AGING AT THE VERY TOP

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June 23, 2025

Abstract

We document that since 2000 U.S. CEOs are on average 7 to 8 years older upon appointment. Using employment history data from BoardEx and LinkedIn, we show that this development is driven by later appointments and a greater variety of prior work experiences. Firms managed by older CEOs exhibit less dynamic profiles: they grow more slowly, take on less risk, and are less innovative in modern dimensions such as computing technology. We hypothesize that these trends reflect a shift toward generalist skills. Using exogenous variation in the proximity to strategy consulting firms and their employees, we show that firms increase their demand for generalist skills in response to greater industry-level uncertainty, and subsequently appoint older CEOs when young generalist consultants are not readily available. Our results also indicate that prospective CEOs strategically respond to these evolving skill requirements. Exploiting the network structure resulting from employment histories, we demonstrate that job mobility increases in response to positive information shocks about the value of job transitions. In particular, workers are more likely to accept positions at lower seniority levels at other firms, reflecting that they are willing to sacrifice short-run wage growth for the longer-run purpose of acquiring generalist skills.

JEL codes: D22, J21, M12, M51

Keywords: CEOs, aging, internal labor markets, managers, promotions, dynamism

We thank Thomas Dohmen, Benjamin Friedrich, Nicola Gennaioli, Dirk Jenter, Wladislaw Mill, Christian Moser, Kelly Shue, as well as seminar participants at University of Bonn and University of Zurich for excellent comments. We also thank Russell Weinstein for providing data. Saidi acknowledges funding by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) under Germany's Excellence Strategy (EXC 2126/1 – 390838866) and through CRC TR 224 (Project C03).

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1 Introduction

We uncover a striking change in the age of CEOs over the last few decades, and attempt to understand its causes and consequences. Between 2000 and 2023, the average age of sitting CEOs in the United States has increased by ten years compared to only two years for the college-educated labor force, with similar patterns observed in Europe. Although this aging may partly be due to longer tenure of CEOs, their age at appointment has risen from 47-48 to 55 over this period. In this paper, we trace this aging trend to firms' increased demand for generalist skills and how executives alter their career paths in response.

We document a number of other important changes in the career profiles of managers and executives. First, obviously, before becoming CEOs, individuals must accumulate experience; we show that external experience has increased by roughly ten years compared to 2000, whereas internal experience has remained almost unchanged. This holds true both for external appointments but also for internal appointments, especially at smaller firms. Second, we consider the composition of this additional experience. At appointment, compared to 2000, CEOs, especially in smaller firms, hold a larger number of positions, across more firms and sectors. Third, turnover has increased with shorter spells in each position. Fourth, the increase in the number of positions dominates the faster turnover, so that CEOs' employment histories have become longer, leading to the very fact that CEOs are now older upon appointment.

What drives this aging of corporate leadership? We consider several potential explanations, some of which are centered on firm-level responses to solving agency conflicts, such as preventing managerial entrenchment by mechanically shortening tenure through hiring older CEOs, or shifts in market structure—especially concentration—reducing the supply of CEO positions. However, we find no evidence that would lend support to these channels. We instead focus on market forces that affect the matching of firms and CEOs.

In particular, we consider an assignment process where workers vary in both innate ability (which peaks at mid-career) and experience (which accumulates over time), in an environment where firms offer hierarchically ranked positions with different productivity requirements. When firms shift to place greater weight on experience relative to ability, older workers become more likely to be assigned to top positions. The reason for this higher value for experience may be due to the necessity to face elevated levels of uncertainty (Baker et al., 2016) or in response to evolving, and more complex, organizational structures (Dessein and Santos, 2006; Pan, 2017). These forces can lead to firms increasingly seeking leaders with generalist skills—which are more closely tied to accumulated experience than to raw ability—and appointing older CEOs as a result.

To test these patterns, we use granular data from LinkedIn on American executives' career trajectories in conjunction with information on board members from BoardEx. We first establish that in the face of rising industry-level uncertainty, firms demand different profiles in their prospective CEO hires. A challenge in relating industry-level uncertainty to the demand for CEO characteristics is that uncertainty itself is likely to be correlated with the pool of available CEO candidates. Ideally, the pool and age of generalist CEOs are given exogenously. To address this issue, we

use spatial variation in the availability of young generalists in the form of strategy consultants, whose consulting stint equips them with an accelerated path to acquiring generalist skills. In this way, we are able to study the differential response to industry-level shocks across space, while controlling for time-varying geographic and sectoral heterogeneity. Exploiting plausibly exogenous variation in travel time to the offices of the top three strategy consulting firms—stemming from office openings and air route expansions—we find that demand for generalist skills in response to greater industry-level uncertainty increases, leading firms to appoint older CEOs whenever generalist but younger strategy consultants are less readily available. The results are stronger for small firms where external experience is in shorter supply, as reflected by our finding of a larger gradient in external experience of small firms' CEOs over time. Therefore, the value added of generalist consultants as substitutes for experience is arguably higher.

Next, we attempt to reconcile firms' increased demand for generalists with the higher observed turnover—across positions, firms, and sectors—prior to CEO appointments, and explore how executives respond to the increasing premium for broad managerial capabilities. We start from the idea that executives learn about career-enhancing moves through professional networks. If the acquisition of generalist skills is revealed to be an important career ingredient, then this can lead to greater willingness to accept lower-level positions and pay in the short run in exchange for building a generalist skill set that enhances their long-term career prospects.

To test this, we consider workers' career paths after learning about CEO appointments of their former peers. Individuals who worked at the same time at the same firm, at a similar seniority level, and in the same metro area with the newly appointed CEO (of another firm) respond by increasing their own job mobility more strongly than colleagues who shared the same firm and seniority level but were located in different metro areas. Furthermore, these individuals accept reduced compensation in the short run for the presumed value of additional experience. This is most clearly reflected in the prevalence of downward switches across firms—where executives accept positions at lower seniority levels—but also in more frequent transitions across sectors. These responses to peer information shocks are more pronounced for coworkers with a longer shared tenure, for those that exhibit more mobility on the way to the top, and for workers in small firms.

Taken together, our findings support the idea that both the demand and the supply of generalist skills have shaped the age profile of CEO appointments since the early 2000s, and that the aging trend is neither a demographic inevitability nor merely a reflection of changing workforce composition.

Aging at the very top of the corporate ladder can have substantial effects on a variety of firm outcomes, e.g., because of older CEOs' distinct management style (Bertrand and Schoar, 2003) or preferences (Jenter and Lewellen, 2015). We discuss this in our context by employing a two-stage estimation approach. We first estimate firm-by-CEO fixed effects for various time-varying firm-level outcomes, capturing the average effects of each CEO's tenure. In the second stage, we relate these fixed effects to the respective CEO's age upon appointment. To establish causality, we instrument CEO appointment age using firms' demand for generalists—captured as before through

the interaction of industry-level uncertainty with travel time to the offices of the top three strategy consulting firms. In this manner, we find that older CEOs are associated with less employment and R&D expenditure growth as well as reduced innovation in computing-based patents. While older CEOs are associated with less dynamic firm profiles, we also show that they enhance firms' resilience to business cycle shocks.

Our analysis makes three contributions. First, we provide the first systematic documentation of CEO aging trends and their relationship to changing career patterns. Second, we develop novel identification strategies that separately estimate demand- and supply-side factors contributing to these changes. Third, we demonstrate how professional networks transmit information about optimal career strategies, leading to widespread behavioral changes among executives.

Our paper speaks to several strands of the literature. A number of studies have explored the changing demand for CEO skills over time. Murphy and Zabojnik (2004, 2007) and Frydman (2019) link the rise in executive compensation and the increasing prevalence of external CEO hiring to a shift toward generalist skills. Custódio et al. (2013) document a pay premium for generalist CEOs, while Adams et al. (2018) highlight the importance of diversified skill sets among board members.

Other research has more directly analyzed shifts in skill requirements using data from job postings and interviews. Kaplan and Sorensen (2021) show that CEOs, compared to other executives, have higher levels of general ability, execution orientation, strategic focus, and analytical skills. Following the financial crises, Decressin et al. (2023) document a shift away from interpersonal skills towards a stronger emphasis on execution orientation, which they find to be positively correlated with firm performance. Similarly, Deming (2021) emphasizes the increasing importance of decision-making skills, and Deming (2017) and Fuller et al. (2021) show that social skills have become more valued in the labor market. Kaplan and Sorensen (2021) argue that too much weight is placed on social skills in the selection of CEOs. Moreover, Deming and Silliman (2024) report that higher-level skills, such as the ability to allocate individual tasks, have gained increasing importance over time.

The evolution of CEO skill demand has frequently been examined in conjunction with changes in firm characteristics, making use of two-sided matching models. This literature has sought to explain rising executive compensation through assortative matching of managerial talent and firm size (Gabaix and Landier, 2008; Terviö, 2008). This relationship may be driven by the multiplicative impact of managerial skills in large firms (Edmans et al., 2009), or by the fact that larger firms pay efficiency wages to discourage shirking, as the signal of managerial quality is more diffuse (Gayle et al., 2015). Using these models, closely related to our findings, Gayle et al. (2015) emphasize the importance of general human capital in the CEO market, while Pan (2017) highlights the nexus between firm scope (that is, diversification) and the CEO experience in relevant industries.

Our work further contributes to a body of literature that examines how technological and institutional changes influence human capital accumulation and the way human capital is traded in labor markets. This debate has been shaped by the distinction between firm-specific and general human capital, first introduced in Becker (1964). Generalist skills are often measured by work experience in multiple firms and industries, capturing skills transferable across different orga-

nizations or roles (Custódio et al., 2013). Conversely, as noted by Lazear (2009), few skills are inherently firm-specific, but many combinations of skills or skill requirements are. Following this reasoning, the extent to which human capital is firm-specific or general mainly depends on market thickness, as documented in Sauvagnat and Schivardi (2024) for the market for executives. Beyond the firm level, the evidence points towards human capital that is specific to industries (Neal, 1995), occupations (Sullivan, 2010), and individual tasks (Gibbons and Waldman, 2004). In the context of task-specific human capital, several studies have explored the role of bundled versus unbundled skills, juxtaposing the traditional view that workers sell their multidimensional skills to a single employer with a scenario where they can supply individual skills to multiple employers (Choné and Kramarz, 2024). A shift from one model to the other carries substantial implications for wage structures and labor market mobility, with differential effects on generalists compared to specialists (Gozlan et al., 2024). Similarly, Dessein and Santos (2006) investigate firms' adaptability—defined as the level of discretion granted to workers—in an environment with uncertainty and task bundling. They show that more adaptive organizational structures, in response to increased uncertainty, tend to feature more bundled jobs, thereby increasing the demand for generalists.

Lastly, we add to the literature on age trends in high-skill professions and their consequences. Older CEOs' management styles reflect that they face different incentives than their younger counterparts, including distinct wealth concerns and career horizons (Dechow and Sloan, 1991; Antia et al., 2010), future career concerns (Li et al., 2017), and different compensation structures involving pensions and deferred benefits (Sundaram and Yermack, 2007).

Besides CEOs, the average age of scientists has also been increasing over the past decades, particularly among grant winners.[1] Daniels (2015) attribute this trend to longer pre-grant career paths, while Fons-Rosen et al. (2023) point to slower hiring and delayed retirements. Similarly, Jones (2010) and Jones and Weinberg (2011) show that both the age at which Nobel Prize-winning discoveries are made and the age at which the prize is awarded have increased over the course of the 20th century. In many fields, such as the judiciary, individual performance tends to decline with age (Ash and MacLeod, 2024). One possible explanation is that aging is associated with changes in cognitive abilities (Salthouse, 2012; Waelchli and Zeller, 2013; Singh-Manoux et al., 2012), physiological capacity, and various forms of human capital (MacLeod, 2016). Additionally, older individuals may experience motivational shifts, placing greater emphasis on maintenance and loss prevention over growth (Ebner et al., 2006), and may tolerate lower levels of effort.

Aging professionals can also have effects on others. Ash and MacLeod (2024) identify negative productivity spillovers to younger judges, likely due to shifts in workload distribution within teams. A higher concentration of older workers has been shown to hinder younger workers' career outcomes in local labor markets (Mohnen, 2019) and slow down younger colleagues' promotion prospects in internal labor markets (Bianchi et al., 2023). These dynamics have important distributional consequences along demographic dimensions, including age (Bianchi and Paradisi, 2024) and gender (Arellano-Bover et al., 2024).

[1] https://grants.nih.gov

2 Data and Stylized Facts

2.1 Data

The empirical analysis mainly relies on data on CEOs from BoardEx and employment biographies obtained from Revelio Labs, which we combine with company-level covariates and information on the availability of strategy consultants. This section contains details on the data.

BoardEx: We use CEO data from BoardEx, a product offered by *Delinean*. This dataset provides comprehensive details on executives' employment histories and demographic characteristics. While BoardEx includes individuals from both North America and continental Europe, our analysis focuses primarily on the United States. We define CEOs as individuals with the job title "CEO" categorized as "Executive Director," following BoardEx's classification. This yields a sample of 67,198 CEOs in North America (20,578 in Europe) with available age data.

For the descriptive analysis, we transform the data into a panel, capturing employment status as of January 1st each year. In cases of overlapping employment periods, more senior positions and those with earlier start dates are prioritized.[2] Following the literature (Cziraki and Jenter, 2021), we exclude CEO appointments of less than 12 months. We focus on a CEO's first appointment per firm. Internally appointed CEOs are defined as those employed by the firm during the last observation prior to their appointment, while all others are considered externally appointed. This implies that external insiders are included in this latter group. Among internally appointed CEOs, we further distinguish those who joined at a managerial level from those who entered at lower levels. Summary statistics are shown in Table A1, Panels A1 and A2.

For the reduced-form analysis, we start with a slightly larger sample of executives. Focusing on age at appointment, we calculate average CEO age at the firm-year level between 2000 and 2022, thereby accounting for Co-CEOs, individuals appointed CEO at multiple companies, and those who held the position multiple times at the same company. We then merge this variable with the company-level variables described below. Summary statistics for this sample are reported in Table A1, Panel B1.[3]

Employment Biographies: We also utilize employment biography data provided by Revelio Labs, which compiles this information by scraping LinkedIn profiles. The dataset encompasses employment details for nearly 500 million workers across approximately 1.8 billion employment spells. The linked employer-employee data include the start and end dates of employment spells, alongside a seniority ranking based on job titles ranging from 1 (lowest) to 7 (highest).[4] Revelio

[2]The seniority ranking applied is as follows (in descending order): CEO, Other Executive Director, Senior Manager, Supervisory Director, and All Other Employees. Throughout this paper, we define seniority as an individual's hierarchical position within a firm, distinguishing it from the concept of relative tenure compared to coworkers, as used for instance in Buhai et al. (2014).

[3]CEO age upon appointment is higher in this sample because we focus on the listed firms contained in Compustat. As we show in Section 2.2, CEOs are consistently older in larger and listed firms.

[4]For examples, see here.

Labs also imputes salaries for each employment spell. The data cover the period from 2008 to 2023 but are backfilled, implying that we can observe employment spells from earlier periods to the extent that they are reported by the respective individual.

Compared to BoardEx, this dataset offers the advantage of including information on rank-and-file employees, enabling us to analyze spillover effects of CEOs on these workers. Another key strength of the data is that they assign individual employment spells to 145 metropolitan statistical areas (MSAs). We use this information to determine the headquarters of the firms included in BoardEx. For this purpose, we define the location of a firm's headquarter as the modal MSA of its executives in the two highest seniority levels, provided they are at least at seniority level 4, which corresponds to the managerial level.

To merge the employment biographies with BoardEx, we proceed as follows. First, we clean company names on both sides by applying standard data normalization techniques and removing previous company names. Second, we consecutively merge on ISIN and CIK, manually verifying the merges since these identifiers can change over time. Third, for the unmerged companies, we perform an exact merge on company names. Fourth, we apply a fuzzy merge algorithm based on *term frequency-inverse document frequency* on the remaining unmerged company names. For the employment histories, we retain only firms with more than 10 employment spells in Northern America. The procedure is highly efficient, as it vectorizes the data into a sparse matrix and fits a k-nearest neighbors algorithm. We then randomly select 1,000 matches, which we manually classify into good and bad matches. In this way, we determine a precision threshold of 0.85, at which 95% of the matches can be considered accurate.[5] Overall, we are able to merge firm-level details for 65% of the CEOs in the BoardEx sample.

Company-Level Covariates: We complement the individual-level data with firm-level information, summarized in Table A1, Panel A3. We obtain annual balance-sheet information from Compustat, which we merge with the BoardEx data using CRSP identifiers. We focus on the following balance-sheet items (Compustat codes in brackets): revenue (*revt*), employment (*emp*), total assets (*at*), and R&D expenses (*xrd*). We also construct leverage ($\frac{dlt+dlc}{seq}$). For all variables, we drop negative values and winsorize below the 1st and above the 99th percentile. We define firm age as the number of years since the first appearance in the sample and firm exit as an identifier equal to one when we observe a firm for the last time in the sample.

For the balance sheet variables, we construct symmetric growth rates γ_{jt} accommodating entry and exit as $\gamma_{jt} = 100 \times \frac{x_{jt}-x_{jt-1}}{0.5(x_{jt}+x_{jt-1})}$, where x_{jt} is the variable of interest for firm j at time t. Given the non-negativity restriction, this implies values between -200 and 200. Using these growth rates, we construct two types of volatility measures. The first is a forward-looking measure at the firm level, defined as the standard deviation of γ_{jt} between time $t+1$ and $t+5$, similar to Neuhann and Saidi (2018). The second one is the cross-sectional standard deviation of γ_{jt} within NAICS-4 sectors.

[5]For additional detail on the fuzzy merge algorithm, we refer to Van Dijcke et al. (2023).

To measure innovative activity, we use data from Hoberg et al. (2014) on changes in a firm's product mix as well as the product and process patents filed by a company. From Babina et al. (2024), we obtain data on the shares of AI-related jobs and job postings. Lastly, we draw on data from the *United States Patent and Trademark Office* provided via *PatentsView*. We merge assignee organizations with company names from BoardEx using the same fuzzy merge algorithm as described above. From these data, we construct an indicator for whether a firm applied for a patent in a given year and calculate the natural logarithm of the number of patents. We define computer-related patents as those invention patents in product class G06. Based on this, we calculate both the natural logarithm of the number of computer-related patents and their share among all invention patents.

MSA-Level Data: Our identification strategy in Section 3.1 exploits plausibly exogenous variation in the supply of strategy consultants, focusing on the presence of MBB (*McKinsey & Company*, *Boston Consulting Group*, and *Bain & Company*) offices across the United States between 2000 and 2022. The data on office expansions are obtained through manual searches of the *archive.org* platform and cross-checked for the years 2001 to 2013 with information from Weinstein (2022).

The identification also leverages information on flight times between MSAs. We use the *28DS - T-100 Domestic Segment Data (World Area Code)* provided by the *Bureau of Transportation Statistics* (BTS), which include monthly information on flight connections by carrier in the United States from 1990 onwards. We restrict the data to regular flight connections, which we define as all scheduled direct flights with a flight distance exceeding 50 miles and, per year and direction, more than 1,000 passengers and at least one departure per week. We then aggregate all flights to the MSA-year level and calculate the travel time as the average ramp-to-ramp time across all flights between two MSAs in that period.[6]

2.2 Stylized Facts

We now use the BoardEx data to present three stylized facts about the role of age in the labor market for CEOs. First, we report a steady increase in the average age of sitting CEOs, largely driven by higher age at appointment, in particular among smaller firms. Second, we show that, in parallel to this trend, prospective CEOs are accumulating more external experience across firms and sectors. Third, exploring the implications of this age increase, we find that older CEOs are associated with lower levels of business dynamism and risk, but increase firms' resilience to business cycle shocks.

CEO Age Developments: In Figure 1, we document a consistent increase in CEO age since 2000. Panel (a) plots the average age of CEOs in the United States over time. Among sitting CEOs, mean age increased by approximately 10 years during the period, while the average age at appointment rose from 48 to 55 years. Panel (b) displays the cumulative distribution of CEO age at appointment

[6]To assign airports to MSAs, we obtain airport coordinates from the *Master Coordinate Table* provided by the BTS and map these coordinates into core-based statistical areas (CBSAs) using the 2013 version of the *TIGER/Line Shapefiles*. We then manually aggregate the CBSAs into the MSAs as defined by Revelio Labs.

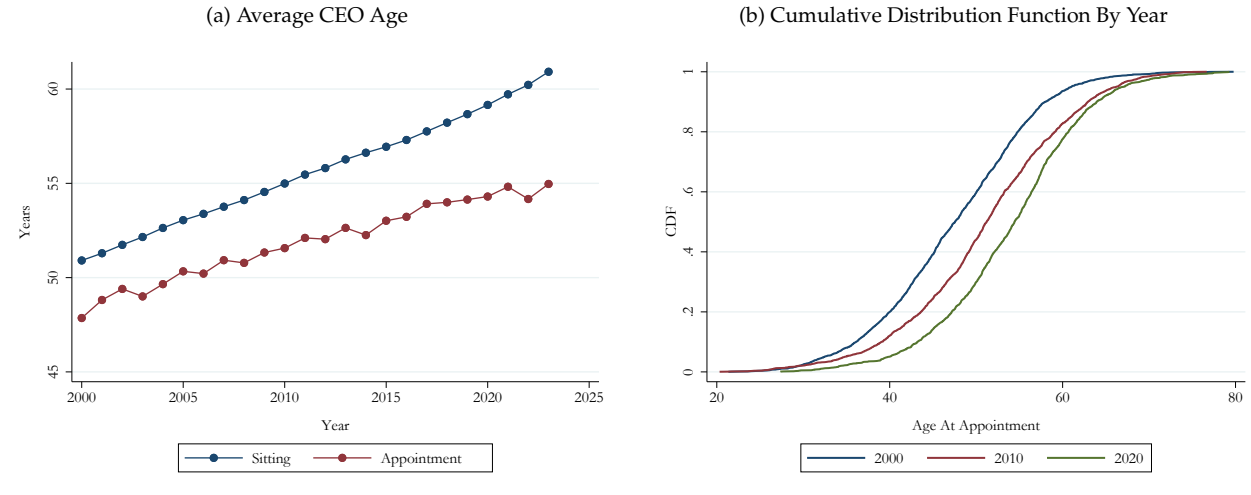
for the years 2000, 2010, and 2020, revealing that the distribution for more recent years is first-order stochastic dominant over that of previous periods. The corresponding patterns for Europe, shown in Figure A1, are very similar and even more pronounced. As we show in Figure A2, the magnitude of the age increase is roughly three times that of the overall labor force. The difference is even larger relative to college-educated workers, who arguably represent a more appropriate reference group. Taken together, this implies that the upward age trend is largely resulting from the appointment of older CEOs instead of prolonged CEO tenure.

We further analyze the rising age among newly appointed CEOs, focusing henceforth specifically on the United States. Figure A3, panel (a), plots the quartiles of the age distribution over time, revealing an upward shift throughout the sample period. Similarly, in panel (b), we observe the same trend for CEOs by their order of appointment. This suggests that the age increase is pervasive and not limited to specific segments of the distribution of newly appointed CEOs.

Next, we assess to what extent the age trend can be attributed to observable factors. To this end, we regress CEO age at appointment on a linear time trend (since 2000, normalized to range between 0 and 1), sequentially introducing an array of covariates. The estimated coefficients on the time trend are shown in Figure A4. In absence of controls, the predicted age difference between 2000 and 2023 is 7 years. This estimate remains stable after accounting for fixed effects at the NAICS-4 level, a firm's listing status, and whether the CEO was hired internally or is female. Next, we consider firm size and age. Controlling for the former is essential, given the interplay between age, accumulated skills, and firm size discussed in the literature review. Considering firm age is also important, as firm formation tends to be concentrated among younger individuals (Liang et al., 2018), though to a lesser extent than commonly assumed (Azoulay et al., 2020). An increase in firm age could thus entail a mechanical increase in CEO age. Notably, when adjusting for the natural logarithm of employment and firm age (both derived from the data on employment biographies), the estimate shrinks only slightly. The coefficient drops markedly to around 4 years, once restricting the data to the firm sample contained in Compustat, and remains unchanged thereafter. Thus, while changes in firm fundamentals cannot mechanically account for the rise in CEO age, the results suggest a crucial role of smaller and unlisted firms in driving the aggregate patterns. We further examine this aspect in Figure A5. The binscatter plot in panel (a) demonstrates that average CEO age at appointment and firm size exhibit a strongly positive relationship. In panel (b), we separately plot age at appointment for firms in the largest size quartile and for smaller firms, showing that the latter group is primarily responsible for the overall age increase.

Even though, as we discuss below, the role of CEO age in shaping firm-level outcomes has received widespread attention, changes in age structures over time have been relatively understudied. One reason may be the lack of comprehensive panel data covering firms beyond the largest ones, for which CEO age has remained relatively similar over the last century. In an early study, Taussig and Joslyn (1932) report the median age of American business leaders in the early 1930s to range between 50 and 54. Warner et al. (1967) states that the typical management hire in the early 1950s was around 50 years old. In line with this, Frydman (2019) tracks the 50 largest US

Figure 1: CEO Age Over Time



Notes: Panel (a) shows the average age of CEOs in the United States over time, separately for sitting CEOs and CEOs at appointment. Panel (b) shows the cumulative distribution function for age at appointment for different years.

corporations over time, for which CEO age has remained almost unchanged throughout the second half of the 20th century. Following CEOs in the Fortune 100 over time, Cappelli et al. (2024) find a slight decline in average CEO age during 1980 and 2000, followed by a rebound by 2020.[7] We attempt to reconcile these patterns by studying data on 1000 executives from the *Great American Business Leaders of the 20th Century* database, with the results shown in Figure A6. Consistent with Frydman (2019), the average CEO age barely changed between 1940 and 1990. However, this masks an increase in age at appointment as well as a decline in tenure. Moreover, in contrast to the bulk of the literature, we observe an increase in average CEO age during the 1990s, possibly due to the fact that the number of annual observations is larger in our data and thus contains a larger number of smaller firms. Despite inconclusive results, this analysis yields two important insights. First, it underscores the critical role of firm heterogeneity, particularly firm size, in tracking CEO age trends over time. Second, it suggests that simple demographic explanations may be insufficient to fully account for the patterns of interest.

Changes in Career Paths: We also investigate the shifts in career trajectories that come along with the rise in CEO age, highlighting the increased importance of external work experience in Figure 2. Panel (a) displays the average number of years spent outside and inside the firm over time. External work experience has increased markedly since the early 2000s, fully accounting for the upward trend in CEO age, while internal experience——measured as the time between joining the firm and becoming CEO——has remained relatively stable throughout our sample period.

[7] For Europe, analyses based on small samples of very large listed companies yield mixed conclusions. While Freye (2010) and Sluyterman and Westerhuis (2022) find no clear age trend in CEO age at appointment throughout the second half of the 20th century for Germany and the Netherlands, respectively, Adams et al. (2023) document a decline in the UK of about five years.

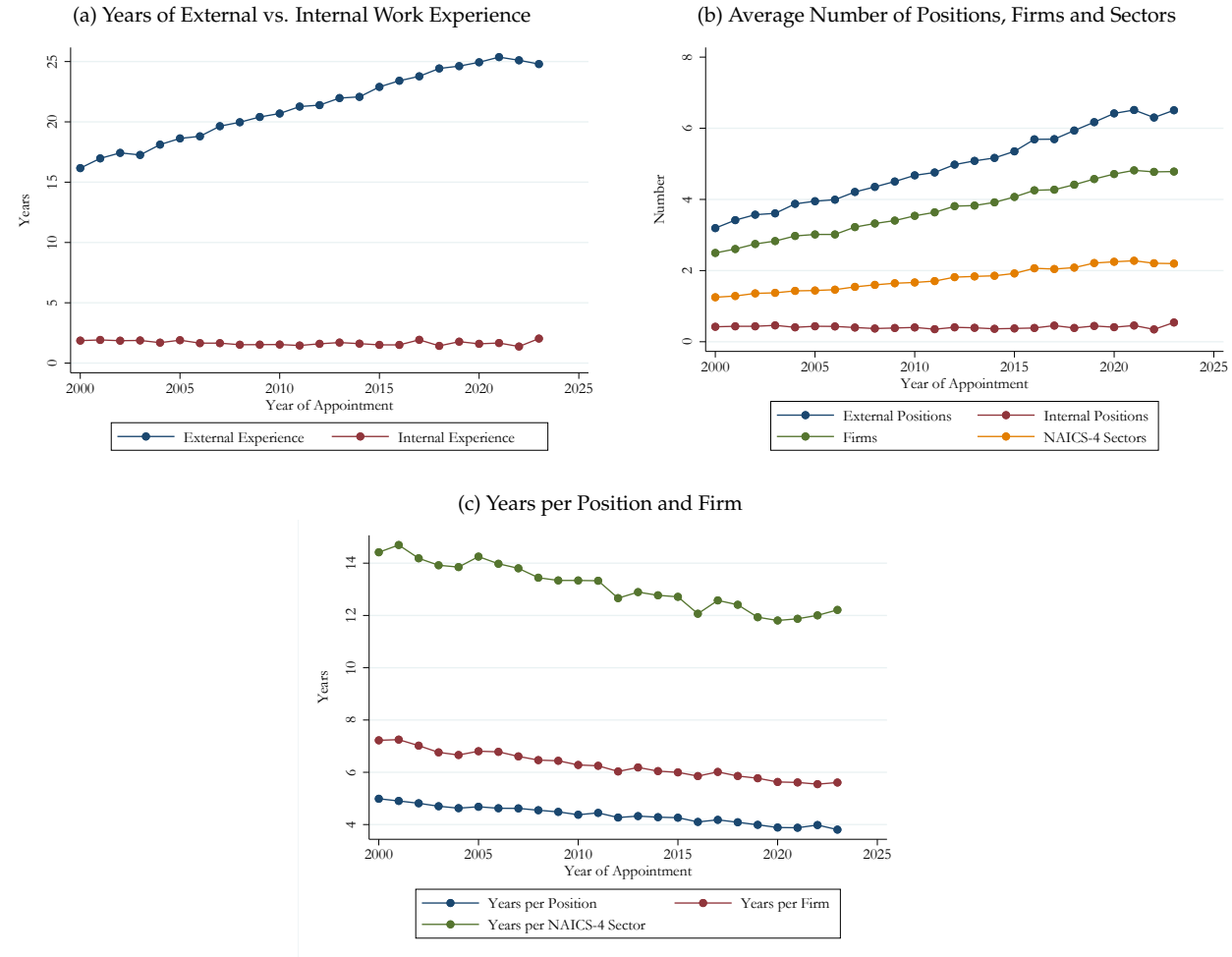
Zooming in on external mobility, panel (b) reveals a sharp increase in job mobility and the number of external positions held before entry into the firm. Before assuming the CEO role, individuals spend more time in multiple roles across a wider range of firms and sectors nowadays. At the same time, the number of years spent in each position, firm, and sector has decreased substantially since 2000 (panel c). We interpret these patterns as evidence in favor of the idea that prospective CEOs transition across different positions, firms, and sectors to gather a broader skill set—pointing to a shift towards a *boundaryless career* in this segment of the labor market (Arthur and Rousseau, 1996).[8] These results are surprising, given that they stand in contrast to a strand of literature that shows a slight increase in tenure among the overall workforce during our sample period (Farber, 2010; Hyatt and Spletzer, 2016).

Next, we examine the extent to which these time trends among CEOs differ from those of other senior employees who did not become CEOs. To this end, we classify all non-supervisory directors in the BoardEx data based on the most senior position they reached throughout the sample and analyze their career paths leading up to the first appointment at that seniority level. In Figures A7 and A8, we replicate Figure 2, showing the differential effects for CEOs compared to non-CEO executives and non-executive managers, respectively. In terms of levels, CEOs accumulate more external experience than both other groups, spanning a greater number of positions, firms, and sectors. Over time, most of these differences become significantly larger. Both in terms of absolute levels and slopes with respect to the number of positions, the differences are more pronounced for non-executive managers, i.e., those who are further away from becoming CEO. Notably, the increasing accumulation of external experience is driven by the number of external positions for CEOs relative to non-CEO executives, whereas for CEOs compared to non-executive managers, it is primarily driven by years of industry experience. In the latter comparison, there is also a striking and growing divergence in terms of internal experience over time. Taken together, this suggests that broad external experience is not only an important factor in the selection of CEOs but also that its relevance has grown over time.

As another way to highlight the rising importance of external experience, we distinguish between externally and internally appointed CEOs, further stratifying the latter into those entering the firm at managerial level or below. Within this classification, three factors may account for the rise in CEO age: increases in (*i*) external or (*ii*) internal experience within each group, or (*iii*) level differences in CEO age across groups, combined with shifts in group composition. As Figure A9 shows, a combination of (*i*) and (*iii*) drives the age trend. Average age rose across all groups but more so for externally appointed CEOs, while the level remained highest for those entering at the managerial level (panel a). Panel (b) shows that since 2000, the share of external appointments has been stable, while managerial-level entries nearly doubled as lower-level entries declined.

[8] In addition to reflecting skill accumulation, years of work experience can be an important factor on their own, as they may indirectly reveal a candidate's age during the interview process. In the United States, the *Age Discrimination in Employment Act* prohibits age-based discrimination in the workplace for individuals over 40. Although it is not illegal, asking applicants directly about their age is uncommon and generally considered inappropriate. This lack of explicit age information during interview processes may be less pertinent in recent years, as birth dates have become publicly accessible in many cases.

Figure 2: Work Experience Prior to CEO Appointment Over Time



Notes: The figure plots work experience of CEOs over time. Panel (a) plots the average external vs. internal work experience prior to appointment. Panel (b) shows the average number of positions (separately for external and internal positions) as well as the number of firms and sectors a prospective CEO worked in. Panel (c) shows the average number of years per position and firm.

Meanwhile, both internally and externally appointed CEOs are joining at later career stages with more external experience (panel c), whereas internal experience grew only for the shrinking group of those entering at less senior positions (panel d). Overall, late entry, both within and across *ports of entry* (Lazear and Oyer, 2002), has thus become increasingly common.

Even though our results highlight the heightened importance of generalist skills, they do not indicate that this shift is uniform across all types of portable skills. In Figure A10, we show that an increasing share of CEOs previously held positions as CFO or COO, but this trend is confined to those who served in these roles at other companies. Accordingly, Decressin et al. (2023) document that CEOs appointed after the Great Financial Crisis score higher in analytical skills and execution orientation, at the expense of lower levels of interpersonal skills and charisma.

These observations are also closely linked to the literature on internal versus external hiring. Cappelli (2010) and Cappelli and Hamori (2004) date the shift from the previously dominant internal managerial development programs toward external hiring to around 1980. Murphy and Zabojnik (2004, 2007) and Frydman (2019) argue that the growing emphasis on generalist skills since that period has contributed to increases in CEO pay and a greater reliance on external hiring. Other studies, however, suggest a more nuanced perspective. For the S&P 500 firms, Cziraki and Jenter (2021) show that the majority of CEOs are promoted internally. Similarly, Hamori and Kakarika (2009) and Koch et al. (2017) underscore the importance of internal work experience for CEOs of large listed organizations. Contrasting these results, Gompers et al. (2023) examine private equity firms (similar in size to MidCap companies) and find that most CEOs are hired externally. A significant portion of these hires had previously worked in public companies and had industry-specific experience. Other studies also point towards a competitive market for CEOs. For example, Bai and Mkrtchyan (2023) show that outside hiring generates productivity gains, in particular among well-performing firms, and Gao et al. (2015) document that companies increase executive pay after managers leave to other firms. Thus, internal promotions appear to be dominant among large and listed firms, while outside hiring is more prevalent among smaller and private firms. Among other factors, this variation has been ascribed to differences in internal talent pools among potential applicants and corporate governance practices (Kaplan and Sorensen, 2021). Friedrich (2023) shows that hiring practices directly affect economic outcomes, as more productive firms recruit more talented trainees and promote managers internally. This mechanism enhances the sorting of talent to firms, boosting aggregate productivity but also exacerbating income inequality.

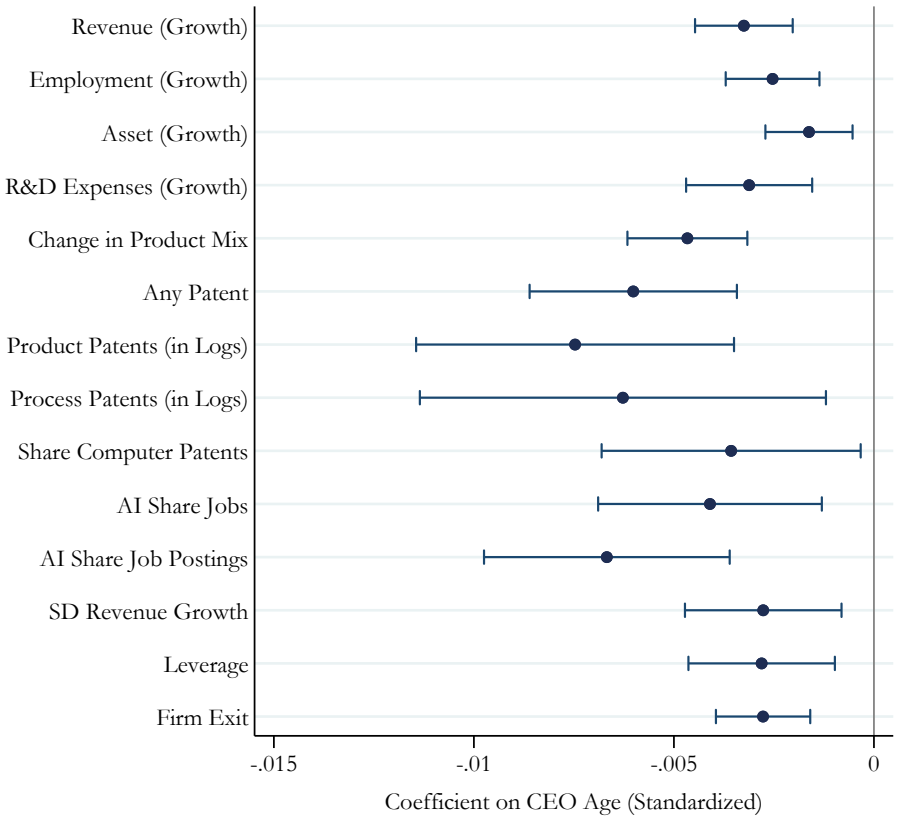
Our descriptive results are in line with these patterns. As shown in Table A2, smaller firms are more likely to hire CEOs externally, while larger firms tend to favor internal candidates.[9] Given that prospective CEOs are gaining increasing amounts of external experience A12, this finding is consistent with our result that smaller firms are the primary drivers of the upward trend in CEO age.

CEO Age and Firm-Level Outcomes: Motivated by upper echelons theory (Hambrick and Mason, 1984), a vast body of research explores the role of executive characteristics in determining company outcomes (Bertrand and Schoar, 2003). A key takeaway from this literature is the association between CEO age and reduced levels of business dynamism and firm risk. Our analysis revisits this relationship, yielding results in line with previous research. Figure 3 summarizes the estimated coefficients, obtained by regressing firm-level outcomes on CEO age alongside NAICS-4-year fixed effects and lagged controls.

We find that CEO age is negatively associated with growth rates of revenue, employment, and total assets. A large strand of literature, starting with Child (1974) and Hart and Mellors (1970) has established a negative correlation between CEO age and firm growth: older CEOs are associated

[9]This results holds when firm size is measured by employment and becomes even more pronounced when stratifying by a firm's listing status. Figure A11 illustrates that these two effects are cumulative, as a firm's listing status remains relevant even after accounting for the number of employees.

Figure 3: CEO Age and Firm-Level Outcomes



Notes: Plots correlations of firm-level outcomes with current CEO age, controlling for fixed effects at the NAICS-4-year level, as well as the natural logarithm of firm age, lagged employment, and lagged revenue. Each coefficient stems from a separate regression. For the sake of exposition, the coefficients are standardized by dividing by the standard deviation of the outcome variable. The sample starts in 2000 and ends in 2022. The outcomes are the symmetric growth rates of revenue, employment, assets, and R&D expenses (all obtained from Compustat), changes in the product mix (Hoberg et al., 2014), an indicator for filing any patent (derived from USPTO data), the natural logarithm of product and process patents (Hoberg et al., 2014), the share of computer patents (share of inventional patents of product class G06), the shares of AI jobs and job postings (Babina et al., 2024), the 5-year ahead standard deviation of revenue growth, leverage and firm exit (derived from Compustat).

with lower investment and sales growth (Acemoglu et al., 2022); asset growth (Barba Navaretti et al., 2022); profitability (Belenzon et al., 2019); firm value, operating performance, and corporate deal-making activity (Cline and Yore, 2016); return on assets (Waelchli and Zeller, 2013); employment growth (Li et al., 2017); firm valuation (Nguyen et al., 2018), and a higher propensity of receiving a takeover bid (Jenter and Lewellen, 2015). Furthermore, firms that undergo strategic change are characterized by management teams with a lower average age (Wiersema and Bantel, 1992; Datta et al., 2003). Recently, return-to-office policies have been found to be more prevalent among firms with older CEOs (Flynn et al., 2024), reflecting a more traditional management approach within this group.

Our analysis also reveals lower levels of innovative activity in firms led by older CEOs. This pattern is evident across several dimensions: research inputs, such as R&D expenses (consistent

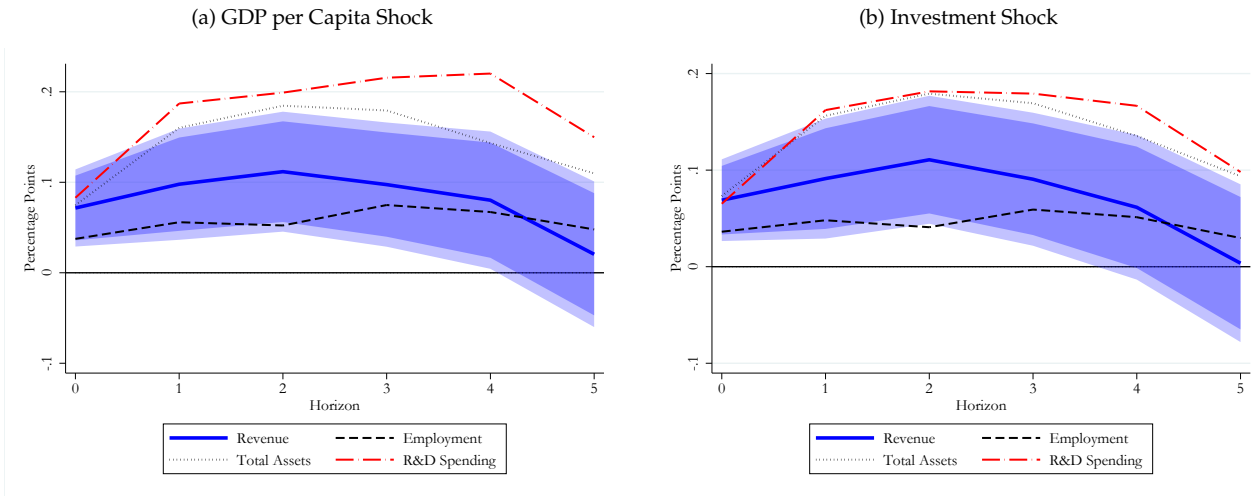
with Serfling (2014), Li et al. (2017) and Barker and Mueller (2002)); the extensive margin of research output, measured as changes in a firm's product mix and overall patenting probability, as well as the log numbers of product and process patents; and the intensive margin of research output, overall and in terms of patents related to digitization. In line with this, Acemoglu et al. (2022) find lower levels of radical innovation among firms with older CEOs. Consistent with evidence from other contexts (Kitchell, 1997), we observe reduced technology adoption in firms with older CEOs, specifically in the creation of AI-related jobs.

Given these drawbacks, why would firms appoint older CEOs? One reason may be that CEO age is systematically linked to lower firm risk. In our sample, older CEOs tend to manage firms with lower variation in 5-year ahead revenue growth, lower leverage, and a smaller probability of firm exit. Accordingly, the literature has found CEO age to be associated with lower idiosyncratic risk, stock return volatility (Peltomäki et al., 2021), stock price crash risk (Andreou et al., 2017), and higher firm survival rates (Belenzon et al., 2019). This finding of reduced risk-taking extends to the banking sector (Ahmed et al., 2023). One explanation for this pattern is that older managers adopt more conservative investment strategies (Vroom and Pahl, 1971). Serfling (2014) documents that older CEOs take fewer risks as they age, showing that firms managed by older CEOs are more diversified across business segments. Efforts to reduce risk also manifest in that firms with older CEOs tend to have higher financial reporting quality (Huang et al., 2012) and take longer to IPO (Yang et al., 2011). Conversely, younger CEOs are more likely to pursue acquisitions (Yim, 2013), aggressive takeovers (Levi et al., 2010), and strategic restructuring (Li et al., 2017).

Desir et al. (2024) report lower levels of managerial ability among older CEOs. This correlation is particularly strong in high-tech firms, but it is reversed in mature and more regulated firms. An obvious but rather understudied question is whether these correlations merely reflect assortative sorting of CEOs and firms, or whether they can be interpreted as causal. Younger CEOs are more common in smaller, high-growth firms, while larger, complex firms tend to select older CEOs (Joos et al., 2003). Acemoglu et al. (2022) find that radical innovation often precedes the appointment of younger CEOs, suggesting a sorting effect, while the causal effects of younger CEOs on innovation are comparatively small.

Lastly, we scrutinize whether these associations are also reflected in how firms react to aggregate shocks. To this end, we estimate the impact of business cycle fluctuations on firm-level outcomes, focusing on heterogeneity by CEO age. Figure 4 presents results from local projections using the shock series from Angeletos et al. (2020). Panel (a) shows the differential responses of revenue, employment, total assets, and R&D spending to an exogenous one standard deviation decrease in the cyclical component of real GDP per capita. Across all outcomes, the coefficients are positive, highly significant, and persistent over several years, even conditional on fixed effects at the NAICS-4-year and firm level. Quantitatively, the effects are sizeable: with an estimated coefficient of around 0.1, a ten-year older CEO increases revenue growth by about 1 percentage point following a negative one standard deviation business cycle shock. Panel (b) presents analogous estimates using

Figure 4: Cyclical Fluctuations of Firm-Level Outcomes—Differential Effect by CEO Age



Notes: The figure shows results from local projections, obtained from h-step-ahead symmetric growth rates of the outcome variables compared to $t-1$ on CEO age, alone and interacted with different shock series. The plots shows the estimated coefficients on this interaction term. Panels (a) and (b) show the results for the real GDP per capita shock and the investment shock series, respectively, which have been obtained from Angeletos et al. (2020). The shock series have been averaged by year, standardized to mean zero and a standard deviation of one, and included in first lags. We control for the natural logarithm of employment and firm age (both obtained from employment history data) as well as CEO tenure. We also include fixed effects at the NAICS-4-year and firm level. The sample runs from 1980 to 2016. The plot shows point estimates alongside 90% and 95% confidence bands, obtained from standard errors clustered at the firm level. Confidence intervals are based on the estimated standard errors for the result on firm revenue.

the investment shock series, revealing a similar pattern. Together, these results suggest that older CEOs enhance firms' resilience to aggregate fluctuations.

3 Reduced-Form Evidence

3.1 Demand-Side Factors

So far, we have documented that future CEOs have become more mobile between positions and firms, possibly in order to gather generalist skills across a wide range of functional areas. In this section, we propose a demand-based narrative: there may be growing firm-level demand for generalist skills because of heightened uncertainty, resulting in firms appointing executives that have taken longer career paths before reaching CEO positions and are, thus, older upon being appointed.

We are interested in identifying the causal effect of increased levels of economic uncertainty on CEO appointment decisions, in particular their level of generalist skills as proxied by their age. Clearly, a simple correlation of uncertainty with CEO age is prone to endogeneity issues arising from reverse causality or sorting of older and more risk-averse executives into more mature industries.

The ideal experiment would therefore induce random variation in firm-level uncertainty, bolstering demand for generalist skills among some firms. Comparing the age of newly appointed

CEOs in high- vs. low-uncertainty firms would then yield the estimand of interest. However, this holds only under a relatively elastic supply of qualified CEOs. Moreover, finding exogenous variation in uncertainty that only acts through increased demand for generalists is likely an extremely challenging task.

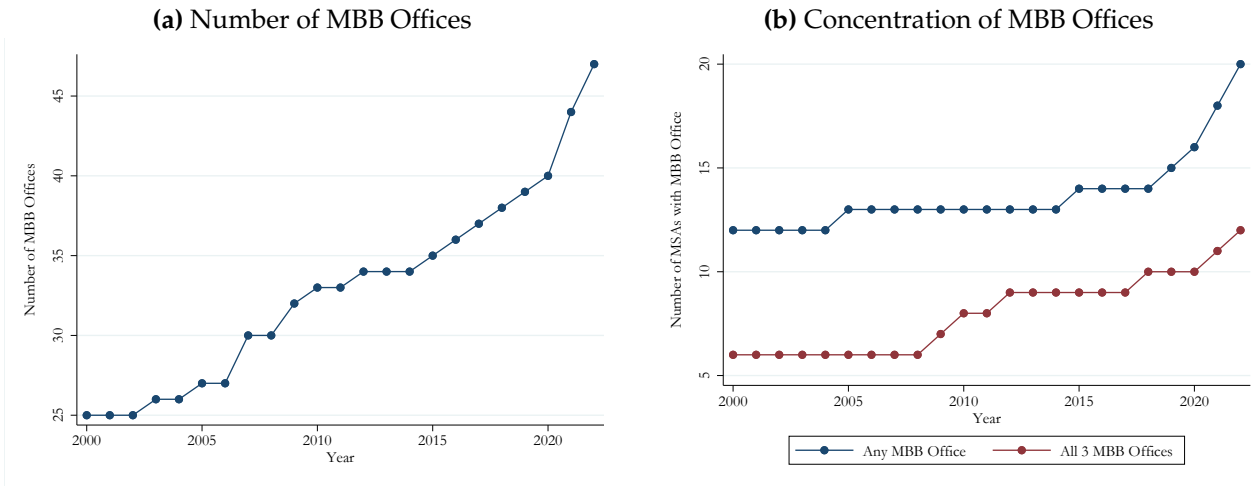
To address these issues, our empirical approach takes a different avenue by exploiting information on both the demand and the supply side. To this end, we use plausibly exogenous variation in the availability of generalist skills and study its *differential* effects on CEO appointments in high- vs. low-uncertainty environments. As a supply shifter, we rely on spatial variation in firms' access to elite strategy consultancies across the United States. These consultancies, with a broad outlook across firms and industries, provide firms with additional manpower in their management teams, allowing them to quickly adjust to changing market environments (Ernst and Kieser, 2002; Glückler and Armbrüster, 2003). In other words, the presence of young external strategy consultants reduces firms' dependence on hiring older CEOs as a means to navigate uncertainty. Consultants effectively serve as substitutes for such executives by supplying the generalist skills that might otherwise be provided by experienced managers. This substitution effect should be particularly strong in high-uncertainty environments, where the demand for rapid adaptation and for generalist skills is more pronounced. Therefore, we expect that firms in areas with better access to elite consultancies are less likely to appoint older CEOs when faced with higher uncertainty. This reasoning draws from the findings of Sauvagnat and Schivardi (2024), who document the importance of the local supply of managerial talent, specifically the thickness of the market for executive skills.

On the supply side, the empirical strategy is based on the idea that the consulting industry is *ex-ante* highly concentrated, but to a heterogeneous extent across time and space. We focus on the three firms commonly considered the most prestigious: *McKinsey & Company*, *Boston Consulting Group*, and *Bain & Company*. Throughout our sample period, these companies (henceforth MBB) have seen a rapid expansion, increasing their number of offices from 25 in 2000 to 47 in 2022, as shown in Figure 5, panel (a). Despite this growth, their offices remain clustered in relatively few cities. As illustrated in panel (b) of Figure 5, while the number of MSAs with any MBB presence has increased substantially, so has the number of MSAs hosting all three MBB offices. In 2022, this latter group accounted for more than 80% of all offices, concentrated in merely 13 cities.

We hypothesize that reducing the geographical proximity between consultancies and their clients enhances the dominance of the consultancies, as consultants typically work on-site, arriving from their office location and staying from Monday until Thursday. In other words, having an MBB office nearby implies an increase in the availability of generalist skills supplied by younger potential CEOs.

However, the timing and location of new office openings may be correlated with existing firm networks (Glückler, 2006) or local economic conditions, since consultancies tend to expand into areas with high demand for their services. To address this potential endogeneity issue, we do not use direct exposure to an MBB office (i.e., a consultancy being located in the same MSA) but, instead, construct a proxy for indirect exposure by exploiting variation in flight times. Connections via flight

Figure 5: Expansion of MBB Offices Across the United States



Notes: The figure shows the evolution of MBB offices (*McKinsey & Company*, *Boston Consulting Group*, and *Bain & Company*) in the United States over time. Panel (a) shows the total number of offices, and panel (b) plots the number of MSAs with at least one or all three offices, respectively. The data are obtained from *archive.org* and cross-checked with information from Weinstein (2022).

routes are relevant because consultants typically arrive by airplane during the workweeks. This approach, inspired by Giroud (2013), creates additional variation that we exploit in our empirical analysis.

With this reasoning in mind, we can spell out the regression equation of interest. Specifically, considering a CEO appointment in firm j, MSA m, industry i and year t, we run the following regression:

$$Age_{jt} = \beta\, Uncertainty_{it} \times Travel\ Time_{mt} + \gamma_{mt} + \phi_{it} + X_{jt} + \epsilon_{jt}, \tag{1}$$

where Age_{jt} denotes CEO age at appointment constructed from the BoardEx data, $Uncertainty_{it}$ is an uncertainty measure at the industry-time level, and $Travel\ Time_{mt}$ is the flight time to closest MBB office. The fixed effects γ_{mt} and ϕ_{it} are at the MSA-year and NAICS-4-year level, respectively, eliminating the standalone coefficients on $Uncertainty_{it}$ and $Travel\ Time_{mt}$. Finally, the vector of controls, X_{jt}, includes the natural logarithm of the number of employees, revenues, and firm age.

The coefficient of interest is β. The estimated coefficient captures the differential effect discussed above, if—conditional on the fixed effects and controls—uncertainty affects age only via the demand for generalist skills, while travel time only acts through the supply side of young generalists (i.e., strategy consultants). Note that the fixed effects control for all time-varying characteristics at the levels of MSAs and industries, implying that our empirical approach relies solely on the fluctuations generated by their interaction. We expect firms to appoint older CEOs if uncertainty is high and the available supply of other generalists is low due to exogenous reasons, as these are the only ones with a sufficiently generalist skill set. Since travel time is negatively related to the MBB exposure, this implies a positive sign for the estimated β.

We emphasize that this exercise is *not* aimed at suggesting that increased MBB exposure causally contributed to the selection of older CEOs. If anything, one would expect the opposite effect, given the expansion of offices and flight routes in conjunction with the substitutive relationship between consultants and more experienced executives. Instead, we exploit the supply of consultants as a source of variation to test our mechanism of interest.

We argue that demand for generalist skills has surged, driven by elevated levels of uncertainty (Baker et al., 2016).[10] As our main measure of uncertainty, we use the cross-sectional standard deviation of the symmetric growth rate of firm revenue within each NAICS-4 sector. This variable has the main advantage that it captures broader, industry-wide fluctuations and is unaffected by idiosyncratic shocks experienced by individual firms. Figure A13 plots the measure over time, alongside uncertainty indices from Baker et al. (2016) and Baker et al. (2019). All three series reveal a structural increase in uncertainty since around 2000 compared to the 1980s and 1990s.

On the supply side, our aim is to distill a plausibly exogenous source of variation for the supply of young generalists, which we measure as firms' travel time to the next MBB office. The time-varying flight times are computed as described in the data section. In the main analysis, we only consider direct connections. For robustness, we also calculate indirect ones with one layover—adding 60 minutes in this case—and use only the fastest connection between two MSAs. We then combine the data on flight times with information on the expansion of MBB offices across the United States. Using this information, we calculate the minimal flight time to any MBB office at the MSA-year level. The final sample covers all observations between 2000 and 2022, excluding those in which an MBB office is present in a given year.

The baseline results obtained from estimating Equation 1 are shown in Table 1. Column (1) includes the results from a simple regression with controls, showing a positive and marginally significant coefficient on the interaction term. By consecutively adding fixed effects for MSAs, NAICS-4 sectors, years, and combinations thereof, the estimated coefficient increases substantially in magnitude and remains consistently significant at the 5%- or 1%-level. The negative baseline coefficient on uncertainty is consistent with the matching of younger CEOs with riskier industries, as noted in the literature review. Quantitatively, the estimated coefficient from our preferred specification (Column 4) is large and lends itself to an intuitive interpretation: One additional hour of travel time, evaluated at one standard deviation above mean uncertainty, translates into an increase in CEO age of 1.6 years.

We provide additional evidence for our mechanism in five ways. First, we corroborate the robustness of the result from Table 1, Column (4) by conducting a number of robustness checks, presented in Table 2. In Column (1), we use the standard deviation of revenue growth at the NAICS-2 level, rather than the NAICS-4 level, as a proxy for uncertainty. The estimated coefficient increases slightly, supporting the idea that broader economic turbulence shifts the demand for generalist skills. Similarly, in the remaining regressions, the results remain highly significant and quantitatively consistent across the board. In Column (2), we use the standard deviation of employment growth

[10] As we document in Figure A3, firms previously exposed to higher uncertainty also exhibit a stronger surge in CEO age after 2000.

Table 1: MBB Availability, Uncertainty and CEO Age

	CEO Age			
	(1)	(2)	(3)	(4)
Travel Time	0.232	0.701		
	(0.297)	(1.193)		
Industry-Level SD	-0.752*	-1.426***	-1.511**	
	(0.414)	(0.383)	(0.649)	
Travel Time × Industry-Level SD	0.408*	0.995***	1.084**	1.732***
	(0.240)	(0.276)	(0.437)	(0.439)
R^2	0.031	0.095	0.305	0.469
Observations	6,961	6,960	6,323	4,791
MSA fixed effects		✓		
Year fixed effects		✓		
MSA-Year fixed effects			✓	✓
Naics4 fixed effects			✓	
Naics4-Year fixed effects				✓

Notes: The dependent variable in all regressions is CEO age upon appointment, obtained from BoardEx. *Travel time to closest office* denotes the flight time (in hours) to the closest office, which we construct from MBB office openings combined with flight data from the Bureau of Transportation Statistics. *Industry-Level SD*, calculated as the cross-sectional standard deviation of the symmetric growth rate of firm revenue within a firm's NAICS-4 sector, is standardized to mean zero and standard deviation one. The sample is restricted to those MSAs without MBB presence. All regressions control for firm size by including the natural logarithm of employment, revenue, and firm age. Standard errors are double-clustered at the NAICS-4 sector and MSA level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

at the NAICS-4 level as the measure of uncertainty. In Column (3), we incorporate minimum travel times via indirect flight connections. In Column (4), instead of using firm-level controls from Compustat, we control for the natural logarithm of employment and firm age, constructed from the employment histories. In this way, the sample size increases substantially. In Column (5), we use lagged values of travel time, leaving the point estimate unchanged but resulting in a slight increase in precision. In Column (6), we replace the linear measure of travel time to the nearest MBB office with a dummy for travel time in the highest quartile. In Column (7), we examine the influence of the current age of the firm's board members, a factor that could play a significant role in CEO selection. In the case of internal appointment, board members are directly part of the pool of potential candidates, while for external appointments older members may favor older CEOs due to similarity attraction (Davidson et al., 2006). However, the estimated coefficient remains qualitatively unchanged, suggesting that board age does not confound our relationship of interest.

Second, we estimate our main regressions separately for small and large firms, defined as those with below- and above-median numbers of employees, respectively. The results, presented in Table A4, reveal that the overall effects are entirely driven by smaller firms, for which we also observe a stronger increase in age at appointment. This finding aligns with our proposed mechanism, as we expect the value added of younger consultants, who serve as substitutes for executive experience, to be greater in smaller firms.

Table 2: MBB Availability, Uncertainty, and CEO Age – Robustness

	CEO Age						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Travel Time × Industry-Level SD	2.014***	1.493**	1.506***	0.632***	1.720***	1.042***	5.663***
	(0.545)	(0.659)	(0.449)	(0.212)	(0.415)	(0.288)	(1.351)
R^2	0.469	0.468	0.472	0.360	0.469	0.468	0.679
Observations	4,791	4,786	4,900	14,132	4,791	4,791	705
MSA-Year fixed effects	✓	✓	✓	✓	✓	✓	✓
Naics4-Year fixed effects	✓	✓	✓	✓	✓	✓	✓
Change Compared to Baseline	NAICS-2 SD	Empl. SD	Indirect	Broader Sample	Lagged	Discretized	Board Age

Notes: The dependent variable in all regressions is CEO age upon appointment, obtained from BoardEx. *Travel time* denotes the flight time (in hours) to the closest office, which we construct from MBB office openings combined with flight data from the Bureau of Transportation Statistics. *Industry-Level SD*, calculated as the cross-sectional standard deviation of the symmetric growth rate of firm revenue within a firm's NAICS-4 sector, is standardized to mean zero and standard deviation one. The sample is restricted to those MSAs without MBB presence. All regressions control for firm size by including the natural logarithm of employment, revenue, and firm age obtained from Compustat. We deviate from this setup in the following ways: Column (1) uses the standard deviation of revenue growth within NAICS-2 sectors; Column (2) uses the standard deviation of employment growth; Column (3) includes indirect flight connections, Column (4) does not control for revenue and uses data on employment and firm age constructed from the employment histories, Column (5) uses the first lag of travel time, Column (6) replaces the linear measure of travel time to the nearest MBB office with a dummy for travel time in the highest quartile, Column (7) additionally controls for average board age. Standard errors double-clustered at the NAICS-4 sector and MSA level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Third, we further scrutinize our empirical approach through the lens of a difference-in-differences framework, for which we show event study estimates in Figure 6. To this end, we estimate the effect of MBB entry in MSAs linked by a direct flight connection, improving access to the closest consultancy compared to the counterfactual of no MBB entry. Separate estimations for sectors with high and low levels of uncertainty reveal no clear differential pre-trend between the two groups and no response in low-uncertainty sectors. In contrast, CEO age in high-uncertainty sectors declines gradually and persistently following the treatment, amounting to a reduction of up to 7 years relative to the counterfactual.[11]

Fourth, we extend our baseline setup to additional outcome variables that capture the changes in CEO careers we are interested in. The estimates, presented in Table A5, closely align with our proposed mechanism: increased demand for generalists led to the appointment of CEOs with more external experience, accumulated by transitioning across a greater number of positions and sectors.[12] In contrast, internal experience in terms of total years declined in response to the shift in skill demand.

Fifth, we plot the coefficient on the interaction term separately for 5-year sub-periods. The estimated coefficients, shown in Figure A15, reveal a V-shaped pattern over time, reaching a trough in 2010–2014 and peaking toward the end of our sample. Economically, the estimated coefficients——evaluated at a given level of travel time——can be interpreted as the elasticity of CEO age with respect to variation in uncertainty. With four of the five coefficients above zero, all but one

[11]We also implement a stacked difference-in-differences analysis, allowing us to leverage additional variation from repeated treatments while mitigating potential issues associated with two-way fixed effects regressions. The resulting coefficients, shown in Figure A14, are qualitatively similar to the baseline results. Quantitatively, however, the coefficients are smaller——an intuitive result given the inclusion of a broader set of weaker treatment events.

[12]The coefficient on the number of firms is positive but insignificant.

statistically significant, this elasticity is positive for most of the post-2000 period. Together with the sharp increase since 2015, this provides tentative evidence that the value of generalist human capital has become increasingly pronounced in recent years, suggesting a gradual rise in the importance of these skills.

Based on the finding that greater industry-level uncertainty leads to older CEOs in the absence of other generalists, we are in a position to characterize the firm-level consequences of higher CEO age. To this end, we use a two-stage estimation approach. First, we estimate firm-by-CEO fixed effects for various time-varying firm-level outcomes to capture the average performance of each CEO throughout their tenure. Second, we regress these fixed effects on the CEO's age at appointment, instrumenting age at appointment with firms' demand for generalists. In the first step, consider a CEO w in firm j, industry i, and year t. We then estimate the following equation for a time-varying firm outcome v_{jt}

$$v_{jt} = \nu_{wj} + \phi_{it} + X_{jt} + \epsilon_{jt}, \tag{2}$$

where ν_{wj} are firm-by-CEO fixed effects and ϕ_{it} denote NAICS-4-year fixed effects. The vector of controls, X_{jt}, includes the natural logarithm of the number of employees and firm age, both obtained from employment history data, as well as the CEO's tenure at the firm. The coefficients of interest are the estimated firm-by-CEO fixed effects $\hat{v}_{wj}$, which capture a firm's performance throughout a CEO's tenure, net of time-varying industry conditions and firm-level characteristics.

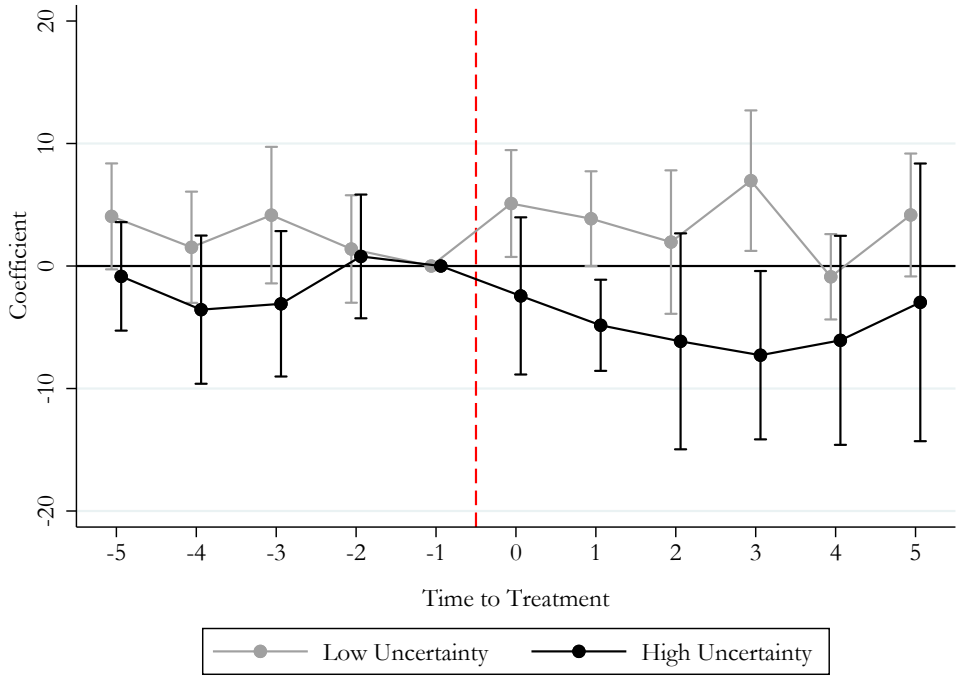
In the second step, we use this measure to estimate the causal effect of CEO age at appointment on the match-specific firm outcomes $\hat{v}_{wj}$, leveraging our plausibly exogenous measure of demand for more experienced CEOs as an instrument. Specifically, we run the following regression

$$\hat{v}_{wj} = \beta \widehat{Age}_{jt} + \gamma_{mt} + \phi_{it} + \epsilon_{jt}, \tag{3}$$

where $\widehat{Age}_{jt}$ is the predicted age at appointment based on Equation 1. That is, we exploit variation in the demand for generalist skills, as captured by the interaction of industry-level uncertainty and travel time to the offices of top strategy consulting firms, to instrument for CEO age at appointment and identify its causal effect on our measures of CEO performance. Analogously to our first-stage regression described by Equation 1, we control for time-varying characteristics at the level of metro areas and NAICS-4 sectors.

We conduct this analysis for two different types of outcomes. On one side, we consider balance sheet variables, specifically the symmetric growth rates of employment and R&D expenditures. On the other side, we exploit information on firms' patenting activity, both overall and restricted to computer-related patents. The results are shown in Table 3. In columns (1) and (2), we detect negative effects on employment and R&D expenditure growth. However, we find no evidence of a causal effect of CEO age on overall patenting behavior, whether measured by an indicator for filing any patent in a given year (column 3) or the number of patents (column 4). Lastly, our results reveal a significantly negative effect on the number of computer patents (column 5) and on the share of computer patents among total patents (column 6). The instrument is relevant throughout, with

Figure 6: MBB Market Entry, Uncertainty and CEO Age – Event Study



Notes: The plot shows event study estimates obtained from regressing CEO age at appointment (obtained from BoardEx) on indicators for time relative to treatment, separately for low- and high-uncertainty NAICS-4 sectors. The treatment is defined as exposure to MBB market entry in an MSA linked by a direct flight connection. An MSA is classified as treated if the minimum travel time to an MBB office is reduced by at least 5% in response to that entry. To ensure sufficient pre-treatment periods, only treatments that occurred in 2005 or later are considered. Uncertainty is measured as the cross-sectional standard deviation of the symmetric growth rate of firm revenue within a firm's NAICS-4 sector. We take the median of this measure across all periods and define high-uncertainty sectors as those with above-median levels of this variable. The sample is restricted to those MSAs without MBB presence. The regression controls for fixed effects at the NAICS-4-MSA and NAICS-4-year level as well as the natural logarithm of employment, revenue, and firm age obtained from Compustat. The endpoints are binned at $t = -6$ and $t = 6$, while $t = -1$ is omitted as the reference category. Point estimates are shown alongside 95% confidence intervals, which are obtained from standard errors double-clustered at the NAICS-4 sector and MSA level.

an F-statistic above 10 in all specifications. In terms of magnitude, having a CEO who is one year older is associated with a decrease in employment and R&D expenditure growth of 1.7 and 3.6 percentage points, respectively, as well as a 2.2% reduction in the share of computer-related patents.

Taken together, this exercise provides strong support for our main hypothesis, but is not intended to suggest that consultancies have contributed to the increase in CEO age. We now present suggestive evidence that elite consultancies may have had a positive effect on CEO age. The key idea is that *former* consultants impose a negative externality on other executives, prolonging their career trajectories and ultimately leading to the appointment of older CEOs.[13] As previously noted, MBB consultancies have expanded rapidly during our sample period. This is likely due to increasing

[13]There are numerous examples of former elite consultants who, often after completing an MBA, were appointed to CEO positions. Two infamous cases are Jeffrey Skilling (Enron) and Tidjane Thiam (Crédit Suisse), both of whom worked at McKinsey before becoming high-profile CEOs.

Table 3: CEO Age and Firm-Level Outcomes—Results from IV Regressions

	Emp. Gr.	R&D Gr.	Any Patent	Log(Patent)	Log(Comp. Patents)	Share Comp. Patent
	(1)	(2)	(3)	(4)	(5)	(6)
CEO Age	-0.017*	-0.036***	-0.016	0.039	-0.057**	-0.022***
	(0.010)	(0.011)	(0.016)	(0.038)	(0.023)	(0.008)
R^2	-0.230	-0.864	-0.165	-0.063	-0.357	-0.460
Observations	2,495	1,136	9,873	1,946	1,946	1,946
MSA-Year fixed effects	✓	✓	✓	✓	✓	✓
Naics4-Year fixed effects	✓	✓	✓	✓	✓	✓
Kleibergen-Paap F-Statistic	11.806	33.064	14.04	10.03	10.03	10.03

Notes: The table shows results from estimating Equation 3. The dependent variables are the firm-by-CEO fixed effects $\hat{v}_{wj}$, which we estimate as described in Equation 3 for the following variables: (1) symmetric growth rates of employment, (2) symmetric growth rates of R&D expenditure, (3) an indicator for filing any patent, (4) the natural logarithm of the number of patents, (5) the natural logarithm of the number of computer-related patents, and (6) the share of computer-related patents. The independent variable is CEO age, which we instrument with the interaction of the flight time (in hours) to the closest MBB office with the cross-sectional standard deviation of the symmetric growth rate of firm revenue within a firm's NAICS-4 sector. The sample is restricted to those MSAs without MBB presence. All regression controls for fixed effects at the MSA-year and NAICS-4-year level. Standard errors are double-clustered at the NAICS-4 sector and MSA level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

financial complexity, further amplified by the regulation enacted under the Sarbanes-Oxley and Dodd-Frank Acts. Given the widespread usage of up-or-out promotion systems in consultancies, the expansion resulted in substantial outflows of highly qualified workers into other firms, often including former clients (Kipping, 1999).

We argue that exposure to former consultants creates a disadvantage for their competitors without similar consulting experience. This is because consulting firms allow for the accelerated accumulation of management-relevant human capital, while their competitors who have climbed the ranks through other channels take longer to match the required skills needed for a CEO position. Thus, former consultants should place upward pressure on the average CEO age among those without consulting experience. From an empirical perspective, this suggests that the inflow of former consultants into a firm should be positively associated with CEO age, but only among executives without a consulting background.

We test this conjecture by combining the CEO data with employment flow data from Revelio Labs. For a CEO w, appointed in firm j, industry i, MSA m, and year t, we estimate regressions of the following form:

$$Age_{wt} = \alpha\, MBB\ Exp_{wt} + \beta\, Inflows_{jt} + \delta\, MBB\ Exp_{wt} \times Inflows_{jt} + \gamma_{mt} + \phi_{it} + X_{jt} + \epsilon_{wt}, \quad (4)$$

where Age_{wt} denotes the CEO's age at appointment, $MBB\ Exp_{wt}$ indicates individual w's experience at one of the MBB firms, and $Inflows_{jt}$ captures the share of employees with MBB experience. Specifically, the latter is defined as the firm-level sum of employees with any MBB experience hired over the previous 10 years, divided by the total number of new employees hired in the firm over the same period. As before, the regression includes fixed effects at the MSA-year and the NAICS-4-year

level. We also control for the natural logarithm of employment and firm age. The main coefficient of interest is δ, capturing the differential effect of MBB inflows on individuals with MBB experience, compared to those without. Since we test for a negative externality on other executives, we expect δ to be negative.

The results are reported in Table 4. Inflows from MBB firms are consistently and positively associated with CEO age. Individuals with experience in one of these firms tend to be appointed as CEOs at substantially younger ages, by more than 3 years. As anticipated, the estimated coefficient on the interaction term is negative, indicating that the age externality is not present for those with MBB experience. These findings are robust across all specifications, conditional on controls and across varying sets of fixed effects.[14] Quantitatively, the estimated externalities are non-negligible. Using the coefficient from our preferred specification, which includes fixed effects the NAICS-4-year and MSA-year level, a one standard deviation increase in MBB inflows translates into a CEO age increase of around 0.5 years for those without MBB experience. This figure is likely a lower bound, as MBB firms represent only a small fraction of the professional services industry in terms of employee outflows.

3.2 Supply-Side Factors

While the previous section has documented the increasing demand for generalist skills in the market for CEOs, we now shift focus to the supply-side dynamics. In the earlier descriptive analysis, we observed not only an age trend among CEOs but also that they have become more mobile prior to their appointments.

This section explores whether the rise in labor market turnover prior to CEO appointment might be driven by executives' voluntary job switches in pursuit of building up generalist skills. The reason is that the increased turnover could partially stem from executives intentionally transitioning across firms and roles to broaden their skill sets, rather than from external factors like employer-employee mismatches, wage disparities, or increased product market competition. With elevated mobility, overall levels of generalist skills in the labor market rise, resulting in an increased supply of these skills and consequently older CEOs.

This argument is based on a large body of literature that highlights the importance of on-the-job human capital accumulation in driving wage growth (see, e.g., Adda and Dustmann, 2023; Jedwab et al., 2023). Against this backdrop, firm characteristics have been shown to play a crucial role in shaping human capital development. These characteristics include coworkers (Jarosch et al., 2021; Nix, 2020; Gong et al., 2018), export shares (Macis and Schivardi, 2016), firm size (Arellano-Bover, forthcoming), and firm connectivity (Del Prato, 2023). Notably, Arellano-Bover (2024) documents large differences in firms' abilities to offer on-the-job learning opportunities, emphasizing the crucial role of general human capital. In line with this, Groes et al. (2015) find that occupational mobility follows a U-shaped pattern with respect to wages, suggesting that higher earners are more likely to transition to other jobs.

[14] The results from a number of additional robustness checks are shown in Table A6.

Table 4: Age Externalities from MBB Inflows

	CEO Age					
	(1)	(2)	(3)	(4)	(5)	(6)
MBB Inflows	0.148***	0.121***	0.104***	0.109***	0.116***	0.275*
	(0.0299)	(0.0274)	(0.0277)	(0.0290)	(0.0307)	(0.148)
MBB Experience	-3.198***	-3.626***	-3.252***	-3.558***	-3.505***	-2.455***
	(0.313)	(0.309)	(0.311)	(0.353)	(0.384)	(0.595)
MBB Inflows × MBB Experience	-0.165***	-0.136***	-0.165***	-0.147***	-0.145**	-0.386**
	(0.0499)	(0.0472)	(0.0467)	(0.0492)	(0.0567)	(0.160)
R^2	0.082	0.112	0.170	0.293	0.382	0.756
Observations	17,469	17,469	17,260	15,573	14,721	10,068
Controls	✓	✓	✓	✓	✓	✓
Year fixed effects		✓	✓			
NAICS-4 fixed effects			✓			
Naics4-Year fixed effects				✓	✓	✓
MSA-Year fixed effects					✓	✓
Company fixed effects						✓

Notes: The dependent variable in all regressions is CEO age at appointment among CEOs. *MBB Experience* is a dummy equal to one, if the individual had ever worked in an MBB firm. *MBB Inflows* is defined as the company-level sum of new managers with MBB experience during the previous 10 years, divided by the total number of new managers in a company summed over the previous 10 years. Controls are the natural logarithm of employment and firm age, both obtained from the employment biographies. Standard errors clustered at the firm level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

For workers to capitalize on variation in on-the-job learning opportunities across firms, they must be aware of these differences and believe that increased mobility will be beneficial to their goal of climbing up the corporate ladder. We therefore expect exposure to information supporting this narrative to increase job turnover in subsequent periods. We operationalize this idea by leveraging the role of information flows via coworker networks. The importance of social networks in shaping labor market outcomes is well-documented, both theoretically (Montgomery, 1991; Schönberg et al., 2010) and empirically in the overall labor market (Bramoullé and Saint-Paul, 2010; Hensvik and Skans, 2016) and in the labor market for CEOs (Liu, 2014; Kim et al., 2023). These studies also show that network ties are formed for various reasons, including prior employment at the same firm (Cingano and Rosolia, 2012), shared educational backgrounds (Oyer and Schaefer, 2009), or residential proximity (Bayer et al., 2008).

In our setting, the positive information shock of interest occurs when a former coworker leaves the firm and later becomes CEO. Consistent with the idea of observational learning, individuals, witnessing their former colleagues' career progress, should become more likely to emulate these career moves and become more mobile across firms and sectors.

Using employment biographies, we document that individuals respond to this shock by increasing their own job mobility. Specifically, they are more likely to move across job categories and into less senior positions, indicating that these switches are unlikely to be solely driven by monetary

incentives. Instead, our findings support the idea that individuals change firms to accumulate general human capital. Note that this approach is agnostic regarding the underlying causes of job mobility; that is, whether mobility occurs in response to shifts in skill demand or as a result of a general increase in turnover.

Before turning to the identification, we present descriptive evidence for the main argument of this section. As noted earlier, job mobility among future CEOs has increased, possibly as they seek to gather a broader skill set across firms or enter other labor markets, even at the cost of reduced income. Consequently, we expect an increase in transitions that cannot be fully explained by financial considerations. Given their impact on the length of career paths to the top, we focus on transitions between firms that involve moving to lower seniority levels ("downward switches") or maintaining the same level ("lateral switches"). These considerations tie in with a large literature highlighting the role of firm-level hierarchies in organizing production processes (for a survey, see Garicano and Rossi-Hansberg, 2015), with implications for individual career progression (Caicedo et al., 2019) and wage growth (Bayer and Kuhn, 2023).

We show that lateral and downward transitions have become more frequent throughout our sample window. Figure 7 plots the evolution of the share of CEOs who ever moved downwards or laterally prior to their appointment over time, across positions within or across firms (panel a) and only across firms (panel b). While all variables exhibit a striking and similar upward trend in absolute terms, the increase in the share of those CEOs who ever moved downward is much larger. Consistent with these findings, Figure A16 plots the shares of downward and lateral switches over total switches—as above—across positions (panel a) and firms (panel b). The probability of moving downward conditional on switching has more than doubled over time, while the conditional probability of switching laterally has only seen modest increases.[15]

We now examine whether these labor market mobility patterns are due to voluntary switches, i.e., whether they are partly caused by heterogeneous information shocks on the returns to job switching. Our labor market data are particularly well-suited to answer this question, given that they capture individuals' information set about their network connections. Due to the high and early prevalence of LinkedIn usage, we focus on the United States.

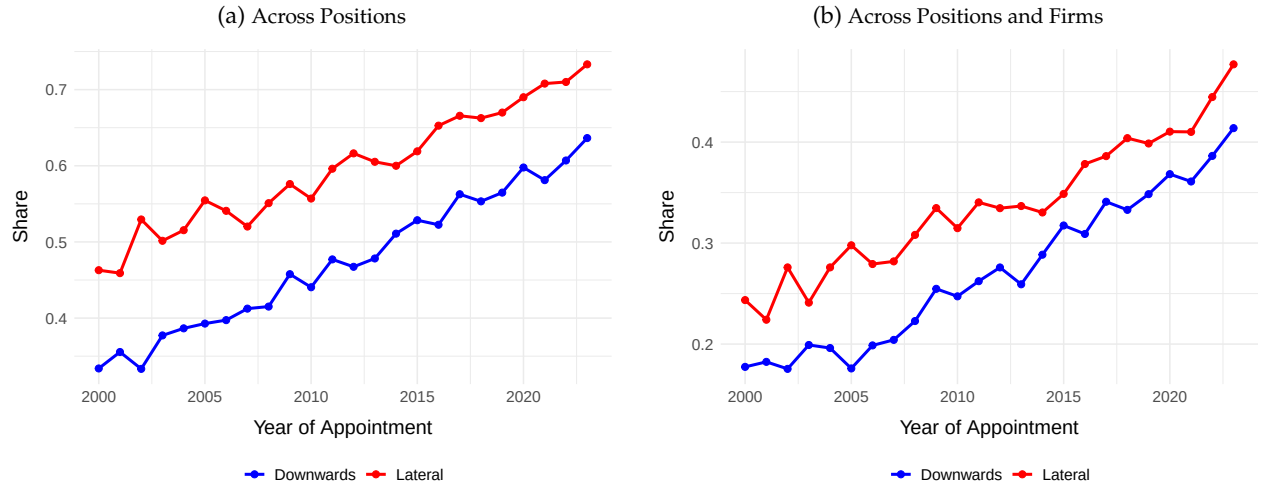
Specifically, consider a worker w in year t, who worked alongside a future CEO in firm j, metro-area m, and seniority level s. We implement a difference-in-differences design by estimating equations of the following form:

$$y_{wt} = \beta \, Treat_{jms} \times Post_{jst} + \gamma_w + \delta_{jst} + \epsilon_{wt}, \tag{5}$$

where y_{wt} is the outcome of interest, $Treat_{jms}$ is an indicator for treated individuals, and $Post_{jst}$ is an indicator for all periods following the CEO appointment of a former colleague. The fixed effects included, γ_w and δ_{jst}, are at the worker and firm-seniority-year level, respectively. The coefficient of interest is β, capturing the increase in job mobility following the CEO promotion event for workers

[15]The results are similar when we only consider moves from smaller to larger firms.

Figure 7: Share of CEOs That Ever Moved Downwards/Laterally



Notes: Plots the share of CEOs by year of appointment that have ever switched downwards or laterally prior to their first CEO appointment. Panel (a) includes all switches across positions, and panel (b) focuses on those across positions and firms. Switches are identified from a panel constructed from employment biographies from Revelio Labs, prioritizing more senior positions and those that started earlier in the case of overlapping spells.

associated with the CEO compared to the counterfactual.

To construct the sample, we start by identifying a list of CEO employment spells, considering only the first CEO appointment for each individual.[16] We then extract the employment histories of these CEOs and retain all spells that meet the following criteria: they ended during the 10 years prior to the CEO appointment; they are at least at seniority level 4; and after these spells, the future CEO left the firm, but did not immediately become CEO. We label these as *connection spells*. The sample includes all individuals who had an employment spell in the same company and at the same seniority level, overlapping with a *connection spell* by at least 90 days. Thus, the sample encompasses all individuals who worked contemporaneously for at least 3 months in the same firm and at the same seniority level as a future CEO.

Among those individuals, the variable $Treat_{jms}$ is set equal to one for all units who were employed in the same MSA as their associated future CEO. In other words, the treatment group is composed of all individuals who have worked alongside a future CEO (that is at the same company, the same seniority level, and in the same MSA), in contrast to the control group comprising individuals that worked at the same company and seniority level but in other MSAs. The variable $Post_{jst}$ is an indicator for all periods following the former colleague's appointment to CEO, which typically takes place years after leaving the firm in question. Each individual enters the sample with the beginning of the spell that overlaps with the *connection spell*, but at the earliest in 1990, and

[16] We focus on employment spells with the following attributes: (*i*) job title includes CEO" or Chief Executive Officer", (*ii*) seniority level of 7, (*iii*) ONET-code in the major group "11 - Management Occupations", (*iv*) firm has at least 100 employees in a given year, and (*v*) located in the United States.

exits the sample after at most 10 years following the CEO appointment, but at the latest at the end of the sample in 2023.

Our main outcome comprises a set of indicators for job switches across firms between two consecutive observations.[17] With all fixed effects in place, this implies that the regressions estimate the change in the propensity to switch firms in response to the CEO appointment, comparing those who were working alongside the future CEO to those who were not. The causal effect is identified under a standard parallel trend assumption, which holds if——conditional on all fixed effects and controls——the change in the probability of switching firms would have been the same in both groups before and after the treatment. We are confident that this assumption is justified in our setting, given that the timing of the treatment is arguably quasi-random from the perspective of the treated individuals.

A burgeoning literature discusses potential biases arising from estimating difference-in-differences models with heterogeneous treatment timing using two-way fixed effects regressions (see, e.g., Goodman-Bacon, 2021; Roth et al., 2023). A key problem is that these designs generate bad comparisons by comparing a treatment group to a comparison group that has already been treated. To alleviate concerns about the validity of our approach, we exclude all individuals who were first assigned to a control group and then to a treatment group. If an individual is treated multiple times, we focus on the first treatment event. Finally, we only consider the first CEO appointment for each CEO. These restrictions ensure that the treatment is binary and that the sample includes only individuals who were either treated simultaneously with all other units in their firm-seniority group or who were never treated. In our preferred specification, we include fixed effects for all firm-seniority-year combinations. Consequently, our final estimate is a weighted average of canonical 2×2 difference-in-differences estimates generated by each of these firm-seniority-year combinations, following the logic of a stacked design (Wing et al., 2024). We also highlight that the control group is relatively large in comparison to the treatment group, accounting for 79% of all observations post-treatment observations and 77% of all individuals, further mitigating potential issues arising from negative weights (De Chaisemartin and d'Haultfoeuille, 2020).

We proceed by estimating Equation 5 on the employment history data. The baseline results are presented in Table 5, where the outcome variable is an indicator of switching between firms. Column (1) displays the coefficients from regressions that include the treatment and post dummies, their interaction, and year fixed effects. While the coefficient on the treatment dummy is insignificant, the coefficient on the post dummy is negative, suggesting that job mobility during the post period tends to decrease——possibly because people are at later stages of their careers and less likely to transition between firms. Finally, the estimated coefficient on the interaction term is positive and significant.

In the subsequent columns, we augment the regression with different sets of fixed effects, which eliminate the coefficients on $Treat_{jms}$ and $Post_{jst}$, but further increase the magnitude and significance

[17] One potential concern is that a CEO may improve job opportunities for connected individuals in firms they have worked in or currently work in. To mitigate this, we exclude transitions to firms where the CEO was employed between the *connection spell* and the CEO appointment.

of the estimated coefficient on the interaction term. Given that the treatment is at the seniority-firm-year level, the specification in column (4) is our preferred one. Quantitatively, the probability of switching firms increases by about 0.5 percentage points, amounting to a 5% increase compared to the baseline.

One challenge to our identification strategy consists of potential latent differences between individuals working alongside a future CEO and their respective control groups; for instance, the former may work at headquarters while the latter are based in regional offices. The environment in the treatment group may be more competitive and ambitious, or it may offer better outside options due to the clustering of similar industries nearby. While we do not observe any baseline differences across the two groups in column (1), we explicitly address this issue by including fixed effects at the MSA-NAICS-4-year level, effectively controlling for any time-varying differences in job mobility across narrow sectors and geographic locations. The results are shown in column (5). While the estimated coefficient slightly decreases in size, this change is neither statistically nor economically significant.

We repeat the analysis for switches across NAICS-4 sectors, with the results included in Table A7. While naturally smaller in absolute size, the signs and relative magnitudes are closely in line with the previous results. For instance, the estimate from column (4) suggests a 6% increase in mobility across industries compared to the baseline.

Moving beyond the overall increase in worker mobility in response to the information shock, we turn to examining the underlying dynamics. To this end, we further differentiate the main outcome based on whether an individual moved to a more senior position, a less senior position, or remained at the same seniority level. The results show that the rise in overall mobility is driven entirely by an increase in the frequency of downward transitions across firms (Table 6), while upward and lateral transitions remain practically unaffected (Tables A8 and A9).

Next, we assess whether the transitions between firms in response to the information shock are accompanied by changes in job categories, distinguishing between seven functional areas.[18] The estimates in Tables A10 and A11 indicate that the increase in job mobility is mainly due to a higher probability of switching across job categories. Even though the coefficients from our preferred specification are similar in both cases, the relative increase in cross-category switches is nearly twice as large, once taking the baseline differences into account.

In sum, these findings support the idea that workers emulate future CEOs' employment trajectories due to career concerns. While upward or lateral moves may be motivated by financial incentives, the greater prevalence of downward transitions suggests that employees are seeking to acquire a broader range of generalist skills across firms and functional areas——skills that are highly valued for future CEO roles.

As a first robustness check, we augment our preferred specification to obtain event study estimates, presented in Figure A17. The estimated coefficients are generally small and insignificant during the pre-treatment periods, followed by a gradual increase in the post-treatment periods for

[18]The job categories are Admin, Engineering, Finance, Marketing, Operations, Sales, and Science.

Table 5: CEO Appointment of Former Coworker and Job Mobility (Any Firm Switch)

	Firm Switch				
	(1)	(2)	(3)	(4)	(5)
Treat	-0.0015				
	(0.0014)				
Post	-0.0098***	-0.0161***	-0.0187***		
	(0.0013)	(0.0013)	(0.0013)		
Treat × Post	0.0017	0.0022	0.0023	0.0048***	0.0041***
	(0.0014)	(0.0014)	(0.0014)	(0.0011)	(0.0011)
R^2	0.01243	0.13893	0.13976	0.16597	0.19727
Observations	22,777,381	22,777,381	22,777,381	22,777,381	16,139,755
Pre-Treatment Control Mean	0.0944	0.0944	0.0944	0.0944	0.0949
Year fixed effects	✓	✓	✓		
Individual fixed effects		✓	✓	✓	✓
Firm-Seniority fixed effects			✓		
Firm-Seniority-Year fixed effects				✓	✓
MSA-Naics4-Year fixed effects					✓

Notes: The dependent variable in all regressions is a dummy equal to one in the last year before an individual switches firms. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

overall and downward switches. In contrast, we observe no discernible response for upward or lateral switches.

To bolster the validity of our mechanism, we provide a battery of consistency checks, focusing particularly on downward mobility. As our argument hinges on network connections, we conjecture that the response in job mobility should be more pronounced among those who have closer ties to the future CEO. One potential measure for proximity is shared tenure, i.e., the time spent together at the same seniority level within a firm during their former job. We test this aspect in Table A12 by including an interaction with a dummy equal to one for those, whose shared tenure is in the highest quartile. The estimated coefficients on the triple interaction are large and significant across the board, suggesting that this group reacts much more strongly to the information shock. Figure A18 shows the coefficients on the marginal effect for downward mobility (column 4) separately for all quartiles of shared tenure, revealing a strong gradient in the response across the entire distribution.

In a similar vein, we hypothesize that the information shock spills over to individuals in other seniority levels at the initial firm. To check this, Tables A13 and A14 focus on individuals in the two levels above and below the future CEO, respectively. We find that employees who worked just above the seniority level of the future CEO exhibit a similar reaction to the treatment as those who worked at the same seniority level as the future CEO, whereas the response in seniority levels below the CEOs is somewhat more muted.

Table 6: CEO Appointment of Former Coworker and Job Mobility (Downward Firm Switch)

	Firm and Downward Switch				
	(1)	(2)	(3)	(4)	(5)
Treat	-0.0050***				
	(0.0005)				
Post	-0.0102***	-0.0122***	-0.0128***		
	(0.0007)	(0.0006)	(0.0006)		
Treat × Post	0.0026***	0.0041***	0.0042***	0.0053***	0.0054***
	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)
R^2	0.00469	0.08973	0.09022	0.11072	0.14353
Observations	22,777,381	22,777,381	22,777,381	22,777,381	16,139,755
Pre-Treatment Control Mean	0.0410	0.0410	0.0410	0.0410	0.0409
Year fixed effects	✓	✓	✓		
Individual fixed effects		✓	✓	✓	✓
Firm-Seniority fixed effects			✓		
Firm-Seniority-Year fixed effects				✓	✓
MSA-Naics4-Year fixed effects					✓

Notes: The dependent variable in all regressions is a dummy equal to one in the last year before an individual switches firm and transitions to a lower seniority level. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

We also examine whether the response to the information treatment has become stronger over time. In Table A15, we test for time variation in the treatment effect by interacting the variable of interest with indicators for 5-year bins, excluding the final two bins to ensure a balanced 10-year post-period. The results indicate a structural break during the period 2000 to 2004, which is omitted as a baseline. In the early 1990s, treated individuals reacted to the information shock by increasing their lateral job mobility. During the late 2000s and early 2010s, the response shifted towards downward job mobility, further prolonging the career trajectory of prospective CEOs. Given the increasing coefficients on downward mobility after 2000, this result speaks against a one-off shock but in favor of a gradual increase in the weight attributed to generalist human capital.

Next, we consider heterogeneity with respect to the future CEOs' job mobility between leaving the firm and being promoted to CEO. In Table A16, the idea is that the information shock is stronger for those who have seen their former colleague transition across a higher number of positions. To evaluate this hypothesis, we introduce an interaction term with an indicator equal to one, if the number of CEO transitions is in the highest quartile. In line with our expectations, the estimated coefficients on the triple interactions are positive across the board. Moreover, we experimented with heterogeneity depending on the direction of the CEO switch in terms of seniority. Assuming individuals imitate successful career paths, one would anticipate a higher probability of upward, lateral, or downward switches after having witnessed a former coworker leaving in the respective

direction (the omitted category is upward, i.e., a future CEO leaving the company for a more senior position). The results shown in Table A17 point in this direction, showing a significant coefficient for downward moves in column (4), the category of greatest interest to us.

In addition to CEOs' career paths, we hypothesize that the treated individual's own characteristics and career considerations will play a role in the response of job mobility. Downward and sector switches should be more prevalent responses among individuals working in smaller firms where it is harder to acquire generalist skills, possibly due to the limited scope of the firm's operations. We scrutinize this idea by including interactions with size quartiles of their current firm, with results shown in Table A18 and Figure A19. As anticipated, we find that the positive response to the information shock is concentrated among individuals working in smaller firms. This result complements Lazear (2009), who argues that quits should be less common among more idiosyncratic, i.e., smaller, firms, as the market for the skills of their employees is thinner. Crucially, the increase in career mobility is not primarily driven by switches to larger firms. To demonstrate this, we distinguish downward moves by the size of the destination firm. The results in Table A19 reveal that the rise in turnover is driven by switches to smaller firms, both in absolute terms and compared to the current employer.[19]

As a direct implication of the higher likelihood of moving to less senior positions, we anticipate that individuals forgo income in the medium run in order to improve their long-term career prospects. To test this hypothesis, we repeat the analysis with the growth rate of imputed salary as the dependent variable. The results included in Table A20 are in line with our expectations, indicating a reduction in salary growth of around 11% relative to the counterfactual. As before, this result is robust to adding fixed effects at the MSA-NAICS-4-year level, suggesting that we can rule out differences in local labor market conditions as the driver of these results.

Taken together, these estimates support the interpretation that the observed trends are at least partially influenced by a surge in generalist skills on the supply side. We have provided evidence in favor of the idea that positive information about the returns on job mobility among connected individuals increases employees' probability of switching across firms, with the intention of gathering generalist skills across a wide range of functional areas. Consequently, the career paths of prospective CEOs become longer, making them on average older at appointment.

4 Alternative Explanations

This paper offers an explanation for the aging of CEOs that is based on an efficient market response to changes in the importance of different skill components among CEOs. Given that many features of firms and the economy more broadly have changed since 2000, we consider a range of potential

[19]This does not exclude the possibility that ambitious and successful individuals are generally willing to trade off working in a larger firm with a lower seniority level. In Figure A20, we focus on firm switches of future CEOs and regress the differences in firm size against differences in seniority. We find that such a trade-off indeed exists and that it has become stronger over time.

alternative explanations. This section reviews several competing narratives and argues that none of them convincingly account for the patterns we document.

CEO Aging as a Demographic Inevitability: One possible explanation centers on demographic shifts across Western countries, which have paralleled the age trends among executives. However, as we report in Figure A2, the age increase among CEOs in the United States and Europe is more than three times that of the overall labor force. This gap is even more pronounced among college-educated workers, who constitute the relevant baseline population, due to the educational expansion that has significantly increased their supply. As a result, it is unlikely that the CEO aging trend reflects mere demographic changes.

Optimal Response to Managerial Entrenchment: A second competing explanation refers to possible increases in rent seeking or entrenchment by CEOs. While entrenchment has potential direct effects on the age of sitting CEOs via longer tenure, it may also impact age at appointment through an anticipation channel. Specifically, boards of directors may attempt to prevent entrenchment by appointing older CEOs, who are potentially easier to replace after a shorter tenure. An empirical implication of this conjecture is that age at appointment and tenure should become more (negatively) correlated over time. Figure A21 examines the joint distribution of age at appointment and tenure, plotting their time-varying correlation. As expected, the two variables are negatively correlated, but the association attenuates throughout our sample period, which would contradict the conjecture. Relatedly, as we document in Table 2, board age does not appear to drive our demand-side findings. These results are consistent with theoretical considerations. In light of increased academic attention on corporate governance since the 1980s (Ma and Shleifer, 2025), followed by changes in firms' compensation practices (Edmans et al., 2017) and regulation, scrutiny over managerial actions has arguably become more pronounced over the last decades.

Rising Market Concentration: A third potential explanation is that rising market concentration may have influenced CEO appointments. As shown by Bao et al. (2022), increasing market power accounts for a substantial share of the growth in top executive compensation. In our context, higher market concentration could imply a reduced supply of CEO positions at large firms, an effect that may be amplified by the tendency of such firms to appoint older CEOs. To test this idea, we correlate CEO age at appointment with market concentration measures from the Economic Census. The results, presented in Table A21, reveal a negative but statistically insignificant association, however.

Reversion to Older CEOs after the Dot-com Crisis: A fourth possible concern relates to the timing of the starting point of our sample. Specifically, the bursting dot-com bubble in the late 1990s may have disproportionately affected young firms led by young CEOs, thereby mechanically increasing average CEO age afterwards. To assess this, we combine data from Execucomp on executives in the S&P 1500 between 1992 and 2000 with delisting information from CRSP. We then test whether firms

delisted for involuntary reasons or through mergers and acquisitions were managed by younger CEOs. The estimates are shown in Figure A22. For sitting CEOs, we find that firms delisted for involuntary reasons had in fact significantly younger CEOs, while this pattern does not hold for M&A-related delistings. Crucially, however, we find no such difference in CEO age at appointment. If anything, CEOs appointed toward the end of the sample window at delisted firms were older than their counterparts. One plausible interpretation of these patterns is that delisted firms were more likely to be run by young founders during the period. Still, the evidence does not support the notion that our results are driven by a rebound effect following the late 1990s.

Longer Education Paths: A final set of hypotheses centers on changes in the role of human capital in the labor market for CEOs, either due to prolonged educational paths or due to more skill accumulation on the job. We examine the former using education data from BoardEx, with results shown in Figure A23. Overall, we observe an increase of approximately one year in the age at highest degree over the sample period (Panel a). This shift is primarily driven by older age at graduation among postgraduate degree recipients and by a rising share of CEOs holding such degrees (Panels b and c). Given the modest size of these changes relative to the broader phenomenon we study, we conclude that extended education alone cannot account for the rise in CEO age. In contrast, the observed increase in the length and diversity of prior experience supports the view that on-the-job human capital accumulation is the key driver of our results.

5 Conclusion

This paper contributes to our understanding of the evolving market for corporate leadership by documenting and explaining the substantial increase in CEO age upon appointment over the past two and a half decades. Our findings reveal that this trend reflects fundamental changes in how executives build careers and how firms select their leaders. The rise in CEO age is primarily driven by longer external career paths prior to appointment, with prospective CEOs accumulating increasingly diverse experiences across positions, firms, and sectors.

Using plausibly exogenous variation in access to strategy consulting firms, we demonstrate that demand for generalist skills in response to uncertainty has causally contributed to the appointment of older CEOs. Simultaneously, executives strategically respond to these evolving skill requirements by increasing their job mobility through professional networks, often at the cost of short-term compensation.

The implications of this trend are substantial. Our analysis shows that older CEOs tend to manage firms with slower growth rates, less innovation, and reduced risk taking. While these patterns might appear concerning for long-term economic dynamism, they may represent a rational response to changing business environments characterized by heightened uncertainty and complexity. Understanding the underlying mechanisms driving this transformation provides important insights into evolving corporate governance, executive career development, and firm performance.

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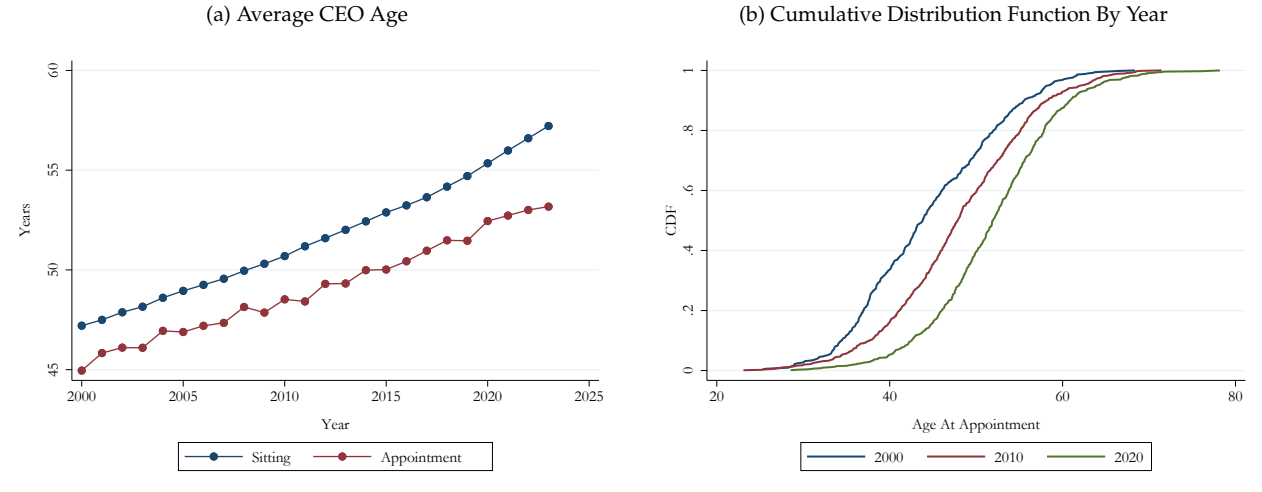
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ONLINE APPENDIX

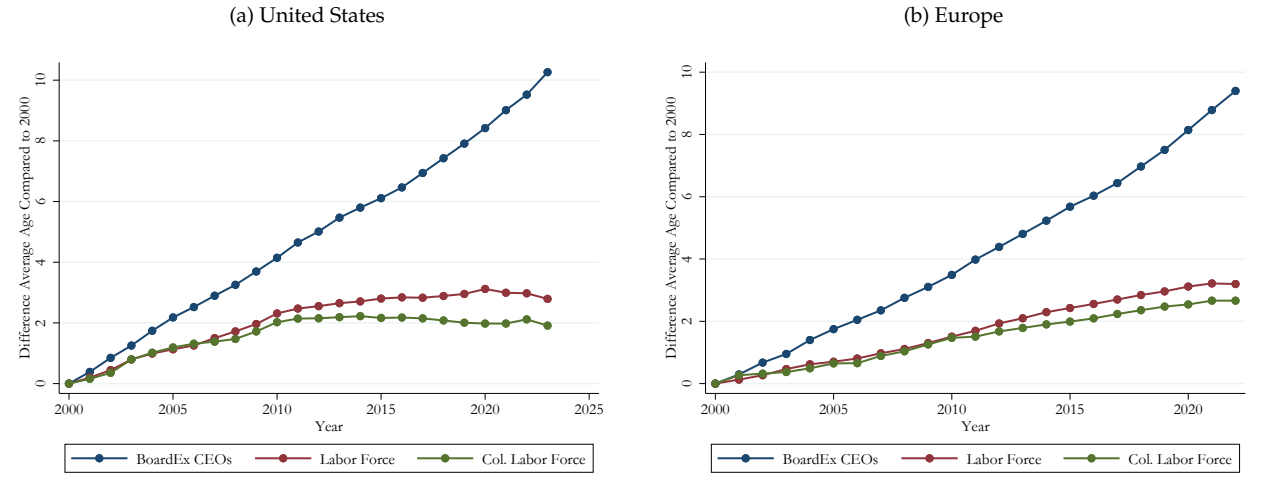
A Additional Figures

Appendix Figure A1: CEO Age Over Time — Europe



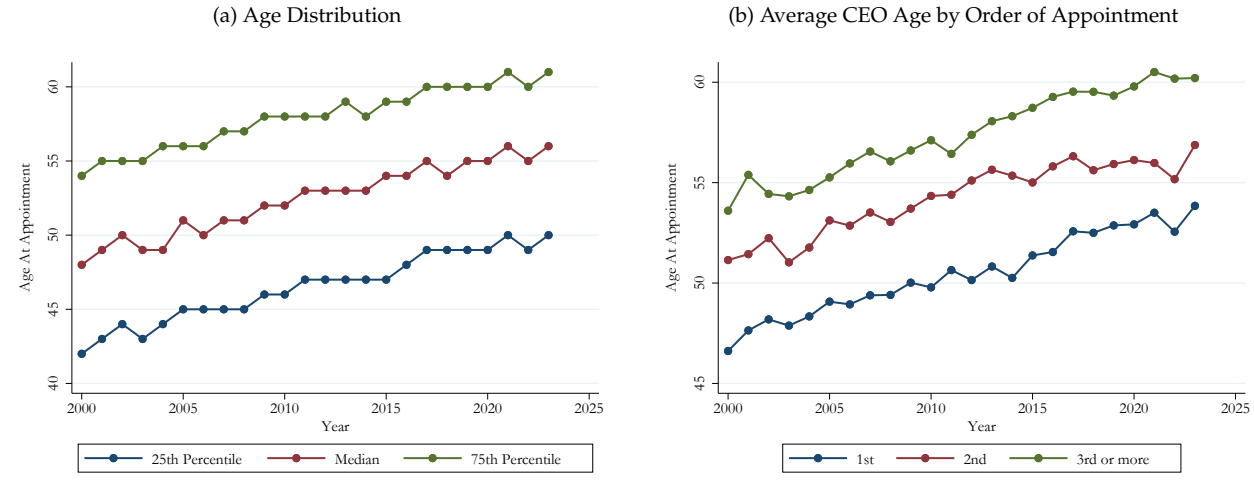
Notes: Panel (a) shows the average age of CEOs in Europe over time, separately for sitting CEOs and CEOs at appointment. Panel (b) shows the cumulative distribution function for age at appointment for different years.

Appendix Figure A2: Change in Average Age Since 2000 for CEOs vs. Labor Force



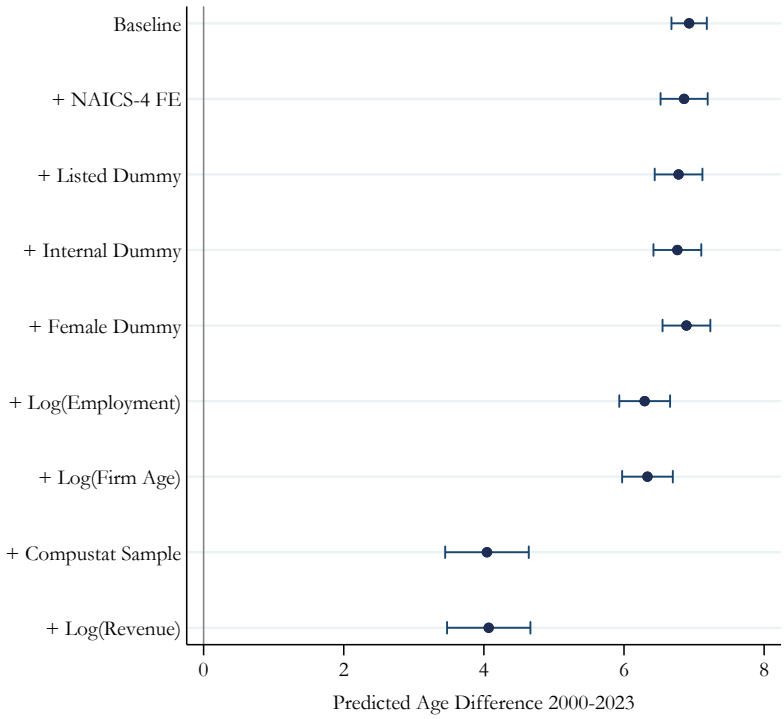
Notes: The figure compares the average age of sitting CEOs from BoardEx with that of the overall and the college-educated labor force, calculated from survey data. Panel (a) uses data from the *Current Population Survey*, showing the average age of all respondents in the labor force, calculated using ASEC weights. We define individuals holding at least a bachelor's degree as college-educated. The data have been obtained via *IPUMS* (Flood et al., 2024). Panel (b) uses data from the *European Labour Force Survey*. We compute average labor force age at the country level and then aggregate across countries, weighting by the number of BoardEx CEOs in each country-year cell. The countries included are Austria, Belgium, Switzerland, Cyprus, Germany, Denmark, Estonia, Greece, Spain, Finland, France, Hungary, Italy, Lithuania, Luxembourg, Norway, Poland, Portugal, and Sweden. We define individuals with some tertiary education as college-educated (ISCED-level 5 or above). Access to the microdata has been granted by Eurostat under research proposal RPP 204/2023-LFS.

Appendix Figure A3: CEO Age at Appointment



Notes: The figure shows CEO age at appointment over time. While panel (a) illustrates the age distribution by plotting the quartiles of CEO age, panel (b) shows average CEO by order of appointment, distinguishing between first, second, and third or higher appointments.

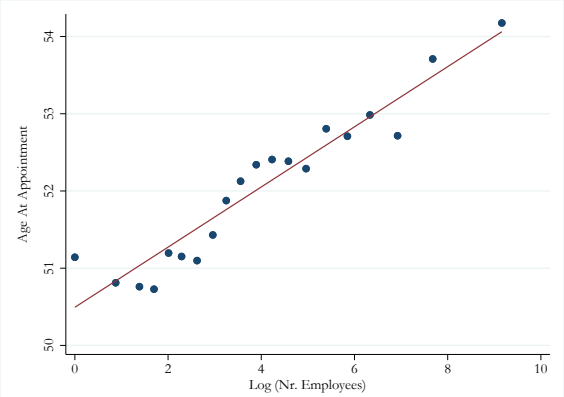
Appendix Figure A4: CEO Age at Appointment – Predicted Age Difference 2000 - 2023 Conditional on Controls



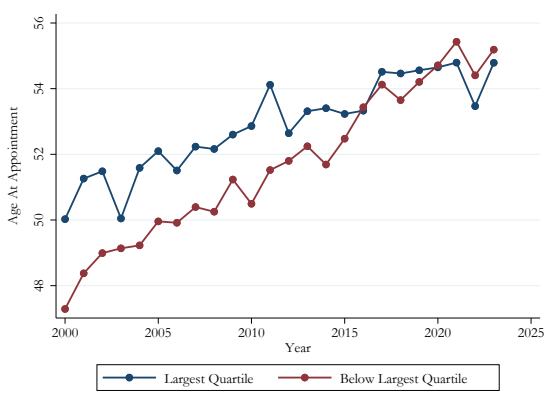
Notes: The figure shows coefficients obtained from regressing CEO age at appointment on a linear time trend since 2000 (normalized to range between 0 and 1). While the baseline specification includes no controls, we then consecutively control for NAICS-4 fixed effects, dummies for whether a firm is listed, or whether the CEO is promoted internally or is female, and the natural logarithm of employment and firm age (both derived from employment biographies). We then restrict the sample to the set of firms contained in Compustat. Finally, we control for the natural logarithm of revenue. Point estimates are plotted alongside 95% confidence intervals, based on standard errors clustered at the firm level.

Appendix Figure A5: CEO Age at Appointment and Firm Size (Number of Employees)

(a) Binscatter Average CEO Age vs. Firm Size

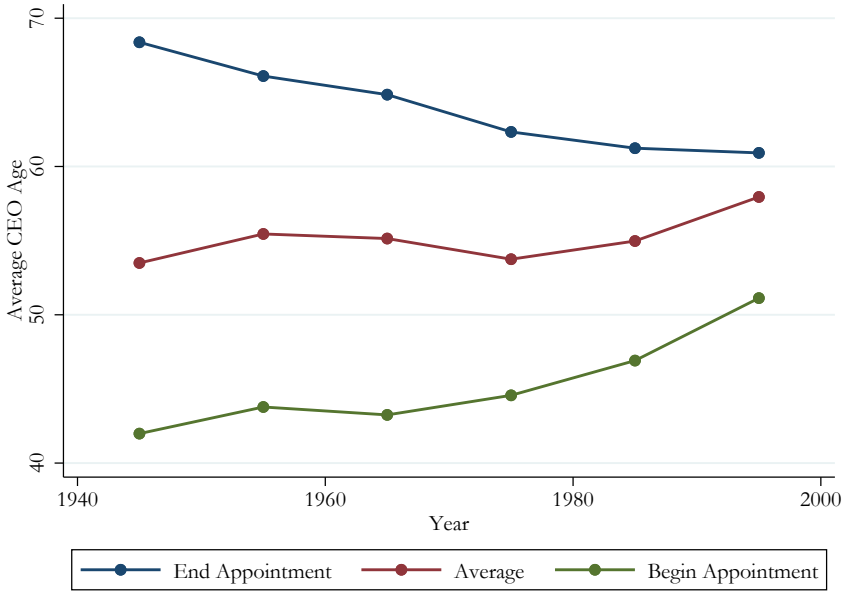


(b) Average CEO Age over Time by Firm Size



Notes: Panel (a) shows a binscatter plot of age at appointment against the natural logarithm of the number of employees. Panel (b) plots age at appointment separately for those in the largest firm quartile and for those in the other three quartiles. Size Quartiles are generated separately by year.

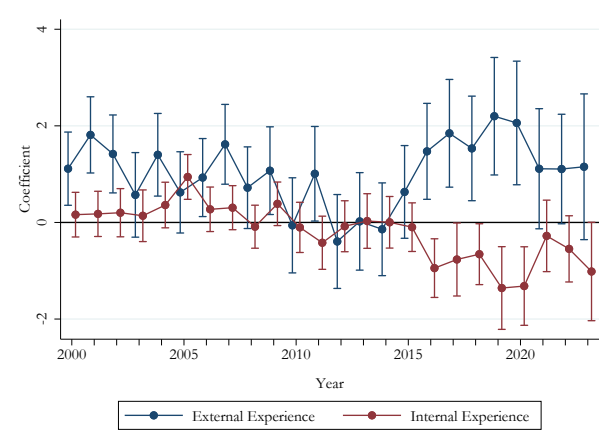
Appendix Figure A6: Long-Run CEO Age Patterns



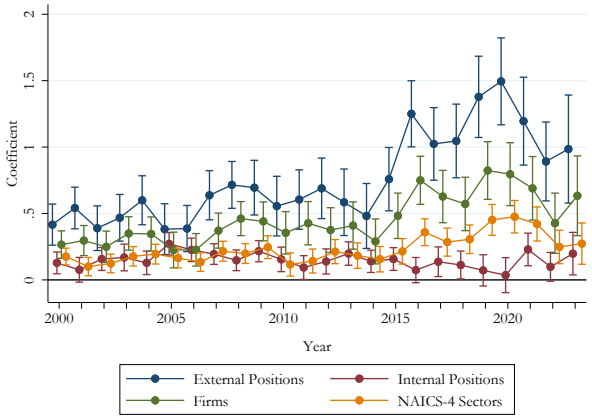
Notes: Plots long-run developments in average age as well as age at the begin and the end of the appointment of American executives, obtained from the *Great American Business Leaders of the 20th Century database* (https://www.hbs.edu/leadership/20th-century-leaders). We show aggregates by decade to reduce noise.

Appendix Figure A7: Work Experience At First Appointment to Most Senior Position: CEOs vs. Non-CEO Executives

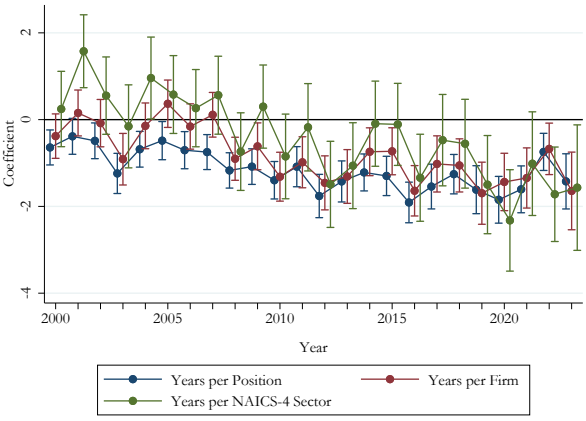
(a) Years of External vs. Internal Work Experience



(b) Average Number of Positions, Firms and Sectors



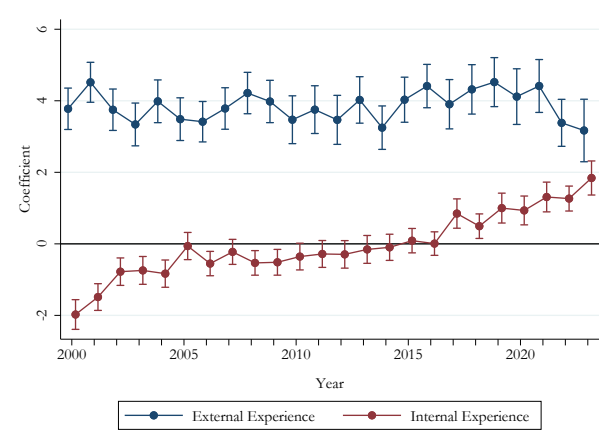
(c) Years per Position and Firm



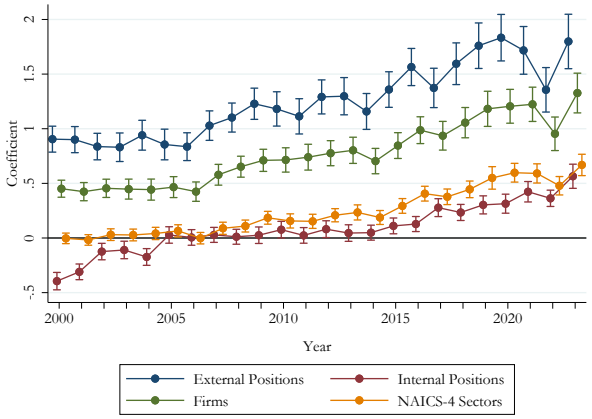
Notes: The figure plots work experience of CEOs vs. non-CEO executives over time, obtained from regressing the dependent variables on year dummies, alone and interacted with indicators for non-CEO executives. The groups are defined based on the most senior position reached by the individual throughout the sample, focusing on the first appointment. Panel (a) plots the average external vs. internal work experience prior to appointment. Panel (b) shows the average number of positions (separately for external and internal positions) as well as the number of firms and sectors a prospective CEO worked in. Panel (c) shows the average number of years per position and firm. Point estimates are shown alongside 95% confidence intervals, which are obtained from standard errors clustered at the firm level.

Appendix Figure A8: Work Experience At First Appointment to Most Senior Position: CEOs vs. Other Managers

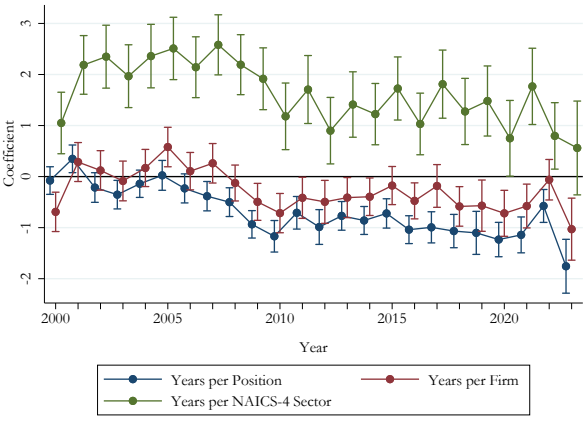
(a) Years of External vs. Internal Work Experience



(b) Average Number of Positions, Firms and Sectors

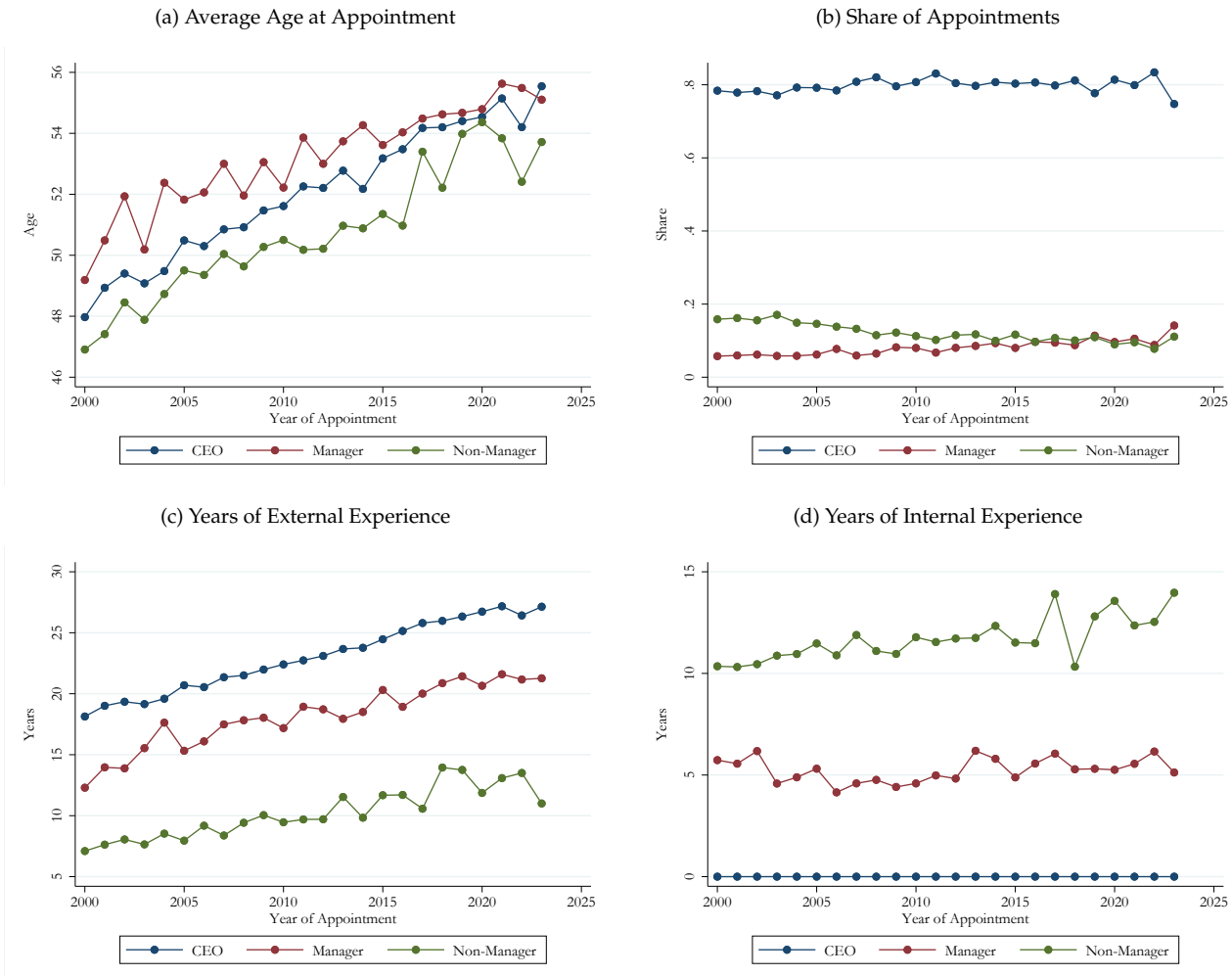


(c) Years per Position and Firm



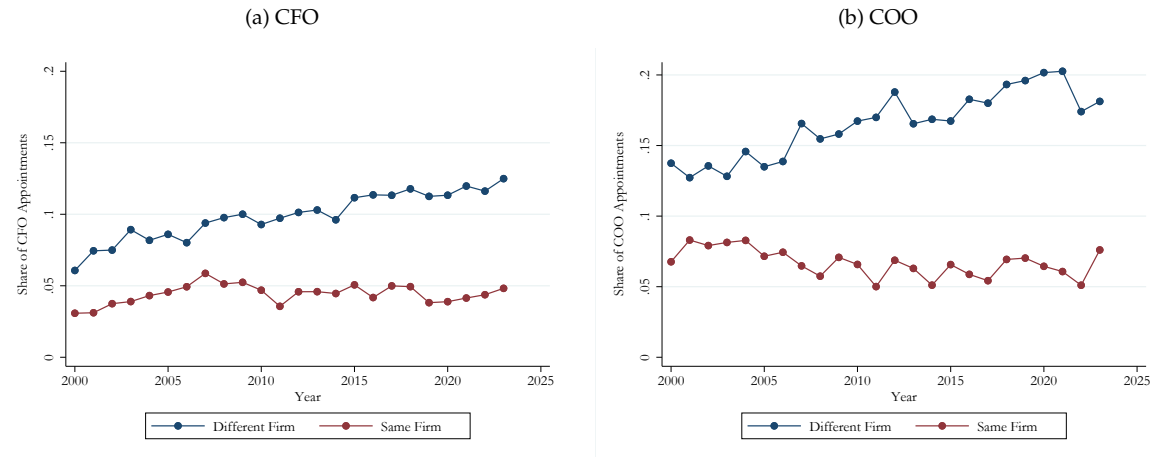
Notes: The figure plots work experience of CEOs vs. non-executive managers over time, obtained from regressing the dependent variables on year dummies, alone and interacted with indicators for non-executive managers. The groups are defined based on the most senior position reached by the individual throughout the sample, focusing on the first appointment. Panel (a) plots the average external vs. internal work experience prior to appointment. Panel (b) shows the average number of positions (separately for external and internal positions) as well as the number of firms and sectors a prospective CEO worked in. Panel (c) shows the average number of years per position and firm. Point estimates are shown alongside 95% confidence intervals, which are obtained from standard errors clustered at the firm level.

Appendix Figure A9: CEO Appointments by Seniority of First Position in Firm



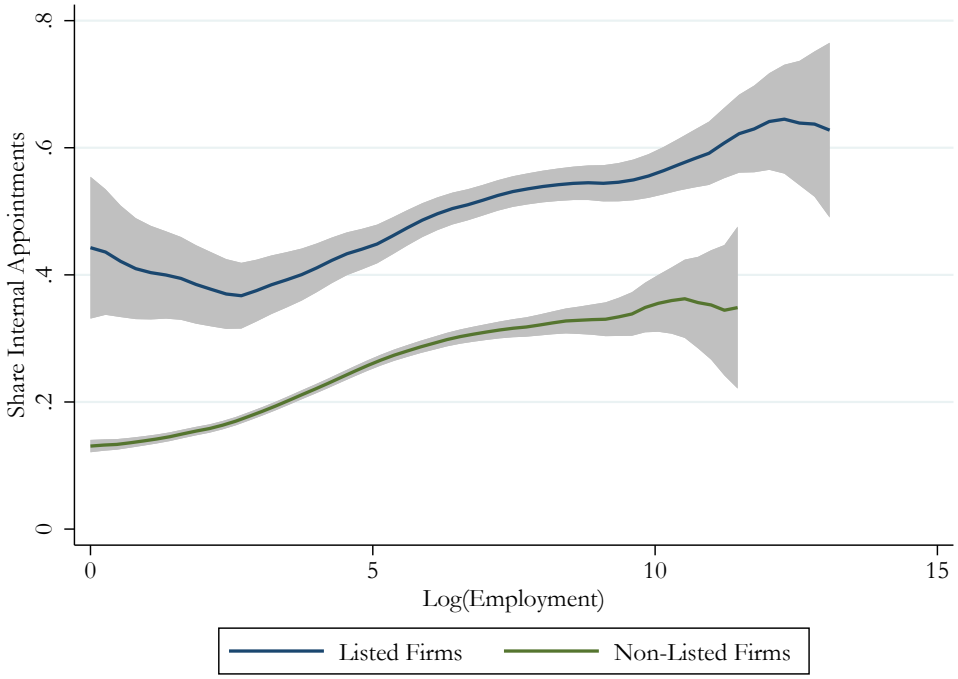
Notes: The figure plots descriptives on CEO appointments over time, stratified by the seniority of their first position in the firm. Panel (a) displays the average age at appointment, while panel (b) shows the share of appointments for each group. Panels (c) and (d) present the average years of external and internal experience, respectively.

Appendix Figure A10: Share of CEO Appointments with Experience as CFO or COO Over Time



Notes: This figure shows the share of appointed CEOs who previously worked as CFO (panel a) or COO (panel b), distinguishing between those who served in this role at the same firm or a different firm from the one that promoted them to CEO. CFOs are identified by role names containing any of the following keywords:: "CFO", "Chief Financial Officer", "General Manager - Finance", and "Head of Finance", "Director - Finance". For COOs, the corresponding keywords are "COO", "Chief Operations Officer", "General Manager - Operations", "Head of Operations", and "Director - Operations".

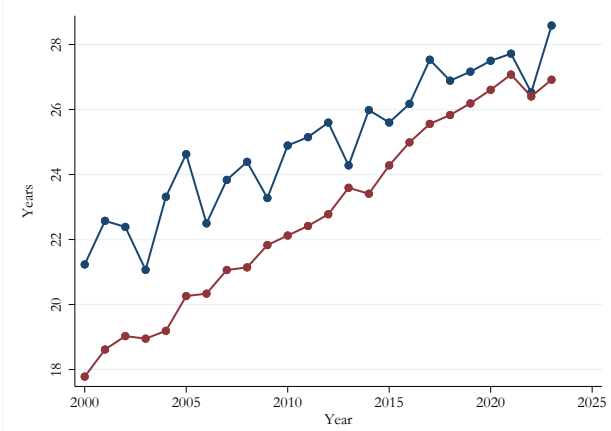
Appendix Figure A11: Share of Internal Appointments by Firm Size and Listing Status



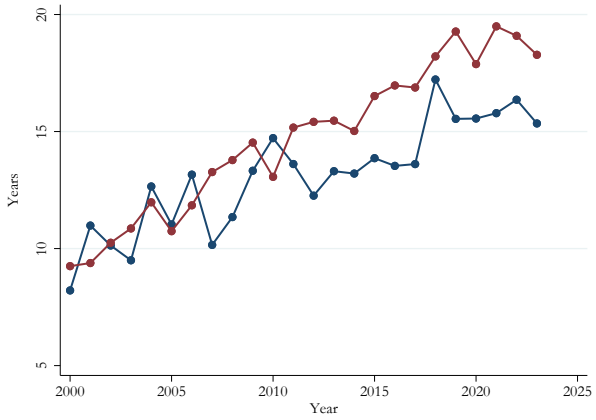
Notes: Plots the share of internal appointments against firm size measured by the natural logarithm of employment (obtained from employment histories). The data are smoothed with a local polynomial with Epanechnikov kernel and bandwidths of 0.91 and 0.78, respectively, which have been obtained via optimal bandwidth selection. Point estimates are shown alongside 95% confidence intervals.

Appendix Figure A12: Years of External vs. Internal Experience by Firm Size

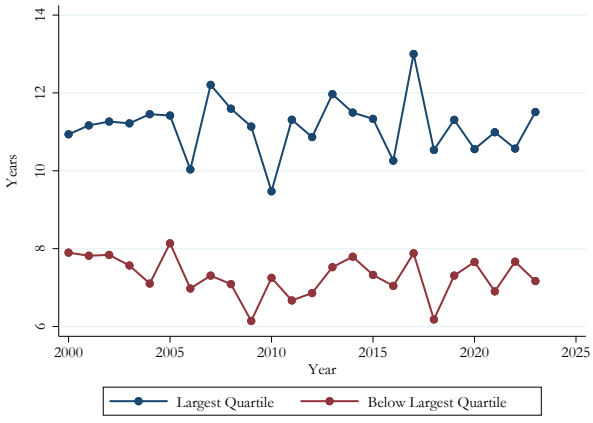
(a) External Appointments, External Experience



(b) Internal Appointments, External Experience

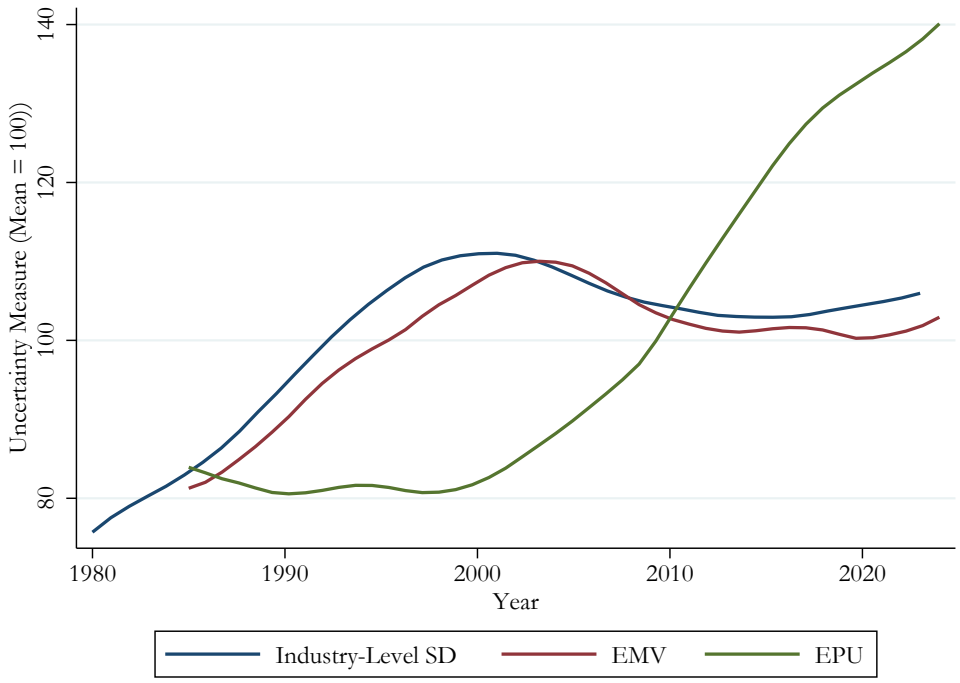


(c) Internal Appointments, Internal Experience



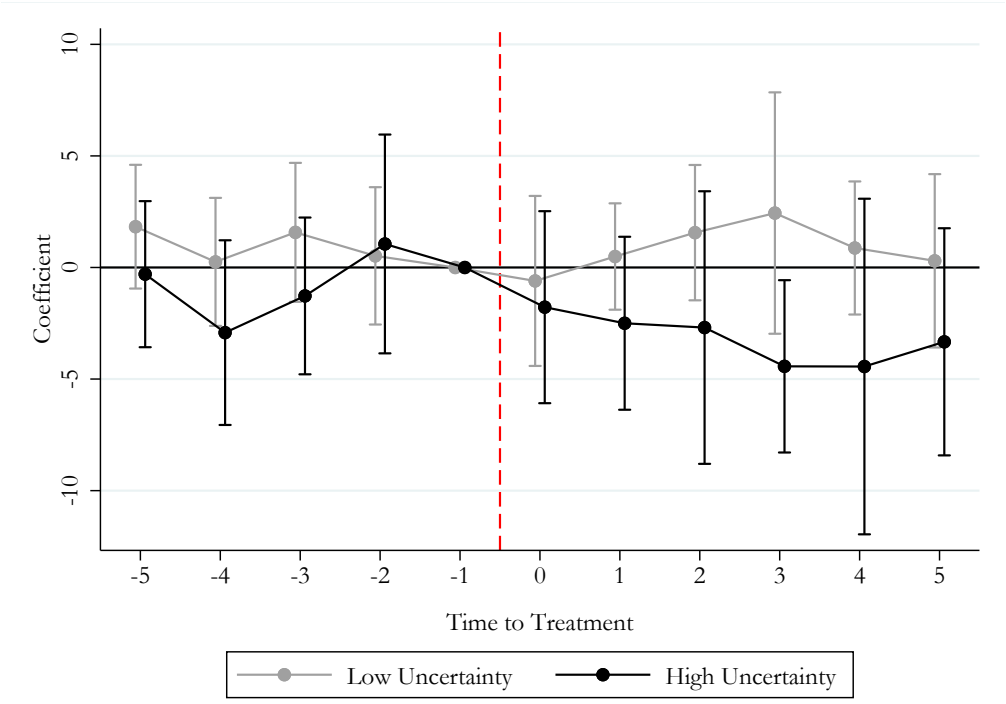
Notes: The figure plots years of experience, separately for those in the largest firm quartile and for those in the other three quartiles. Panel (a) shows years of external experience for externally appointed CEOs, panel (b) shows years of external experience for internally appointed CEOs, and panel (c) shows years of internal experience for internally appointed CEOs.

Appendix Figure A13: Uncertainty Indices Over Time



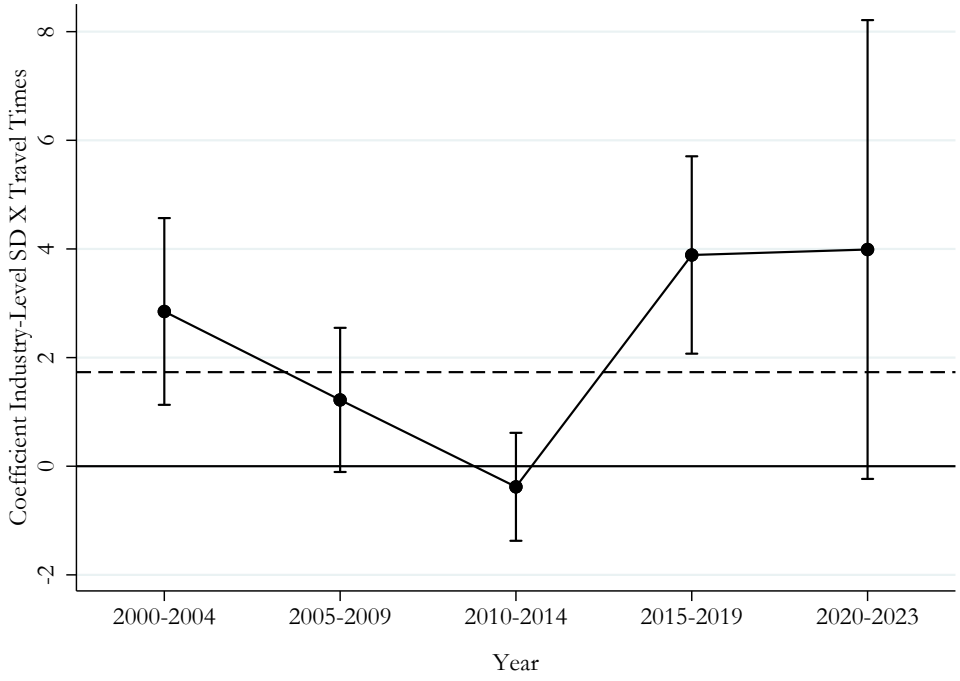
Notes: Plots measures of aggregate uncertainty over time. *Industry-Level SD* is the cross-sectional (NAICS-4-level) standard deviation of revenue growth rate (obtained from Compustat), which we aggregate by weighting with revenue. *EMV* is a newspaper-based Equity Market Volatility index constructed in Baker et al. (2019). *EPU* is the Economic-Policy Uncertainty index for the US, obtained from Baker et al. (2016). We annualize the variables by computing their arithmetic means and normalize them by adjusting their average over the sample window to 100. The data are smoothed with a local polynomial with Epanechnikov kernel and bandwidths of 3.78, 5.26, and 5.08, respectively, which have been obtained via optimal bandwidth selection.

Appendix Figure A14: MBB Market Entry, Uncertainty and CEO Age – Stacked Event Study



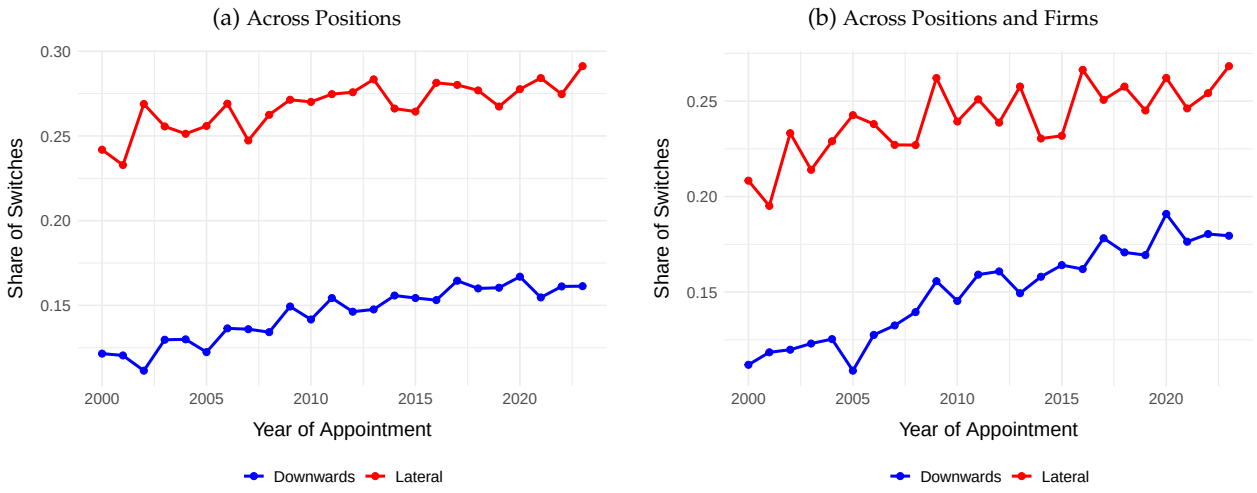
Notes: The plot shows stacked event study estimates obtained from regressing CEO age at appointment (obtained from BoardEx) on indicators for time relative to treatment, separately for low- and high-uncertainty NAICS-4 sectors. The treatment is defined as exposure to any MBB market entry in the MSA that is linked by the shortest direct flight connection. To ensure sufficient pre-treatment periods, only treatments occurring in 2005 or later are considered. Uncertainty is measured as the cross-sectional standard deviation of the symmetric growth rate of firm revenue within a firm's NAICS-4 sector. We take the median of this measure across all periods and define high-uncertainty sectors as those with above-median levels of this variable. The sample is restricted to those MSAs without MBB presence. Both event studies compare the MSAs that are treated in a given year to all other MSAs that remain untreated throughout the treatment window and are estimated in pooled regressions across all sub-experiments. Only the first treatment is considered if an MSA is treated repeatedly during the 5-year interval following treatment. The regression controls for fixed effects at the NAICS-4-MSA-sub-experiments and NAICS-4-year-sub-experiments level as well as the natural logarithm of employment, revenue, and firm age obtained from Compustat. The endpoints are binned at $t = -6$ and $t = 6$, while $t = -1$ is omitted as the reference category. Point estimates are shown alongside 95% confidence intervals, which are obtained from standard errors double-clustered at the NAICS-4 sector and MSA level.

Appendix Figure A15: MBB Market Entry, Uncertainty and CEO Age – Time-Varying Estimates



Notes: The plot shows coefficients from time-varying estimates, obtained by augmenting the specification from Table (1), Column (4) with interactions for 5-year bins. Uncertainty, calculated as the cross-sectional standard deviation of the symmetric growth rate of firm revenue within a firm's NAICS-4 sector, is standardized within each 5-year bin to mean zero and standard deviation one. Point estimates are shown alongside 95% confidence intervals, which are obtained from standard errors double-clustered at the NAICS-4 sector and MSA level. The dashed horizontal line shows the point estimate from the baseline regression.

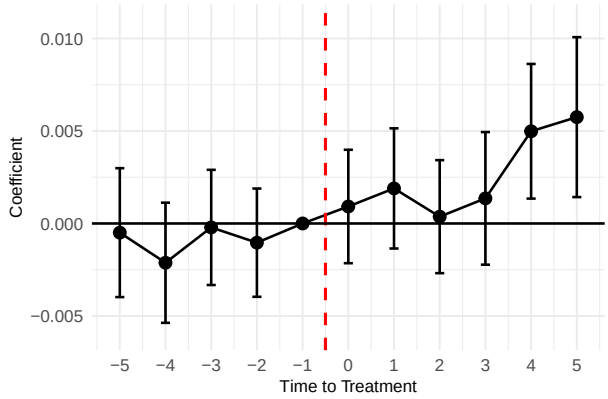
Appendix Figure A16: Share of Downward/Lateral Switches of CEOs Prior to Appointment



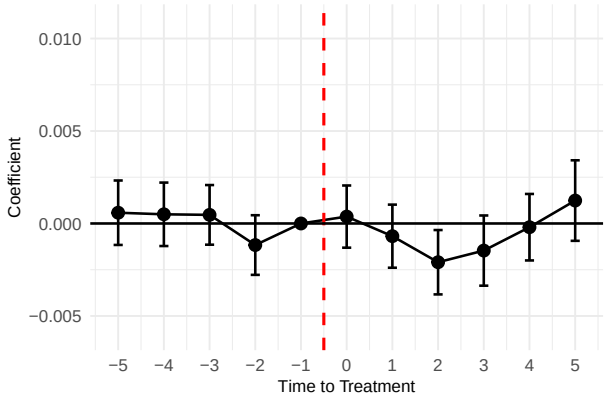
Notes: Plots the share of downward/lateral switches of CEOs prior to appointment by year of appointment, calculated as the ratio between the number of downward or lateral switches over the number of total switches. Panel (a) includes all switches across positions, panel (b) focuses on those across positions and firms. Switches are identified from a panel constructed from employment biographies from Revelio Labs, prioritizing more senior positions and those that started earlier in the case of overlapping spells.

Appendix Figure A17: CEO Appointment of Former Coworker and Job Mobility – Event Study

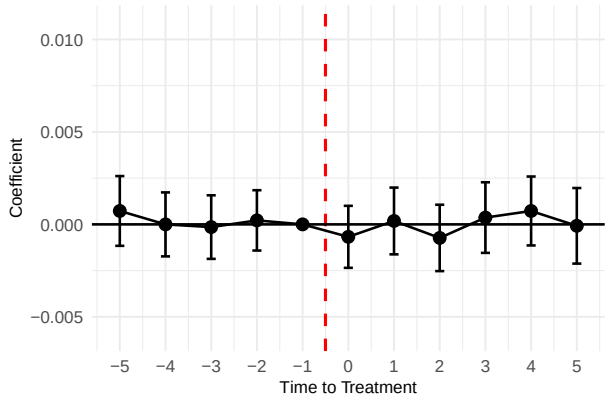
(a) Any Firm Switch



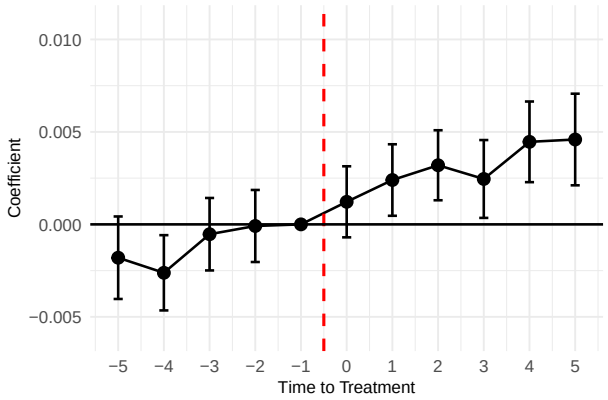
(b) Upward Firm Switch



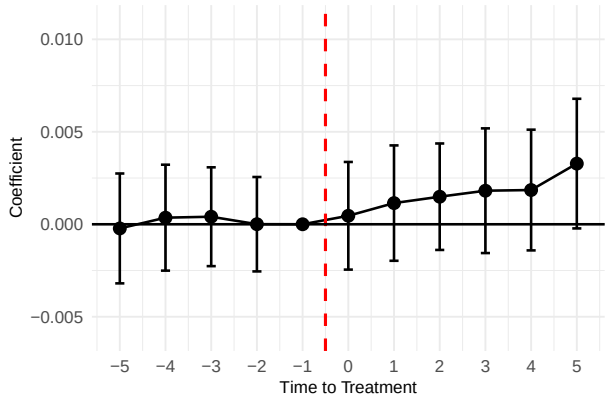
(c) Lateral Firm Switch



(d) Downward Firm Switch

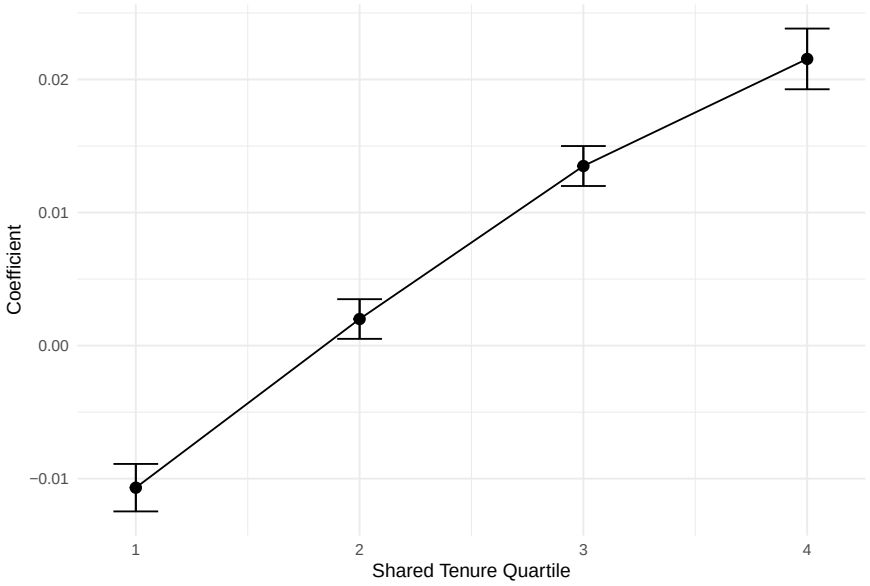


(e) Any Sector Switch



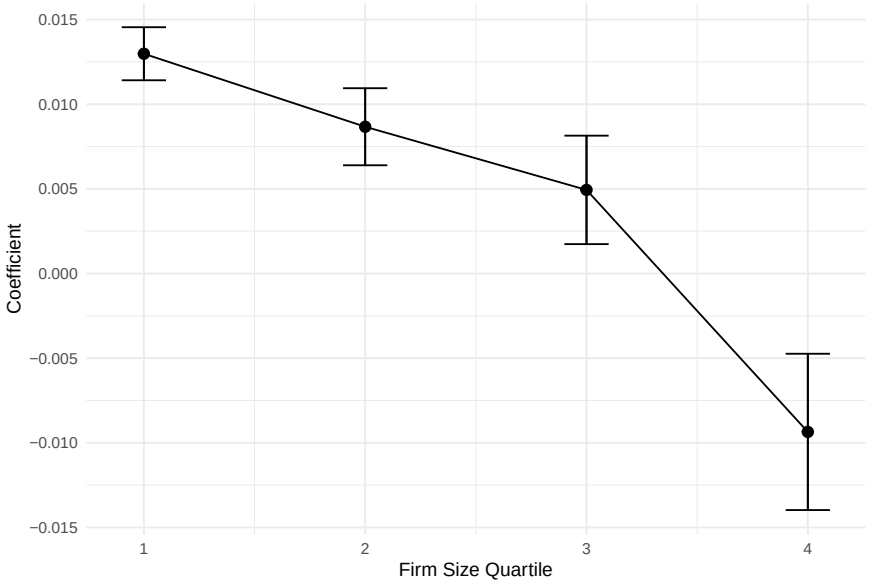
Notes: The specification equals column (4) from Table 5 (panel a), Table 6 (panel b), Table A8 (panel c), Table A9 (panel d), and Table A7 (panel e), respectively, replacing *Post* by indicators for the number of years until treatment. The endpoints are binned at $t = -6$ and $t = 6$, while $t = -1$ is omitted as the reference category. Point estimates are shown alongside 95% confidence intervals, which are obtained from standard errors clustered at the firm level.

Appendix Figure A18: Heterogeneity for Downward Mobility Response by Quartile of Shared Tenure



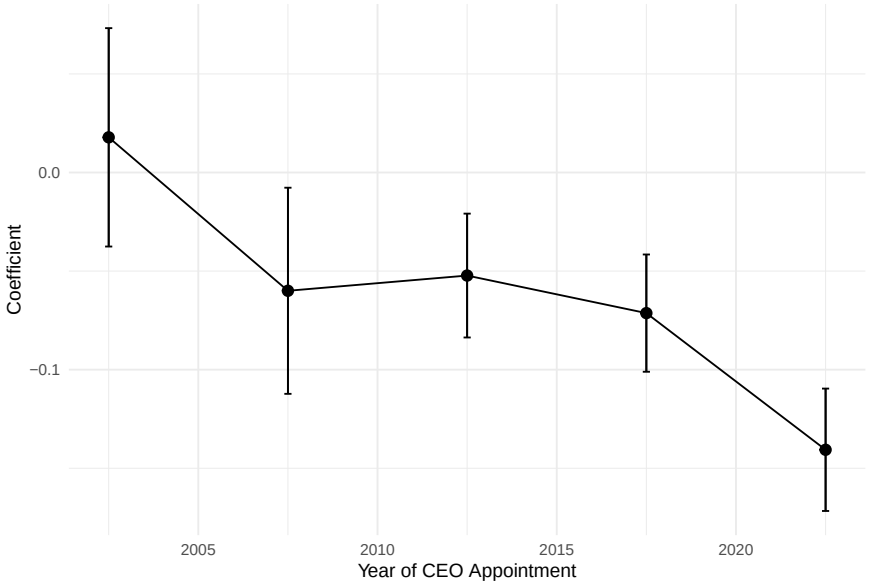
Notes: The specification equals column (4) from Table A12. Shows the point estimates for the coefficients on $Treat \times Post \times Quartile = k \; \forall k = 1, 2, 3, 4$ alongside 95% confidence intervals. Standard errors clustered at the firm level in parentheses.

Appendix Figure A19: Heterogeneity for Downward Mobility Response by Size Quartile of Current Firm



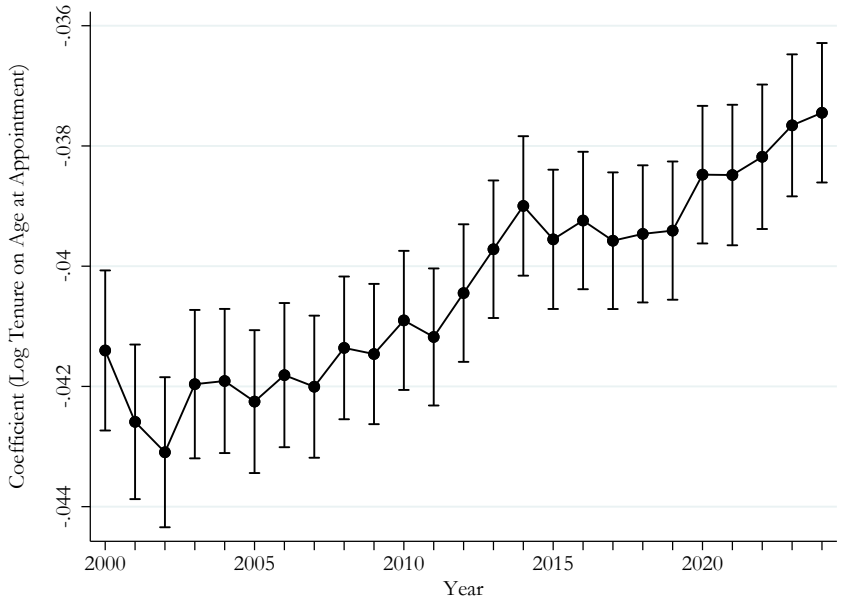
Notes: The specification equals column (4) from Table A18. Shows the point estimates for the coefficients on $Treat \times Post \times Quartile = k \; \forall k = 1, 2, 3, 4$ alongside 95% confidence intervals. Standard errors clustered at the firm level in parentheses.

Appendix Figure A20: Time-Varying Correlation of Firm Size and Seniority Differences from CEO Employment Histories



Notes: Plots the time-varying correlation of differences in firm employment and differences in seniority levels for job switches, using data from CEO employment histories. The coefficients are obtained from regressions of first differences of ln(firm employment) on 5-year bins for year of appointment, both alone and interacted with first differences in seniority. Point estimates are plotted alongside 95%-CIs. Standard errors are clustered at the CEO level.

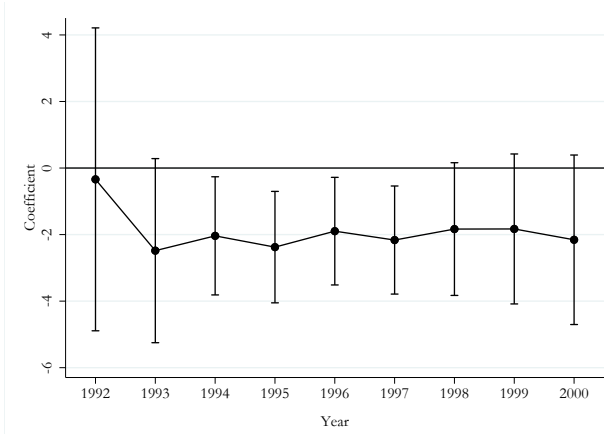
Appendix Figure A21: Time-Varying Correlation of CEO Tenure and Age at Appointment



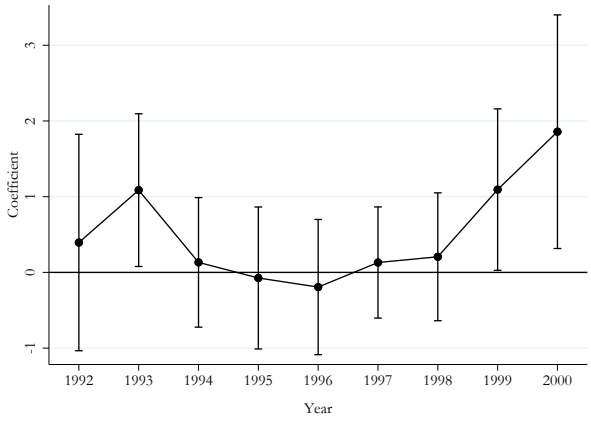
Notes: Shows the time-varying correlation of CEO tenure with age at appointment. The data are at the CEO-year level. The coefficients are obtained from regressions of the natural logarithm of tenure on year dummies, both alone and interacted with CEO age at appointment. Point estimates are plotted alongside 95%-CIs. Standard errors are clustered at the company level.

Appendix Figure A22: CEO Age of Firms Delisted 1997-2002 — Differential Effects

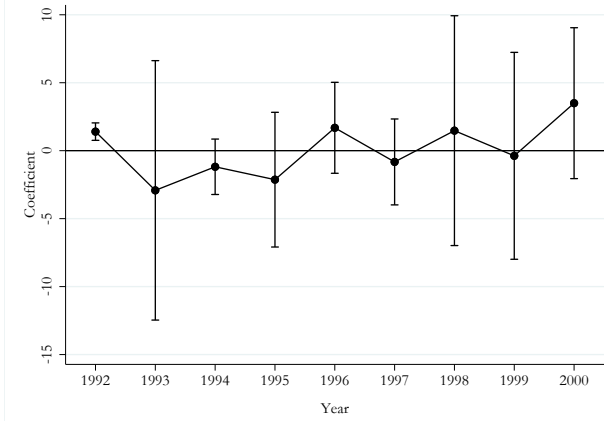
(a) Involuntary Delisting, Sitting CEOs



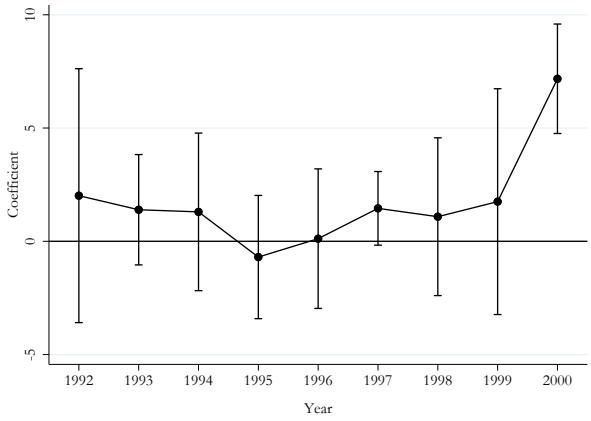
(b) M&A, Sitting CEOs



(c) Involuntary Delisting, Appointed CEOs



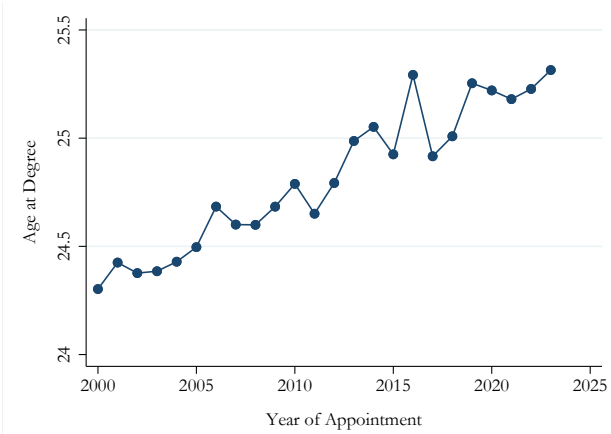
(d) M&A, Appointed CEOs



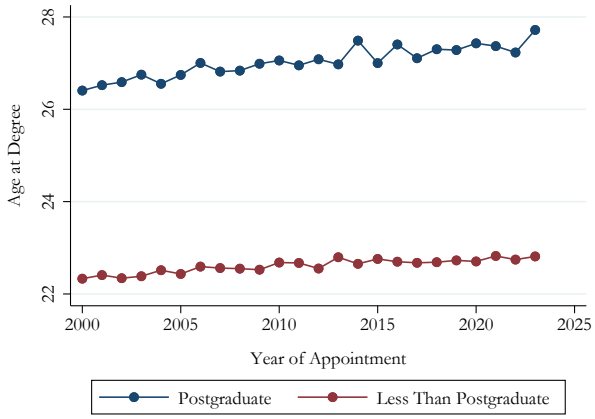
Notes: Shows coefficients from regressions of CEO age on year fixed effects interacted with indicators for different types of delistings (involuntary delistings in panels (a) and (c) and delistings due to M&A activity in panels (b) and (d)). The CEO data are from Execucomp and cover the S&P1500 during 1992 and 2000. The data have been combined with information on delistings during 1997 and 2002, obtained from CRSP. We follow the literature (e.g. Bharath and Dittmar, 2010) in our definition of involuntary delistings due to bankruptcy or liquidation (DLSTCD codes $\geq$ 400 excluding 570 and 573) and mergers and acquisitions (DLSTCD codes 200-399 excluding 332). All regressions include NAICS-4-year fixed effects and control for the natural logarithm of firm age, employment, and revenue, obtained from Compustat. Point estimates are plotted alongside 95%-CIs. Standard errors clustered at the NAICS-4 level.

Appendix Figure A23: CEO Education By Year of Appointment

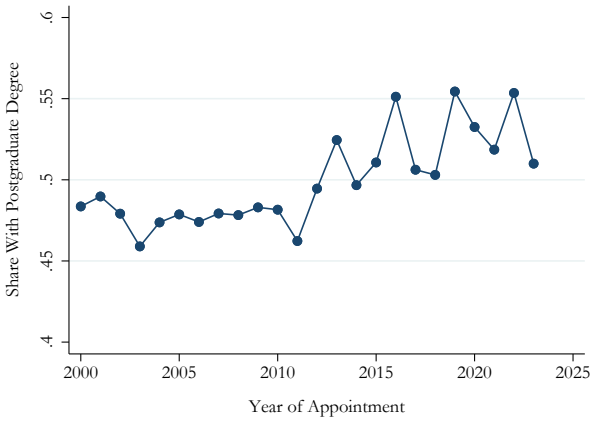
(a) Average Age at Highest Full-Time Degree



(b) Age at Highest Degree By Degree Type



(c) Share of CEOs with Postgraduate Degree



Notes: Shows CEO education by year of appointment, focusing on full-time degrees obtained after at most years post labor market entry. The data are from BoardEx. Panel (a) plots average age at the highest full-time degree. Panel (b) shows average age at the highest full-time degree, differentiating between postgraduate and less than postgraduate degrees. Panel (c) plots the share of CEOs with a postgraduate degree.

B Additional Tables

Appendix Table A1: Summary Statistics – Descriptives and Demand-Side Regressions

	Mean	SD	P25	P50	P75	N
Panel A1: Descriptives, CEO Age						
CEO Age (Northern America)	55.81	10.55	49.00	56.00	62.00	481560
CEO Age (Europe)	52.28	9.24	46.00	52.00	58.00	139376
CEO Age at Appointment (Northern America)	51.85	9.17	46.00	52.00	58.00	57394
CEO Age at Appointment (Europe)	49.31	8.17	44.00	49.00	55.00	17962
Panel A2: Descriptives, Career Paths United States						
Internal Appointment	0.20	0.40	0.00	0.00	0.00	50510
Internal Appointment, Firm Entry Manager	0.10	0.30	0.00	0.00	0.00	50510
Years of External Experience	21.12	10.76	14.00	21.00	29.00	50510
Years of Internal Experience	1.67	5.15	0.00	0.00	0.00	50510
Number External Positions	4.86	3.01	3.00	5.00	7.00	50510
Number Internal Positions	0.41	1.11	0.00	0.00	0.00	50510
Number of Firms	3.67	2.29	2.00	3.00	5.00	50510
Number of NAICS-4 Sectors	1.75	1.27	1.00	2.00	2.00	50510
Panel A3: Firm-Level Outcomes, Real Effects						
Revenue (Growth)	8.61	35.31	-2.00	7.74	19.66	87297
Employment (Growth)	4.77	25.40	-3.59	3.07	12.54	86922
Asset (Growth)	8.85	28.88	-2.60	6.02	17.42	86888
R&D Expenses (Growth)	7.95	39.18	-5.99	7.53	22.67	37649
Change in Product Mix	17.97	15.08	8.00	14.12	23.40	74752
Any Patent	0.28	0.45	0.00	0.00	1.00	82592
Product Patents (in Logs)	1.57	1.44	0.00	1.39	2.48	13818
Process Patents (in Logs)	1.34	1.38	0.00	1.10	2.20	11120
Share Computer Patents	0.14	0.30	0.00	0.00	0.02	23008
AI Share Jobs (in %)	0.10	0.34	0.00	0.00	0.05	28740
AI Share Job Postings (in %)	0.26	1.54	0.00	0.00	0.00	16224
SD Revenue Growth	20.80	25.30	6.99	12.93	24.18	64279
Leverage	0.88	1.57	0.07	0.43	1.02	82985
Firm Exit	0.03	0.18	0.00	0.00	0.00	87562
Panel B1: Demand-Side, Main Regression Sample						
CEO Age	54.07	7.79	49.00	54.00	59.00	6628
Travel Time to Closest Office	1.17	0.40	0.93	1.13	1.24	6628
Revenue Growth (NAICS-4-Level SD)	34.80	22.66	17.60	30.84	44.74	6628
Revenue Growth (NAICS-2-Level SD)	39.71	16.52	29.12	37.11	42.98	6628
Employment Growth (NAICS-4-Level SD)	25.77	13.02	16.41	24.29	33.22	6615
Log(Revenue)	5.70	2.39	4.22	5.97	7.45	6628
Log(Employment)	7.05	2.14	5.46	7.13	8.70	6628
Log(Employment), Revelio Labs	5.41	2.24	3.97	5.56	7.05	6441
Log(Firm Age)	2.52	1.02	1.79	2.64	3.33	6628
Log(Firm Age), Revelio Labs	3.32	0.70	3.00	3.50	3.83	6481
Panel B2: Age Externalities						
MBB Inflows (in %)	0.74	4.68	0.00	0.01	0.15	23213
MBB Experience	0.05	0.21	0.00	0.00	0.00	23213

Notes: Shows summary statistics for the results in Sections 2.2 and 3.1.

Appendix Table A2: Share of Appointments by Firm Size and Listing Status

Panel A: By Firm Size Quartile					
	Q5	Q4	Q3	Q2	Q1
External	.60	.71	.79	.83	.87
Internal	.40	.29	.21	.17	.13
Manager	.19	.14	.11	.09	.07
Non-Manager	.21	.15	.1	.08	.06
Panel B: By Listing Status					
	S&P500	S&P400	S&P600	Other Listed	Private
External	.44	.49	.55	.71	.85
Internal	.56	.51	.45	.29	.15
Manager	.30	.30	.29	.19	.06
Non-Manager	.26	.21	.16	.10	.09

Notes: The tables tabulate the share of appointments by seniority at firm entry against firm size quintile by employment (Panel A) and listing status (Panel B).

Appendix Table A3: Change in CEO Age and Pre-2000 Firm-Level Uncertainty

	CEO Age			
	(1)	(2)	(3)	(4)
Firm-Level SD	-0.420*	-0.569***	-0.454**	-0.571***
	(0.214)	(0.208)	(0.223)	(0.220)
Years since 2000 × Firm-Level SD	0.037**	0.048***	0.040**	0.051***
	(0.017)	(0.017)	(0.017)	(0.017)
R^2	0.109	0.116	0.109	0.116
Observations	5,373	4,717	5,351	4,696
Controls		✓		✓
Naics4 fixed effects	✓	✓	✓	✓
Year fixed effects	✓	✓	✓	✓
Time Period Uncertainty	1980-1999	1980-1999	1980-1999	1990-1999

Notes: The dependent variable in all regressions is CEO age upon appointment. *Firm-Level SD* denotes the firm-level standard deviation of the symmetric growth rate of firm revenue, calculated over the period shown in the last row of the table. The uncertainty measures are standardized to have mean zero and standard deviation one. Controls are the natural logarithm of the number of employees and firm age, both extracted from the employment history data, each alone and interacted with years since 2000. All regressions include fixed effects at the NAICS-4 and year levels. Standard errors are clustered at the NAICS-4 level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A4: MBB Availability, Uncertainty and CEO Age by Firm Size

	Smaller Firms		Larger Firms	
	CEO Age			
	(1)	(2)	(3)	(4)
Industry-Level SD	-2.299*		-0.146	
	(1.259)		(0.726)	
Travel Time × Industry-Level SD	1.789**	2.370***	-0.327	1.056
	(0.681)	(0.745)	(0.517)	(1.128)
R^2	0.406	0.525	0.368	0.634
Observations	2,528	1,842	3,140	1,686
MSA-Year fixed effects	✓	✓	✓	✓
Naics4 fixed effects	✓		✓	
Naics4-Year fixed effects		✓		✓

Notes: The dependent variable in all regressions is CEO age upon appointment, obtained from BoardEx. *Smaller Firms* are defined as those with below-median employee counts, while *Large Firms* comprise those above the median. *Travel* denotes the flight time (in hours) to the closest office, which we construct from MBB office openings combined with flight data from the Bureau of Transportation Statistics. *Industry-Level SD*, calculated as the cross-sectional standard deviation of the symmetric growth rate of firm revenue within a firm's NAICS-4 sector, is standardized to mean zero and standard deviation one. The sample is restricted to those MSAs without MBB presence. All regressions control for firm size by including the natural logarithm of employment, revenue, and firm age. Standard errors are double-clustered at the NAICS-4 sector and MSA level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A5: MBB Availability, Uncertainty and Other Outcomes Variables

	Ext. Exp	Int. Exp	Ext. Pos	Int. Pos	Nr Firms	Nr Sectors
	(1)	(2)	(3)	(4)	(5)	(6)
Travel Time × Industry-Level SD	2.636**	-1.780***	0.659**	-0.281	0.148	0.426***
	(1.022)	(0.632)	(0.273)	(0.194)	(0.227)	(0.147)
R^2	0.641	0.663	0.614	0.657	0.605	0.572
Observations	1,618	1,618	1,618	1,618	1,618	1,618
Independent Variable Mean	20.503	3.159	4.83	.997	3.866	2.256
Controls	✓	✓	✓	✓	✓	✓
MSA-Year fixed effects	✓	✓	✓	✓	✓	✓
Naics4-Year fixed effects	✓	✓	✓	✓	✓	✓

Notes: The dependent variables are (1) years of external experience, (2) years of internal experience, (3) number of external positions, (4) number of internal positions, (5) number of firms, and (6) number of NAICS-4 sectors. Columns (1) and (2) are estimated via OLS, columns (3) to (6) via Poisson pseudo-maximum likelihood regressions. *Travel time* denotes the flight time (in hours) to the closest office, which we construct from MBB office openings combined with flight data from the Bureau of Transportation Statistics. *Industry-Level SD*, calculated as the cross-sectional standard deviation of the symmetric growth rate of firm revenue within a firm's NAICS-4 sector, is standardized to mean zero and standard deviation one. The sample is restricted to those MSAs without MBB presence. All regressions control for firm size by including the natural logarithm of employment, revenue, and firm age. Standard errors are double-clustered at the NAICS-4 sector and MSA level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A6: Age Externalities from MBB Inflows – Robustness

	CEO Age			
	(1)	(2)	(3)	(4)
MBB Inflows	1.084***	0.0997***	0.116***	0.137***
	(0.285)	(0.0244)	(0.0294)	(0.0339)
MBB Experience	-3.313***	-3.513***	-3.490***	-3.755***
	(0.443)	(0.395)	(0.384)	(0.652)
MBB Inflows × MBB Experience	-1.451*	-0.102**	-0.151***	-0.615*
	(0.751)	(0.0428)	(0.0550)	(0.354)
R^2	0.382	0.382	0.382	0.461
Observations	14,721	14,721	14,721	5,869
Controls	✓	✓	✓	✓
Naics4-Year fixed effects	✓	✓	✓	✓
MSA-Year fixed effects	✓	✓	✓	✓
Change Compared to Baseline	Discretized	Seniority > 3	5 Year	Controls

Notes: The dependent variable in all regressions is CEO age at appointment among CEOs. *MBB Experience* is a dummy equal to one, if the individual had ever worked in an MBB firm. *MBB Inflows* is defined as the company-level sum of new managers with MBB experience during the previous 10 years, divided by the total number of new managers in a company summed over the previous 10 years. Controls are the natural logarithm of employment and firm age, both obtained from the employment biographies. We deviate from this setup in the following ways: Column (1) discretizes MBB inflows, assigning a value of 1 to all values in the highest quartile (conditional on being strictly positive); Column (2) normalizes the MBB inflows by dividing by inflows at seniority level 4 or above; Column (3) restricts inflows to the past 5 years prior to appointment; Column (4) replaces the control variables by the natural logarithm of employment, revenue and firm age, obtained from Compustat. Standard errors clustered at the firm level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A7: CEO Appointment of Former Coworker and Job Mobility (Any Sector Switch)

	Sector Switch				
	(1)	(2)	(3)	(4)	(5)
Treat	0.0017*				
	(0.0010)				
Post	-0.0042***	-0.0067***	-0.0080***		
	(0.0010)	(0.0009)	(0.0009)		
Treat × Post	-0.0007	0.0008	0.0009	0.0025**	0.0018**
	(0.0011)	(0.0011)	(0.0011)	(0.0010)	(0.0008)
R^2	0.00626	0.16146	0.16257	0.18626	0.21534
Observations	14,144,297	14,144,297	14,144,297	14,144,297	12,898,708
Pre-Treatment Control Mean	0.0415	0.0415	0.0415	0.0415	0.0405
Year fixed effects	✓	✓	✓		
Individual fixed effects		✓	✓	✓	✓
Firm-Seniority fixed effects			✓		
Firm-Seniority-Year fixed effects				✓	✓
MSA-Naics4-Year fixed effects					✓

Notes: The dependent variable in all regressions is a dummy equal to one in the last year before an individual switches across NAICS-4 sectors. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A8: CEO Appointment of Former Coworker and Job Mobility (Upward Firm Switch)

	Firm and Upward Switch				
	(1)	(2)	(3)	(4)	(5)
Treat	0.0012**				
	(0.0005)				
Post	0.0024***	-0.0001	-0.0011**		
	(0.0004)	(0.0004)	(0.0004)		
Treat × Post	-8.29×10^{-5}	-0.0003	-0.0004	-0.0006	-0.0007
	(0.0005)	(0.0005)	(0.0005)	(0.0004)	(0.0005)
R^2	0.00385	0.08995	0.09077	0.10519	0.13423
Observations	22,777,381	22,777,381	22,777,381	22,777,381	16,139,755
Pre-Treatment Control Mean	0.0247	0.0247	0.0247	0.0247	0.0251
Year fixed effects	✓	✓	✓		
Individual fixed effects		✓	✓	✓	✓
Firm-Seniority fixed effects			✓		
Firm-Seniority-Year fixed effects				✓	✓
MSA-Naics4-Year fixed effects					✓

Notes: The dependent variable in all regressions is a dummy equal to one in the last year before an individual switches firms and rises to a higher seniority level. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A9: CEO Appointment of Former Coworker and Job Mobility (Lateral Firm Switch)

	Firm and Lateral Switch				
	(1)	(2)	(3)	(4)	(5)
Treat	0.0024***				
	(0.0006)				
Post	-0.0021***	-0.0038***	-0.0047***		
	(0.0004)	(0.0004)	(0.0004)		
Treat × Post	-0.0009*	-0.0016***	-0.0015***	8.01×10^{-5}	-0.0007
	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0006)
R^2	0.00369	0.11043	0.11125	0.12885	0.15992
Observations	22,777,381	22,777,381	22,777,381	22,777,381	16,139,755
Pre-Treatment Control Mean	0.0286	0.0286	0.0286	0.0286	0.0289
Year fixed effects	✓	✓	✓		
Individual fixed effects		✓	✓	✓	✓
Firm-Seniority fixed effects			✓		
Firm-Seniority-Year fixed effects				✓	✓
MSA-Naics4-Year fixed effects					✓

Notes: The dependent variable in all regressions is a dummy equal to one in the last year before an individual switches firm but remains at the same seniority level. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A10: CEO Appointment of Former Coworker and Job Mobility (Across Firms and Job Categories)

	Switch Across Firms and Job Categories				
	(1)	(2)	(3)	(4)	(5)
Treat	-0.0018***				
	(0.0006)				
Post	-0.0026***	-0.0067***	-0.0075***		
	(0.0006)	(0.0006)	(0.0006)		
Treat × Post	0.0012**	0.0020***	0.0020***	0.0026***	0.0027***
	(0.0005)	(0.0006)	(0.0006)	(0.0005)	(0.0006)
R^2	0.00294	0.12662	0.12733	0.14446	0.17633
Observations	22,777,381	22,777,381	22,777,381	22,777,381	16,139,755
Pre-Treatment Control Mean	0.0343	0.0343	0.0343	0.0343	0.0334
Year fixed effects	✓	✓	✓		
Individual fixed effects		✓	✓	✓	✓
Firm-Seniority fixed effects			✓		
Firm-Seniority-Year fixed effects				✓	✓
MSA-Naics4-Year fixed effects					✓

Notes: The dependent variable in all regressions is a dummy equal to one in the last year before an individual switches firm and job category. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A11: CEO Appointment of Former Coworker and Job Mobility (Across Firms, Within Job Categories)

	Switch Across Firms Within Job Categories				
	(1)	(2)	(3)	(4)	(5)
Treat	0.0004				
	(0.0010)				
Post	-0.0072***	-0.0095***	-0.0112***		
	(0.0010)	(0.0008)	(0.0008)		
Treat × Post	0.0005	0.0002	0.0002	0.0022***	0.0014*
	(0.0010)	(0.0009)	(0.0009)	(0.0008)	(0.0009)
R^2	0.00911	0.13915	0.13990	0.16038	0.19107
Observations	22,777,381	22,777,381	22,777,381	22,777,381	16,139,755
Pre-Treatment Control Mean	0.0600	0.0600	0.0600	0.0600	0.0614
Year fixed effects	✓	✓	✓		
Individual fixed effects		✓	✓	✓	✓
Firm-Seniority fixed effects			✓		
Firm-Seniority-Year fixed effects				✓	✓
MSA-Naics4-Year fixed effects					✓

Notes: The dependent variable in all regressions is a dummy equal to one in the last year before an individual switches firms but stays in the same job category. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A12: Heterogeneity by Length of Shared Tenure

	Any Firm	Upward	Lateral	Downward	Any Sector
	(1)	(2)	(3)	(4)	(5)
Treat × Post	-0.0028**	-0.0017***	-0.0026***	0.0015**	-0.0009
	(0.0011)	(0.0004)	(0.0005)	(0.0006)	(0.0010)
Treat × Post × High Overlap	0.0371***	0.0055***	0.0130***	0.0187***	0.0163***
	(0.0020)	(0.0006)	(0.0008)	(0.0011)	(0.0013)
R^2	0.16605	0.10520	0.12888	0.11076	0.18628
Observations	22,777,381	22,777,381	22,777,381	22,777,381	14,144,297
Pre-Treatment Control Mean	0.0944	0.0247	0.0286	0.0410	0.0415
Individual fixed effects	✓	✓	✓	✓	✓
Firm-Seniority-Year fixed effects	✓	✓	✓	✓	✓

Notes: The specification equals column (4) from the baseline tables. "Long Shared Tenure" is a dummy equal to 1 if the length of the overlapping period of the individual and the future CEO working in the same company is in the highest quartile, and zero otherwise. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A13: Effects on Individuals at Seniority Level below Future CEO

	Any Firm (1)	Upward (2)	Lateral (3)	Downward (4)	Any Sector (5)
Treat × Post	0.0016*	-0.0011***	-0.0001	0.0028***	0.0001
	(0.0009)	(0.0004)	(0.0003)	(0.0004)	(0.0007)
Post × Treat × Two Levels Below	-3.77×10^{-5}	-0.0002	0.0004	-0.0003	0.0004
	(0.0010)	(0.0004)	(0.0004)	(0.0005)	(0.0007)
R^2	0.16241	0.10348	0.12726	0.10565	0.18089
Observations	53,842,096	53,842,096	53,842,096	53,842,096	33,975,831
Pre-Treatment Control Mean	0.1015	0.0329	0.0304	0.0382	0.0453
Individual fixed effects	✓	✓	✓	✓	✓
Firm-Seniority-Year fixed effects	✓	✓	✓	✓	✓

Notes: The specification equals column (4) from the baseline tables, with the sample restricted to those working at the two seniority levels directly below the future CEO. For the workers two levels below the future CEO, we focus on a random 50% subsample of all individuals to maintain computational feasibility. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A14: Effects on Individuals at Seniority above Future CEO

	Any Firm (1)	Upward (2)	Lateral (3)	Downward (4)	Any Sector (5)
Treat × Post	0.0047**	-0.0006	0.0009	0.0044***	0.0030*
	(0.0020)	(0.0005)	(0.0009)	(0.0009)	(0.0018)
Treat × Post × Two Levels Above	0.0011	0.0030***	-0.0002	-0.0017	0.0022
	(0.0022)	(0.0008)	(0.0010)	(0.0015)	(0.0016)
R^2	0.16998	0.11153	0.13541	0.11993	0.18909
Observations	13,119,386	13,119,386	13,119,386	13,119,386	8,465,394
Pre-Treatment Control Mean	0.0906	0.0191	0.0294	0.0421	0.0406
Individual fixed effects	✓	✓	✓	✓	✓
Firm-Seniority-Year fixed effects	✓	✓	✓	✓	✓

Notes: The specification equals column (4) from the baseline tables, with the sample restricted to those working at the two seniority levels directly above the future CEO. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A15: Time Variation in Effect of CEO Appointment of Former Coworker and Job Mobility (5-Year Bins)

	Any Firm (1)	Upward (2)	Lateral (3)	Downward (4)	Any Sector (5)
Treat × Post	-0.0034*	-0.0012	-0.0020**	-0.0002	-0.0004
	(0.0017)	(0.0009)	(0.0009)	(0.0011)	(0.0016)
Treat × Post × 1990-1994	0.0093**	-0.0004	0.0054**	0.0044	0.0077**
	(0.0042)	(0.0021)	(0.0027)	(0.0032)	(0.0038)
Treat × Post × 1995-1999	0.0028	0.0008	0.0026	-0.0006	0.0016
	(0.0041)	(0.0016)	(0.0017)	(0.0025)	(0.0027)
Treat × Post × 2005-2009	0.0056**	-0.0003	0.0024*	0.0035**	0.0033
	(0.0025)	(0.0012)	(0.0013)	(0.0014)	(0.0021)
Treat × Post × 2010-2014	0.0149***	0.0022*	0.0038***	0.0089***	0.0082**
	(0.0033)	(0.0013)	(0.0014)	(0.0016)	(0.0033)
R^2	0.14678	0.09192	0.11386	0.09277	0.16368
Observations	13,829,579	13,829,579	13,829,579	13,829,579	8,685,741
Pre-Treatment Control Mean	0.0794	0.0209	0.0239	0.0346	0.0346
Individual fixed effects	✓	✓	✓	✓	✓
Firm-Seniority-Year fixed effects	✓	✓	✓	✓	✓

Notes: The specification equals column (4) from the baseline tables. The sample is restricted to CEO appointments between 1990 and 2014. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. The baseline period includes the years 2000 to 2004. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A16: Heterogeneity by Mobility of CEO

	Any Firm (1)	Upward (2)	Lateral (3)	Downward (4)	Any Sector (5)
Treat × Post	0.0034***	-0.0009**	-0.0003	0.0047***	0.0018*
	(0.0011)	(0.0004)	(0.0005)	(0.0006)	(0.0009)
Treat × Post × High Mobility CEO	0.0043*	0.0011	0.0012	0.0021*	0.0022
	(0.0024)	(0.0009)	(0.0009)	(0.0011)	(0.0023)
R^2	0.16597	0.10519	0.12885	0.11072	0.18626
Observations	22,777,381	22,777,381	22,777,381	22,777,381	14,144,297
Pre-Treatment Control Mean	0.0944	0.0247	0.0286	0.0410	0.0415
Individual fixed effects	✓	✓	✓	✓	✓
Firm-Seniority-Year fixed effects	✓	✓	✓	✓	✓

Notes: The specification equals column (4) from the baseline tables. "High Mobility CEO" is a dummy equal to 1 if the number of positions held by the CEO between leaving the firm and being appointed to CEO is in the highest quartile, and zero otherwise. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A17: Heterogeneity by Direction of CEO Switch

	Any Firm (1)	Upward (2)	Lateral (3)	Downward (4)	Any Sector (5)
Treat × Post	0.0049***	4.5×10^{-5}	0.0002	0.0046***	0.0031***
	(0.0014)	(0.0005)	(0.0006)	(0.0008)	(0.0012)
Post × Treat × Lateral Switch	-0.0020	-0.0015*	-0.0012	0.0007	-0.0039**
	(0.0020)	(0.0008)	(0.0009)	(0.0011)	(0.0016)
Treat × Post × Downward Switch	0.0031	-0.0007	0.0013	0.0025*	0.0032
	(0.0033)	(0.0013)	(0.0012)	(0.0015)	(0.0033)
R^2	0.16597	0.10519	0.12885	0.11072	0.18626
Observations	22,777,381	22,777,381	22,777,381	22,777,381	14,144,297
Pre-Treatment Control Mean	0.0935	0.0244	0.0283	0.0407	0.0407

Notes: The specification equals column (4) from the baseline tables. "Lateral Switch" ("Downward Switch") are dummies equal to 1 if the future CEO leaves the company while staying at the same seniority level (switching to a lower seniority level), and zero otherwise. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A18: Heterogeneity by Size Quartile of Current Firm

	Any Firm (1)	Upward (2)	Lateral (3)	Downward (4)	Any Sector (5)
Quartile = 2	0.0327***	0.0071***	0.0091***	0.0165***	0.0177***
	(0.0017)	(0.0005)	(0.0007)	(0.0011)	(0.0015)
Quartile = 3	0.0527***	0.0082***	0.0126***	0.0319***	0.0341***
	(0.0025)	(0.0008)	(0.0009)	(0.0017)	(0.0023)
Quartile = 4	0.0654***	0.0093***	0.0140***	0.0420***	0.0440***
	(0.0033)	(0.0017)	(0.0013)	(0.0035)	(0.0037)
Treat × Post	0.0063***	-0.0052***	-0.0014**	0.0130***	0.0106***
	(0.0014)	(0.0007)	(0.0007)	(0.0008)	(0.0018)
Post × Treat × Quartile = 2	0.0077***	0.0076***	0.0044***	-0.0043***	-0.0020
	(0.0019)	(0.0008)	(0.0010)	(0.0011)	(0.0019)
Post × Treat × Quartile = 3	0.0065**	0.0095***	0.0050***	-0.0080***	-0.0039
	(0.0028)	(0.0011)	(0.0012)	(0.0017)	(0.0026)
Post × Treat × Quartile = 4	-0.0231***	0.0026*	-0.0033**	-0.0223***	-0.0207***
	(0.0035)	(0.0015)	(0.0015)	(0.0026)	(0.0033)
R^2	0.16795	0.10540	0.12918	0.11244	0.18724
Observations	22,777,381	22,777,381	22,777,381	22,777,381	14,144,297
Individual fixed effects	✓	✓	✓	✓	✓
Firm-Seniority-Year fixed effects	✓	✓	✓	✓	✓

Notes: The specification equals column (4) from the baseline tables. The quartiles refer to the firm the individual works for in a given year. Firm size is measured by number of employees. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses.* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A19: CEO Appointment of Former Coworker and Job Mobility (Downward Firm Switch) By Firm Size of Current vs. Destination Firm

	Larger Firm (1)	Smaller Firm (2)	Higher Quartile (3)	Same Quartile (4)	Smaller Quartile (5)	Highest Quartile (6)
Post × Treat	0.0012***	0.0044***	0.0008***	0.0012***	0.0036***	0.0006***
	(0.0003)	(0.0004)	(0.0002)	(0.0002)	(0.0004)	(0.0002)
R^2	0.11202	0.10075	0.10982	0.11612	0.09637	0.10615
Observations	22,745,916	22,745,916	22,745,916	22,745,916	22,745,916	22,745,916
Pre-Treatment Control Mean	0.0134	0.0284	0.0084	0.0112	0.0221	0.0055
Individual fixed effects	✓	✓	✓	✓	✓	✓
Firm-Seniority-Year fixed effects	✓	✓	✓	✓	✓	✓

Notes: The dependent variable in all regressions is a dummy equal to one in the final year before an individual switches firms and moves to a position with lower seniority. We differentiate transitions by the relative size of the destination firm, measured by the number of employees. We distinguish between switches to firms that are larger (column 1) or smaller (column 2) than the individual's current firm, as well as moves to a higher (column 3), the same (column 4), or a lower (column 5) firm size quartile. In Column (6), we focus on switches towards firms in the highest size quartile. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A20: CEO Appointment of Former Coworker and Salary Growth

	Log Salary in First Differences				
	(1)	(2)	(3)	(4)	(5)
Treat	0.0024***				
	(0.0003)				
Post	0.0007**	-0.0022***	-0.0032***		
	(0.0003)	(0.0004)	(0.0004)		
Treat × Post	-0.0005	-0.0005	-0.0005	-0.0017***	-0.0019***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0006)
R^2	0.00034	0.05184	0.05232	0.06957	0.09804
Observations	22,739,139	22,739,139	22,739,139	22,739,139	16,111,774
Pre-Treatment Control Mean	0.0155	0.0155	0.0155	0.0155	0.0157
Year fixed effects	✓	✓	✓		
Individual fixed effects		✓	✓	✓	✓
Firm-Seniority fixed effects			✓		
Firm-Seniority-Year fixed effects				✓	✓
MSA-Naics4-Year fixed effects					✓

Notes: The dependent variable in all regressions is log salary in first differences. *Treat* is an indicator for having worked alongside a future CEO. *Post* is an indicator for periods following the CEO appointment. All fixed effects refer to the position the individual worked in alongside the future CEO. Standard errors clustered at the firm level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A21: CEO Age and Industry-Level Market Concentration

	CEO Age					
	(1)	(2)	(3)	(4)	(5)	(6)
4-firm concentration ratio	-1.158					
	(0.888)					
8-firm concentration ratio		-1.058				
		(0.865)				
20-firm concentration ratio			-1.096			
			(0.920)			
HHI-Floor Sales				-7.883		
				(4.952)		
HHI-Floor Employment					-4.500	
					(6.379)	
HHI-Floor Payroll						-4.605
						(5.924)
R^2	0.119	0.119	0.119	0.119	0.131	0.131
Observations	45,370	45,370	45,370	45,326	33,092	33,092
Year fixed effects	✓	✓	✓	✓	✓	✓
Naics4 fixed effects	✓	✓	✓	✓	✓	✓

Notes: Shows results from regressing CEO age at appointment on different measures of market concentration at the NAICS4-level, using data from the most recent wave of the Economic Census (1997, 2002, 2007, 2012, and 2017). Data from the Economic Census have been obtained from here for years up to 2012 and via the United States Census Bureau for 2017. In columns (1), (2), and (3), the concentration measures are the combined percentage of the total industry sales accounted for by the largest 4, 8, and 20 firms in the industry, respectively. Columns (4), (5), and (6) use the HHI-floor based on sales, employment, and payroll, respectively. The HHI-floor is a lower-bound estimate of the Herfindahl–Hirschman Index (HHI), constructed from concentration ratios, as described in Keil (2017). All regressions control for NAICS-4 and year fixed effects as well as the natural logarithm of employment and firm age, both obtained from the employment history data. Standard errors are clustered at the firm level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.