation in the levels of managerial SK in a firm. That is, not all managers in a target firm have the same SK or SK matching the target firm. To mitigate the concern that target managers' SK measure may be capturing, in part, managers' tenure at the focal firm, we control for managerial tenure in all specifications. In addition to the binary measure, we use a continuous measure of manager-level centralized SK in the robustness checks (see Appendix Table B5).

Control Variables

We follow prior studies to include controls that could affect the propensity of the acquirer to retain target managers (Haspeslagh and Jemison, 1991; King et al., 2020; Krug et al., 2014;

Netter et al., 2011). Accordingly, our estimations include controls at the deal, firm, manager, and industry levels.

Deal-level controls. We control for whether the deal is a *Cash Offer,* whether it is *Cross-border*, and whether the target unit was a *Divestiture of Related Business* (target unit and their parent seller are in the same industry), and we capture *Deal Value* as the natural logarithms of the amount paid.

Firm-level controls. These include the *Public Status* of both the target and the ultimate acquirer (since public and private firms may face different governance restrictions on TMT changes), *Target Firm Age* as the natural logarithms of the difference between the completion year and the firm's founding, and ultimate acquirer's *Acquisition Experience* as the natural logarithms of the number of acquisitions completed since 2001 to address concerns that prior acquisition experience also affects the decision to retain (Zollo and Singh, 2004). Target and acquirer country indicators were included to account for geographic factors, since national-level cultural aspects might affect the integration intent and outcomes of acquisition (Barkema et al., 1996; Tang and Zhao, 2023). Therefore, we include *U.S. target* and *U.S. acquirer* as binary variables for country-level controls. *Target Board Size* is defined as the natural logarithms of the number of target managers on board at the time of acquisition completion. We use a full set of two-digit SIC indicators of the target to account for industry-specific factors that might influence the propensity of firms to retain managers. We construct completion year fixed effects to account for heterogeneity over time.

Manager-level controls. The manager-level regressions include individual-level controls that may affect the likelihood of target manager retention. *Board Flag* is an indicator of whether the manager was ever on the board of the target firm, *Manager Tenure* is the natural logarithm of

the number of years the manager has worked in the target firm, and *CEO Indicator* is based on whether the target manager is the unit head (CEO, President, etc.). Alternatively, we also used a full position rank variable from the data. The position types are ranked (e.g., President = 1) and then ordered hierarchically. The provided ranking is comparable across all firms in the data: the lower the rank number, the higher the position is.

The detailed definitions of all the main variables are in the Appendix Table B1.

Summary Statistics

We focus on two main post-acquisition employment patterns of target executives. Managers still employed by the acquirer two years following deal completion were coded as retained, and managers no longer employed by the acquirer two years following deal completion were coded as not retained. In our sample, 48% of target managers are retained, and 52% are not. Detailed employment patterns and summary mobility statistics are in Appendix Figure B1.

Table 2.1 summarizes the patterns in the raw data: the percentage of target managers retained by the acquirers two years after deal completion by deal relatedness and SK similarity. *Related* and *Unrelated* indicate firm-level deal relatedness, SK+ and SK- represent manager-level structural knowledge similarity and dissimilarity, respectively. The overall average rate of retention is 44.6% when a deal is related, compared to 50.7% when a deal is unrelated, consistent with the prior literature's finding that target managers are less likely to be retained in related acquisitions than in unrelated acquisitions (e.g., Datta, 1991; Datta and Grant, 1990; Krishnan et al., 1997; Zollo and Singh, 2004). The overall average retention rates of SK+ (47.9%) and SK- (46.9%) do not differ significantly, however, when a deal is related, SK+ results in 47.0% manager retention compared to 41.7% in SK-. This implies that SK+ on its own does not have much effect on manager retention, but in related acquisitions where there may be a higher need for integration

and coordination, SK+ seems to play a more significant role in determining target manager retention, consistent with our hypotheses. Table 2.2 presents the summary statistics and correlations of all key variables.

2.3.2 Methodology

To examine the relationship between the firm-level retention rate of target managers and SK similarity in related acquisitions (Hypothesis 1), we employ the following empirical specification for an OLS regression.

$$Retention\ Rate_{jt} = \alpha_0 + \alpha_1 Related\ Deal_{jt} + \alpha_2 SK^{+}_{jt} + \alpha_3 Related\ Deal_{jt} \times SK^{+}_{jt} + \gamma_j\ + \chi_{mt} + \rho_{lt} + \varphi_k + \tau_t + \varepsilon_{jt} \quad (2.1)$$

where i denotes a manager, and j denotes the deal that manager i is involved in, representing unique pairs of acquirer firm l and target firm m. t denotes year, k denotes target industry, γ_j is a vector of deal-level controls, χ is a vector of target m firm-level controls, ρ is a vector of acquirer l firm-level controls, φ_k and τ_t are complete sets of industry and year dummies, respectively, and ε_{jt} is an independent and identically distributed (i.i.d.) error term. $Retention\ Rate$ is the deal-level retention rate that is the share of target managers retained by the acquirer two years after deal completion. We cluster the standard errors by deal. We expect α_3>0 if SK similarity has a positive relationship with managerial retention in related acquisitions.

To test Hypothesis 2, we use the following empirical specification to estimate a logistical regression at the manager-level:

$$\Pr\left(Retention_{ijt}\right) = F(\beta_0 + \beta_1 Related\ Deal_{jt} + \beta_2 SK^{+}_{ilt} + \beta_3 Related\ Deal_{jt} \times SK^{+}_{ilt} + \gamma_j\ + \chi_{mt} + \rho_{lt} + \delta_i + \varphi_k + \tau_t + \varepsilon_{ijt}) \quad (2.2)$$

where i denotes a manager, which is the unit of observation, and j denotes the deal that manager i is involved in, representing unique pairs of acquirer firm l and target firm m. t denotes year, k denotes target industry, γ_j is a vector of deal-level controls, χ is a vector of target m firm-level controls, ρ is a vector of acquirer l firm-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, and ε_{ijt} is an independent and identically distributed (i.i.d.) error term. $Retention$ is the manager-level retention indicator, which equals one if the target manager stays with the acquirer two years post-acquisition and equals zero otherwise. The standard errors are clustered by deal. We expect β_3>0 if SK+ has a positive relationship with the probability that a target manager with SK similarity is retained in related acquisitions.

Table 2.1: Percentage of target managers retained by the acquirer post-M&A

		Deal Relatedness		
		Related Deals	Unrelated Deals	
Structural similarity	SK+ SK similar	**47.0%**	**48.9%**	*47.9%*
	SK- SK dissimilar	**41.7%**	**53.1%**	*46.9%*
		44.6%	*50.7%*	

Notes: This table shows the percentage of managers retained two years after M&A completion in each category of Deal Relatedness and Structural Knowledge similarity. Related deals are deals between firms in the same industry. SK+/- denotes structural knowledge similarity between the target and acquiring firm.

Table 2.2: Correlations

	Variables	Mean	Std. Dev.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1)	Firm-level retention rate	0.510	0.442	1																		
(2)	Manager-level retention indicator	0.475	0.500	**0.888**	1																	
(3)	Indicator for deal relatedness	0.530	0.499	**-0.088**	**-0.061**	1																
(4)	Indicator for firm-level SK similarity	0.561	0.497	-0.009	0.011	0.022	1															
(5)	Indicator for manager-level SK similarity	0.565	0.496	-0.003	0.010	-0.028	**0.859**	1														
(6)	Cash offer deal	0.628	0.483	0.038	0.026	**-0.241**	**-0.112**	**-0.064**	1													
(7)	Size of the deal	2.689	4.905	-0.056	**-0.085**	**0.156**	0.023	-0.013	**0.289**	1												
(8)	Cross-border deal	0.214	0.410	0.019	0.041	**-0.086**	**0.080**	**0.068**	**0.167**	**0.072**	1											
(9)	Divestiture of related business indicator	0.472	0.499	-0.043	-0.034	**0.266**	-0.045	-0.047	**-0.074**	0.027	**-0.113**	1										
(10)	Public acquirer	0.337	0.473	-0.030	-0.001	**0.155**	0.052	0.016	0.002	**0.259**	**0.145**	0.000	1									
(11)	Public target	0.028	0.166	0.079	0.036	**-0.128**	0.016	0.015	**0.057**	**0.108**	**0.185**	**-0.090**	**-0.112**	1								
(12)	Target firm age	3.215	1.076	**-0.153**	**-0.132**	**0.133**	**0.059**	0.035	-0.051	**0.097**	0.037	**0.139**	**0.076**	-0.025	1							
(13)	Acquirer M&A experience	0.290	1.916	0.007	0.006	**-0.069**	-0.005	-0.020	0.008	0.018	**0.056**	0.001	**0.161**	**0.131**	0.040	1						
(14)	U.S. acquirer	0.693	0.461	-0.013	-0.016	0.003	**-0.065**	-0.028	-0.043	**-0.166**	**-0.475**	0.029	**-0.235**	**-0.062**	**-0.077**	0.001	1					
(15)	U.S. target	0.704	0.457	-0.003	-0.013	0.039	**-0.077**	-0.023	-0.038	**-0.178**	**-0.441**	**0.111**	**-0.155**	**-0.146**	-0.021	0.005	**0.697**	1				
(16)	Target firm board size	0.804	1.865	**-0.201**	**-0.137**	**0.171**	-0.024	**-0.080**	**-0.117**	**0.098**	**-0.055**	**0.147**	**0.079**	**0.091**	**0.139**	**0.071**	**0.091**	0.026	1			
(17)	Target manager on board indicator	0.334	0.472	**-0.091**	-0.023	0.032	0.050	0.030	-0.019	-0.026	-0.002	0.045	-0.015	0.013	-0.022	0.029	0.008	-0.038	**0.310**	1		
(18)	Target manager tenure	1.514	0.825	-0.046	**-0.093**	-0.003	0.022	-0.001	**0.095**	**0.077**	0.030	-0.053	0.009	0.014	0.048	**-0.068**	0.026	0.051	**0.139**	**0.069**	1	
(19)	Target CEO indicator	0.144	0.351	-0.043	-0.003	-0.010	0.025	0.020	0.021	-0.008	**0.061**	-0.022	0.023	-0.006	0.006	-0.049	**-0.110**	**-0.125**	**-0.057**	**0.210**	-0.051	1

Notes: This table presents summary statistics and correlations for the main variables used in the estimation. N=1,339; the DVs on firm-level retention rate have N=616. . Bolded figures are significant at 5% level.

2.4 Results

2.4.1 Main results

Table 2.3 reports the results of the estimations testing the relationship between SK similarity and target managers' retention (Hypotheses 1 and 2). We start building the main model by including the SK and *Related Deal* indicators along with year and industry fixed effects to estimate the relationship with the firm-level retention rate (Column 1, Table 2.3). The estimated coefficient on deal relatedness is negative and statistically significant (p=0.006), consistent with extant literature showing that with deal relatedness, there is greater turnover of target managers (e.g., Datta and Grant, 1990; Krishnan et al., 1997). The estimated coefficient on SK is small and not statistically significant, which suggests that SK similarity alone has no effect on manager retention. In Column 2, we include an interaction term between *SK* and *Related Deal*. The estimated coefficient on the interaction term is positive and statistically significant (p=0.008), which suggests that SK similarity can increase the retention rate in related acquisitions. In Column 3, we report the results from the full model, which includes all the relevant controls. The estimated coefficient on the interaction term is positive and statistically significant (p=0.006), which suggests that in related acquisitions, SK similarity between firms can result in a 10.8% greater share of target managers being retained post-acquisition (the estimated retention rate with covariates at means for *Related Deal* and *SK+* is 51.4%, compared to 40.6% for *Related Deal* and *SK-*). The magnitude of these effects is in line with previous research on top management retention rates post-M&As (e.g., Krug et al., 2014; Tang and Zhao, 2023).

Next, we present the results from the estimation of the relationship between the probability of an individual manager being retained and their individual SK similarity with the acquirer firm (Hypothesis 2). We note that manager-level results are very similar to firm-level results: managers

are less likely to be retained in related acquisitions (column 4), but managers with SK similar to the acquirer are more likely to be retained (the estimated coefficient on the interaction terms are positive and statistically significant in columns 5 and 6). The results suggest that in related acquisitions, SK similarity of managers is associated with a 9.1-percentage point increase in the probability of them being retained by the acquirer (the predicted probability at [*Related Deal=1*, SK+] is 49.8%, and the predicted probability at [*Related Deal=1*, SK-] is 40.7%).

2.4.2 Additional analyses of the mechanisms

Geographic Distance

To probe the proposed mechanism of the importance of structural knowledge for managerial allocation in related acquisitions, we examine the heterogeneity of effects by geographic distance. Our theory assumes that related acquisitions generally require greater integration and coordination (Larsson and Finkelstein, 1999; Puranam et al., 2009; Zollo and Singh, 2004), and that there are opportunity costs for acquirers to replace the target's managers with their own (Capron and Mitchell, 1998; Levinthal and Wu, 2010). We examine whether the main effect of SK similarity is larger with greater geographic distance. The key logic in this thought experiment is that greater geographic distance between the acquirer and target makes it more difficult for the acquirer to send their own managers and thus more likely for the acquirer to retain the target managers with SK similarity. In line with this reasoning, previous research indicates that acquiring firms strongly prefer geographically close targets (Chakrabarti and Mitchell, 2013, 2016 ; Ragozzino and Reuer, 2011; Testoni et al., 2022) because geographic proximity allows higher information flow between firms and reduces relocation and transportation costs. Also, research shows that if individuals are required to relocate due to an involuntary transfer to another division, they are more likely to leave a firm due to the high personal costs of moving away from the

communities with which they are familiar (Lee et al., 2017; Smith et al., 2011). Accordingly, acquiring firms often pursue "light touch" integration after cross-border acquisitions by preserving the entire top management team of the target firms (Tang and Zhao, 2023). Therefore, when the distance between the acquiring and target firms is great, the acquiring firm faces a higher opportunity cost of deploying its existing managers to the target unit. Building on these works, we posit that the effect of SK+ on manager retention in related acquisitions varies by geographical distance between the two firms. We should see a larger positive effect of SK+ on manager retention in related acquisitions with greater distance between the acquiring and target firms.

Table 2.4 presents the results by distance. Columns 1 and 2 split the sample by the cross-border nature of the deal and compare the differences between the coefficients on the interaction term. The acquiring and target firms are assumed to be more distant from each other if they are in different countries. Deals are *Cross-border* if the headquarters of the acquiring firm and the location of the target unit differ by country (Column 1), deals between firms located in the same country are classified as *Non Cross-border*. The estimated coefficient on the interaction term is larger in the cross-border sub-sample estimation (1.464) compared to the non-cross border sub-sample estimation (0.651). In cross-border deals, managers have a 25.8 percentage point greater probability of being retained if the firms have SK similarity in related acquisitions compared to firms with less SK similarity. Conversely, in non-cross border deals, managers have a 7 percentage points greater probability of being retained if the firms have similar SK. The results suggest the positive effect of SK+ on target manager retention in related acquisitions is greater when the distance between the acquiring and target firms is greater.

Next, we examine the distance between target and acquirer firms located within the United States (columns 3 and 4). We derive the geographical coordinates (longitude and latitude) of the

cities in which firms are located. We calculate geographical distances between firms by measuring the length of the shortest path between two coordinates along the surface of a mathematical model of the world (Vincenty, 1975). We split the sample by the threshold of 166 miles, which corresponds to the definition of mega-commuting distance by the U.S. Census Bureau (Rapino and Fields, 2013). We assume that any distance greater than mega-commuting distance would increase the propensity of retaining target managers with similar SK. Column 3 presents the results from the sub-sample of firms with greater than 166 miles between the acquiring and target firms. The results suggest a 20.7 percentage point higher likelihood for managers to be retained if the firms have similar SK and undergo a related deal compared to those with dissimilar SK. Column 4 presents the results from the sub-sample of firms within the mega-commuting distance between the acquiring and target firms. The estimated coefficient on the interaction term is negative and not statistically significant. The results are also robust to different commuting distances, such as extreme commuting, which is 71 miles. Taken together, these results provide additional support to our main proposition that SK matters for related acquisitions because there are greater opportunity costs for the acquiring firm to allocate its own managers, which increases with geographic distance.

Acquisition Motivation

Next, we examine the role of managerial structural knowledge by acquisition motivation. In this test, we expect that the retention patterns of target managers with greater structural knowledge are stronger for related acquisitions with explicitly stated post-integration motivations. We collect the data on acquisition motivation for each deal from the Refinitiv SDC Platinum M&A database. We follow Tang and Zhao (2023) to identify absorption-type acquisitions, given their stated motivations in the SDC purpose code for each transaction—acquisitions that involve the expansion of existing operations or improving the current portfolio. About 50% of our sample

deals have a purpose code (323 deals), and about 67.8% of the deals with purpose codes are classified as absorption-type transactions (219 deals). These figures are very similar to 68% of absorption-type deals coded in Tang and Zhao (2023). We expect that related absorption-type acquisitions will have higher post-acquisition integration needs and that target managers with relevant structural knowledge are more likely to be retained than in related but non-absorption-type acquisitions.

The reported results in Table 2.5 provide support for the proposed mechanism. We ran the manager-level logit estimations by splitting the sample into absorption and non-absorption types of deals. The results suggest that SK+ target managers are more likely to be retained in related acquisitions if the deal is absorption-type. The estimated coefficient on the interaction term in the absorption-type sub-sample estimation is positive, with a p-value of 0.021 (Column 1), whereas the estimated coefficient in the non-absorption-type sub-sample estimation is much smaller in magnitude, with a p-value of 0.675 (Column 2). These results provide additional support to our hypothesized mechanism that SK matters for related acquisitions because SK is more valuable for post-acquisition integration.

Table 2.3: Propensity of target manager retention by deal relatedness and SK similarity

	(1)	(2)	(3)	(4)	(5)	(6)
Hypothesis:		H1			H2	
		OLS models			Logit models	
Dependent variable:		Firm-level retention rate			Manager-level retention indicator	
Indicator for Related Deal, interacted with:						
Indicator for firm SK similarity		0.200**	0.207**			
		(0.075)	(0.076)			
Indicator for manager SK similarity					0.808**	0.846**
					(0.280)	(0.291)
Indicator for Related Deal	-0.114**	-0.229***	-0.203**	-0.322*	-0.788**	-0.695**
	(0.042)	(0.059)	(0.062)	(0.154)	(0.233)	(0.258)
Indicator for firm-level SK similarity	-0.008	-0.106*	-0.100†			
	(0.037)	(0.054)	(0.054)			
Indicator for manager-level SK similarity				-0.027	-0.458*	-0.477*
				(0.136)	(0.207)	(0.208)
Cash offer			0.042			0.053
			(0.044)			(0.170)
ln(deal value)			-0.006			-0.031†
			(0.005)			(0.018)
Cross-border deal			-0.010			0.138
			(0.058)			(0.208)
Divestiture of related business			-0.030			-0.048
			(0.043)			(0.155)
Public acquirer			-0.012			0.127
			(0.046)			(0.176)
Public target			0.129			0.754†
			(0.086)			(0.384)
ln(target firm age)			-0.052**			-0.253**
			(0.018)			(0.079)
ln(acquirer M&A experience)			-0.009			-0.028
			(0.010)			(0.039)
US acquirer			-0.058			-0.082
			(0.060)			(0.206)
US target			0.016			-0.030
			(0.061)			(0.221)
ln(target firm board size)						-0.132**
						(0.040)
Target manager on board						-0.072
						(0.139)
Target manager tenure, ln(years worked)						-0.102
						(0.090)
Target CEO indicator						-0.006
						(0.186)
Constant	0.971***	0.504**	0.775***	-0.716	-0.313	1.022
	(0.130)	(0.182)	(0.196)	(0.862)	(0.873)	(1.037)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	616	616	616	1,339	1,339	1,339
R-squared	0.156	0.166	0.188			
Pseudo R-squared				0.076	0.081	0.106

Notes: Columns 1-3 present the results from an OLS model estimating the effect of deal relatedness and SK similarity on target mananger retention rate; unit of observation is deal-level. Columns 4-6 present the results from a logit model estimating the propensity of target manager being retained by deal relatedness and manager-level SK similarity; unit of observation is manager-level. Standard errors in the parentheses are clustered by deal. Quantification of the results is the difference in percentage point between the firm-level retention rate of [Related Deal=1, SK+] and [Related Deal=1, SK-] in Columns 1-3 and the difference between the predicted probabilities of target manager being retained in [Related Deal=1, SK+] vs. [Related Deal=1, SK-] in Columns 4-6. †$p < 0.1$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Table 2.4: Heterogeneity of the effects based on distance

	(1)	(2)	(3)	(4)
	Logit models		Logit models	
	Cross-Border	Non Cross-Border	Distance>166 miles	Distance<=166 miles
Dependent variable:	Manager-level retention indicator		Manager-level retention indicator	
Indicator for Related Deal, interacted with:				
Indicator for firm SK similarity	1.464†	0.651†	1.076*	-1.082
	(0.841)	(0.347)	(0.539)	(1.957)
Indicator for Related Deal	-0.246	-0.750*	-0.974*	0.335
	(0.820)	(0.294)	(0.454)	(1.402)
Indicator for firm SK similarity	-0.362	-0.367	-0.233	-2.091†
	(0.719)	(0.249)	(0.364)	(1.182)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Deal-level controls	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes
Manager-level controls	Yes	Yes	Yes	Yes
Observations	286	1,053	497	167
Pseudo R-squared	0.262	0.114	0.205	0.501

Notes: This table presents results from logit models estimating the propensity of target manager being retained by deal relatedness and SK similarity. Unit observation is manager-level. The sample is split by the degree of geographical proximity between the target and acquiring firms. Standard errors in the parentheses are clustered by deal. Quantification of the results is the difference between the predicted probabilities of [Related Deal=1, SK+] and [Related Deal=1, SK-]. †$p < 0.1$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Table 2.5: Heterogeneity of the effects based on acquisition motivation

	(1)	(2)
	Logit models	
	Absorption-type	Non Absorption-type
Dependent variable:	Manager-level retention indicator	
Indicator for Related Deal, interacted with:		
Indicator for firm SK similarity	1.269*	0.697
	(0.550)	(1.660)
Indicator for Related Deal	-0.312	-1.417
	(0.434)	(1.128)
Indicator for firm SK similarity	-0.734†	-0.661
	(0.407)	(0.798)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Deal-level controls	Yes	Yes
Firm-level controls	Yes	Yes
Manager-level controls	Yes	Yes
Observations	519	206
Pseudo R-squared	0.207	0.299

Notes: This table presents the results from logit models estimating the propensity of a target manager being retained by deal relatedness and SK similarity. Unit observation is manager-level. The sample is split by the acquisition purpose of the deal. Standard errors in the parentheses are clustered by deal. Quantification of the results is the difference between the predicted probabilities of [Related Deal=1, SK+] and [Related Deal=1, SK-]. †$p < 0.1$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

M&A Performance

Next, we examine whether structural similarity results in higher M&A performance. If the structural knowledge of target managers is important to post-acquisition integration and performance, we should see better performance in related acquisitions that have structural similarities between firms. Given that the level of integration between the two merged firms enhances performance (Capron, 1999; Zollo and Singh, 2004), and target manager retention is a critical part of the acquirers' integration plan (Bilgili et al., 2017; Cannella and Hambrick, 1993; Larsson and Finkelstein, 1999; Zollo and Singh, 2004), then retention of managers with relevant structural knowledge should enhance organizational performance. Target managers' structural knowledge may create coordination advantages and increase the merged organization's ability for synergy realization, positively affecting M&A outcomes. Thus, we expect that retention of target managers with similar structural knowledge as the acquirer will facilitate integration and coordination in related acquisitions, thereby positively contributing to acquirers' performance.

To measure the post-acquisition performance of the acquirer, we obtained financial information on the ultimate acquirer firm from Compustat. The data sets were matched to the DCA by parent company names, first using a matching algorithm and then by performing extensive manual checks. The performance estimation data is limited to public firms due to data availability. Our data period starts in 2001, due to the DCA data availability, and ends in 2017 to allow sufficient time to observe managerial mobility and post-acquisition performance.

We use the return on assets (ROA) measure to capture acquirer firms' performance post-acquisition. ROA is a measure of the company's performance and stakeholder value that has been frequently used in prior studies (Barkema and Schijven, 2008; Das and Kapil, 2012; King et al., 2021; Zollo and Singh, 2004). ROA is calculated by taking the income before extraordinary items

(Compustat annual item IB) scaled by total assets (item AT). However, because better pre-merger performance can partly explain better post-merger performance (Bouraoui and Li, 2014), we aim to eliminate the pre-merger variation by using the change in post-merger ROA from the pre-merger value. Specifically, we calculate the average ROA of the acquirer firm *n* years after completion year *t* minus the average ROA *n* years before, calculated as follows:

$$\Delta ROA_{tn} = ROA_{averaged\ over\ t+1\ to\ t+n} - premerger\ ROA_{averaged\ over\ t-1\ to\ t-n} \quad (2.3)$$

With this measure, we focus on the improvements in performance of specific acquirers and eliminate differences in the pre-merger business performance. Past studies have used a time lag from one to six years to evaluate the effect of M&A (King et al., 2021). Moreover, according to McKinsey's 2021 study, performance in the long-term is a more reliable measure of deal success: "You cannot judge a deal by the market's response to its announcement. Neither can you predict its success based on investor reaction at closing. It is only after the first 12 to 18 months of integration and after companies have reported the performance of their first year that the markets can reliably predict the success of the deal." Hence, we use 3-, 5-, and 6-year changes (n = 3, 5, or 6) to examine short- and long-term performance implications.

To test this association, we adopt the following OLS specification to estimate the relationship between SK relatedness and acquirers' performance:

$$\Delta ROA_{ljt} = \theta_0 + \theta_1 Related\ Deal_{jt} + \theta_2 SK_{jt}^{+} + \theta_3 Related\ Deal_{jt} \times SK_{jt}^{+} + \gamma_j + \chi_{mt} + \rho_{lt} + \varphi_k + \tau_t + \varepsilon_{ljt} \quad (2.4)$$

where ΔROA is the change in the ultimate acquirer's post-merger ROA from pre-merger ROA, averaged over 3, 5, or 6 years, m denotes targets, and l denotes acquirer in deal j, the unit of observation, t denotes year, and k denotes acquirer industry. χ is a vector of target m firm-level controls, ρ is a vector of acquirer l firm-level controls, γ_j is a vector of deal-level controls, φ_k and

τ_t are complete sets of industry and year dummies, respectively, and ε_{ijt} is an independent and identically distributed (i.i.d.) error term. The standard errors are clustered by deal. We expect $\theta_3>0$ if SK similarity has a positive relationship with ROA in related acquisitions.

Table 2.6 reports the results of the OLS regressions estimating the relationship between acquirer performance and SK similarity for related acquisitions. We use different time windows to examine the effect of SK similarity on the change in the ultimate acquirer's post-merger ROA from pre-merger ROA. Columns 1-3 present the estimation results with the dependent variable of ROA change averaged over three years. The estimated coefficient on the interaction term in the full model is positive but not statistically significant (p=0.196). In Columns 4-6, we present the results from using the change in ROA over five years as the dependent variable. The estimated coefficient on the interaction term is positive and statistically significant (p=0.044) in the estimation of the full model (Column 6). Finally, we use the change in ROA over six years as the dependent variable in Columns 7-9. The estimated coefficient on the interaction term is positive and statistically significant (p=0.027) (Column 9). The results suggest that related acquisitions that have SK similarity between the target and the acquirer are likely to have greater ROA than related acquisitions with less SK similarity, especially in the long term. For a change in ROA over a six-year period, this difference represents about a 69% greater ROA (over the sample average ROA) for firms with more SK similarity.

As part of robustness analyses, we also use two alternative measures of performance: return on investment (ROI) and return on equity (ROE). ROI is constructed by dividing net income by total invested capital, and ROE is calculated by dividing net income by shareholders' equity. The results are robust to using these alternative measures of performance.

Table 2.6: Acquirer's post-acquisition performance by deal relatedness and structural similarity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	OLS models			OLS models			OLS models		
Dependent variable:	Changes between the average ROA 3 years before and after deal completion			Changes between the average ROA 5 years before and after deal completion			Changes between the average ROA 6 years before and after deal completion		
Indicator for Related Deal, interacted with:									
Indicator for firm SK similarity		0.028	0.031		0.043†	0.041*		0.051*	0.047*
		(0.026)	(0.024)		(0.022)	(0.020)		(0.024)	(0.021)
Indicator for Related Deal	-0.004	-0.020	-0.028	-0.007	-0.031†	-0.037*	-0.007	-0.035†	-0.042*
	(0.010)	(0.022)	(0.023)	(0.009)	(0.018)	(0.018)	(0.011)	(0.019)	(0.020)
Indicator for firm SK similarity	0.000	-0.016	-0.020	0.005	-0.020	-0.022	0.002	-0.028†	-0.029†
	(0.010)	(0.022)	(0.022)	(0.009)	(0.016)	(0.015)	(0.009)	(0.017)	(0.015)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal-level controls	No	No	Yes	No	No	Yes	No	No	Yes
Firm-level controls	No	No	Yes	No	No	Yes	No	No	Yes
Observations	384	384	384	339	339	339	309	309	309
R-squared	0.144	0.149	0.220	0.124	0.141	0.196	0.123	0.146	0.220

Notes: This table presents results from OLS models estimating the post M&A acquirer firm performance affected by deal relatedness and SK similarity; unit of observation is deal-level. Standard errors in the parentheses are clustered by deal. Quantification of the results is the difference between the change in ROA of [Related Deal=1, SK+] and [Related Deal=1, SK-] over the sample average ROA. †$p < 0.1$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Relative Importance of Centralized and Decentralized Structural Knowledge

Next, we explored whether retention rates differ between targets with centralized versus decentralized structures. Because structural integration requires managerial effort to coordinate interaction, systems, processes, communication, alignment, and standardization activities between two firms (Graebner et al., 2017; Larsson and Finkelstein, 1999), managers with centralized knowledge may be better equipped to facilitate coordination and communication between the firms. As a result, for an acquirer with a centralized structure, decentralized knowledge may be less important than centralized knowledge for a decentralized acquirer. Hence, we compared the retention rates of the structural mismatches to examine whether centralized or decentralized knowledge is more important in PAI of acquisitions with non-matching structures. Table 2.7 plots the share of target managers retained by the acquirer and target structural types. In the cross-diagonals, 47 percent of target managers are retained by decentralized acquirers from centralized targets compared to 41 percent of target managers retained by centralized acquirers from decentralized targets.

We examined this relationship more formally in a three-way interaction model to estimate the relationship between target firm centralization and target managers' retention rates for deals with dissimilar structures (the cross-diagonals). The results presented in Table 2.8 are consistent with the patterns observed in the raw data: a higher share of target managers are retained by decentralized acquirers from centralized targets compared to centralized acquirers from decentralized targets. The results suggest that centralized knowledge is more important in the PAI, consistent with the idea that PAI involves a high degree of coordination and communication between firms, a skill more predominantly developed by managers in centralized structures.

Table 2.7: Retention rates by structural similarity

	Centralized Target	Decentralized Target
Centralized Acquirer	**49.2%**	**41.0%**
Decentralized Acquirer	**47.0%**	**49.1%**

Notes: This table presents the average retention rates of target top managers by structural similarity. Our main interest is in the cross-diagonals: when structures don't match, target managers centralized firms are more likely to be retained than managers from decentralized firms (47% vs. 41%).

Table 2.8: Propensity of target manager retention by knowledge similarity and target centralization – Three-way interaction

	(1)	(2)	(3)
		OLS models	
Dependent variable:		Firm-level retention rate	
Indicator for Related Deal, interacted with:			
SK similarity X *Centralized target*		-0.263†	-0.262†
		(0.155)	(0.156)
SK similarity		0.332**	0.340**
		(0.111)	(0.112)
Centralized target		0.203†	0.189
		(0.116)	(0.117)
Indicator for Related Deal	-0.114**	-0.335***	-0.304***
	(0.042)	(0.082)	(0.086)
Indicator for firm-level SK similarity	-0.008	-0.241**	-0.225**
	(0.038)	(0.075)	(0.075)
Indicator for centralized target	0.012	-0.175*	-0.167†
	(0.041)	(0.086)	(0.087)
SK similarity X Centralized target		0.261*	0.245*
		(0.108)	(0.109)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	616	616	616
Pseudo R-squared	0.156	0.176	0.196

Notes: This table presents the results from OLS models estimating the effect of firm-level deal relatedness, SK similarity, and target firm centralization on target mananger retention rate. Standard errors in the parentheses are clustered by deal. Quantification of the results is the difference in percentage point between the firm-level retention rate of centralized target and decentralized target when there is no SK match in related deals (i.e., [Related Deal=1, SK-]). †$p < 0.1$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

2.4.3 Robustness checks

Matching Analyses

To address potential concerns about selection, we use the coarsened exact matching (CEM) methodology to create pseudo control and treatment groups using observable firm- and deal-level characteristics (Iacus et al., 2012). We matched on deal value, ownership share, deal relatedness, acquisition method (cash vs. stock), public status, number of subsidiaries, SIC codes, and deal year (Tang and Zhao, 2023). Appendix Tables B2 and B3 show pre- and post-matched comparisons of means between the two groups, respectively. Pre-matching comparisons show that SK+ and SK- deals share similar key characteristics. The matching procedure further reduced these differences.

Appendix Table B4 reports the results from the matched sample analyses. We estimated the relationship between firms' SK similarity and the post-acquisition retention rate of target managers. The results are consistent with the main results: the estimated coefficient on the interaction term is positive, with a p-value of 0.030 (Column 3).

Alternative Specifications

For an additional robustness check, we split the SK similarity measure into acquirer centralization and manager centralization continuous variables to perform a three-way interaction. We used a continuous measure for the *acquirer centralization* measure using the count of base units. Generally, the greater the number of base units of the firm, the more decentralized the firm is. So, we reversed this order so that the greater the centralization measure, the more centralized the firm is. We used the natural log of the transformed index to create a continuous measure of centralization. Next, we constructed a manager-level centralization measure using the percentage of years the manager has worked at a centralized company during the previous seven years before the acquisition completion year. The greater the index, the more centralized the manager SK is.

The average percentage of years of a manager working at a centralized firm is 50.6%, which indicates a large variation in managerial SK within a given organizational structure.

We use a logit model with a three-way interaction between deal relatedness, manager-level centralization index, and acquirer centralization index. The empirical specification is outlined in Appendix B. The results are consistent with our main results (Table B5 in the Appendix).

As an alternative measure of related deals, we used the technological relatedness index by Robins and Wiersema (1995), which measures technological similarity between paired industries. We obtain results that are consistent with our main results (Table B6 in the Appendix).

2.5 Discussion and Conclusion

In this study, we examined the effects of organizational structure similarity on the retention of target managers in related acquisitions. Our results highlight the importance of managers' structural knowledge—experience in specific organizational structures—in shaping managerial retention patterns. We find that in related acquisitions, managers with structural knowledge similar to that in the acquiring firm are about 10% more likely to be retained by the acquirer as compared to managers with less similar structural knowledge. Consistent with the notion that retention of target managers' structural knowledge is key to post-acquisition integration and performance, we find that the long-term performance of the acquirer is greater when the acquisition is between firms with similar structures.

Our study contributes to three streams of literature. First, we contribute to the M&A integration and post-acquisition performance literature. A pressing question in the M&A literature is which types of acquisitions create value for acquiring firms (Hitt et al., 2001; Kim and Finkelstein, 2009; King et al., 2021). Although the literature agrees that retention of managers is important for post-acquisition performance (e.g., Bilgili et al., 2017; Butler et al., 2012; Cannella

and Hambrick, 1993), the specific mechanisms through which managers can create value remain underexplored and consequently result in conflicting accounts. Our study aims to contribute to this literature by highlighting one mechanism through which target managers may influence acquisition performance. Our results suggest the importance of managerial structural knowledge in facilitating integration and improving performance.

Second, we answer the call in the resource reconfiguration literature for more empirical work on non-financial resource allocation, including human resources and knowledge (Folta et al., 2016; Karim and Capron, 2016). The main obstacle in this line of work has been the difficulty of observing resource allocation within and between firms. In this study, we directly tracked individual managerial movements to unpack firms' allocation decisions for resources that span internal and external organizational boundaries. We explored the conditions under which the acquirer retains the target manager or redeploys its own manager, as well as the tradeoffs associated with these allocation decisions. We also examined how firms manage the joint allocation of multiple types of resources (Feldman and Hernandez, 2022) and the combination of technical and structural knowledge. Moreover, we studied how the combination of an acquiring firm's resource base, target managers' human capital, and organization design features shape managerial allocations post-acquisition.

Finally, our study contributes to the strategic human capital literature by highlighting the importance of organizational design in shaping managerial human capital (Fiedler and Welpe, 2010; Karim, 2012; Karim and Williams, 2012; Nelson and Winter, 1982). We suggest that in addition to knowledge and expertise about their industry and markets, managerial structural knowledge can be a source of valuable human capital that can affect executive mobility and subsequent performance outcomes (Coff, 2002). We provide evidence for the importance of

structural knowledge for firm human capital allocation decisions and performance (Karim 2012; Karim and Williams, 2012).

Our study has several limitations that invite future work. First, as in previous studies, we could not distinguish between voluntary and involuntary turnover. Within the scope of our study, whether managerial departure is due to manager or firm choice, the patterns we observe in our data are consistent with what our theory predicts. Because our study focuses on retention, our theory and results on the effects of managerial knowledge on managerial retention are consistent with the target managers and acquirer firms deciding to continue the working relationship. Future work could use richer data to disentangle the nature of managerial retention further.

Second, this study examined the fundamental elements of organizational structure as the first step in this line of inquiry: the centralization and decentralization dimensions of organizational design (Argyres, 1996; Chandler, 1986; Joseph and Gaba, 2020; Mintzberg, 1980; Rajan and Wulf, 2006; Williamson, 1975, 1985). Future work could explore other dimensions of organizational structure that make up managerial structural knowledge, such as modularity and hierarchies (e.g., Feldman and McGrath, 2016; Karim, 2006; Zhou, 2013).

Third, we focused on the retention of top managers. Much work is yet to be done to understand the extent to which lower-level managers and other workers influence the PAI and to what outcomes (e.g., Woehler et al., 2021). Especially for deals that aim to acquire human resources and capabilities, the structural knowledge dynamics driving fit, motivation, and mobility costs are central to this question (e.g., Boyacıoğlu et al., 2024).

Lastly, we invite future work to examine the interaction between organizational structure and culture in the post-acquisition allocation of managers. The concepts of culture and structure are distinct and have been studied separately and independently (e.g., Janićijević, 2013; Marchetti,

2020). Organizational culture refers to mutual assumptions, beliefs, norms, and attitudes shared by an organization's members (Giorgi et al., 2015), while organizational structure influences an individual's behavior through formal limitations set by the division of labor, grouping of units, authority distribution, and coordination (Chandler, 1962; Galbraith and Kazanjian, 1986; Mintzberg, 1979; Nadler and Tushman, 1997). Studying the interaction between the two may yield additional insights into post-acquisition integration and performance.

Despite its limitations, this study offers much-needed research into the role of target top managers in post-acquisition integration and performance by highlighting how a combination of the acquiring firm's resource base and target managers' human capital shapes managerial retention post-acquisition.

CHAPTER 3

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

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3.1 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.

3.2 Theory and Hypothesis

3.2.1 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 3.1. Next, we examine how these differences may impact the career advancement opportunities of managers and how these opportunities may differ for women managers.

3.2.2 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 3.2.

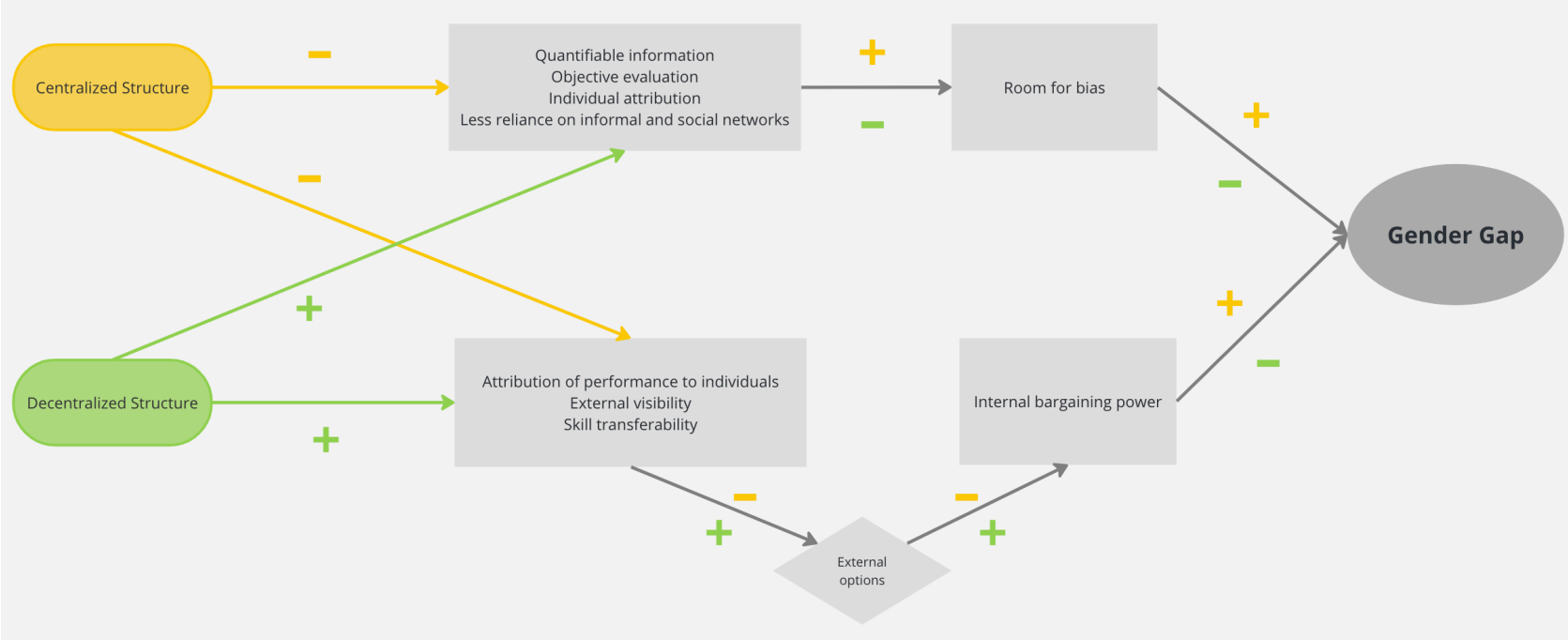
Thus, we predict that:

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

Figure 3.1: 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 3.2: Factors contributing to the gender gap in centralized vs. decentralized organizational structures



3.3 Data and Methodology

3.3.1 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 3.1 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 3.2 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 3.3 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 3.4 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 3.1: 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 3.2: 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 3.3: 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 3.4: 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).

3.3.2 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:

$$Promotion_{ijt} = \alpha_0 + \alpha_1 Decentralized_{j(i)t} + \alpha_2 Woman_i + \alpha_3 Decentralized_{j(i)t} \times Woman_i + \gamma_j + \chi_m + \delta_i + \phi_k + \tau_t + \epsilon_{ijt} \quad (3.1)$$

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.

3.4 Results

3.4.1 Main results

Table 3.5 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 3.5). 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 C2, 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 3.5 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.

3.4.2 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:

$$Promotion_{ijt} = \beta_0 + \beta_1 Experience_{it} + \beta_2 WomanManager_i + \beta_3 Experience_{it} \times WomanManager_i + \gamma_j + \chi_m + \delta_i + \phi_k + \tau_t + \epsilon_{ijt} \quad (3.2)$$

$Experience$ 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 3.6. 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:

$$Promotion_{ijt} = \eta_0 + \eta_1 IDD\ rejection_{jt} + \eta_2 Experience_{it} + \eta_3 + IDD\ rejection_{jt} \times$$
$$Experience_{it} + \gamma_j + \chi_m + \delta_i + \phi_k + \tau_t + \epsilon_{ijt} \quad (3.3)$$

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 3.7 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 3.5: 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 3.6: 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 3.7: 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.*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

3.4.3 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 C1 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 C2).

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 C3 and are consistent with the main analyses in Table 3.5.

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 C4 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 C5 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.

3.5 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 A

Appendix Table A1: Hybrid CEO performance – Coarsened exact matching

	(1)	(2)	(3)	(4)
	OLS models			
Dependent variable:	ROA, 3-year average			
	Outsider as baseline	Insider as baseline	Outsider as baseline	Insider as baseline
Indicator for post, interacted with:				
Hybrid CEO	0.024	0.012	-0.020	-0.011
standard error	(0.016)	(0.009)	(0.024)	(0.013)
Hybrid CEO, interacted with industry-level turbulence			0.078**	0.043**
			(0.032)	(0.018)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Manager-level controls	Yes	Yes	Yes	Yes
Observations	2,040	2,040	2,040	2,040
R-squared	0.787	0.787	0.794	0.794

Notes: This table reports the results of using coarsened exact matching method by matching hybrid CEO transition to insider and outsider CEO transition based upon a set of pre-succession variables, including firm performance, firm size, firm age, and industry. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Appendix Table A2: Hybrid CEO performance – Increase in Chinese import penetration

	(1)	(2)	(3)	(4)
	OLS models			
Dependent variable:	ROA, 3-year average			
	Outsider as baseline	Insider as baseline	Outsider as baseline	Insider as baseline
Indicator for post, interacted with:				
Hybrid CEO	0.013	0.009	-0.014	-0.009
standard error	(0.012)	(0.008)	(0.016)	(0.011)
Hybrid CEO, interacted with Chinese import increase			0.060**	0.037**
			(0.024)	(0.016)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Manager-level controls	Yes	Yes	Yes	Yes
Observations	3,046	3,046	3,046	3,046
R-squared	0.804	0.804	0.805	0.805

Notes: This table reports the results of using the rise in Chinese import penetration as a third measure of turbulence. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Appendix Table A3: Hybrid CEO performance – Account for dominant subsidiaries

	(1)	(2)	(3)	(4)
	OLS models			
Dependent variable:	ROA, 3-year average			
	Outsider as baseline	Insider as baseline	Outsider as baseline	Insider as baseline
Indicator for post, interacted with:				
Hybrid CEO	-0.035*	-0.016*	-0.035*	-0.015*
standard error	(0.019)	(0.009)	(0.019)	(0.009)
Hybrid CEO, interacted with industry-level turbulence	0.045*	0.026*	0.046**	0.027*
	(0.023)	(0.016)	(0.022)	(0.015)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Manager-level controls	Yes	Yes	Yes	Yes
Observations	4,044	4,044	4,240	4,240
R-squared	0.776	0.776	0.775	0.775

Notes: Columns 1 and 2 report the results of excluding firms with dominant subsidiaries (i.e., firms with a subsidiary that accounts for more than 50% of the total workforce of the company). Columns 3 and 4 report the results of accounting promotions from dominant subsidiaries as insider CEO succession. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

Appendix B

Appendix Figure B1: Allocation patterns of target executives post-acquisition

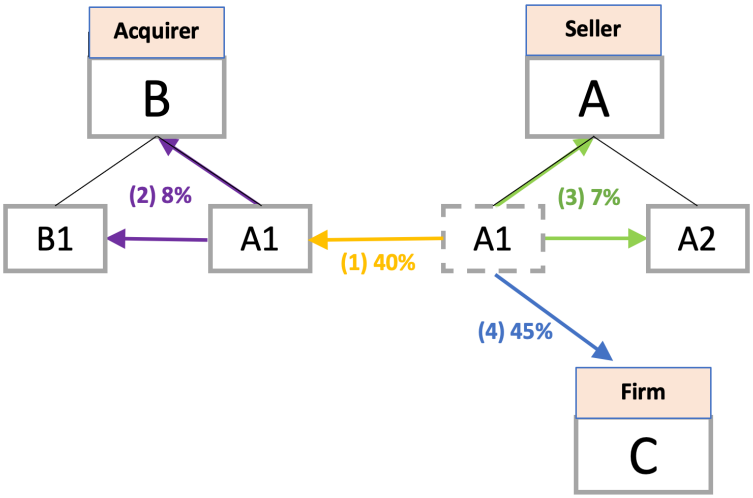


Figure B1 is a breakdown of the allocation patterns of target executives two years post-acquisition, with the percentage for each scenario. A1 is the target firm (i.e., a subsidiary firm of seller A) bought by acquirer B. In scenario (1), the target manager stays with the target firm A1 as it is bought by acquirer B, accounting for 40% of the sample. In scenario (2), the target manager moves to the acquirer B or to another subsidiary firm B1 of the acquirer (8%). Scenarios (1) and (2) account for 48% of the target managers, which is coded as retained in our sample. In scenario (3), the target manager is redeployed back to seller A or to another subsidiary firm A2 of the seller (7%); In scenario (4), the target manager goes to another firm C (45%). Managers in scenarios (3) and (4) are no longer employed by the acquirer two years following deal completion and, thus, were coded as not retained, together accounting for 52% of the target managers.

Additional Specification

We break down the indicator of manager-level SK relatedness into separate measures of *Acquirer Centralization* and *Manager Centralization* to perform a three-way interaction model specified as the following:

$$\begin{aligned}\Pr(Retention) = F\big(&\mu_0 + \mu_1 TK_{jt}^{+} + \mu_2 Manager\ Centralization_{it} + \mu_3 Acquirer\ Centralization_{lt} \\ &+ \mu_4 TK_{jt}^{+} \times Manager\ Centralization_{it} \\ &+ \mu_5 TK_{jt}^{+} \times Acquirer\ Centralization_{lt} + \mu_6 Manager\ Centralization_{it} \times Acquirer\ Centralization_{lt} \\ &+ \mu_7 TK_{jt}^{+} \times Manager\ Centralization_{it} \times Acquirer\ Centralization_{lt} + \gamma_j + \chi_{mt} + \rho_{lt} + \delta_i + \varphi_k + \tau_t \\ &+ \varepsilon_{ijt}\big)\end{aligned}$$

where i denotes a manager, the unit of observation, and j denotes the deal that manager i is involved in, representing unique pairs of acquirer firm l and target firm m. t denotes year; k denotes target industry; γ_j is a vector of deal-level controls; χ is a vector of target m firm-level controls; ρ is a vector of acquirer l firm-level controls; φ_k and τ_t are complete sets of industry and year dummies, respectively; and ε_{ijt} is an independent and identically distributed (i.i.d.) error term. $Retention$ is the manager-level retention indicator that equals one if the target manager stays with the acquirer two years post-acquisition and equals zero otherwise. *Acquirer Centralization* is a measure of ultimate acquirer firm centralization based on the number of baseline subsidiaries; *Manager Centralization* is a measure of manager-level centralization based on the percentage of years the target manager has worked at a centralized firm during the past seven years. The regression outputs are in Appendix Table B5.

Appendix Table B1: Variable definition

Variables	Definition
(1) Firm-level retention rate	% of target TMT staying with the acquirer 2 years following the deal completion
(2) Manager-level retention indicator	Indicator of whether the target manager stays with the acquirer 2 years following the deal completion
(3) Indicator for deal relatedness	Indicator of whether the target and the acquirer are in related industries, based on the first 2-digit SIC code
(4) Indicator for firm-level SK similarity	Indicator of whether the target and the acquirer comes from ultimate parent firms with structural similarity
(5) Indicator for manager-level SK similarity	Indicator of whether the target manager and the acquirer carry similar structural knowledge
(6) Cash offer deal	Deal-level. Dummy variable coded 1 if a cash offer is made and 0 for any other form of payment such as cash and stock
(7) Size of the deal	Deal-level. Ln(deal value)
(8) Cross-border deal	Deal-level. Dummy variable to account for the cross-border nature of a deal, coded 1 if the target unit and the acquirer are not in the same country, 0 otherwise
(9) Divestiture of related business indicator	Deal-level. Indicator of whether or not the target and the seller are in related industries, based on the first 2-digit SIC code
(10) Public acquirer	Firm-level. Dummy of whether the ultimate acquirer was publicly owned, 1 for public, 0 otherwise
(11) Public target	Firm-level. Dummy of whether the target was publicly owned, 1 for public, 0 otherwise
(12) Target firm age	Firm-level. ln(target firm age)
(13) Acquirer M&A experience	Firm-level. ln(number of previous M&As the acquirer announced)
(14) US acquirer	Firm-level. Dummy of whether or not the acquirer is a U.S. company
(15) US target	Firm-level. Dummy of whether or not the target is a U.S. company
(16) Target firm board size	Firm-level. Ln(number of managers on board in the target firm)
(17) Target manager on board indicator	Manager-level. Indicator of the manager was ever on the board of the target firm
(18) Target manager tenure	Manager-level. ln(number of years the manager has worked at the target firm)
(19) Target CEO indicator	Manager-level. Indicator of whether the target manager is the CEO of the target firm, 0 otherwise

Notes: This table presents definitions of the main variables used in the estimation.

Appendix Table B2: Pre-matching comparison of means

Key deal characteristics	SK+ deals (Mean)	SK+ deals (N)	SK- deals (Mean)	SK- deals (N)	*Diff.*	*t-statistics*	*p-value*
Deal value	620.469	359	736.125	257	115.656	0.470	0.638
Deal relatedness	0.476	359	0.498	257	0.022	0.531	0.595
Acquirer public status	0.281	359	0.300	257	0.018	0.622	0.493
Acquirer number of employees	40475.850	359	29200.200	257	11275.650	-1.404	0.161
Acquirer number of subsidiaries	26.833	359	22.506	257	4.327	-0.997	0.319
Acquirer prior acquisitions, # of deals	5.279	359	5.922	257	0.644	0.665	0.506
US acquirer	0.677	359	0.693	257	0.016	0.413	0.680

Notes: This table presents the pre-matching comparison of means: SK+ deals (deals with similar structures) with 359 obs versus SK- deals (deals with dissimilar structures) with 257 obs.

Appendix Table B3: Post-matching comparison of means

Key deal characteristics	SK+ deals (Mean)	SK+ deals (N)	SK- deals (Mean)	SK- deals (N)	*Diff.*	*t-statistics*	*p-value*
Deal value	312.409	137	253.824	124	58.585	-0.662	0.509
Deal relatedness	0.482	137	0.508	124	0.026	0.423	0.673
Acquirer public status	0.197	137	0.226	124	0.029	0.566	0.572
Acquirer number of employees	9990.467	137	13112.350	124	3121.888	1.052	0.294
Acquirer number of subsidiaries	27.372	137	24.685	124	2.687	-0.369	0.712
Acquirer prior acquisitions, # of deals	5.715	137	6.968	124	1.252	0.729	0.467
US acquirer	0.730	137	0.694	124	0.036	-0.647	0.519

Notes: This table presents the post-matching comparison of means: SK+ deals (deals with similar structures) with 137 obs versus SK- deals (deals with dissimilar structures) with 124 obs.

Appendix Table B4: Coarsened exact matching results

	(1)	(2)	(3)
		OLS models	
Dependent variable:		Firm-level retention rate	
Indicator for Related Deal, interacted with:			
Indicator for firm SK similarity		0.223†	0.301*
		(0.133)	(0.138)
Indicator for Related Deal	-0.161*	-0.277**	-0.295**
	(0.072)	(0.100)	(0.105)
Indicator for firm-level SK similarity	-0.064	-0.174†	-0.207*
	(0.063)	(0.090)	(0.095)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Deal-level controls	No	No	Yes
Firm-level controls	No	No	Yes
Manager-level controls	No	No	Yes
Observations	261	261	261
R-squared	0.283	0.293	0.332

Notes: This table reports the results from the coarsened exact matching (CEM) analyses. We created "treatment" and "control" groups by matching on deal value, ownership share, deal relatedness, acquisition method (cash vs. stock), public status, number of subsidiaries, SIC codes, and deal year. The treatment group is defined when the organizational structure between the acquiring and target firms is similar; control group otherwise. We estimate an OLS model of the relationship between deal relatedness and SK similarity and target manager retention rate; unit of observation is deal-level. Quantification of the results is the difference in percentage point between the firm-level retention rate of [Related Deal=1, SK+] and [Related Deal=1, SK-] in Column 3. †$p < 0.1$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Appendix Table B5: Propensity of target manager retention by knowledge similarity – Three-way interaction

	(1)	(2)	(3)
		Logit models	
Dependent variable:		Manager-level retention indicator	
Indicator for Related Deal, interacted with:			
Manager centralization X *Acquirer centralization*		0.381*	0.389*
		(0.179)	(0.185)
Manager centralization		-1.382†	-1.404
		(0.830)	(0.859)
Acquirer centralization		-0.368**	-0.388**
		(0.121)	(0.126)
Indicator for Related Deal	-0.341*	1.090*	1.275*
	(0.142)	(0.535)	(0.560)
Manager-level degree of centralization	-0.094	0.681	0.626
	(0.141)	(0.573)	(0.591)
Degree of centralization of the acquirer	0.093*	0.285**	0.261**
	(0.041)	(0.084)	(0.087)
Manager centralization X Acquirer centralization		-0.216†	-0.212
		(0.125)	(0.129)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Deal-level controls	No	No	Yes
Firm-level controls	No	No	Yes
Manager-level controls	No	No	Yes
Observations	1,339	1,339	1,339
Pseudo R-squared	0.078	0.084	0.107

Notes: This table presents the results from logit models estimating the propensity of target manager being retained by deal relatedness, manager centralization, and acquirer centralization. We break down the single measure of manager SK similarity by continuous measures of manager centralization and acquirer centralization. Standard errors in the parentheses are clustered by deal. †$p < 0.1$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Appendix Table B6: Propensity of target manager retention by alternative measure of deal relatedness and SK similarity

	(1)	(2)	(3)	(4)	(5)	(6)
Hypothesis:		H1			H2	
		OLS models			Logit models	
Dependent variable:		Firm-level retention rate			Manager-level retention indicator	
Related Deal index, interacted with:						
Indicator for firm SK similarity		0.270	0.308†			
		(0.164)	(0.173)			
Indicator for manager SK similarity					1.605†	1.826†
					(0.942)	(0.983)
Related Deal index	-0.253**	-0.404**	-0.384**	-1.372***	-2.493**	-2.866***
	(0.083)	(0.130)	(0.138)	(0.350)	(0.819)	(0.815)
Indicator for firm-level SK similarity	0.048	-0.136	-0.095			
	(0.074)	(0.135)	(0.149)			
Indicator for manager-level SK similarity				0.082	-1.233	-1.349
				(0.259)	(0.864)	(0.945)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	176	176	176	407	407	407
R-squared	0.356	0.368	0.439			
Pseudo R-squared				0.188	0.195	0.225

Notes: Columns 1-3 present the results from an OLS model estimating the effect of firm-level deal relatedness and SK similarity on target mananger retention rate; unit of observation is deal-level. Columns 4-6 present the results from a logit model estimating the propensity of target manager being retained by firm-level deal relatedness and manager-level SK similarity; unit of observation is manager-level. The related deal index is a continuous measure derived from the Robins-Wiersema (1995) index of relatedness, which is the weighted measure of technological similarity bewteen paired industry, based on the proportion of technology flows in the US manufacturing sector. The index is greater if two industries are technologically related. There is a positive correlation between this index and the indicator for deal relatedness used in the main regressions (0.794). †$p < 0.1$; *p < 0.05; **p < 0.01; ***p < 0.001.

Appendix C

Appendix Table C1: 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 C2: 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 C3: 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 C4: 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 C5: 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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