The Labor Market for Corporate Leaders

Evidence from a quarter million director and officer appointments

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Abstract

We study segmentation in the labor market for corporate leaders by tracking directors and officers at over 35,000 U.S. firms across a quarter century. Director and officer labor markets are highly segmented across sectors. Sector switchers overwhelmingly preserve their roles (e.g., director to director), whereas role switching is far more common within sectors. Labor market integration across sectors follows a hub-and-spoke pattern: some sector pairs exhibit partial integration (e.g., Technology and Consumer), while others remain largely segmented. These differences in integration affect subsequent board and officer recruitment patterns in response to sector expansion shocks. Our findings illuminate how equilibrium board structure depends on supply—labor market segmentation and human capital transferability—in addition to firms' demand for skilled directors and officers.

Keywords: Directors, Corporate Finance, Labor Market, Human Capital

JEL codes: G30, J24, J44, D22

1 Introduction

A vast body of research in finance, management, and economics examines how director and executive skills, experiences and human capital shape firm behavior.[1] Notably, the literatures on directors and officers have developed largely in parallel, with recent reviews treating them as distinct labor markets (Withers et al., 2012; Withers et al., 2024). At the same time, our understanding of the labor market dynamics—movements of directors and officers across firms, and transitions between these roles—is limited. An understanding of these dynamics is significant as it explains the origins of corporate leaders' diverse skills and experiences, which is largely taken for granted in the literature on directors and CEOs (Adams, Akyol, and Verwijmeren, 2018).

The origins of director and officer expertise have practical significance. As Ronald P. O'Hanley, President and CEO of State Street Global Advisors, remarked: "Boards are responsible for overseeing a company's long-term strategy, but many are comprised of directors who, frankly, lack expertise, scope and the diverse views and backgrounds necessary to effectively do that" (O'Hanley, 2017). If boards seek directors with diverse sector backgrounds, understanding which sectors exchange talent—and which remain segmented—becomes essential for evaluating both the supply of qualified directors and officers, and the constraints firms face in assembling effective boards. This issue is increasingly salient for U.S. firms because officer turnover, particularly CEO turnover, has risen and incoming officers are often less experienced (Francis, 2026).

We study the portability of skills and experiences by tracking the career trajectories of more than a quarter million directors and officers at public and private U.S. firms from 1998 to 2024. Our unit of observation is an individual person, traced through time across roles, firms, and sectors. Building on the extensive literature on the demand for directors and officers, which includes research on board structure (e.g., Coles et al., 2008), executive compensation (e.g., Core et al., 1999), director skill sets (e.g., Fich, 2005; Güner et al., 2008; Wang, Xie, and Zhu, 2015), the value of directors from related industries (Dass et al., 2014), and firm-level responses to demand shocks for director expertise (Chen et al., 2020), we emphasize a key insight: Equilibrium labor market outcomes depend not only on demand but also the limited supply of individuals who possess the desired backgrounds, skills, and experiences (see, e.g., Adams, Akyol, and Verwijmeren, 2018; Adams, Hermalin, and Weisbach, 2010; Linck, Netter, and Yang, 2009). From the hiring perspective, each officer or director

[1] Adams and Ferreira 2010; Bizjak, Lemmon, and Whitby 2009; Stuart and Yim 2010; Duchin, Matsusaka, and Ozbas 2010; Nguyen and Nielsen 2010; Ahern and Dittmar 2012; Fracassi and Tate 2012; Custodio and Metzger 2013; Dass, Kini, Nanda, Onal, and Wang 2014; Ishii and Xuan 2014; Rousseau and Stroup 2015; Wang, Xie, and Zhu 2015; Stroup 2017; Ding, Hu, Li, and Lin 2021; Agcayazi, Hibbert, and Morillon 2024.

can be conceived as a bundle of characteristics—skills, prior experiences, and information (e.g., Custódio, Ferreira, and Matos 2013; Güner, Malmendier, and Tate 2008; Rousseau and Stroup 2015; Field and Mkrtchyan 2017), decision-making positionality (e.g., independence), and more—so that each appointment necessarily reveals some complementarity between supply and demand for human capital (Adams, Akyol, and Verwijmeren, 2018). This supply is shaped by individuals' prior experiences, and because skills and experiences are not perfectly transferable across sectors, the labor markets for corporate leaders are partially segmented.

Key to our approach is the observation that the movement of an individual who previously served as a director or officer in sector i and was later hired by a firm in sector j provides direct evidence that the labor markets for these sectors share some degree of overlap. In our data, some sector pairs—such as Technology and Financials—exhibit a large fraction of observed people movements between them, while other pairs (e.g., Healthcare and Real Estate) appear to be largely disconnected. We interpret these persistent sector-level differences in people movements as revealing segmentation in the labor market for corporate leaders. Thus, our revealed-preference approach identifies variation in labor market connectedness and human capital transferability by tracing the observed career movements of directors and officers over time.

Our findings include new facts that shed light on labor markets for skilled individuals. First, director and officer labor markets are highly segmented across sectors: even the most permeable sectors fill fewer than 7 percent of positions with cross-sector hires, and the least permeable fill fewer than 2 percent. Despite universally low rates, we find that segmentation is not uniform but varies systematically across sectors, with a four-fold difference in permeability between the most and least integrated sectors. We find, for example, that the Financials sector is the largest net importer of directors and officers from other sectors.

Second, role transitions and sector transitions function as substitutes rather than complements: individuals who move across sectors overwhelmingly preserve their roles (e.g., a director in one sector taking a director role in other sector), while role switching is substantially more common for moves within sectors. Officers making within-sector moves transition to director roles 49.1% of the time, compared to only 17.5% when moving across sectors—a 31.6 percentage point gap. To illustrate the substitutability, consider two hypothetical moves: an officer at a healthcare firm who joins the board of another healthcare company (a within-sector role change), versus a director at a technology firm who joins the board of a consumer products company (a cross-sector role-preserving move). Our data reveal that the latter pattern is far more common: changing sectors and changing roles simultaneously appears to exceed a threshold of feasibility in director and officer career progressions.

Third, cross-sector mobility patterns reveal substantial heterogeneity in labor market

integration, with some sector pairs exhibiting relatively more moves of people between them (e.g., Directors in the Technology sector who are later recruited by Consumer firms). Other sector pairs remaining largely disconnected (e.g., Healthcare almost never hires directors and officers in the Real Estate sector). Some pairs exhibit bi-directional flows while in others one-way recruitment is the norm. Overall, the director and officer labor market networks exhibit a hub-and-spoke structure. We find, for example, that Financials and Consumer sectors occupy central positions as destination sectors, while Technology and Industrials serve as major exporters of directors and officers. Peripheral sectors—Funds, Utilities, Real Estate—connect primarily to the central hubs but not each other. These cross-sectional patterns in director and officer labor markets are largely time-invariant, and we show that the ranking of sectors by permeability is preserved even under sector size changes, confirming that segmentation reflects durable structural features of human capital portability in the market for directors and officers.

Fourth, we show that these pre-existing cross-sector connections actively channel reallocation of directors and officers in response to sector-level shocks. We find that a one-standard-deviation demand shock to a destination sector increases expected cross-sector hires by 42% at the mean level of pre-existing integration, and by 157% at the maximum. Sector pairs with the highest baseline integration respond roughly four times more elastically to destination shocks than pairs at the mean.

In the spirit of empirical work that establishes foundational patterns to guide subsequent theory and policy (e.g., Hoberg and Phillips, 2024), we provide the first comprehensive characterization of cross-sector segmentation in director and officer labor markets as well as quantification of mobility patterns, their directionality, and their network structure. The new facts we document about the labor market for corporate leaders—have not previously been measured despite their significance for understanding how boards are assembled and how corporate expertise circulates across the economy.

Our descriptive contributions respond directly to calls made by Adams, Akyol, and Verwijmeren (2018) and Adams, Hermalin, and Weisbach (2010) for greater attention to understanding the supply side of the director labor market. We complement the extensive demand-side literature on firms' desired board composition, executive compensation, and firm performance by documenting equilibrium outcomes that reveal how supply-side segmentation interacts with demand-side preferences to determine observed labor market outcomes. This is also the first study to analyze the labor markets for directors and officers within the perspective of equilibrium outcomes documenting joint determinants of supply and demand, cross-industry segmentation, and movements between director and officer roles. While the literatures on directors and officers have recognized their distinctness (Withers et al., 2012;

2024), the permeability of the boundary between roles—and how this permeability varies with sector mobility—has not previously been examined.

We also provide new causal evidence on how changes in firms' demand interact with structural features of the supply side: when a destination sector experiences an expansion, incremental hires flow disproportionately through sector pairs where labor market integration was previously established. This finding demonstrates that pre-existing labor market structure actively channels how firms recruit in response to changing conditions. More broadly, our findings have direct implications for the literature on board composition and director expertise (e.g., Dass et al., 2014; Wang, Xie, and Zhu, 2015; Chen et al., 2020). Firms cannot hire just anyone: the pool of available candidates is constrained by which sectors have previously developed transferable human capital, and these constraints are largely time-invariant.

The remainder of the paper is organized as follows. Section 2 reviews the related literature. Section 3 describes our conceptual framework. Section 4 describes our data and measurement approach. Section 5 documents empirical facts about role transitions, cross-sector mobility, and industry-size counterfactuals. Section 6 develops a regression framework that tests whether pre-existing labor market integration channels the dynamic response to sector-level demand shocks. Section 7 concludes and outlines directions for future research.

2 Related Literature

2.1 Human Capital and Director Effectiveness

Within the labor market for directors and officers, each person possesses human capital that could be transferable across sectors, with the observable variation in their backgrounds reflecting the decomposition into general, industry-specific, and firm-specific capital. However, some of a director's human capital is non-portable, firm-specific knowledge which limits their ability to be effective directors at other firms (Gao et al., 2024).

Earlier research has constructed various direct proxies for specific skills. As an example, a director who holds an MBA degree might possess general management skills; these and other observable characteristics could be aggregated to create a vector of director attributes (Cashman et al., 2014). Similarly, Adams et al. (2018) report that approximately 38% of all directors have management skills, defined as finance and accounting, company business, or management experience.

The banker director literature exemplifies the insight that an individual director's current or past experiences are a form of valuable human capital. Bankers on a board are likely to

facilitate and better monitor access to capital markets (e.g., Byrd and Mizruchi, 2005; Sisli Ciamarra, 2012) and growth (Huang et al., 2014), with the effects coming predominantly from affiliated banker directors where the bank and the firm have a professional relationship (Song et al., 2024). Banker executives are more likely to be on corporate boards and to be on a larger number of boards than are executives from other sectors (Kroszner and Strahan, 2001).

More broadly, a huge literature in corporate finance has documented how individual director and officer attributes - including their prior experience - have a direct effect on the corporation (e.g., Cashman et al., 2014; Hwang and Kim, 2009). The experiences of individual directors and executives have been shown to affect corporate outcomes, with these experiences become portable as directors move across firms and sectors. Examples include experience with acquisition execution and performance (Field and Mkrtchyan, 2017), international experience (Stroup, 2017), financial expertise (Güner, Malmendier, and Tate, 2008), and private equity deal exposure (Stuart and Yim, 2010).

The demand for director expertise has evolved as corporations have grown larger and more complex (Hoberg and Phillips, 2024). Firms increasingly operate across multiple locations and business lines, requiring greater breadth of advice and monitoring from boards. This trend creates competing pressures on director selection. On the one hand, boards may place a premium on industry-specific knowledge, which would explain the high frequency of intra-sector appointments documented by Gopalan et al. (2024). On the other hand, firms with business interests spanning multiple sectors may value directors with cross-sector experience. Our analysis of mobility patterns speaks to which of these pressures dominates in equilibrium.

2.2 Segmented Labor Markets, Networks and Director Selection

Labor markets for skilled individuals are somewhat segmented: not every past and current director or officer is viable for each position. Therefore, proximity and networks create segmentation in labor markets across firms and sectors. As an example, consider the finding that geographically proximate executives are disproportionately represented in a particular firm's hiring pool (Knyazeva et al., 2013), even while qualified individuals from any location appear in the relevant pool (Field et al., 2020). Rather than defining the relevant labor market a priori, our revealed-preference approach allows any individual currently serving as a director or officer to be a potential candidate for any position.

The labor market for director and officer appointments is operationally opaque to individuals outside the hiring firm: boards do not typically advertise vacancies publicly so

there is no process by which candidates can apply for openings. Typically, the existing board nominates a slate of new directors for shareholders to vote on, and the slate is usually elected. Each board's process of selecting a replacement or expansion director is significant as the company must choose what types of individuals will best serve their anticipated future needs, even as the quality or value of individual directors is only observed ex post (Burt et al., 2020).

Earlier research shows that a firm's existing knowledge base—embodied in its current officers and directors—influences which candidates are selected for open positions. For example, more connected directors are better monitors (Intintoli et al., 2018) and thus are more likely to be appointed to boards. Cai et al. (2022) report that sixty-nine percent of new directors in 2003–2014 have professional ties to existing board members, and these professional networks benefit firm value (Bakke et al., 2024). Similarly, Lalanne (2023) finds that a director who holds social connections to members of a board is 35.8–41.1 percentage points more likely to be appointed to that board, and Hwang and Kim (2009) report that 25% of directors have social connections to the incumbent board or CEO. CEOs can help the directors at their firms obtain subsequent directorships through their social and professional networks and benefit strategically from their directors obtaining additional appointments (Kim et al., 2023).

Boards may also seek out directors who have past experience with specific corporate events. Directors with prior acquisition experience, particularly when the acquisition performance was strong, are positively related to subsequent firm performance (Field and Mkrtchyan, 2017). Director reputation is affected by forced CEO turnovers at firms where they serve (Von Meyerinck et al., 2025). Corporate investments and value are both affected by director network connections (Bakke et al., 2024; Fracassi and Tate, 2012) and when a CEO serves as an outside director (Fahlenbrach et al., 2010).

Cross-sector hiring is not without potential costs. Directors who serve on multiple boards are associated with weaker firm outcomes (Fich and Shivdasani, 2006), an effect that strengthens as the sample extends beyond S&P 500 firms (Cashman et al., 2012). More directly relevant to our analysis, Wang and Verwijmeren (2019) find that directors may be distracted by events at firms in their original sectors, leading to reduced attention and declines in firm value. These findings suggest that while cross-sector experience may bring valuable expertise, it may also impose attention costs—a tradeoff that could influence observed mobility patterns.

2.3 Directors and Officers as Distinct Labor Markets

While the academic literature on corporate leaders has extensively examined both directors and officers, these literatures have largely developed in parallel. Withers, Lee, Bermiss, and Boivie (2024) explicitly exclude directors from their comprehensive review of the executive labor market, citing "the unique context of the market for corporate directors" (see Withers, Hillman, and Cannella, 2012). This disciplinary segmentation reflects substantive differences in how these roles function: directors serve primarily in oversight and advisory capacities, often holding multiple board positions simultaneously across firms, while officers bear operational responsibility for firm management and typically serve one firm at a time. The career incentives also differ-officers may seek board appointments to signal quality and gain prestige (Fama and Jensen, 1983), while directors' reputations depend on their monitoring effectiveness across multiple appointments (Levit and Malenko, 2016). Despite this recognition that directors and officers occupy distinct labor markets, little empirical work has examined how individuals transition between these roles, or whether mobility patterns differ for role-preserving versus role-switching moves.

2.4 Connections to the Broader Labor Economics Literature

Our analysis also connects to a broader literature in labor economics on worker mobility, occupational transitions, and labor market segmentation. The decomposition of human capital into general, industry-specific, and firm-specific components is central to models of job matching and turnover (Jovanovic, 1979; Neal, 1995), and empirical work has documented that industry-specific capital is a quantitatively important determinant of worker mobility and wage dynamics (Parent, 2000; Kambourov and Manovskii, 2009). Our setting differs from these standard labor markets in several respects that motivate a distinct empirical approach. The market for corporate leaders is operationally opaque—boards do not advertise vacancies, and candidates do not apply through public channels—making matching inherently network-mediated and bilateral rather than intermediated through posted prices (Cai et al., 2022). Directors and officers are also fundamentally different from typical workers: they are experienced professionals whose prior appointments constitute a public track record, they frequently hold simultaneous positions at multiple firms, and their compensation structures differ markedly from wage workers. Revealed-preference methods for studying labor market structure (Sorkin, 2018), which we adapt to the corporate director and officer context, provide a natural bridge between these literatures.

3 Conceptual Framework

At any point in time, firms demand directors and officers with particular characteristics, while a pool of experienced individuals—those currently or previously serving as corporate leaders—constitutes the supply of potential candidates.

Labor market segmentation arises when frictions impede potential matches. On the supply side, human capital accumulated in one sector may not transfer effectively to another. Therefore, skills and attributes are neither purely general nor purely firm-specific. For corporate leaders, this implies that a director with deep expertise in pharmaceutical regulation may possess knowledge that is less applicable, or perceived as less applicable, to firms in the technology sector. On the demand side, network-based hiring practices (Cai et al., 2022), geographic constraints (Knyazeva et al., 2013), or preferences for industry-specific experience may lead firms to draw candidates from a restricted subset of the available pool. The key insight is that supply-side skill specificity and demand-side preferences segment labor markets, but neither are directly observed. Rather, the appointments we observe in the data represent equilibrium outcomes of this matching process, reflecting the intersection of unobserved firm demand and candidate supply, neither of which tell the full story of labor market integration.

Our empirical approach addresses this identification challenge through revealed preference. This logic of inferring underlying preferences and constraints from observed choices has a long tradition in economics (Samuelson, 1948) and has recently been applied to study firm heterogeneity and compensating differentials in labor markets (Sorkin, 2018).

We treat observed cross-sector movements as equilibrium outcomes of labor market frictions, supply, and demand. When a person serving in sector i takes a new role in sector j, it reveals that the labor markets for these two sectors share some degree of overlap: the human capital accumulated in sector i was valued by a firm in sector j, and no friction was severe enough to prevent the match from occurring. Conversely, the absence of observed flows between certain sector pairs suggests segmentation, whether arising from non-transferable skills, demand-side preferences, or other frictions.

The following framework clarifies how we interpret cross-sector mobility patterns. Figure 1 illustrates how observed movements between sectors reflect the interaction of two distinct forces: the *size* of each sector's labor pool and the *portability* of human capital between sector pairs.

To understand Figure 1, consider the thick arrow pointing from Funds to Financials. This represents a relatively large number of people movements when viewed from the perspective of the sending sector, Funds, though not necessarily from the receiving sector,

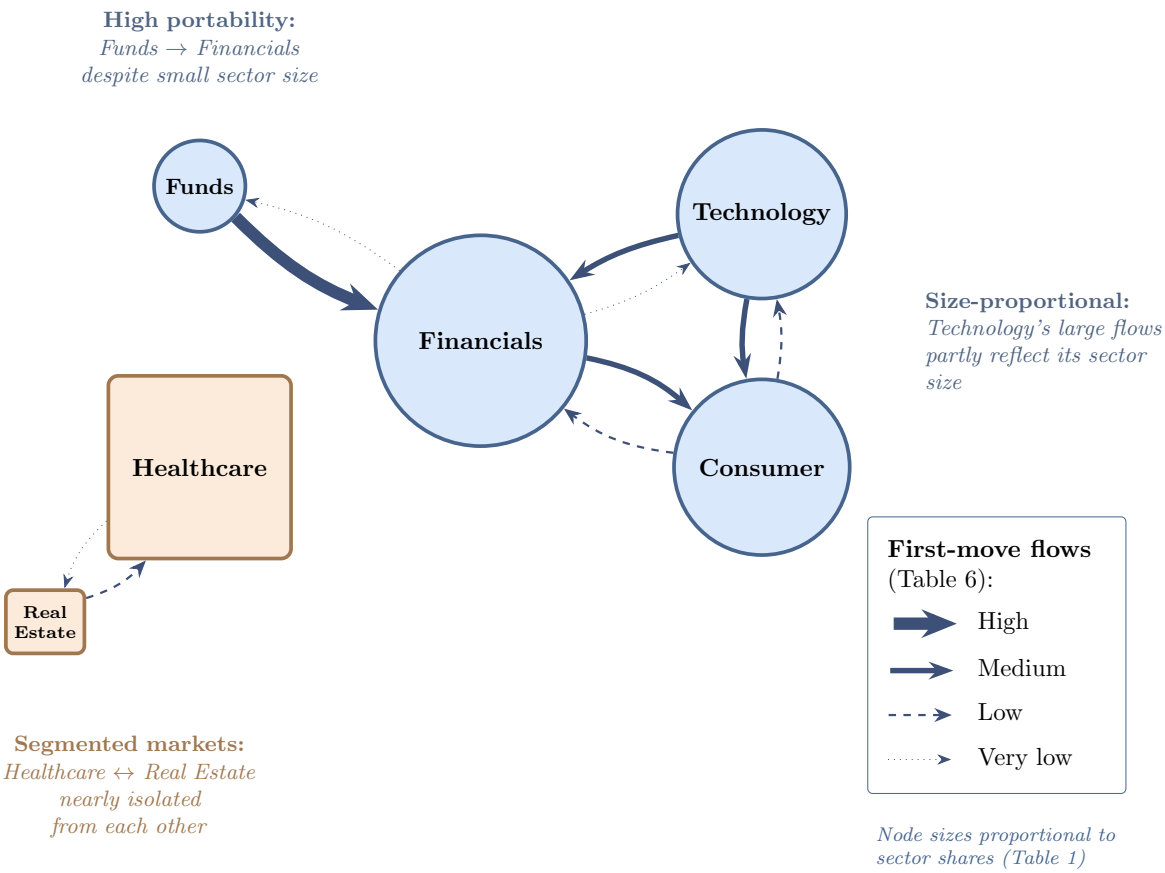


Figure 1: Sector size and direction of people movement. Node sizes are proportional to sector shares of total seats. Arrow thicknesses indicate first-move flow magnitudes: high (thick solid), medium (thin solid), low (dashed), and very low (dotted). Tan-shaded rectangles denote the segmented sector pair.

Financials. Based on this pattern, we would say that by revealed preference, there is a high degree of human capital portability from Funds to Financials, or equivalently a relatively low degree of labor market segmentation between these sectors in that direction. The return flow—indicated by the dotted arrow from Financials back to Funds—is much smaller, indicating that the portability is asymmetric.

The thin and dotted arrows between Healthcare and Real Estate (the tan-shaded rectangles) illustrate a different scenario. Here, the number of people movements is small relative to sector sizes, in both directions. In this case, we would say that Healthcare and Real Estate have relatively segmented labor markets, and this segmentation is evident when viewed from either sector's perspective. The human capital accumulated in Healthcare appears to have limited portability to Real Estate, and vice versa.

Now consider linkages involving Technology. Here, the thickness of arrows is substantial, but this must be interpreted in light of Technology's size (indicated by its node). While the flows from Technology to Consumer and to Financials are large in absolute terms, they may be largely explained by Technology's size as a sending sector (by the total number of currently employed people in Technology). Thus, while Consumer and Financials draw heavily on Technology for hires of skilled directors and officers, this can be explained partly by the large number of people in Technology, rather than necessarily reflecting a higher *propensity* of any given Technology person to move relative to individuals in other sectors.

An important takeaway from this framework is that the set of skilled potential hires available to any firm depends on two distinct factors: (1) the propensity of human capital accumulated in other sectors to be portable to the hiring firm's sector, and (2) the relative number of individuals employed within each potential-sending sector. Labor market segmentation (i.e., the inverse of human capital portability) and sector size are thus distinct determinants of observed sector connections. Our empirical analysis aims to disentangle these forces.

This framework also clarifies the multiple mechanisms mentioned in the literature, which could generate observed cross-sector flows. When we observe an individual moving from sector A to sector B, the move could reflect:

- **Transferable expertise**: The individual carries industry-specific skills (e.g., knowledge of digital transformation, supply chain management, regulatory compliance) that are valuable in the receiving sector.

- **Information transfer**: The individual carries information about competitive dynamics, market conditions, or strategic practices in their origin sector that is useful to firms in the receiving sector—particularly if the receiving sector has business relationships

with the origin sector.

- **Supply constraints**: The receiving sector may prefer candidates with same-sector experience, but the available supply of such candidates is insufficient, leading firms to hire from related sectors.
- **Underlying similarity**: The origin and destination sectors may require similar skills despite being classified separately, making cross-sector moves reflect functional similarity rather than true cross-sector expertise transfer.

The findings reported below take a first step toward documenting the movement patterns across sectors represented by these various mechanisms.

4 Data and Measurement

4.1 Data Sources

Our data on director and officer employment histories comes from the London Stock Exchange Group (LSEG) Officers and Directors database. Our starting point is the universe of public and private active companies headquartered in the United States. We then obtain annual employment records for each person who served as a director or officer at any point in time between 1998 and 2024.

The resulting sample covers 296,559 unique seats (a role-firm year observation) at 47,502 public and private companies spanning the 1998–2024 period. Because we filter out director-firm observations for which a start date is not observed, our final sample includes 249,057 people observed at 35,103 companies. Of these, 130,056 entail people serving at private firms and 119,001 people serving at public firms. Just over half (53.8%) are for director positions, with the remaining 114,838 being officers.

We obtain information on firm sectors using the Thomson Reuters Business Classification (TRBC) 2020 edition. Because the TRBC is market-based and designed to identify peer companies, this classification provides a natural proxy for similarity in the labor markets for directors and officers.

Table 1 reports the distribution of seats across sectors and time periods. Financials represents the largest sector with 19.2% of all seats (46,114), followed by Healthcare (16.2%, 38,927 seats), Consumer (15.4%, 37,106 seats), and Technology (14.2%, 34,092 seats). The smallest sectors are Utilities (2.4%, 5,740 seats) and Real Estate (3.5%, 8,447 seats). The composition has shifted meaningfully over time: Healthcare's share increased from 12% in 2001–2010 to 19% in 2011–2020, reflecting the growing importance of the healthcare and life

sciences sectors in the U.S. economy. Funds declined from 11% to 7% over the same period. These shifts in sector composition have implications for the available supply of directors possessing industry-specific experience at each point in time.

Table 1: Distribution of Seats by Sector

Sector	**2001–2010**		**2011–2020**		**1998–2024**	
	Seats	**%**	**Seats**	**%**	**Seats**	**%**
Consumer	9,198	15	14,104	15	37,106	15.4
Financials	11,955	20	15,858	17	46,114	19.2
Funds	6,639	11	6,350	7	16,127	6.7
Healthcare	7,388	12	18,639	19	38,927	16.2
Industrials	7,003	12	11,367	12	30,423	12.7
Primary	7,343	12	9,852	10	23,435	9.7
Real Estate	1,859	3	3,715	4	8,447	3.5
Tech	7,416	12	13,649	14	34,092	14.2
Utilities	1,780	3	2,382	2	5,740	2.4

Notes: This table reports the distribution of director and officer positions ("seats") across sectors and time periods. The sample is constructed from the LSEG Officers and Directors database and includes all individuals who served as a director or officer at a U.S.-headquartered public or private company between 1998 and 2024. A seat is defined as a unique person-firm-role-year observation. The sample includes 249,057 unique individuals at 35,103 companies. Sector classifications are based on the Thomson Reuters Business Classification (TRBC) 2020 edition, which assigns each firm to one of nine broad economic sectors based on its primary business activities. *Seats* reports the total number of person-firm-role-year observations in each sector-period cell. *%* reports each sector's share of total seats within the indicated time period. Observations are excluded if the start date of the appointment is not recorded.

4.2 Employment History Measurement

4.2.1 Empirical Definitions

We begin by identifying each unique individual in terms of their role and sector of employment when first recorded in the dataset. Formally, let $P_{p,f,r,s,t} \in \{0, 1\}$ be an indicator that takes a value of unity if person p served in role r at firm f in sector s in year t, and zero otherwise. This indicator forms the foundation of our analysis: each person in a role at a firm within a sector in a given year represents a "seat" in our data.

A **movement from sector i to sector j in year t** is defined to occur if

$$\exists f, r \text{ s.t. } P_{p,f,r,j,t} = 1 \quad \text{and} \quad \exists f', r', k < t \text{ s.t. } P_{p,f',r',i,k} = 1.$$

Equivalently: the person is observed in sector j at year t and has been observed in sector i at least once in any earlier year. This definition captures the revealed-preference logic of our approach: when we observe an individual with prior experience in sector i taking a position in sector j, it reveals that the hiring firm in sector j valued the human capital accumulated in sector i.

4.2.2 Appearance Operators

To track individuals through time, we define several appearance operators. The **firm appearance year** for person p at firm f is

$$A_{p,f} \equiv \min\{t : \exists r, s \text{ s.t. } P_{p,f,r,s,t} = 1\},$$

which records the first year in which person p is observed at firm f in any role and sector. Similarly, the **role-at-firm appearance year** is

$$A_{p,f,r} \equiv \min\{t : \exists s \text{ s.t. } P_{p,f,r,s,t} = 1\},$$

which records the first year in which person p is observed in role r at firm f.

These operators allow us to order an individual's career history and identify transitions. When $A_{p,f_2} > A_{p,f_1}$, person p appeared at firm f_2 after firm f_1, indicating a potential movement.

4.2.3 Sector Assignment

Let the set of sectors in which person p is observed during year t be

$$\mathcal{S}_{p,t} \equiv \{s : \exists f, r \text{ s.t. } P_{p,f,r,s,t} = 1\}.$$

In most cases, $\mathcal{S}_{p,t}$ contains a single sector. However, some individuals hold simultaneous positions in multiple sectors (e.g., serving on boards in both Technology and Healthcare in the same year).

4.2.4 Types of Movement

We distinguish among several types of movement based on whether the transition crosses firm, role, or sector boundaries.

Within-sector, across-firm moves. For each person p, order firms f by $(A_{p,f}, f)$ and let consecutive firms be (f_{k-1}, f_k). An across-firm within-sector move occurs in year t when

$$A_{p,f_k} = t, \quad f_k \neq f_{k-1}, \quad s(f_k) = s(f_{k-1}),$$

where $s(f)$ denotes the sector label attached to firm f at the time of the person's appearance. This type of move represents mobility within a sector's labor market: the individual changes employers but remains in the same sector, suggesting that their human capital is valued by multiple firms within the sector.

Cross-sector moves Using the assigned sector series $S_{p,t}$, we define **sector spells** as maximal contiguous runs of years with constant $S_{p,t}$. Spell m for person p has start year $T^{\text{start}}_{p,m}$, end year $T^{\text{end}}_{p,m}$, and sector $S^{\text{spell}}_{p,m}$. A cross-sector move occurs at the boundary between consecutive spells m and $m+1$ when

$$S^{\text{spell}}_{p,m} \neq S^{\text{spell}}_{p,m+1},$$

with move year

$$t^{\text{move}}_{p,m} = T^{\text{end}}_{p,m} + 1,$$

and incubation period

$$\text{incubation}_{p,m} = T^{\text{end}}_{p,m} - T^{\text{start}}_{p,m} + 1.$$

The incubation period measures how long the individual spent in sector $S^{\text{spell}}_{p,m}$ before transitioning to sector $S^{\text{spell}}_{p,m+1}$. Longer incubation periods suggest deeper accumulation of sector-specific human capital prior to the move.

4.2.5 Role Classification

The LSEG Officers and Directors database records each person's position at the role level, distinguishing among specific titles such as director, CEO, CFO, COO, and other named officer positions. Following the convention in the literature that treats directors and officers as operating in distinct labor markets, we aggregate these granular role classifications into two categories, based on the traditional distinction between oversight roles (directors) and

operational roles (officers). Directors serve primarily in monitoring and advisory capacities and frequently hold positions at multiple firms simultaneously. Officers bear responsibility for firm management and typically serve as an officer at one firm at a time.

Let $\mathcal{R}$ denote the set of all roles observed in the data. We partition $\mathcal{R}$ into two subsets:

$$\mathcal{R}^D = \{\text{Director}\}, \quad \mathcal{R}^O = \{\text{CEO, CFO, COO, etc.}\}.$$

We then define the role category function $C : \mathcal{R} \to \{D, O\}$ as:

$$C(r) = \begin{cases} D & \text{if } r \in \mathcal{R}^D \\ O & \text{if } r \in \mathcal{R}^O \end{cases}$$

Using the seat indicator $P_{p,f,r,s,t}$ defined in Section 4.2.1, we define the role category for person p at firm f in year t as:

$$C_{p,f,t} \equiv C(r) \text{ where } r \text{ satisfies } P_{p,f,r,s,t} = 1.$$

A *role transition* occurs when an individual's role category changes between consecutive firm appearances. Let f_k and f_{k+1} denote consecutive firms for person p, ordered by appearance year $A_{p,f}$ as defined in Section 4.2.2. A role transition occurs if:

$$C_{p,f_k,A_{p,f_k}} \neq C_{p,f_{k+1},A_{p,f_{k+1}}}.$$

We distinguish two types of role transitions based on whether the move also crosses sector boundaries: Within-sector role transition occurs when: $s(f_k) = s(f_{k+1})$ and $C_{p,f_k,A_{p,f_k}} \neq C_{p,f_{k+1},A_{p,f_{k+1}}}$. Cross-sector role transition occurs when: $s(f_k) \neq s(f_{k+1})$ and $C_{p,f_k,A_{p,f_k}} \neq C_{p,f_{k+1},A_{p,f_{k+1}}}$.

A move that preserves the individual's role category—remaining a director or remaining an officer—is classified as *role-preserving*, regardless of whether it crosses sector boundaries. This classification enables us to examine whether role transitions and sector transitions function as substitutes or complements in the career trajectories of corporate leaders.

4.2.6 All Moves vs. First Moves

The definitions above allow us to identify all cross-sector moves in an individual's career. However, individuals may make multiple cross-sector moves over time, which creates ambiguity in interpreting the direction of human capital transfer. To understand why, consider an individual whose career proceeds as follows: sector A (years 1–5) → sector B (years 6–10) →

sector C (years 11–15). This individual makes two cross-sector moves: A→B in year 6 and B→C in year 11. The first move (A→B) most cleanly identifies the direction of experience transfer from A to B: the individual accumulated five years of experience in sector A and later worked as a director or officer at B. But the second move (B→C) is more ambiguous: when the individual moves to sector C, are they transferring human capital accumulated in A, in B, or some combination?

To address this ambiguity, we distinguish between two samples:

- **All moves**: The complete set of cross-sector transitions, counting each move in an individual's career. This sample maximizes statistical power and documents the full scope of cross-sector mobility. However, moves beyond the first are subject to the ambiguity described above.
- **First moves**: The subset of cross-sector transitions that represent each individual's first move to a different sector. By construction, the first move cleanly identifies the direction of human capital transfer: when an individual moves from sector A to sector B for the first time, the expertise being transferred is unambiguously that accumulated in sector A.

Our empirical analysis reports both samples. The "all moves" transition matrix (Table 6) establishes the broad patterns of cross-sector mobility. The "first moves" transition matrix (Table 7) provides a cleaner indication of human capital portability by isolating the initial transfer of sector-specific expertise.

5 Empirical Findings

5.1 Role Transitions: The Substitutability of Role Change and Sector Change

As noted in Section 2.3, directors and officers are typically studied as operating in distinct labor markets (Withers et al., 2012; Withers et al., 2024). However, the permeability of the boundary between these markets—and how this permeability varies with other dimensions of mobility—has received little attention. Table 2 documents role transitions between directors and officers for individuals making their first recorded move to a new position, allowing us to examine whether and how individuals cross this boundary.

Table 2 documents role transitions between directors and officers for individuals making their first recorded move to a new position.

Table 2: Role Transitions in First Moves: Within-Sector vs. Across-Sector

	All first moves		Only within sector		Only across sectors	
Origin role	**To director**	**To officer**	**To director**	**To officer**	**To director**	**To officer**
Panel A: Percentage distribution						
Director (total)	93.2%	6.8%	88.8%	11.2%	94.3%	5.7%
– Never officer	93.6%	6.4%	89.1%	10.9%	94.7%	5.3%
– Past officer	83.6%	16.4%	65.2%	34.8%	85.0%	15.0%
Officer (total)	21.1%	78.9%	49.1%	50.9%	17.5%	82.5%
– Never director	19.6%	80.4%	46.3%	53.7%	16.3%	83.7%
– Past director	64.0%	36.0%	86.5%	13.5%	57.3%	42.7%
Panel B: Number of transitions						
Director (total)	15,065	1,096	2,785	352	12,280	744
– Never officer	14,515	988	2,755	336	11,760	652
– Past officer	550	108	30	16	520	92
Officer (total)	1,954	7,303	516	534	1,438	6,769
– Never director	1,748	7,187	452	524	1,296	6,663
– Past director	206	116	64	10	142	106

Notes: This table reports role transitions for individuals making their first recorded move to a new position at a different firm. The sample is constructed from the LSEG Officers and Directors database covering U.S. public and private companies from 1998 to 2024. *Origin role* identifies the individual's role (director or officer) at their most recent position prior to the move. *To director* and *To officer* identify the role in the destination position. Panel A reports the percentage distribution of destination roles within each row category. Panel B reports the number of transitions. *All first moves* includes all individuals making their first recorded move to a new firm. *Only within sector* restricts to moves where the origin and destination firms are in the same TRBC sector. *Only across sectors* restricts to moves where the origin and destination firms are in different TRBC sectors. Within each origin role category, we further distinguish individuals who have *Never* held the other role type versus those who have held the other role at some point in their career (*Past officer* or *Past director*). The sample includes 25,418 first moves: 16,161 by directors and 9,257 by officers.

Panel A reports the shares of all first moves between roles, for example, each time a person who is an officer takes on their first directorship. Directors overwhelmingly transition to other director positions: 93.2% of all first moves by directors lead to another directorship, with only 6.8% transitioning to officer roles. This represents 15,065 director-to-director transitions versus just 1,096 director-to-officer transitions (Panel B). Officers display greater role mobility, with 21.1% transitioning to director roles and 78.9% remaining in officer positions, corresponding to 1,954 officer-to-director moves and 7,303 officer-to-officer moves. These baseline patterns confirm that the labor markets for directors and officers, while somewhat connected, are meaningfully distinct.

A second finding emerges when we decompose these first transitions by whether the move occurs within or across sectors. The contrast is sharpest for officers. Among officers making within-sector moves, the split between director and officer destination roles is nearly equal: 49.1% transition to director roles and 50.9% to officer roles (516 and 534 moves, respectively). In contrast, officers making across-sector moves overwhelmingly remain in officer positions: 82.5% stay in officer roles while only 17.5% transition to directorships (6,769 versus 1,438 moves). The difference—a 31.6 percentage point gap in the rate of transition to director roles—suggests that changing sectors and changing roles are not independent decisions.

A similar pattern holds for people whose initial role is as a director. Within-sector moves show an 11.2% rate of transition to officer roles, compared to just 5.7% for across-sector moves. In levels, 352 directors transitioned to officer roles within their sector, while 744 did so when moving across sectors—but the latter figure reflects a much larger base of cross-sector moves (13,024 total) compared to within-sector moves (3,137 total).

A person's prior role history further moderates these patterns. Directors who previously held officer positions show higher rates of role switching: 16.4% of their moves lead to officer roles, compared to just 6.4% for directors who never served as officers. This gap widens dramatically for within-sector moves, where 34.8% of past-officer directors transition back to officer roles—more than five times the rate (6.8%) observed in the aggregate. Symmetrically, officers who previously held director positions transition to director roles at much higher rates (64.0% overall) than officers without prior board experience (19.6%). For within-sector moves, past-director officers transition to director roles 86.5% of the time—suggesting that prior board experience substantially lowers barriers to returning to the boardroom, particularly when industry-specific knowledge is preserved.

These patterns suggest that changing roles and changing sectors function as substitutes rather than complements in the career trajectories of corporate leaders. Individuals rarely undertake both transitions simultaneously. One interpretation is that each type of move imposes adjustment costs—learning a new organizational context, adapting to different sec-

tor norms, or shifting from operational to oversight responsibilities—and combining both types of adjustment exceeds some threshold of feasible career reorientation. An alternative interpretation emphasizes the matching process: firms seeking candidates from outside their sector may place particular value on role-specific expertise, while firms hiring from within their sector can more readily evaluate candidates for different roles based on shared sector knowledge.

The finding that role persistence increases with sector distance has direct implications for how we interpret cross-sector mobility patterns: If individuals who change sectors tend to preserve their roles, then observed cross-sector flows primarily reflect the portability of role-specific human capital across sector boundaries, rather than wholesale career reinvention. This motivates the examination of sector-level transition patterns, to which we now turn.

5.2 Sector-Level Mobility Rates

In this section, we document each sector's overall connectedness to the broader labor market.

Table 3 reports aggregate movement counts for each sector: the total number of individuals who take positions in the focal sector after holding positions in other sectors (inbound), the total number who take positions in other sectors after holding positions in the focal sector (outbound), and the net balance.

Financials emerges as the largest net importer of director and officer talent, with 320 more inbound than outbound moves over the full sample period. This pattern is consistent with the *information transfer* mechanism identified in Section 3: financial sector firms may value the industry-specific knowledge that directors carry from their origin sectors, particularly when those sectors represent current or prospective clients, investment targets, or counterparties. The banker-director literature has documented how financial expertise flows outward to other sectors, but our data reveal that the financial sector is in addition a substantial recipient of officers and directors from other sectors.

Consumer and Funds show the largest net outbound balances, with 246 and 178 more outbound than inbound moves, respectively. The Consumer pattern suggests that experience in consumer-facing sectors—marketing, brand management, retail operations, and product development—constitutes *transferable expertise* (Section 3) valued across the economy. The Funds pattern is notable: individuals from Funds who take positions in other sectors overwhelmingly move to Financials (200 of 314 first moves, or 64%), a pattern that likely reflects *underlying similarity* (Section 3) in the skills and talents accumulated within these adjacent sectors.

These movement patterns remain broadly stable across subperiods, suggesting persistent

Table 3: Cross-Sector Movement Counts by Sector

Sector	Inbound			Outbound			Net		
	98–24	**01–10**	**11–20**	**98–24**	**01–10**	**11–20**	**98–24**	**01–10**	**11–20**
Consumer	1,658	273	797	1,904	325	870	−246	−52	−73
Financials	1,722	257	744	1,402	230	657	320	27	87
Funds	252	62	148	430	111	198	−178	−49	−50
Healthcare	990	148	487	1,039	147	451	−49	1	36
Industrials	1,677	245	758	1,583	242	712	94	3	46
Primary	958	162	485	1,032	156	510	−74	6	−25
Real Estate	539	114	271	477	74	233	62	40	38
Tech	1,538	234	658	1,487	235	712	51	−1	−54
Utilities	363	66	167	343	41	172	20	25	−5
All	9,697	1,561	4,515	9,697	1,561	4,515	0	0	0

Notes: This table reports cross-sector movement counts for directors and officers by sector and time period. The sample is constructed from the LSEG Officers and Directors database covering U.S. public and private companies from 1998 to 2024. *Inbound* is the total number of individuals who take a position in the focal sector after previously holding a position in a different sector. *Outbound* is the total number of individuals from the focal sector who subsequently take a position in a different sector. *Net* equals Inbound minus Outbound; positive values indicate the sector is a net importer of directors and officers, negative values indicate a net exporter. Sector classifications are based on the TRBC 2020 edition. An individual is counted as an inbound move to sector j in year t if they hold a position in sector j in year t and held a position in some other sector $i \neq j$ in any prior year. Outbound moves are defined symmetrically. By construction, total inbound equals total outbound across all sectors in each time period.

structural features of labor market integration rather than transitory patterns. One notable exception is Technology, which shifted from approximate balance in 2001–2010 (net of −1) to a modest net inbound position by the full sample period (net of 51). This shift may reflect the increasing demand for technology expertise across the economy as digital transformation became central to business models in all sectors.

Raw counts, however, can confound sector size with labor market openness. A large sector will mechanically generate more cross-sector moves simply because it contains more individuals. To isolate labor market integration from sector scale, Table 4 presents size-adjusted mobility rates.

The inbound rate for sector i measures the share of positions filled by individuals who arrived from other sectors—capturing how heavily the sector draws on outside talent. The outbound rate measures the share of positions held by individuals who later take roles elsewhere—capturing how much the sector serves as a talent source for other sectors. Together, these rates characterize how permeable each sector's labor market boundaries are to cross-sector talent flows.

Sectors differ markedly in their permeability. Real Estate and Utilities exhibit the highest

Table 4: Cross-Sector Mobility Rates by Sector

Sector	Inbound rate (%)			Outbound rate (%)		
	98–24	**01–10**	**11–20**	**98–24**	**01–10**	**11–20**
Consumer	4.47	2.97	5.65	5.13	3.53	6.17
Financials	3.73	2.15	4.69	3.04	1.92	4.14
Funds	1.56	0.93	2.33	2.67	1.67	3.12
Healthcare	2.54	2.00	2.61	2.67	1.99	2.42
Industrials	5.51	3.50	6.67	5.20	3.46	6.26
Primary	4.09	2.21	4.92	4.40	2.12	5.18
Real Estate	6.38	6.13	7.29	5.65	3.98	6.27
Tech	4.51	3.16	4.82	4.36	3.17	5.22
Utilities	6.32	3.71	7.01	5.98	2.30	7.22

Notes: This table reports cross-sector mobility rates for directors and officers by sector and time period. The sample is constructed from the LSEG Officers and Directors database covering U.S. public and private companies from 1998 to 2024. *Inbound rate* is the number of individuals taking positions in the focal sector after holding positions in other sectors (from Table 3), divided by the total number of seats in the focal sector (from Table 1), expressed as a percentage. This rate measures the share of positions in each sector filled by individuals with prior experience in other sectors. *Outbound rate* is the number of individuals from the focal sector who subsequently take positions in other sectors, divided by total seats in the focal sector. This rate measures the share of positions held by individuals who later move to other sectors. Sector classifications are based on the TRBC 2020 edition.

inbound rates (6.38% and 6.32%), indicating that roughly one in sixteen positions in these sectors is held by someone whose prior corporate leadership experience was in a different sector. This openness to external hires is consistent with the *supply constraints* mechanism (Section 3): these sectors may have insufficient internal pipelines of experienced directors and officers, leading firms to recruit more heavily from outside. Real Estate's high inbound rate may also reflect its position as a crossroads sector, where expertise in finance, construction, consumer markets, and regulatory affairs—acquired in other sectors—has direct application.

At the other extreme, Funds and Healthcare exhibit the lowest inbound rates (1.56% and 2.54%), suggesting relatively insular labor markets. For Funds, this insularity on the inbound side contrasts with its higher outbound rate (2.67%)—the sector draws few people from outside but produces many individuals who subsequently take positions in other sectors. This asymmetry is consistent with fund management requiring specialized expertise that is difficult to acquire outside the sector, but once acquired, is valued in adjacent sectors. For Healthcare, the low rates in both directions suggest genuine labor market segmentation: the sector neither draws heavily on outside people nor produces many individuals

who take positions elsewhere. This pattern is consistent with healthcare requiring specialized knowledge—regulatory expertise, clinical understanding, reimbursement dynamics—that is neither easily acquired nor readily applied in other sectors.

Table 5 summarizes these patterns by reporting the ratio of outbound to inbound rates for each sector. A ratio greater than one indicates that the sector is a net exporter of directors and officers on a size-adjusted basis; a ratio less than one indicates net importation.

Table 5: Ratio of Outbound to Inbound Mobility Rates

Sector	**1998–2024**	**2001–2010**	**2011–2020**
Consumer	1.15	1.19	1.09
Financials	0.81	0.89	0.88
Funds	1.71	1.79	1.34
Healthcare	1.05	0.99	0.93
Industrials	0.94	0.99	0.94
Primary	1.08	0.96	1.05
Real Estate	0.88	0.65	0.86
Tech	0.97	1.00	1.08
Utilities	0.94	0.62	1.03

Notes: This table reports the ratio of outbound to inbound mobility rates for each sector and time period. The ratio is computed as *Outbound rate* divided by *Inbound rate* from Table 4. A ratio greater than one indicates the sector is a net exporter of directors and officers on a size-adjusted basis: the sector sends more individuals to other sectors (relative to its size) than it receives. A ratio less than one indicates the sector is a net importer of directors and officers on a size-adjusted basis. A ratio equal to one indicates balanced flows. Sector classifications are based on the TRBC 2020 edition.

Funds stands out with a ratio of 1.71 over the full sample period: for every individual Funds attracts from other sectors (on a size-adjusted basis), it produces 1.71 individuals who take positions elsewhere. This stark asymmetry—low inbound, high outbound—reinforces the interpretation that fund management develops specialized expertise valued in adjacent sectors, particularly Financials. Consumer also shows a ratio above one (1.15), indicating it is a net exporter on a size-adjusted basis even though it receives large absolute inflows from Technology, Industrials, and Healthcare.

Financials (0.81) and Real Estate (0.88) show ratios below one, confirming their status as net importers of talent. For Financials, this is consistent with its role as a destination sector that draws on expertise developed in client sectors. Real Estate's position as a net importer may reflect demand for expertise in finance, construction, and property management that is developed in adjacent sectors.

These ratios are broadly stable across subperiods, with some notable exceptions. Utilities shifted from a ratio of 0.62 in 2001–2010 (indicating strong net importation) to 1.03 in 2011–2020 (approximate balance). This shift may reflect changing sector dynamics as the utilities sector evolved.

Cross-sector mobility rates have increased over time across nearly all sectors. Comparing 2001–2010 to 2011–2020, inbound rates rose in eight of nine sectors, with increases ranging from 0.61 percentage points (Healthcare) to 3.30 percentage points (Utilities). This secular trend may reflect the increasing complexity of corporations documented by Hoberg and Phillips (2024): as firms expand across product markets and geographies, boards may place greater value on directors with diverse sector backgrounds who can advise on multifaceted strategic challenges.

Even as each sector receives directors from other sectors, they also promote from within. The number of directors in each sector in 2011–2020 (Table 1) exceeds the number in 2001–2010 plus net cross-sector inflows (Table 3), confirming that each sector also develops talent internally. Intra-sector promotions signal that incumbent boards place value on industry-specific knowledge—a pattern that coexists with the cross-sector hiring we document.

5.3 Cross-Sector Transitions

We now turn to the bilateral structure of cross-sector movements across sectors. Table 6 presents the transition matrix of directors across all sectors for the 1998–2024 period, counting all observed cross-sector transitions. This matrix documents the full scope of cross-sector mobility in our sample and establishes that there is substantial movement between nearly every pair of sectors.

The "all moves" matrix reveals several notable patterns. First, there is movement between nearly every pair of sectors during 1998–2024, demonstrating that labor markets for corporate leaders are not completely segmented by sector. Even sector pairs that might seem unrelated, such as Healthcare and Primary (90 and 91 moves) or Utilities and Technology (29 and 42 moves), exhibit non-trivial bilateral flows.

Second, the matrix reveals asymmetries in bilateral flows. Consumer sends 372 individuals to Financials but receives only 305 in return. Technology sends 350 to Consumer but receives 440. These asymmetries suggest that the portability of human capital exhibits directional tendencies.

Third, the Funds sector exhibits a distinctive pattern: it sends 232 individuals to Financials—by far its largest outflow—while receiving only 97 from Financials. Its connections to other sectors are comparatively modest: 33 to Consumer, 15 to Healthcare, 37 to Industrials.

This pattern suggests that Funds operates as a specialized feeder into the broader financial services sector, with limited integration with non-financial sectors.

Fourth, certain sector pairs show particularly strong bilateral connections. Consumer and Technology exchange 440 and 350 individuals respectively, for a combined flow of 790—among the largest bilateral connections in the matrix. Industrials and Technology show similarly strong connections (361 and 357). These patterns may reflect the increasing importance of technology in consumer products and industrial operations.

Table 6: Transition Matrix of Directors and Officers Across Sectors: 1998–2024 (All Moves)

From ↓ / To →	**Consumer**	**Financials**	**Healthcare**	**Industrials**	**Primary**	**Real Est.**	**Tech**	**Utilities**	**Funds**
Consumer		372	241	427	191	139	440	56	38
Financials	305		163	236	163	121	249	68	97
Healthcare	205	229		201	90	50	231	21	12
Industrials	371	235	192		261	68	361	65	30
Primary	232	137	91	290		37	134	90	21
Real Estate	110	122	40	66	31		66	17	25
Tech	350	326	224	357	111	60		42	17
Utilities	52	69	24	63	79	15	29		12
Funds	33	232	15	37	32	49	28	4	

Notes: This table reports the bilateral transition matrix of cross-sector moves for directors and officers over the 1998–2024 period. The sample is constructed from the LSEG Officers and Directors database covering U.S. public and private companies. Each cell reports the number of individuals who held a position in the row sector and subsequently took a position in the column sector at any point during the sample period. The matrix counts *all* cross-sector moves, including second, third, and later moves by individuals who make multiple cross-sector transitions during their careers. Diagonal cells are empty by construction (within-sector moves are excluded). Row totals represent total outbound moves from each sector; column totals represent total inbound moves to each sector. Sector classifications are based on the TRBC 2020 edition. The matrix is not symmetric: for example, Consumer sends 372 individuals to Financials while Financials sends 305 to Consumer, indicating directional asymmetry in bilateral flows.

As discussed in Section 4, the "all moves" measure has an important limitation: when an individual makes multiple cross-sector transitions over their career, later moves conflate human capital accumulated across all prior sectors, making it difficult to identify which sector's expertise the receiving firm values.

Table 7 reports a cross-sector transition matrix using the narrower sample of *first* cross-sector moves only, which is a cleaner indicator of human capital portability. Each cell reports the count of individuals whose initial recorded position was in the row sector and whose first move to a different sector led to a position in the column sector.

The first-move matrix reveals starker patterns than the all-moves matrix, precisely because it isolates the initial transfer of industry-specific human capital. Several patterns merit attention.

First, the matrix reveals substantial heterogeneity that cannot be fully explained by sector size. Some sector pairs exhibit large bilateral flows: Technology sends 286 to Consumer and 287 to Industrials; Industrials sends 339 to Consumer and 202 to Financials. Other pairs show minimal connection despite comparable sector sizes: Healthcare sends only 1 individual to Real Estate; Real Estate sends none to Technology. The Healthcare sector is substantially larger than Real Estate (Table 1), yet the bilateral flows between Healthcare and Financials (211 and 7) dwarf those between Healthcare and Real Estate (1 and 32).

Second, the asymmetric direction of flows are significantly pronounced in the first-move matrix. Consumer receives heavily from other sectors (293 from Financials, 195 from Healthcare, 339 from Industrials, 286 from Technology) but sends relatively few individuals out (17 to Financials, 10 to Healthcare, 24 to Industrials, 25 to Technology). This asymmetry is largely obscured in the all-moves matrix, where subsequent moves by individuals who initially came to Consumer can create the appearance of more balanced flows of human capital across sector boundaries.

Third, the Funds-Financials connection is even more striking: Funds sends 200 individuals to Financials in their first cross-sector move, but receives only 5 from Financials. This 40:1 ratio is consistent with the view that Funds serves as a training ground for individuals who subsequently move to the broader financial services sector, rather than as a destination for financial services professionals.

Figure 2 provides a visual representation of the complete first-move transition matrix reported in Table 7. The figure displays all nine sectors as nodes, with sizes proportional to each sector's share of total seats (from Table 1). Arrows connect each sector pair where at least one first move was observed, with arrow thickness indicating the magnitude of flows: thick solid arrows represent the largest flows (250 or more individuals), medium solid arrows represent flows of 150–249 individuals, dashed arrows represent flows of 50–149 individuals,

Table 7: Cross-Sector First-Move Transition Matrix

From ↓ / To →	**Consumer**	**Financials**	**Healthcare**	**Industrials**	**Primary**	**Real Est.**	**Tech**	**Utilities**	**Funds**
Consumer		17	10	24	7	7	25		
Financials	293		7	10	3	4	9	2	5
Healthcare	195	211		16	7	1	12		
Industrials	339	202	159		16	1	31	2	1
Primary	184	109	72	246			5	2	
Real Estate	93	101	32	41	28				2
Technology	286	261	166	287	77	34		1	1
Utilities	39	49	15	51	64	7	21		1
Funds	17	200	7	21	16	36	15	2	

Notes: This table reports the bilateral transition matrix of *first* cross-sector moves for directors and officers over the 1998–2024 period. The sample is constructed from the LSEG Officers and Directors database covering U.S. public and private companies. Each cell reports the number of individuals whose first recorded position was in the row sector and whose first move to a different sector resulted in a position in the column sector. Unlike Table 6, this matrix excludes second and later cross-sector moves, providing a cleaner measure of the direction of human capital transfer: when an individual makes their first cross-sector move from sector i to sector j, the expertise being transferred is unambiguously that accumulated in sector i. Diagonal cells are empty by construction. Empty off-diagonal cells indicate no observed first moves between those sector pairs. Sector classifications are based on the TRBC 2020 edition. The total number of first cross-sector moves in the sample is 4,187.

and dotted arrows represent the smallest flows (fewer than 50 individuals).

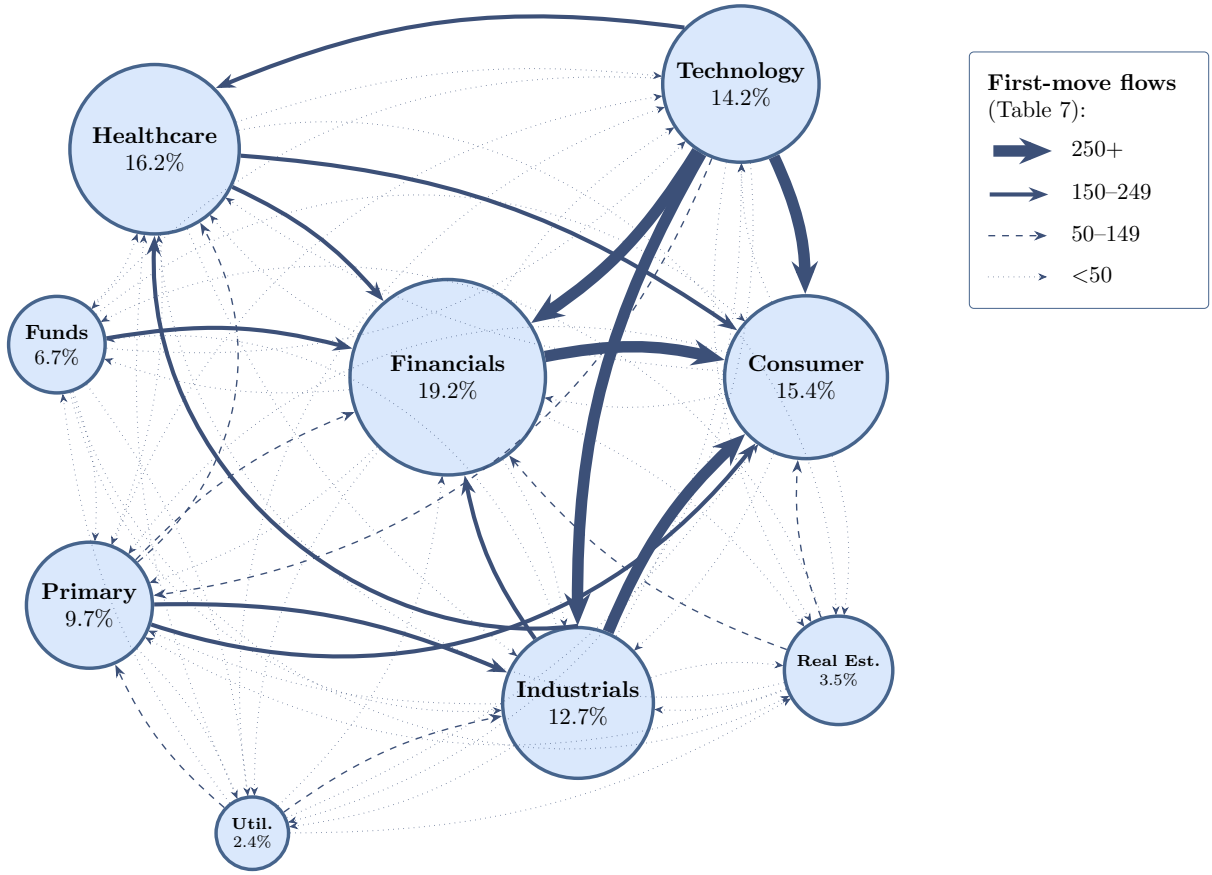


Figure 2: Network of Cross-Sector First Moves. This figure visualizes the complete first-move transition matrix from Table 7. Node sizes are proportional to sector shares of total seats (Table 1). Arrow thicknesses indicate first-move flow magnitudes: high (250+, thick solid), medium (150–249, thin solid), low (50–149, dashed), and very low (<50, dotted). All non-zero bilateral flows are shown, with each sector pair connected by two arrows (one in each direction) where flows exist in both directions.

The network visualization reinforces several patterns evident in the tabular data while revealing additional structure. The thick arrows emanating from Technology, Industrials, and Financials toward Consumer confirm that Consumer serves as a major destination sector, drawing directors and officers from multiple sources. The visual density of arrows converging on Financials—including thick arrows from Technology (261) and medium arrows from Healthcare (211), Industrials (202), Funds (200), and Primary (184 to Consumer, 109 to Financials)—underscores that sector's role as an importer of human capital from across the economy.

The asymmetry of flows is particularly striking when viewed graphically. For most sec-

tor pairs, the two arrows connecting them differ markedly in thickness: the thick arrow from Technology to Industrials (287) contrasts sharply with the thin dotted return arrow (31); the medium arrow from Funds to Financials (200) has essentially no visible counterpart in the reverse direction (5). This visual asymmetry captures what the tabular data show numerically: human capital flows are highly directional, with expertise accumulated in certain sectors (Technology, Industrials, Healthcare) being deployed elsewhere rather than exchanged bilaterally.

The sparse connections between certain sector pairs are also evident. Despite Healthcare and Real Estate both appearing prominently in the figure due to their node sizes, the arrows connecting them are among the thinnest—just 1 individual moved from Healthcare to Real Estate, and 32 moved in the reverse direction. Similarly, the Utilities node, though small, shows limited connections to most other sectors, with its primary outflows directed toward Primary (64) and Industrials (51). The visual isolation of these sector pairs from the broader network reinforces the interpretation that certain segments of the labor market for corporate leaders remain structurally distinct.

Finally, the figure reveals the hub-and-spoke structure of the labor market network. Financials and Consumer occupy central positions, receiving flows from nearly all other sectors. Technology and Industrials serve as major exporters, sending thick or medium arrows to multiple destinations. Peripheral sectors—Funds, Utilities, Real Estate—connect primarily to the central hubs rather than to each other. This network topology suggests that the labor market for corporate leaders is not fully integrated but rather organized around a core of highly connected sectors surrounded by more specialized peripheral sectors with limited cross-connections.

The findings in Table 7 and Figure 2 are consistent with the complementary mechanisms identified in Section 3. The large directional flows from Technology (286), Industrials (339), and Healthcare (195) into Consumer—with much smaller reverse flows—are consistent with *transferable expertise*: these sectors develop functional knowledge (e.g., digital transformation, supply chain management, clinical development) that Consumer firms increasingly demand. The substantial flows into Financials from nearly all sectors (Funds: 200, Technology: 261, Industrials: 202, Healthcare: 211 in first moves) suggest *information transfer*: financial firms may value operating experience in the sectors they finance, invest in, or advise. The sparse connections between certain pairs—Healthcare to Real Estate (1 first move), Real Estate to Technology (0)—point to *supply constraints* where specialized human capital limits cross-sector transferability. Finally, flows between adjacent sectors such as Funds-to-Financials (200) and Primary-to-Industrials (246) likely reflect *underlying similarity* in required expertise that transcends sector classifications.

Certain sectors emerge as net exporters or importers of directors and officers. Summing across rows in the first-move matrix, Technology sends the most individuals to other sectors: 286 to Consumer, 261 to Financials, 287 to Industrials, 166 to Healthcare, and 77 to Primary. Industrials similarly exports heavily: 339 to Consumer, 202 to Financials, 159 to Healthcare. In contrast, Consumer and Financials appear to be net importers, receiving large inflows from multiple sectors while sending relatively few individuals out in their first moves. These aggregate patterns suggest that some sectors serve as "training grounds" that develop human capital subsequently deployed elsewhere, while others are "destination sectors" that draw directors and officers from across the economy.

The transition matrices exhibit evidence consistent with all of these mechanisms. Distinguishing among them—and assessing their relative importance—requires moving beyond descriptive patterns to regression analysis that exploits variation in sector-pair characteristics.

5.4 Industry-size Counterfactuals

The preceding analysis documents substantial cross-sectional heterogeneity in labor market integration: some sector pairs exchange directors and officers freely while others remain largely segmented. A natural question is whether these patterns reflect stable structural features of sectors or transitory conditions that fluctuate over time. At the same time, sectors may grow or contract in response to economic forces—technological change, shifts in consumer demand, regulatory developments—that reshape the distribution of corporate leadership positions across the economy. These sector size dynamics are economically interesting in their own right, distinct from the question of human capital portability between sectors.

Table 8 addresses both questions by holding the number of cross-sector moves fixed at their 2001–2010 levels and recalculating mobility rates using the sector sizes observed in 2011–2020. This counterfactual exercise decomposes observed changes in mobility rates into two components: changes in the volume of cross-sector movement (the numerator) and changes in sector scale (the denominator). The gap between actual and counterfactual rates isolates the mechanical contribution of sector size changes, allowing us to assess whether cross-sectional patterns of labor market segmentation persist independently of industry dynamics.

Table 8 documents substantial shifts in the sectoral composition of corporate leadership positions—shifts that reflect the reallocation of economic activity across sectors in response to industry-level shocks (e.g., Gort, 1969). For example, Healthcare's share of total seats

Table 8: Counterfactuals: Adjusting for Sector-Size Changes

	Inbound rate		Outbound rate	
Sector	**Observed**	**Counterfactual**	**Observed**	**Counterfactual**
Consumer	2.97%	1.94%	3.53%	2.30%
Financials	2.15%	1.62%	1.92%	1.45%
Funds	0.93%	0.98%	1.67%	1.75%
Healthcare	2.00%	0.79%	1.99%	0.79%
Industrials	3.50%	2.16%	3.46%	2.13%
Primary	2.21%	1.64%	2.12%	1.58%
Real Estate	6.13%	3.07%	3.98%	1.99%
Tech	3.16%	1.71%	3.17%	1.72%
Utilities	3.71%	2.77%	2.30%	1.72%

Notes: This table presents a counterfactual analysis comparing actual and hypothetical mobility rates. The sample is constructed from the LSEG Officers and Directors database covering U.S. public and private companies. *Actual* columns report the observed inbound and outbound rates for the 2001–2010 period, computed as in Table 4: cross-sector moves divided by seats in each sector during 2001–2010. *Counterfactual* columns report hypothetical rates that would have been observed in 2001–2010 if sector sizes had been as they were in 2011–2020, holding the number of cross-sector moves fixed. Specifically, Counterfactual Rate = (2001–2010 Moves) / (2011–2020 Seats). This exercise isolates the mechanical effect of sector size changes on mobility rates. For sectors that grew between periods (e.g., Healthcare), the counterfactual rate is lower than the actual rate because the same number of moves is divided by a larger denominator. For sectors that shrank (e.g., Funds), the counterfactual rate is higher. Sector classifications are based on the TRBC 2020 edition.

grew from 12% to 19% between 2001–2010 and 2011–2020, consistent with demographic aging, rising healthcare expenditures, and the maturation of biotechnology as a major sector of the economy. Technology expanded from 12% to 14% of seats as digital transformation became central to business models across the economy. Real Estate nearly doubled its share from 3% to 4%, reflecting the sector's expansion in the years following the 2008 financial crisis and subsequent recovery. In contrast, Funds contracted sharply from 11% to 7% of total seats, a pattern consistent with consolidation in asset management, the shift toward passive investment vehicles, and competitive pressures that reduced the number of actively managed portfolios requiring dedicated leadership. Primary industries (energy and materials) similarly declined from 12% to 10%, reflecting both commodity price cycles and the broader transition toward a service-oriented economy.

These compositional shifts document sector-level shocks to the demand and supply for corporate leadership. The growth sectors—Healthcare, Technology, Real Estate—required more directors and officers in 2011–2020 than in the prior decade, creating new positions that firms filled through some combination of internal promotion and external hiring. The contracting sectors—Funds, Primary—saw their leadership ranks shrink, releasing experienced officers and directors into the broader labor market.

Crucially, these sector size dynamics are conceptually distinct from cross-sector differences in human capital portability and labor market segmentation: A sector can grow rapidly while maintaining an insular labor market (if growth is accommodated primarily through internal promotion), or it can remain stable in size while becoming more integrated with other sectors (if turnover increasingly involves cross-sector hires).

The findings in Table 8 demonstrate that cross-sector labor market segmentation is largely a time-invariant, cross-sectional feature of human capital portability and sector-pairs labor market segmentation rather than a byproduct of changing sector sizes. Even under counterfactual sector sizes, the ranking of sectors by permeability is preserved: Real Estate and Utilities maintain the highest inbound rates (3.07% and 2.77%), while Healthcare and Funds remain the most insular (0.79% and 0.98%). The four-fold difference between the most and least permeable sectors persists regardless of how we scale the denominators. Healthcare's low permeability, for instance, cannot be attributed to its rapid growth: even when we counterfactually expand the sector to its 2011–2020 size, its inbound rate remains the lowest among all sectors. Similarly, Funds' insularity on the inbound side is not an artifact of its contraction; under counterfactual (smaller) sector sizes, its inbound rate rises only marginally from 0.93% to 0.98%.

This stability suggests that the heterogeneity in labor market integration documented throughout our analysis reflects durable structural features—the nature of human capital

accumulated in each sector and its applicability elsewhere—rather than transitory conditions tied to sector scale. The skills and knowledge developed in Healthcare (regulatory expertise, clinical understanding, reimbursement dynamics) appear to be specialized in ways that limit their transferability to other sectors, and this limitation persists across different industry configurations. Conversely, the expertise developed in sectors like Industrials and Technology appears to be broadly applicable, and this portability is equally stable. Cross-sectional labor market segmentation, in other words, appears to be a fundamental characteristic of how human capital is produced and valued across sectors of the economy.

6 Dynamic Consequences of Labor Market Integration

The preceding sections establish two central findings: role and sector transitions function as substitutes in equilibrium (Section 5.1), and cross-sector integration is highly heterogeneous and largely time-invariant across sector pairs (Sections 5.2–5.5). As emphasized in Section 3, these patterns reflect equilibrium outcomes of the matching process between firms and candidates—they do not by themselves uncover the influence of demand-side matching preferences (firms compensating for weak sector fit by insisting on role fit) that have been proposed in the corporate finance and management literatures. To shed light on this issue, we ask: when a destination sector expands (e.g. Healthcare in the mid 2010s), does it draw disproportionately from sector pairs where the labor market (with healthcare) was already integrated? In this section, we propose an identification framework based on relatively fixed sector-pair integration and sector-specific shocks that answers these questions.

6.1 Empirical Framework

Our approach to identifying demand-side (firm-side) shifts is motivated by Gort (1969), who argued that industry shocks trigger economic reallocation. In our setting, such shocks correspond to expansions in destination sectors, which in turn require firms to recruit skilled individuals to fill a growing number of board seats. Importantly, changes in sector size alone are not sufficient for identification: they can reflect many forces that are correlated with both the demand for, and the supply of, directors and officers. We therefore adopt a more recent approach that sharpens identification by exploiting transitory changes in destination-sector demand for seats. This section develops that approach.

Consider as unit of observation a directed sector pair (i, j) in year t. The dependent variable M_{ijt} is the count of directors and officers hired by the destination sector j from

origin sector i in a given year. We estimate:

$$M_{ijt} \;=\; \alpha \;+\; \beta \cdot \mathrm{LMI}_{ij} \;+\; \gamma \cdot \mathrm{Shock}_{jt} \;+\; \delta \cdot (\mathrm{LMI}_{ij} \times \mathrm{Shock}_{jt}) \;+\; \mathbf{B}'\mathbf{\Omega}_{ijt} \;+\; \mu_{ij} \;+\; \lambda_t \;+\; \varepsilon_{ijt} \quad (1)$$

where μ_{ij} denotes ordered sector-pair fixed effects (distinct fixed effects for each direction), λ_t denotes year fixed effects, and $\mathbf{\Omega}_{ijt}$ is a vector of sector-pair controls that vary across specifications (gravity controls or fixed effects). LMI_{ij} measures the initial degree to which sectors i and j are directionally connected in the labor market for directors and officers. We construct LMI_{ij} as the fraction of sector i seats held by individuals who subsequently moved to sector j during a baseline period (1998–2010):

$$\mathrm{LMI}_{ij} \;=\; \frac{M_{ij}^{\mathrm{base}}}{\mathrm{Seats}_i^{\mathrm{base}}} \quad (2)$$

where M_{ij}^{base} is the count of cross-sector moves from i to j during the baseline period, and $\mathrm{Seats}_i^{\mathrm{base}}$ is the total person-firm-year observations in sector i during the same period. This directed measure captures the portability of human capital accumulated in sector i for use in sector j, and is directly related to the transition matrices reported in Tables 6 and 7 and visualized in the network structure of Figure 2. Sector pairs connected by thick arrows in Figure 2—such as Technology→Consumer or Funds→Financials—will have high LMI_{ij}; pairs connected by thin or absent arrows will have low LMI_{ij}.

Shock_{jt} captures time-varying variation in the pull that destination sector j exerts in year t. Our identification strategy (described below), relies on short-run year-over-year growth in destination-sector seats:

$$\mathrm{Shock}_{jt} \;=\; \frac{\mathrm{Seats}_{jt} - \mathrm{Seats}_{j,t-1}}{\mathrm{Seats}_{j,t-1}} \quad (3)$$

Growth in sector j's seats reflects firm entry, expansion, or turnover that creates new positions, increasing demand for hires from the pool of skilled individuals available to sector j.

Parameter of interest. δ is the coefficient on the interaction $\mathrm{LMI}_{ij} \times \mathrm{Shock}_{jt}$. It measures whether sector pairs with higher baseline labor market integration experience disproportionately larger increases in cross-sector people flows when the destination sector booms. The parameter δ is identified from across-time variation within ordered pairs: for a given sector pair, do years in which the destination sector experiences growth correspond to years in which it hires more people from the origin sector?

A positive $\hat{\delta}$ has a direct interpretation within the framework of Section 3. Sector-wide

growth in the destination sector increases its demand for directors and officers. A positive $\hat{\delta}$ indicates that booming sectors recruit disproportionately along pre-existing channels—consistent with the demand-side matching interpretation developed in Section 5.1, where firms treat sector-specific expertise and role-specific expertise as substitutes in their preferences for industry skills.

Identification and Estimation. Our identification strategy is formalized by Goldsmith-Pinkham, Sorkin, and Swift (2020), and follows the increasingly common usage of the shift-share structure in corporate finance (e.g., Adelino et al., 2017; Darmouni and Sutherland, 2024; Fonseca and Liu, 2024; and Sarto and Wang, 2026). Equation (1) has the classic Bartik structure: a sticky "shares" component (LMI_{ij}) and a time-varying "shifts" component (Shock_{jt}). We adopt the shares-based identification approach: LMI_{ij}, measured from the first half of the sample, measures a baseline feature of the sector pair. The identifying assumption is that baseline sector-pair labor market integration between sectors i and j is uncorrelated with unobserved time-varying factors that independently affect M_{ijt}. In other words, conditional on controls and fixed effects, long-term sector-pair integration should not predict *changes* in future flows, except through the demand-shock: A positive demand shock to Healthcare (driven, say, by demographic trends or regulatory changes) increases hiring from connected sectors because of the pre-existing labor market linkage, not because the linkage was caused by the same time-varying forces driving Healthcare's growth.

Goldsmith-Pinkham et al. (2020) characterize the primary identification threat which, in our context, is that LMI_{ij} might reflect persistent unobserved complementarities between sectors that coincidentally respond differentially to economic conditions. We address this concern in two ways. First, we show that our results are robust to pair-specific time trends, which absorb gradual changes in pair-level integration that might be correlated with shifting economic conditions. In the context of our Poisson pseudo-maximum likelihood (PPML) estimation (whose multiplicative structure mechanically purges trend contamination), inclusion of pair trends will have almost no effect on the estimates. This is strong evidence in favor of the identifying assumption in our context.

An important feature of our data influences the choice of estimator in addition to our identification strategy: the prevalence of zeros (structurally disconnected sector-pairs with no cross-sector hires in a given year). By construction, the narrower the industry definition, the more zeros will be present. Our current aggregated sector approach reveals over 50 percent of ordered sector pairs having no moves in a given year.

It is well-known that these zeros meaningfully affect consistency of OLS because it treats these zeros equivalently when fitting a linear conditional mean, while Poisson models them as

informative outcomes reflecting low expected counts. Santos Silva and Tenreyro (2006) show that Poisson PML produces consistent estimates for gravity-type models with many zeros, regardless of the conditional variance structure. Cohn, Liu, and Wardlaw (2022) demonstrate further that Poisson PML requires no assumptions about higher-order error moments and that OLS of count outcomes can produce sign-reversed estimates when heteroskedasticity scales with the covariates—a concern that is operative in our data. The variance of M_{ijt} almost certainly increases with $\text{LMI}_{ij} \times \text{Shock}_{jt}$: high-LMI pairs experiencing demand booms have both higher expected counts *and* more dispersion around those counts. Cohn et al. (2022) show that this form of heteroskedasticity biases OLS coefficients downward, potentially flipping their sign, while Poisson remains consistent.

For these reasons, our main estimates of equation (1) use Poisson PPML and robust standard errors, though we do report OLS for robustness.

A feature of our research context provides an additional motivation for the Poisson Estimator. Zeros in our data reflect that over the past quarter century in our sample, the labor market for corporate leaders has gradually become less segmented over time, a pattern we refer to as *secular desegmentation*. This gradual desegmentation implies that some pairs see boards gradually hiring across sector boundaries. Four pairs (e.g., Technology→Consumer, Funds→Financials) recorded positive flows in every sample year, having been connected from the outset. Eight pairs at the other extreme recorded zero cross-sector moves throughout. The desegmentation is concentrated among pairs that were dormant in the late 1990s and gradually activated on idiosyncratic timelines. Several economic forces plausibly drove this process, reinforcing that the declining zeros reflect genuine changes in hiring rather than data artifacts. Digital transformation blurred sector boundaries, as Consumer and Financials firms increasingly sought directors with Technology expertise. Post-Enron (2002) and post-financial-crisis (2010) governance reforms pushed boards toward independence and broader skill sets, expanding the candidate aperture beyond within-sector networks. The professionalization of executive search replaced informal referrals with systematic cross-sector scanning. And the accumulation of successful cross-sector appointments created path dependence: individuals who performed well after crossing sector boundaries served as visible proof that cross-sector expertise could add value, making subsequent cross-sector hires in that pair easier to justify.

This heterogeneous activation creates an identification concern for OLS: if a pair's activation schedule correlates with destination-sector growth, the interaction $\text{LMI}_{ij} \times \text{Shock}_{jt}$ could capture trend-on-trend correlation rather than demand-shock propagation through pre-existing channels. Secular desegmentation therefore further underscores our preference for the Poisson estimator. In the multiplicative Poisson specification, the secular trend

in the level of M_{ijt} is absorbed by pair fixed effects (each pair's average expected count) and year fixed effects (the common proportional scaling across all pairs in each year), so $\hat{\delta}$ identifies whether proportional *surprises*—year-to-year deviations from each pair's own trajectory—correlate with demand shocks weighted by LMI. By contrast, the OLS linear conditional mean allows gradual upward drift in a pair's move count to enter the residual directly, contaminating $\hat{\delta}$.

6.2 Econometric Findings

Estimates of equation (1) are reported in Table 9. Columns (1)–(6) report Poisson pseudo-maximum likelihood (PPML) estimates. Column (1) includes no controls; columns (2)–(4) progressively add gravity controls with year fixed effects, origin and destination sector fixed effects, and directed-pair fixed effects.[2] Column (5) replaces the growth-rate shock with a log-difference measure as a robustness check on the shock definition. Column (6) adds pair-specific linear time trends to the preferred specification. Column (7) reports OLS with pair fixed effects and pair trends.

In the main Poisson pair-FE specification (column 4), the coefficient of interest $\hat{\delta}$ is positive and statistically significant, revealing that pre-existing labor market integration functions as a *conduit* for director and officer hires: when a destination sector experiences a positive demand shock, it draws proportionally more directors and officers from sectors to which it was already connected in the baseline period. At the mean LMI_{ij}, the Poisson estimate implies a 41.8% increase in expected cross-sector moves. At the 75th percentile of LMI_{ij}, the increase is 57%. At the maximum LMI_{ij} (the Real Estate→Financials pair), the estimated magnitude reaches 157%.

This main finding is stable across all seven specifications. More importantly, the coefficient estimates remain stable through progressively more demanding fixed-effects structures, while the sign and significance of $\hat{\delta}$ are preserved. Column (5) confirms that the finding is not an artifact of functional form, with the log-difference measure yielding nearly identical estimates to the growth rate. Adding pair-specific time trends in column (6)—which absorb the secular desegmentation trend described in Section 6.1 change the Poisson estimate by less than 5%.

The causal findings in this section demonstrate that pre-existing labor market integration (absence of segmentation) affects reallocation of corporate leadership in response to sector

[2]Specifications without directed pair fixed effect include gravity controls (log of origin-sector seats and log of destination-sector seats), which absorb the mechanical relationship between sector size and volume of cross-sector moves (Santos Silva and Tenreyro, 2006). This ensures that the coefficient of interest reflects the interaction of baseline integration with demand shocks rather than a simple scale effect

shocks (e.g., Gort 1969). This finding complements the finding in Section 5.4, which showed that the *ranking* of sectors by permeability is largely invariant to sector size. The causal results in this section demonstrate in addition that not only are cross-sectional equilibrium integration patterns stable over time, but they in addition determine which sector pairs respond fluidly to changing conditions and which remain insulated even during booms. Since identification is on the demand side, this result implies that existing labor market integration channels serve as a conduit for firms' demand for directors and officers outside their own sector rises in response to industry booms.

The heterogeneity in cross-sector hiring responses to origin sector shock responsiveness maps onto the specific sector-pair patterns documented in earlier sections: The regression results show that directed pairs with the most labor market integration, such as Funds→Financials, where baseline integration is highest, are precisely those where earlier analysis postulated strong underlying similarity in required expertise (Section 5.4). The least elastic pairs—such as Healthcare→Real Estate, where baseline integration is near zero—correspond to the segmented labor markets in which human capital portability is weakest. The regression thus confirms that the hub-and-spoke network structure visible in Figure 2 has dynamic consequences for the director and officer labor market: the thick arrows in the network are not merely descriptive of historical flows but predictive of how the system responds to shocks.

The finding of positive demand-pull from connected sectors also sheds light on the role-sector substitutability documented in Section 5.1. Recall that individuals who change sectors overwhelmingly preserve their roles—a pattern we interpreted as reflecting either adjustment costs or demand-side preference for role fit when sector fit is compromised. The results in this section are consistent with the demand-side mechanism operating at the sector-pair level: a positive shock to destination sectors will amplify incremental hires flow through channels where the portability of human capital is already established. If firms were indifferent to match quality—simply grabbing any available candidate—we would expect $\hat{\delta} \approx 0$, with growth shocks spreading hiring more across connected and unconnected origins. The significantly positive $\hat{\delta}$ with our demand-side identification indicates that firms remain selective even under demand pressure, channeling hires through pairs where the value of transferred expertise has been revealed by historical flows.

Table 9: Labor Market Integration and Cross-Sector Hires

	Poisson (PPML)						OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\hat{\delta}$: $\text{LMI}_{ij} \times \text{Shock}_{jt}$	5005***	10526***	8494***	6772***	7293***	6439**	94102***
	(1902)	(1788)	(2251)	(2472)	(2777)	(2890)	(23211)
$\hat{\gamma}$: Shock_{jt}	-8.956	2.323	2.975	3.408	4.125	4.392	-0.349
	(1.351)	(0.996)	(2.058)	(2.187)	(2.623)	(2.656)	(0.994)
$\hat{\beta}$: LMI_{ij}	1295.1	1165.1	810.8	—	—	—	—
	(374.6)	(238.8)	(270.2)				
Gravity controls	No	Yes	—	—	—	—	—
Year FE	No	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	No	No	Yes	—	—	—	—
Pair FE	No	No	No	Yes	Yes	Yes	Yes
Pair trends	No	No	No	No	No	Yes	Yes
Shock measure	Growth	Growth	Growth	Growth	Log-diff	Growth	Growth
Observations	1944	1944	1944	1944	1944	1944	1944
R^2							0.791

Notes: This table reports estimates of equation (1). The dependent variable is M_{ijt}, the count of individuals moving from origin sector i to destination sector j in year t. LMI_{ij} is baseline labor market integration, measured as the fraction of sector i seats that moved to sector j during 1998–2010. Columns (1)–(6) report Poisson pseudo-maximum likelihood (PPML) estimates, preferred for count data with many zeros (Santos Silva and Tenreyro, 2006; Cohn, Liu, and Wardlaw, 2022). Column (4) is the preferred specification. The demand shock in all columns except (5) is year-over-year percentage growth in destination-sector seats; column (5) uses the log-difference, $\ln(\text{Seats}_{jt}) - \ln(\text{Seats}_{j,t-1})$, as a robustness check on the shock definition. Column (6) adds 72 pair-specific linear time trends to absorb secular desegmentation (see text); the Poisson estimate barely changes (less than 5%), confirming robustness to trending confounders. Column (7) reports OLS with pair fixed effects and pair trends. Without pair trends, OLS produces a downward-biased $\hat{\delta}$ due to heteroskedasticity in count data (Cohn et al., 2022) compounded by omitted-variable bias from secular desegmentation (see text); including pair trends removes this bias and OLS agrees with Poisson in sign. Gravity controls are $\ln(\text{seats}_{it})$ and $\ln(\text{seats}_{jt})$. Sector FE includes separate origin and destination sector fixed effects. Pair FE are directed sector-pair fixed effects (72 pairs), which absorb $\hat{\beta}$ and the sector FE. Standard errors clustered at the directed pair level in parentheses. $^{*}p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

7 Conclusion

We document new facts about the labor market for corporate leaders. Using data on over 249,000 individuals at more than 35,000 U.S. firms from 1998 to 2024, we trace career trajectories as directors and officers move across roles, firms, and sectors.

First, Director and officer labor markets are highly segmented across sectors: among a quarter million individuals, very few are recruited to new positions in different sectors. Segmentation is much greater in the director market than in the officer market.

Second, role transitions and sector transitions function as substitutes. Officers making within-sector moves transition to director roles 49.1% of the time, compared to only 17.5% when moving across sectors—a 31.6 percentage point gap. This pattern suggests that individuals rarely undertake both types of transition simultaneously, consistent with adjustment costs that make combined role-and-sector changes prohibitively difficult.

Third, cross-sector mobility patterns reveal substantial heterogeneity in labor market integration. Some sector pairs exhibit large bilateral flows (e.g., Technology to Consumer: 286 first moves; Industrials to Consumer: 339), while others remain largely disconnected (e.g., Healthcare to Real Estate: 1). These patterns are consistent with multiple mechanisms including transferable expertise, information transfer, supply-side segmentation, and underlying similarity in skill requirements.

Fourth, structural labor market integration across sectors has dynamic consequences: we find that sector pairs with higher baseline integration experience disproportionately larger increases in cross-sector hires when the destination sector booms—a one-standard-deviation demand shock increases expected flows by 42% at the mean level of integration and by 157% at the maximum.

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Appendix A: Transition Matrices by Decade

The following tables document transition patterns within each of the following sub-periods: 2001–2010 and 2011–2020. These decade-level matrices complement the full-sample matrix in Table 6 and allow examination of whether bilateral flow patterns are stable over time.

The decade-level matrices show that bilateral flow patterns are broadly stable over time, though the magnitudes increase substantially in 2011–2020 reflecting both sector growth and increased overall mobility. In both periods, Consumer-to-Financials flows exceed Financials-to-Consumer flows (70 vs 64 in 2001–2010; 158 vs 131 in 2011–2020). The Funds-to-Financials connection remains the dominant outflow from Funds in both periods (50 in 2001–2010; 105 in 2011–2020).

Table 10: Transition Matrix of Directors and Officers Across Sectors: 2001–2010

From ↓ / To →	Cons.	Fin.	Health	Ind.	Prim.	RE	Tech	Util.	Funds
Consumer		70	37	65	36	23	72	11	11
Financials	64		22	28	27	23	30	13	23
Healthcare	33	21		23	22	10	32	3	3
Industrials	53	40	27		39	9	59	11	4
Primary	39	13	13	37		6	26	18	4
Real Estate	18	23	4	7	2		7	3	10
Tech	54	32	38	63	21	17		7	3
Utilities	3	8	3	9	9	1	4		4
Funds	9	50	4	13	6	25	4	0	

Notes: This table reports the bilateral transition matrix of cross-sector moves for directors and officers during 2001–2010. See Table 6 for variable definitions and construction details. Each cell reports the number of individuals who held a position in the row sector and subsequently took a position in the column sector during this period. The matrix counts all cross-sector moves occurring within the 2001–2010 window.

Table 11: Transition Matrix of Directors and Officers Across Sectors: 2011–2020

From ↓ / To →	Cons.	Fin.	Health	Ind.	Prim.	RE	Tech	Util.	Funds
Consumer		158	123	180	94	76	199	20	20
Financials	131		73	107	82	67	102	36	59
Healthcare	92	78		96	40	25	104	8	8
Industrials	173	95	96		127	32	141	28	20
Primary	117	63	54	139		23	55	49	10
Real Estate	61	55	20	29	21		27	5	15
Tech	176	161	102	165	56	21		19	12
Utilities	29	29	13	29	45	9	14		4
Funds	18	105	6	13	20	18	16	2	

Notes: This table reports the bilateral transition matrix of cross-sector moves for directors and officers during 2011–2020. See Table 6 for variable definitions and construction details. Each cell reports the number of individuals who held a position in the row sector and subsequently took a position in the column sector during this period. The matrix counts all cross-sector moves occurring within the 2011–2020 window.