Poaching, Raids, and Managerial Compensation[*]

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Abstract. This paper presents a model of employee poaching with asymmetric employer learning. Firms poach managers not only due to their track record but also for their personnel-specific information about workers. In equilibrium, more productive firms poach managers, whose compensation increases in the quality of their information about workers. While poaching reassigns more able workers to more productive firms, efficiency does not obtain due to information frictions. Drawing on the universe of contracts in Brazil's formal labor market, we test implications of our model and show they are consistent with manager and worker movements and their compensation histories. (*JEL* codes: C78, D21, J24, J30, M51)

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1. Introduction

Labor turnover is an important indicator of business dynamism, and thus crucial for the functioning of an economy (Decker et al., 2020). A fluid labor market more readily allows for reallocation of workers into more productive job opportunities (Decker et al., 2017). In this paper, we argue that researchers and regulators alike should particularly pay attention to the rate at which managers move across firms, highlighting an understudied mechanism: Through supervision and evaluation, managers obtain detailed information about worker ability and aptitude (Becker, 1993; Lazear, 2000; Bandiera et al., 2020; Friedrich, 2023). This *personnel-specific* information meaningfully affects the rate at which high-productivity firms *poach* managers, who then *raid* their former employees for high-ability workers, inducing efficient talent reallocation.

We introduce a model of managerial poaching and worker raids with asymmetric employer learning, and show that the compensation of poached managers increases in the value of their personnel-specific information.[1] This is because firms that are about to lose their manager take their potential subsequent loss of talent into account when formulating counter-offers to retain their manager. The resulting *information rent* makes it crucial for firms to weigh the benefits of poaching a manager against this additional cost of recruiting them. While managerial poaching can serve as a catalyst for efficient talent reallocation, we find it to be self-limiting. Information rents of well-informed managers induce high-productivity firms to poach at inefficient rates. Restrictive covenants such as *non-compete agreements* (NCAs) further stifle worker reallocation and are potentially more harmful than previously thought.

While there are prominent studies about hiring through worker referrals (e.g., Montgomery, 1991; Burks et al., 2015; Brown et al., 2016; Friebel et al., 2023), managerial incentives to recommend hiring workers differ from those of workers in two substantive ways: first, managers hold an information advantage regarding worker ability due to their involvement in both supervision and evaluation (*information*). Second, future promotion opportunities and the compensation of managers themselves depend on worker performance (*accountability*). As a result, we expect managers to be more selective in their recommendations of workers than their peers.

In our base model, two firms, each endowed with one manager and one worker, decide whether to attempt to poach their competitor's manager to learn about their worker's ability.[2] When poaching a manager or raiding a worker, an auction reflecting an offer

[1] There is a comprehensive empirical literature building on Gibbons and Katz (1991) providing support for the asymmetric employer learning hypothesis.

[2] Firms hire managers for different reasons, such as their managerial skill set (Lazear et al., 2015), including the ability to evaluate talent (Friebel and Raith, 2023). As poaching firms are generally unaware of a

and counter-offer process takes place (compare with Lazear, 1986), and the winner obtains the manager or worker at the highest compensation the loser is willing to pay. The more productive firm *poaches* if its own worker's ability falls short of a cutoff. It then decides whether to *raid* its competitor's worker, *retain* its own, or *replace* them with a junior worker of unknown ability, with each alternative arising in equilibrium.

We find that the rate of poaching increases in the number of workers at the poaching (demand for information) and at the poached (supply of information) firms. Poaching, in expectation, also benefits the poacher and increases welfare by reassigning more able workers to more productive firms. While poached managers and raided workers always benefit, the poached firm suffers a loss. The manager's information rent, however, prevents poaching from taking place at an efficient rate. A firm whose manager receives an outside offer accounts for the possibility of losing talent when submitting a counter-offer to retain its manager. As a result, a poached manager receives an information rent, a salary increase that stems from their information about high-ability workers at their former employer. Poaching firms then "pay twice" to obtain a more able worker: once indirectly for the relevant personnel-specific information through the manager's *salary*, and once directly through the worker's *wage*.[3]

Our model generates important testable predictions along three main categories: poaching (1), managerial compensation (2-5), and talent reallocation (6-7): 1. When a firm poaches a manager from another firm, the poaching firm is more likely to raid the poached firm's workers; 2. Poached managers earn higher salaries; 3. The salary of a poached manager increases in the demand for information; 4. The salary of a poached manager increases in the supply of information; 5. The salary of a poached manager increases in the raided workers' abilities; 6. Managers are poached by more productive firms; 7. Raided workers are of higher ability than non-raided workers.

Managerial poaching and subsequent worker raids are, in fact, common business practices.[4] Using rich administrative data from Brazil, we find empirical support for the

manager's competence in assessing workers, we simplify in order to highlight the effects of their personnel-specific information. In fact, we explicitly assume in our theoretical model that managers differ only in their knowledge of workers but not in their managerial abilities. Implicitly, however, more able managers may know more about their workers. Therefore, we empirically control for managerial ability using "AKM" worker fixed effects (Abowd et al., 1999).

[3]In Appendix D, we show that our main results are robust to dynamic considerations by analyzing an infinite horizon version with overlapping generations of managers and workers as well as arbitrary numbers of worker slots. This dynamic model produces complementary results: While manager poaching is not always successful, it always increases the manager's salary. Also, poaching is self-propelling. Poaching today increases the likelihood of poaching tomorrow. Finally, while we focus on two firms throughout, we discuss in Section 3 why competition among more poachers should strengthen our theoretical results.

[4]So common, in fact, that firms would get into "no-poaching" agreements so often that regulatory bodies such as the European Union (see Article 101(1) EU (2016)) and Federal Trade Commission (NYT, 2024) issued guidelines against it. Only recently, six leading Silicon Valley tech companies settled a lawsuit

testable predictions of our model. We define a poaching event as a direct move of a manager or worker from one firm to another, with no unemployment period in between job spells. Between 2010 and 2017, we identify 5722 managerial poaching events among Brazil's largest firms (those with more than 50 employees).[5] For each managerial poaching event, we trace the job transitions of all workers who worked in the same firm as the poached manager (the "origin firm") and classify those who moved to the same firm as the manager (the "destination firm") as raided workers.

Consistent with our model, firms that poach managers are more productive on average and pay higher wages. Following a *managerial* poaching event, we find that the share of new hires that come from the same origin firm jumps to about 8 percentage points higher in the month the poached manager moves, and stays at a sustained higher level for the next 9 months. This is equivalent to managers bringing, on average, about 2 workers along with them, and at least one more within the next few months. We repeat the exercise with a random sample of employee poaching events, and, while there is co-movement, it is significantly weaker and slightly delayed, more consistent with worker referrals. This suggests that managerial poaching and employee raids are fundamentally different from employee poaching and referrals.

Furthermore, we find evidence that poached managers' salaries are systematically correlated with the expected supply of good workers in the origin firm and the expected need for workers in the destination firm. We find that poached managers who are from larger firms and, notably, those from larger firms with higher-ability workers command higher salaries in their destination firms. This relationship does not hold for workers hired into managerial positions (lack of information), nor for poached managers who are hired as workers at the destination firm (lack of accountability).[6]

Destination firms that are larger and growing also pay their poached managers relatively higher salaries, and again, we find evidence that the ability of the workers they are able to bring with them, rather than just the raw number, is linked with a higher

alleging wage depression through mutual no-poaching agreements for $415 million after more than 10 years of litigation (WSJ, 2014; CNET, 2024).

[5]We focus our empirical analysis on events between 2010 and 2017, using 2003 to 2009 to estimate worker ability and firms' wage premia.

[6]Our proxy for ability is the worker fixed effect from the Abowd et al. (1999) two-way fixed effect model. There is an active debate in this literature on whether the metric measures "ability." For example, there is an argument that because the relationship between AKM worker effects and productive traits is theoretically unclear (Eeckhout and Kircher, 2011), the term "quality" may be a more accurate description of the metric (Cornwell et al., 2021). Since no term is without contention, we use *ability* reflecting that workers with higher worker fixed effects are better paid, thus assuming that well-functioning private sector markets lead firms to pay higher wages to higher ability workers. As higher-ability workers are likely to make firms more productive, the positive correlation between higher worker AKM fixed effects and firm productivity lends credibility to this assumption (see Figure 1 in Cornwell et al. (2021) and Figure 3 in Bender et al. (2018)).

starting salary for the poached manager. In fact, the distribution of the ability of raided workers stochastically dominates the respective distribution for non-poached new hires into comparable positions. Likewise, the same is true for poached managers' salaries. These empirical facts provide strong support for our theoretical model.

Inefficiently low turnover is also described by the literature on adverse selection in labor markets due to Greenwald (1986), albeit for a different reason.[7] In our framework, high-productivity firms inefficiently retain low-ability workers, whereas low-productivity firms inefficiently retain high-ability ones, the second effect being reminiscent of Ferreira and Nikolowa (2023). Their result, however, is driven by a trade-off between poaching and talent development. The importance of personnel-specific information for turnover rates is also consistent with recent studies of talent hoarding (Friebel and Raith, 2023; He and Waldman, 2024), i.e., inefficient information sharing by managers within firms to retain high-ability workers within their division.

The information channel we describe in this paper remains relevant when firms poach teams, but the nature of personnel-specific information differs. When firms ponder hiring teams, an important role of managers is to point out which team members to hire and which not to. It is well known that an important determinant of a worker's output under a specific manager is production complementarities – it depends on their fit with the manager (and/or workers) – and the literature on hiring teams is well established (see Marx and Timmermans, 2017; Herkenhoff et al., 2024).

When a firm poaches a manager in the presence of complementarities, it may learn about workers' conditional abilities as part of a team, thus affecting both firms' wage offers. Nevertheless, the information acquisition stage, i.e., manager poaching, will closely resemble poaching in our model. As such, the poaching firm pays for additional team output through the manager's salary, reflecting the information loss of the poached firm. A worker's wage increase, on the other hand, may be limited as the poached firm's value of retaining the worker diminishes when losing its manager. In order to simplify the exposition of our analysis, we abstract from complementarities throughout but postulate that our qualitative results are robust to team production.

The literature provides two alternative potential explanations for the stylized fact that workers seem to follow managers across firms. First, managerial recommendations may resemble worker referrals, which are known to convey some information about the output of workers at the hiring firm: workers referred by others tend to lead to lower recruiting costs as workers are, for example, more likely to be hired and stay longer with the firm (Montgomery, 1991; Granovetter, 1995; Dustmann et al., 2016;

[7]See Waldman and Yin (2024) for an excellent overview of this literature.

Barr et al., 2019). Second, managers may exert favoritism towards a group of workers (Bramoulle and Goyal, 2016), and facilitate their hiring in the new firm independent of their abilities (Bandiera et al., 2009; Patacchini and Mocanu, 2024).

While administrative data does not include reasons for hiring, we use data on transitions between position types (manager to non-manager and non-manager to manager) and other hires around the same time to support our interpretation that our results are neither consistent with worker referrals nor non-performance-based favoritism. For example, our data suggests workers who follow managers tend to be of higher ability relative to comparable new hires. This is inconsistent with the referrals and non-performance-based favoritism literature that finds these workers are typically no more productive than other workers hired into comparable positions (Burks et al., 2015; Brown et al., 2016; Prendergast and Topel, 1996). Thus, worker raids look different from regular referrals and do not seem to simply be a consequence of favoritism. We also rule out other reasons such as common shocks or favorable amenities as the driving force behind the co-movement of managers and workers we observe.

Further, considering the differences between poached managers who were hired as managers relative to those hired as non-managers can be instructive. For events with at least one raided worker, we find that the ability and quantity of raided workers are correlated with a higher salary at the destination firm, but poached managers who are hired as managers incur a penalty for additional hires unless they are of high ability. The same is not true for poached managers who are hired as non-managers and thus do not have direct accountability to the workers they refer. This suggests that the weight of our results is likely driven by managers looking to bring high-ability workers along into their new firm. Finally, we do find limited evidence for both worker referrals and favoritism, which we distinguish from poaching for personnel-specific information.

Finally, non-compete agreements (NCAs) aim to curtail the free movement of managers to (among other things) ensure employers invest in firm-specific human capital (Shi, 2023; Cowgill et al., 2024).[8] They come, however, at a significant cost as their anti-competitive nature precludes the efficient reallocation of managers.[9] We suggest that previous studies about the optimal regulation of labor markets underestimate

[8]NCAs ban parting employees from competing with their former employer for business. A related instrument, non-solicitation of employees agreements (NSEAs), avoids parting employees from soliciting other employees to leave with them. While NCAs do limit worker mobility (Cowgill et al., 2024), NSEAs are rarely taken into account by courts, are often challenged as illegal and prosecuted by government authorities themselves (DoJ, 2010), and lack enforceability. This is because "... the solicited party can always indicate that it was its choice to follow the former executive, meaning that there was no solicitation" (Azevedo, 2020).

[9]For more details, see in particular Shi (2023), Cowgill et al. (2024) as well as Lipsitz and Starr (2022) focusing on low-wage workers and Balasubramanian et al. (2022) on the high-tech industry. For an excellent overview of the regulation perspective, see Starr (2023).

the detrimental effects of NCAs. This is because they do not take their amplifying effects on worker movements into account. While the Federal Trade Commission (FTC) issued a rule to ban the majority of NCAs in the United States (NYT, 2024) in April 2024—suggesting an increase in the labor market value of personnel-specific information held by managers—the ruling was suspended in August 2024 and whether it will take effect in the future remains uncertain.

2. The Model

In this section, we present a stylized model highlighting the role of personnel-specific information held by managers in poaching and raids, before analyzing the model and variations thereof in the following sections. In Appendix D, we discuss an infinite horizon version of our model with overlapping generations of managers and workers, indicating that our main results persist when dynamic considerations matter.

There is an industry with two firms, A and B.[10] Each firm requires two types of employees to produce. In fact, each firm i, $i \in \{A, B\}$, has a single position for a *manager* and a single slot for a *worker*.[11] Whereas managers are homogeneous in their skill, the ability of a worker, a, takes on values in $[\underline{a}, \overline{a}] \subset \mathbb{R}_+$ according to a differentiable distribution function $F(\cdot)$. When both its positions are filled, firm i's output is

$$y_i = \rho_i a_i,$$ [12]

with ρ_i denoting firm i's productivity.[13] If either one of the two positions remains vacant, the firm's output is zero. Without loss of generality, we stipulate that $\rho_A \geqslant \rho_B$, i.e., A is weakly more productive than B.[14]

At the beginning of the game, firm i, $i \in \{A, B\}$, is endowed with its present manager m_i and worker a_i. Over the course of the game, firms decide whether to retain their employees, hire their competitors' or outside replacements. We refer to a manager (worker) who is retained or poached (raided) as a *senior* manager (worker). A senior manager's (worker's) outside option is s_e (w_e). Firms also have access to a pool of *junior* managers and workers, whose outside options are s and w, respectively. When

[10] For simplicity, when unambiguous, we refer to firm A (B) simply as A (B).

[11] For tractability reasons, we assume throughout this paper that managers and workers are not substitutes. This assumption specifically rules out the possibility of promotion, which is not our focus. The subsequent analysis is thus orthogonal to the promotion (see Gibbons and Waldman, 1999) and promotion signaling literature (see Waldman, 1984; Ricart i Costa, 1988) with Friedrich (2023) a more recent representative.

[12] Note that the qualitative results presented in this paper are independent of the functional form of the firm's production function as long as it satisfies increasing differences in its arguments.

[13] Throughout, a_i (m_i) refers, for simplicity, also to the worker (manager) themselves.

[14] See Syverson (2004) and Foster et al. (2008) for arguments that firms differ persistently in their respective productivities, including in their marginal products of labor.

hiring a new manager (worker), a firm incurs *training costs* t_m (t_w).[15] Firm i's costs then equal the sum of its manager's *salary*, its worker's *wage*, and potentially training costs, i.e.,

$$c_i^\tau = (s_i + \mathbb{1}_i^m t_m) + (w_i + \mathbb{1}_i^w t_w)\,,$$

where $\mathbb{1}_i^m(\mathbb{1}_i^w)$ equals 1 if firm i hires a new manager (worker) and 0 otherwise.

A and B then engage in a poaching game to maximize their respective profits

$$\pi_i \equiv y_i - c_i,$$

$i \in \{A, B\}$. The timeline of events is as follows:

(1) Firms decide whether to attempt to poach the other firm's manager.
(2) Firms decide whether to attempt to raid the other firm's worker.[16]
(3) Firms decide whether to retain their manager, replace them with a junior manager, or with a previously laid off one.[17]
(4) Firms decide whether to retain their worker, replace them with a junior worker, or with a previously laid-off one.[18]
(5) Production takes place, firms accrue output, and pay managers/workers.

We assume firms act simultaneously at each step of the timeline. In order to simplify, we assume that (i) lay-offs are free of cost, (ii)

$$\rho_B \mathbb{E}[a] - s - t_m - w - t_w > 0, \tag{1}$$

with

$$\mathbb{E}[a] \equiv \int_{\underline{a}}^{\overline{a}} a \; dF(a),$$

so that both firms always produce, (iii) $s_e - s < t_m$ and $w_e - w < t_w$ such that no firm fires senior managers (workers) only to save on salary (wage), and (iv) firms do not attempt to poach (raid) if they are indifferent.

When a firm attempts to poach a manager (or raid a worker), we stipulate—similar to Lazear (1986)—an offer and counteroffer process ending when one firm ceases to offer. When offers are free of cost, this gives rise to a subgame perfect equilibrium in

[15]We imagine this training cost to subsume all costs specific to newly hired employees that are not transfers from the firm to the employee. Examples for such costs are moving costs, on-boarding, training, on-the-job learning, social and cultural integration, etc.

[16]Firm i, $i \in \{A, B\}$, can only attempt to raid its competitor's worker if it poached its manager.

[17]Note that the option to retain one's manager is only available if they were not poached by the other firm.

[18]Retaining one's worker is only feasible if they were not hired by the other firm. Hiring a recently laid-off worker is only an option if the firm hired their manager before.

which the firm with the larger value of hiring/retaining the manager (worker) does so at a salary (wage) that equals the other' firm's value for hiring/retaining.[19,20]

Also, suppose when a firm hires a junior worker, it initially does not know their ability, but privately learns it after production has occurred. Crucially, not only does the firm (e.g., the owner, board of directors, etc.) learn the worker's ability, but so does its manager. As a consequence, if A poaches m_B, it learns a_B (and vice versa).

Finally, we stipulate learning to be asymmetric, i.e., a firm is not aware of the ability (and identity) of the other firm's worker unless it poaches its manager.[21] Therefore, the poaching game described in this section is one of incomplete information. As such, our focus is Perfect Bayesian Equilibrium (PBE) throughout. To pin down a unique PBE, we assume that whenever firms are engaged in a competition for a manager/worker, a sequential equilibrium (SE) (Kreps and Wilson, 1982) arises.[22]

3. Equilibrium Analysis

We now describe the equilibrium outcome of the model in Section 2 and highlight results about manager and worker movements, their compensation, firm profits, and welfare. For illustration purposes, Appendix B provides a numerical example complementing our theoretical analysis. All results presented in this section remain valid in the infinite horizon model in Appendix D unless explicitly noted otherwise.

3.1. **Equilibrium behavior.** At the beginning of the poaching game, A faces three choices: (i) attempt to poach B's manager in order to potentially raid its worker, (ii) retain its current manager and worker, and (iii) retain its manager and replace its worker with a junior one. We first observe that firm i, $i \in \{A, B\}$, never opts to retain a worker of very low ability.

[19]This offer and counteroffer process can be modeled as an ascending clock auction (see Milgrom and Weber, 1982). In an ascending clock auction, an auctioneer continuously raises the bid, i.e., salary (wage), until one firm is unwilling to pay the bid for the manager (worker) in question.

[20]If both firms simultaneously attempt poaching each other's managers (and potentially raiding each other's workers), we assume that a fair lottery determines which competition takes place first, and that offers are irrevocable. That is, if say, A makes higher offers to both managers, A retains its manager and poaches B's. As a consequence, it obtains B's manager's information about B's worker and keeps B from obtaining information about its own worker. A second manager, however, does not increase production but is paid the offered salary nevertheless. While this assumption contributes to fully specifying the game between A and B, we will show in the next section that B never attempts to poach A's worker in equilibrium.

[21]In our base model we assume that A (B) can only make offers to a_B (a_A) if it hires m_B (m_A) first, thereby learning a_B's (a_A's) identity. This prevents firm A (B) to sufficiently learn about a_B (a_A) simply from engaging in a bidding contest with B (A). While this assumption is likely satisfied in many industries, it becomes irrelevant in the more realistic case of firms commanding many worker slots (see Appendix D).

[22]Technically, we assume when firms engage in offers and counteroffers, each firm believes at every instance with probability $\epsilon > 0$ that its competitor ceases to bid. We then characterize the unique PBE as $\epsilon \to 0$.

Lemma 1 (**Firing**). *There is a cutoff* $a_i^F \equiv \mathbb{E}[a] - \frac{t_w-(w_e-w)}{\rho_i}$*,* $i \in \{A, B\}$*, such that firm* i *prefers replacing its worker* a_i *with a junior worker when* $a_i < a_i^F$*.*

Lemma 1 implies $a_B^F < a_A^F$, and as a result, A prefers replacing a worker $a \in [a_B^F, a_A^F]$ with a junior worker while B would opt to retain. This is because the expected value of a junior worker is higher for the more productive firm, at which every worker exhibits a higher marginal product of labor, while both firms incur training costs.

In order to characterize equilibrium behavior, we proceed by backward induction and first establish the consequences of poaching. Suppose that A has poached B's manager and therefore learned B's worker's ability a_B. At this point, the maximum wage B is willing to pay to retain a_B over replacing them with a junior worker is

$$w_R(a_B) = w + t_w + \rho_B (a_B - \mathbb{E}[a]), \tag{2}$$

which follows from equating B's profit when retaining its worker with the expected profit of a junior replacement. If $a_B < a_B^F$, B is not willing to pay a wage that exceeds the worker's outside option w_e, and therefore does not retain its worker. As a result, A can raid a_B at $\max\{w_e, w_R(a_B)\}$. Note that if A hires a_B, their wage is independent of A's productivity but depends on a_B's ability as well as on B's productivity.

If B poached m_A to potentially raid B for a_A, B's outside option would change, affecting $w_R(\cdot)$. It turns out, however, that B never attempts to poach A's manager in equilibrium. This is because B can always hire A's laid-off manager and (possibly its) worker at the end of the recruitment process. As such, B never gains from poaching but may, in fact, lose if A poaches m_B with a higher likelihood since B's outside option improves, lowering its own retention wage when poaching A's manager.[23]

Proposition 1 (**Equilibrium behavior**). *Fix an industry* $(F, \rho_A, \rho_B, s, s_e, t_m, w, w_e, t_w)$*. In equilibrium, firm* B *never poaches firm* A*'s manager* m_A*. There are* ρ_A' *and* ρ_A'' *with* $\rho_B < \rho_A' < \rho_A''$ *such that*

(1) if $\rho_A \leqslant \rho_A'$*, a* ***no-poaching equilibrium*** *materializes: firm* A *does not poach firm* B*'s manager. Firm* i*,* $i \in \{A, B\}$*, retains its manager* m_i*, and retains its worker if* $a_i \geqslant a_i^F$ *and replaces them with a junior worker otherwise.*

(2) If $\rho_A > \rho_A'$*, a* ***poaching equilibrium*** *materializes: there is* a_P^**, and a strictly increasing function* $\alpha : A \to A : a \mapsto \alpha(a)$ *such that firm* A *poaches firm* B*'s manager if and only if* $a_A < a_P^*$*. It then*

(a) replaces its worker with a junior worker if $a_A < a_A^F$ *and* $a_B \leqslant \alpha(a_A^F)$*,*

(b) retains its worker if $a_A \in [a_A^F, a_P^*]$ *and* $a_B \leqslant \alpha(a_A)$*, and*

[23]We flesh out the entire argument in the proof of Proposition 1.

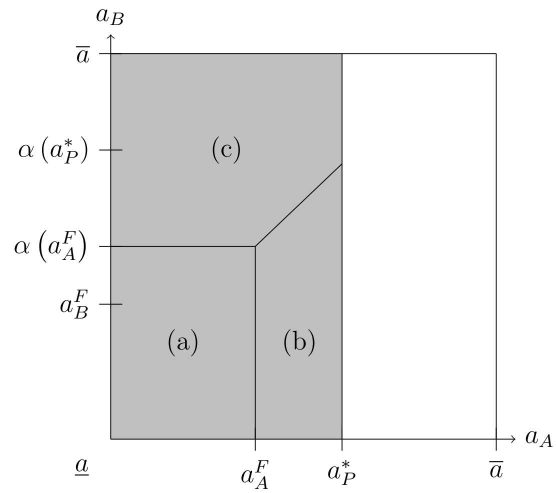


FIGURE 1. Equilibrium poaching behavior

(c) *raids firm B's worker if* $a_B > \max\{\alpha(a_A^F), \alpha(a_A)\}$.

(3) *When firm A raids firm B's worker, firm B hires a junior manager and worker if* $\rho_A \in (\rho'_A, \rho''_A]$, *but may hire firm A's laid off manager if* $\rho_A > \rho''_A$.[24]

Proposition 1 establishes that if A and B are similarly productive, i.e., $\rho_A \leqslant \rho'_A$, there is no poaching in equilibrium. Recall that the wage at which A can hire B's worker is independent of A's productivity but reflects B's profit loss when replacing a_B with a junior worker. The salary that A has to pay to poach B's manager m_B in the first place then reflects B's expected profit loss from A learning its worker's ability a_B. It is this *information rent*—which we discuss in detail below—that prevents A from poaching m_B in the first place if the firms are similarly productive.

If A is sufficiently more productive than B, i.e., $\rho_A > \rho'_A$, however, A poaches m_B in equilibrium if its own worker is of low ability, i.e., $a_A < a_P^*$. This scenario is illustrated by the gray-shaded area in Figure 1. If A is highly productive, it is more than willing to pay for B's profit loss through both the poached manager's salary and the worker's wage. Fix A's productivity ρ_A. For high values of a_A, i.e., $a_A > a_P^*$, A never poaches m_B. This is because the likelihood that a_B sufficiently exceeds a_A to justify raiding at a higher wage is too small to warrant poaching of m_B at a higher salary.

[24] If poaching occurs in equilibrium, firm B's detailed behavior is as follows: when firm A does not hire firm B's worker, firm B hires a junior manager and replaces its worker with a junior worker if and only $a_B < a_B^F$. There is an increasing cutoff function $a_B^C(\cdot) : A \to A : a \mapsto a_B^C(a)$ such that when firm A hires firm B's worker, firm B hires a junior manager and replaces its worker with a junior worker if $\rho_A \leqslant \rho''_A$ or $\rho_A > \rho''_A$ and $a_B \leqslant a_B^C(\rho_A)$. If $\rho_A > \rho''_A$ and $a_B \leqslant a_B^C(\rho_A)$, firm B hires firm A's laid off manager m_A, replaces its worker with firm A's laid off worker if $a_A > \mathbb{E}[a] + \frac{w_e - w}{\rho_B}$ and replaces its worker with a junior worker otherwise. Note that for some industries $\rho''_A = \infty$.

Note that whenever A attempts to poach m_B in equilibrium, it does so successfully. Since A's expectation of a_B warranted the poaching attempt in the first place, A's expectation of a_B increases as long as B does not cease to make counter-offers for its manager.[25] Therefore, whenever A is poaching m_B if $a_A = a'$, it also poaches them for a_A, $a_A < a'$. To see why this is the case, note that—after successfully poaching m_B and treating their salary as sunk cost—A faces three options: (a) replace a_A with a junior worker at $w + t_w$, (b) retain a_A at w_e or (c) raid a_B at a wage that reflects B's profit loss. Note that A's profit only increases in a_A locally under option (b). Thus, A's profit from poaching increases in a_A with probability $F(a_P^*) - F(a_A^F)$, whereas its profit when not poaching increases with probability $1 - F(a_A^F)$ by the same amount. Also note that the cutoff value for a_B, $\alpha(a_A^F)$, above which A raids a_B, is constant for $a_A < a_A^F$ but strictly increases for $a_A \in [a_A^F, a_P^*]$, as depicted in Figure 1 which illustrates when A chooses (a), (b) or (c). This is because A never retains if $a_A < a_A^F$.

3.2. **Compensation.** Understanding when A poaches m_B allows us to solve for equilibrium salaries of managers and workers' wages. As B hiring A's laid-off manager and/or worker does not qualitatively affect our results, we focus our discussion on parameters at which B always replaces its worker with a junior worker if A raids a_B, i.e., $\rho_A \in (\rho'_A, \rho''_A]$. Following the above logic, we first establish equilibrium wages.

Lemma 2 (**Wages**). *Fix an industry* $(F, \rho_A, \rho_B, s, s_e, t_m, w, w_e, t_w)$ *with* $\rho_A \leqslant \rho''_A$. *(1) In a no-poaching equilibrium, junior workers earn* w *and senior workers* w_e. *(2) In a poaching equilibrium, likewise (a) junior workers earn* w *and (b) retained workers earn* w_e, *while (c) raided workers with ability* a *earn* $w + t_w + \rho_B\,(a - \mathbb{E}[a])$.

As B never hires m_A, replacing a_B with a junior worker is B's outside option when losing its worker to A if $\rho_A < \rho''_A$. Henceforth, the equilibrium wage of a worker with ability a_B raided by firm A, $w_R(a_B)$, is given by Equation (2), and accounts for a junior worker's outside option w, worker training cost t_w, and B's expected profit loss $\rho_B\,(a_B - \mathbb{E}[a])$. This allows us to derive managers' equilibrium salaries.

Proposition 2 (**Salaries**). *Fix an industry* $(F, \rho_A, \rho_B, s, s_e, t_m, w, w_e, t_w)$ *with* $\rho_A \leqslant \rho''_A$. *(1) In a no-poaching equilibrium, managers earn* s_e. *(2) In a poaching equilibrium, (a) junior managers earn* s, *while (b) poached managers earn* s_P^* *ranging from* $\underline{s}_P = s + t_m$ *to* $\overline{s}^P = s + t_m + \rho_B(\overline{a} - \mathbb{E}[a]) + t_w + (w - w_e)$ *and increasing in the quality of the manager's information, i.e., in* a_B.

[25] This is not the case in the dynamic model in Appendix D, in which firms are unaware of the number of high- respectively low-ability workers employed by their competitor. As a consequence, a poaching attempt may not be successful but increase the manager's salary nevertheless.

In a no-poaching equilibrium, firms retain their managers at a senior manager's outside option s_e, while B replaces their manager with a junior one at s in case A poaches m_B. The determination of a poached manager's salary in equilibrium,

$$s_P\left(a_B\right) = s + t_m + \mathcal{P}\left(a_B\right)\left[\rho_B\left(a_B - \mathbb{E}[a]\right) + t_w + \left(w - w_e\right)\right], \tag{3}$$

is naturally more involved. It is the highest amount that B is willing to pay to retain m_B, comprising the cost of a junior manager replacement, $s + t_m$, as well as the expected profit loss from A learning B's worker's ability a_B. This profit loss can be expressed as the product of two factors: the sum of the expected loss of output if A raids a_B, $\rho\left(a_B - \mathbb{E}(a)\right)$, worker training cost t_w and the savings from not retaining a senior worker $(w - w_e)$, as well as the probability of this raid taking place given a_B, which we denote by $\mathcal{P}(a_B)$.[26] We refer to $\mathcal{P}\left(a_B\right)\left[\rho_B\left(a_B - \mathbb{E}[a]\right) + t_w + \left(w - w_e\right)\right]$ as a poached manager's information rent.

Figure 2 below depicts the equilibrium salary of a poached manager as a function of a_B. Note that A never hires B's worker if $a_B \leqslant \alpha(a_A^F)$. In this case, the poached manager's salary simply reflects the managerial training cost t_m incurred by B when replacing its manager. On the other hand, if $a_B > \alpha(a_A^F)$, $s_P(a_B)$ reflects B's loss of profits from A obtaining information about a_B. If the probability of A raiding a_B as expected by B, i.e., $\mathcal{P}\left(a_B\right)$, equals 1, the slope of $s_P(\cdot)$ is linear. If $a_B \in [\alpha(a_A^F), \alpha(a_P^*)]$, $s_P(\cdot)$ is strictly increasing, but its slope depends on $F(\cdot)$.

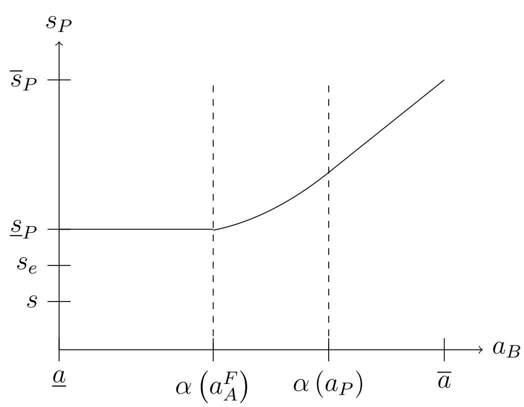


FIGURE 2. The salary of a poached manager

Proposition 2 (and Figure 2), however, describes ex-post salaries. When A decides whether to poach, it is not aware of B's worker's ability a_B. Instead, it weighs the expected benefits of poaching m_B against its direct and opportunity costs. m_B's

[26]Note that the probability of a raid from A's perspective is necessarily independent of A's worker a_A.

expected salary when poached, $\hat{s}_P$, is A's expectation of the highest salary at which B wants to retain its manager. Note that $\hat{s}_P$,

$$\hat{s}_P(a_P) = s + t_m + \int_{\alpha(a_A^F)}^{\alpha(a_P)} \frac{F\left(\alpha^{-1}(a)\right)}{F(a_P)} \left(w_R(a) - w_e\right) dF(a) + \int_{\alpha(a_P)}^{\bar{a}} \left(w_R(a) - w_e\right) dF(a), \tag{4}$$

is necessarily independent of a_A as it is unknown to B. $\hat{s}_P$ reflects A's expectation over B's salary for a junior replacement manager m, their training cost t_m and B's expected loss of profit when A obtains information about a_B and potentially proceeds to hire them. $\hat{s}_P$ contributes to determine the equilibrium cutoff a_P^*.

Lemma 3 (**Poaching**). *Fix an industry* $(F, \rho_A, \rho_B, s, s_e, t_m, w, w_e, t_w)$ *with* $\rho_A \leqslant \rho_A''$. *In a poaching equilibrium,* $\mathbb{P} = F(a_P^*)$ *denotes the likelihood of poaching where* a_P^* *solves*

$$\int_{\alpha(a_P^*)}^{\bar{a}} \left[\rho_A\left(a - a_P^*\right) - \left(w_R(a) - w_e\right) - t_w\right] dF(a) = \left(\hat{s}_P(a_P^*) - s_e\right) + t_m.^{27} \tag{5}$$

Equation (5) determines the equilibrium cutoff of a_A at which A is indifferent between poaching m_B or not, pitting A's gain from poaching B's manager instead of retaining its own when $a_A = a_P$ against the additional managerial salary it expects to pay when poaching. Below, we discuss the welfare consequences of these findings.

3.3. **Welfare.** We now consider the welfare implications of poaching in our model. It follows from Lemma 2 and Proposition 2 that firms that poach managers in order to raid high-ability workers pay twice for the resulting additional output. They first pay the manager an information rent $\mathcal{P}\left(a_B\right)\left[\rho_B\left(a_B - \mathbb{E}[a]\right) + t_w + (w - w_e)\right]$ in order to learn about their competitor's worker. Then, in case of a raid, they pay $\rho_B\left(a - \mathbb{E}[a]\right) + t_w$ directly to the worker for the additional output over a junior worker.

This observation allows us to derive two important sets of welfare-related results. First, in equilibrium, A does not always gain when poaching. It does not if it poaches m_B but elects not to raid, or raids a_B for whom it would not have wanted to poach m_B in the first place. Nevertheless, A's willingness to poach when a_A exceeds a_P signals

[27] For simplicity, we refer below to $\hat{s}_P^* \equiv \hat{s}_P(a_P^*)$.

that, in expectation, A benefits from poaching. Naturally, B's profits decline while poached managers and raided workers benefit from increased salaries and wages.

Second, in expectation, poaching increases social welfare, but A does not poach often enough from an efficiency perspective. In fact, A needs to be significantly more productive than B, i.e., $\rho_A > \rho'_A$, to warrant paying twice for the option value of higher worker ability. And even if A poaches with positive probability, it does not do so often enough from a welfare perspective. Let $\hat{a_P}$ denote the efficient poaching cutoff for A's worker a_A. That is to say, a planner maximizing industry profits recommends A to poach m_B whenever $a_A < \hat{a_P}$. This allows us to analyze efficient poaching.[28]

Lemma 4 (**Efficient poaching**). *Fix an industry* $(F, \rho_A, \rho_B, s, s_e, t_m, w, w_e, t_w)$ *with* $\rho_A \leqslant \rho''_A$. *A maximizes industry profits if it chooses to poach whenever* $a_A < \hat{a_P}$ *where* $\hat{a_P}$ *solves*

$$\int_{\alpha(a_P^*)}^{\bar{a}} \left[\rho_A \left(a - a_P^*\right) - \left(w_R(a) - w_e\right) - t_w\right] dF(a) = 2t_m - \left(s_e - s\right). \tag{6}$$

Lemma 4 pits A's benefits and B's costs (through $w_R(a)$) from poaching against manager training costs at both firms and B's savings from not retaining their manager. Having established the efficient poaching level allows we to state our welfare results.

Proposition 3 (**Welfare considerations**). *Fix an industry* $(F, \rho_A, \rho_B, s, s_e, t_m, w, w_e, t_w)$ *with* $\rho_A \leqslant \rho''_A$. *Poaching, in expectation (i) increases firm A's profits, (ii) decreases firm B's profits, (iii) always benefits poached managers and raided workers, and (iv) increases social welfare, but (v) not to the efficient level, i.e.,* $a_P^* > \hat{a_P}$.

Since A benefits despite paying for all social costs that arise due to poaching in order to raid a_B, the same is true for social welfare. Social costs of poaching comprise B's lost production value, the managerial training costs incurred by both A and B, as well as the worker training costs incurred by the firms as a result of raids (i.e., if the firms would not have replaced their workers otherwise). Note that when A poaches, it pays for these costs either directly (training cost) or indirectly (through the manager's salary and the worker's wage) and still expects an increase in profits. As a result, social welfare increases in expectation as poaching facilitates assortative matching, i.e., increases the likelihood that more able workers work for more productive firms.

The information friction that arises from asymmetric employer learning, however, causes A to not always poach if it is efficient to do so. Formally, this can be seen

[28]Note that such a planner always prevents firm B from poaching.

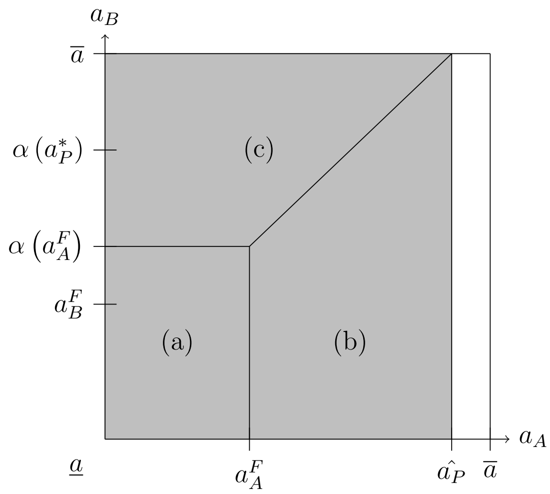


FIGURE 3. Welfare loss in equilibrium

as the right-hand side of Equation 5 exceeds the right-hand side of Equation 6 for any level of a_P^*. This is because the expected equilibrium costs of the poaching firm comprise the manager's information rent. This information rent, however, is not a social cost of poaching but rather a transfer from the poaching firm to the manager. Thus, the rate of managerial poaching and subsequent raids is inefficiently low. Figure 3 illustrates this logic graphically. The left-hand side depicts a hypothetical situation in which a planner recommends A to poach B's manager whenever $a_A < \hat{a_P}$. Just as in Figure 1, firm A then replaces their worker under (a), retains under (b), and raids firm B's under (c). On the right-hand side, in a poaching equilibrium, A poaches m_B if $a_A < a_P^*$. As a result, A fails to raid B's worker inefficiently in the dark gray-shaded triangle. The numerical example in Appendix B translates this logic into numbers.

Note that the numerical example describes a firm A poaching with significant likelihood in equilibrium, but not often enough from a welfare perspective. More generally, by Proposition 3, asymmetric employer learning reduces poaching rates. While some firms, depending on their productivity, reduce their rate of poaching, others cease to poach managers for personnel-specific information altogether.

3.4. **Competition.** Finally, consider an extension of our model in which multiple firms vie to poach a firm's manager to learn about workers. In such a setting, we expect poaching salaries to depend on the second most productive firm that decides to attempt to poach a manager from another firm. While poaching in this scenario possibly leads to a reassignment of workers, increasing efficiency in the market, firms need to be sufficiently more productive than their most similar competitors in order to make poaching worthwhile. This suggests that the welfare loss from asymmetric employer learning may increase in competition for managers (and workers).

4. Multiple Workers

In this section, we explore how the number of worker slots per firm affects the outcome of the poaching game introduced in Section 2, specifically the rate of poaching, managerial compensation, and welfare. We analyze a 2×1 model, i.e., A has two worker slots while B has one, and a 1×2 model, i.e., A has one worker slot while B has two. In both these settings, B never poaches A's manager. This allows us to compare results directly to Section 3, shedding light on the effects of additional worker slots at either firm.[29] In particular, we lay out why and how additional worker slots increase the probability of poaching as well as the poached manager's expected salary. We focus on poaching equilibria in which B does not hire A's laid-off manager.

4.1. A 2×1 model.

In this setting, B continues to have a single worker slot. Thus, its profit loss when losing its single worker—having to replace them with a junior worker—remains the same as in the base model analyzed in Section 3, and so does $w_R(a_B)$, the highest wage at which B is willing to retain a_B, and therefore the wage of a raided worker in equilibrium. Likewise, the range of poached managers' salaries remains the same.[30] Poached managers with intermediate quality information, i.e., $a_B \in (\alpha(a_A^F), \alpha(a_P)]$, however, command higher salaries as the likelihood that A raids a_B in this range increases in the number of A's worker slots. These insights allow us to state the following results comparing the 2×1 with the base model.

Proposition 4 (**A** 2×1 **model**). *Fix an industry* $(F, \rho_A, \rho_B, s, s_e, t_m, w, w_e, t_w)$ *with* $\rho_A \in (\rho'_A, \rho''_A] \cap (\rho'_{A(2\times1)}, \rho''_{A(2\times1)}]$.[31] *In the poaching equilibrium,*

(1) $\hat{s}^*_{P(2\times1)} > \hat{s}^*_P$,
(2) $a^*_{P(2\times1)} < a^*_P$, *and*
(3) $\mathbb{P}_{(2\times1)} > \mathbb{P}$.

Proposition 4 (1) follows from the discussion above. Suppose $a^*_P = a^*_{P(2\times1)}$. By (1), the highest salary B is willing to pay in to retain m_B in expectation, $\hat{s}^*_{P(2\times1)}$, exceeds $\hat{s}^*_P$ (since A is more likely to raid B's worker when poaching). This is illustrated in

[29] See Proposition 6 in Appendix D reaffirming the results presented in this section in a dynamic model in which firms command arbitrary numbers of worker slots.

[30] This is because, conditional on manager poaching, A never raids B's worker if $a_B = \underline{a}$ but always if $a_B = \overline{a}$.

[31] Throughout this section, we add $(n_A \times n_B)$ as a subscript to indicate values for an industry in which A has n_A and B n_B worker slots.

Figure B.1 and the continued numerical example in Appendix B. As a consequence, poaching becomes less attractive, causing A to adjust its poaching cutoff $a^*_{P(2\times1)}$ downwards. This makes poaching less likely. Nevertheless, in equilibrium, $\mathbb{P}_{(2\times1)} = 1 - \left[1 - F\left(a^*_{P(1\times2)}\right)\right]^2$ always exceeds $\mathbb{P} = F(a^*_P)$. Otherwise, $\hat{s}^*_{P(2\times1)} \leqslant \hat{s}^*_P$.

4.2. **A 1×2 model.** Assume now that the less productive firm B has an additional worker slot. Just as in the 2×1 model, B's profit ramifications of losing a worker—conditional on their ability—are the same as in the base model. As a consequence, the highest wage at which B is willing to retain a worker with ability a remains $w_R(a)$. It follows that the upper and lower bounds of poached manager salaries, $\underline{s}_P$ and $\overline{s}_P$, respectively, remain the same as well. Once A poaches m_B, however, its chance to learn about a highly able worker increases.

Proposition 5 (**A 1×2 model**)**.** *Fix an industry $(F, \rho_A, \rho_B, s, s_e, t_m, w, w_e, t_w)$ with $\rho_A \in (\rho'_A, \rho''_A] \cap (\rho'_{A(1\times2)}, \rho''_{A(1\times2)}]$. In the poaching equilibrium,*

(1) $\hat{s}^*_{P(1\times2)} > \hat{s}^*_P$,
(2) $a^*_{P(1\times2)} > a^*_P$, and
(3) $\mathbb{P}_{(1\times2)} > \mathbb{P}$.

To understand Proposition 5, suppose that $a^*_{P(1\times2)} = a^*_P$. In this case, the probability of poaching in the 1×2 model and the base model is the same, $F(a^*_P)$. A's benefit from poaching, however, is larger since it raids one of B's workers more often than in the base model, as it is more likely that one of B's workers exceeds its thresholds $\alpha(a^F_A)$ and $\alpha(a^*_P)$. This implies that $\hat{s}^*_{P(1\times2)}$ must exceed $\hat{s}^*_P$ reducing A's benefit from poaching. However, the profit loss incurred by B falls short of A's additional gain from poaching. As such, A poaches more often than in the base model.

Figure B.2 and the continued numerical example in Appendix B illustrate the effect of an additional worker slot at B. The additional profit from poaching at $a_{P(1\times2)}$, $\Delta\pi_{A(1\times2)}$, increases everywhere (shifts to the right) as A is more likely to learn about a highly able worker at B. At the same time, B's expected profit loss—conditional on poaching—$s_{P(1\times)}$ increases for every $a_{P(1\times2)}$ for the same reason. Thus, $\hat{s}^*_{P(1\times2)} > \hat{s}^*_P$, and since A's gain necessarily dominates B's loss if ρ_A is large enough, $a^*_{P(1\times2)} > a^*_P$.

In this section, we have shown that an additional slot at either firm increases the expected salary of a poached manager since A is more likely to raid B's worker(s). As A's additional benefit of poaching exceeds B's additional profit loss, the probability of poaching increases in both cases. However, the mechanisms of action are different. In case the more productive firm has an additional worker slot, its additional profits from poaching remain the same (as it is indifferent between poaching and retaining at $a_{A,1} = a^*_{P(2\times1)}$ if $a_{A,2} \geqslant a^*_{P(2\times1)}$), but it is more likely to poach in the first place. If the less productive firm has an additional worker slot, A's additional profit from poaching increases as A is more likely to learn about a highly able worker at B. Finally, while additional worker slots at both less and more productive firms increase the rate of poaching, the relative welfare loss due to asymmetric employer learning increases.

5. Testable Implications

In this section, we derive testable implications from our equilibrium and comparative statics analyses in Sections 3 and 4 that allow us to take our model of managerial poaching and raids to data. We organize seven predictions into three categories: poaching, managerial compensation, and talent reallocation. While some of our predictions are consistent with other labor market phenomena, we propose that no other theory accounts for their entirety as well as our model of managerial poaching for personnel-specific information. Below, we briefly summarize our predictions as they guide our empirical analysis in subsequent sections.

Poaching:

Prediction 1. *When a firm poaches a manager from another firm, the poaching firm is more likely to also raid their workers.* Proposition 1 establishes that more productive firms poach managers for the option value of identifying high-ability workers the manager supervises at their current employer. It follows that a firm that successfully poaches another firm's manager may raid the manager's current workers.

Managerial Compensation:

Prediction 2. *Poached managers earn higher salaries.* This prediction follows from Proposition 2 and is illustrated by Figure 2. The salary of a poached manager weakly exceeds the salary of a retained manager and does so strictly if the manager holds valuable personnel-sepcific information.

Prediction 3. *The salary of a poached manager increases in the demand for information.* By Proposition 4, the expected salary of a poached manager increases in the poaching firm's number of workers. This follows because a firm with more worker slots is more likely to raid a worker, increasing the expected value of personnel-specific information, and making the manager more valuable to retain for the poached firm. This result is illustrated by Figure B.1 in Appendix B. Proposition 6 generalizes this result to arbitrarily many worker slots.

Prediction 4. *The salary of a poached manager increases in the supply of information.* By Proposition 5, the expected salary of a poached manager is larger if the poached firm has an additional worker slot, as illustrated by Figure B.2 in Appendix B. Proposition 6 in Appendix D generalizes this result to arbitrary numbers of worker slots in a dynamic setting. The intuition behind Prediction 5 is that losing a manager with information about more workers increases the probability of a raid, again because the expected value of information increases. As a result, the manager is more valuable to retain for the poached firm.

Prediction 5. *The salary of a poached manager increases in the raided workers' abilities.* Proposition 2 establishes that the salary of a poached manager weakly increases in their worker's ability. Moreover, their salary strictly increases if the firm that poached the manager raids the worker. This is because the poached firm is about to lose high ability workers. This is illustrated by Figure 2. The generalization to multiple workers follows from the proof of Proposition 6 in Appendix D.

Talent reallocation:

Prediction 6. *Managers are poached by more productive firms.* Prediction 1 directly follows from Proposition 1. A firm poaches a manager for personnel-specific information in equilibrium only if it is sufficiently more productive than the manager's current employer, i.e., $\rho_A > \rho'_A$. Intuitively, the poaching firm's productivity has to exceed a level that makes paying for the manager's information rent attractive.

Prediction 7. *Raided workers are of higher ability than non-raided workers.* This prediction follows from Proposition 1 and is illustrated by Figure 1. A firm only raids a worker if their ability exceeds the firm's own worker's ability and a junior worker's expected ability non-trivially. Proposition 6 in Appendix D extends the statement for arbitrarily many workers, as firms only raid high-ability workers.

6. Data

The dataset we use is the *Relação Anual de Informações Sociais* (RAIS, 2003-2017), a linked employer-employee dataset derived from administrative records covering all formal sector employment contracts in Brazil. This is a Ministry of Labor dataset that serves the purpose of administering social security programs, and the data is submitted (by law) by all firms employing formal workers. Records include a worker's tax identifier, average monthly earnings, start and end date of their contract, cause of separation (including whether they were fired, quit, or transferred between subsidiaries of the same firm), number of contracted weekly hours, occupation code (6-digit), and education level. We deflate earnings using the Consumer Price Index for 2008. The data also records information on the contracting establishment, including its unique tax identifier, the primary industry in which it operates, and its municipality.

Brazil is a large country with a formal sector workforce of over 60 million people. We use the data for three purposes: (1) construct a proxy measure of "worker ability" using employment histories; (2) identify events where a firm "poached" a manager (or worker) from another firm (that is, hired them away with no unemployment spell in-between jobs); (3) identify co-workers of the poached manager (or worker) in the origin firm, and track their trajectories into the same destination firm, or other firms.

6.1. **Measuring worker ability and firm wage premium.** We measure worker ability following the Abowd et al. (1999) two-way fixed effect decomposition (the *AKM model*).[32] This model decomposes the firm-specific and worker-specific "wage premia," such that a higher firm fixed effect indicates that the firm tends to pay higher wages relative to others. Correspondingly, a higher worker fixed effect indicates that a particular worker tends to earn higher wages relative to other workers in the firms they work at. As such, this worker fixed effect can be interpreted as the value of portable skills workers take with them, or as a proxy of worker ability.

To estimate this, we run the following model

$$\ln w_{it} = \alpha + x_{it}\beta + \eta_{Y(i,t)} + \theta_i + \varepsilon_{it}, \tag{7}$$

with dependent variable w_{it}, the real log wage of worker i in year t. $Y(i,t)$ captures the place of employment for worker i at time t. $\eta_{Y(i,t)}$ captures the establishment "wage premium." The θ_i captures worker ability, as described above. This estimation controls for a normalized cubic in age interacted with race and gender, and year effects in x_{it}.[33] For this estimation, we use data from 2003 to 2008 to build a proxy of ability that pre-dates the poaching and raid events we study in the next section.[34]

6.2. **Identifying poached workers.** We focus on a specific set of job-to-job transitions, as we are interested in managers and workers who were likely *poached* from the origin firm by the destination firm rather than workers who were hired at the

[32] As noted above, the worker fixed effect from this estimation is sometimes referred to as worker "ability," though the theoretical basis for the correlation between this fixed effect and worker productivity is not clear (Eeckhout and Kircher (2011)). We assume better-paid workers tend to be of better ability and rely on the positive correlations between average worker AKM fixed effects and firm productivity found in Brazil (Cornwell et al. (2021)) and Germany (Bender et al. (2018)) as corroborating evidence.

[33] We normalize the experience profile to be flat at 20 years of experience, as per Card et al. (2018).

[34] It is also worth noting that this model rests on an assumption of exogenous mobility, while our theoretical framework discusses a case of endogenous mobility. Using the universe of job-to-job transitions in 2003-2008 ensures we are using *all* transitions (including many that can be plausibly expected to be exogenous) to estimate worker quality and firm wage premia, not focusing only on those which may be endogenous.

destination firm following an unemployment spell. To classify a poaching event, we focus on employees that (1) are employed in *private* firms with an average of at least about 50 employees in the sample months, (2) were employed in the *origin firm* for at least one year prior to the poaching event, (3) were hired by a different *destination firm* (not a different establishment of the same firm) at time $t = 0$, and (4) were *formally separated* from their origin firm (i.e. cannot be holding both origin firm and destination firm contracts in the same month).[35]

For all workers satisfying these movement criteria, we further define a *manager* poaching event when the leaving worker was a manager in the origin firm and is hired as a manager in the destination firm.[36] The Brazilian Occupation Codes (CBO) include a classification for middle managers (the third digit in the occupation code is a "0") as well as for directors (those starting with a "1").[37] Our primary analysis will focus on *middle manager* movements: this is because they are the managers generally in charge of hiring and supervising employees in the establishment and have information about workers as their direct reports.[38] To avoid overlapping events where multiple managers may be poached at the same time, we restrict our analysis to only those that are at least 25 months apart. As a comparison group, we randomly select a set of non-manager poaching events following the same criteria.

Between 2010 and 2016, there are 5,722 manager-to-manager transitions and 95,580 such transitions for non-managers to non-managers. We also identify 6,813 manager to non-manager transitions and 3,143 non-manager to manager transitions. Out of the 5,722 manager-to-manager transitions, 2,864 transitions include at least one raided worker by the destination firm. The equivalent for manager to non-manager is 2,603, and for non-manager to manager is 1,260.

6.3. **Identifying raided workers.** For all poaching events, we then identify all the co-workers of the poached managers in the origin firm at $t = -12$, and track their trajectories for the year following the poaching event. We define those workers who

[35] We focus on firms with at least 50 employees as that is the generally accepted minimum size category for medium to large firms, which account for about 60% of formal employment in the country. Smaller firms are fundamentally different in many HR functions, so we focus our analysis on this set of more comparable firms. Table C.1 details the summary statistics of firms in the Brazilian formal sector by size category.

[36] We discuss manager to non-manager and non-manager to manager transitions in Section 8.

[37] Occupation codes are usually reported by HR or other senior managers and are generally accurate, though not completely immune to misclassification (Cornwell et al., 2021). To mitigate this, we include in our manager classification employees who are classified as managers in either the origin or destination firm *and* are within the top decile of earnings in the other, non-managerial classification. Our results are robust to not classifying such events as managerial poaching events.

[38] We include an analysis where we define the event as poaching of *directors* rather than middle managers and track the co-movement of workers in Appendix Figure C.3. We find that the co-movement exists but is much more subdued, not too distinct from the referrals share but with slightly different timing.

worked with the poached employee in the origin firm and moved to the same destination firm as *raided* co-workers. We choose the more restrictive set of workers who were in the same firm at least a year prior to the poaching event to allow enough co-working time (and at least one round of potential annual review evaluations) to take place and build information on the workers' ability. We also calculate, for every poached manager, the average tenure overlap they have with their employees as a measure of how well they are likely to know the cohort of employees in their firm.[39]

7. Empirical results

In this section, we document empirical evidence consistent with the testable implications of our model of poaching and raids outlined in Section 5.

7.1. **Summary statistics and key variables.** We focus on establishments that had at least one poaching event in our time period. Table 1 shows the summary statistics of origin and destination establishments in our sample. The table reports the 10th percentile, median, 90th percentile and mean values for each variable for origin and destination firms, and additionally reports the t-test of the difference in means in the last column. For example, the 10th percentile origin firm has about 73 employees, while the 10th percentile destination firm has about 63.

Origin establishments tend to be larger, with about 971 employees on average (328 at the median) to destination establishments' 565 average (and 230 median). Origin establishments are in broadly similar industries to the destination establishments. Destination establishments are, on average, more productive (proxied by the AKM wage premium) and tend to have more productive workers (measured by the average of the AKM worker ability in the firm), despite being smaller. Destination firms pay higher wages to their raided workers across the distribution. Poached manager characteristics are listed under the origin firm, indicating their characteristics at the time of poaching. The average poached manager is about 38 years old with almost 20 years of labor force experience.

[39]Our tenure overlap measure relies on the length of the connection between poached managers and their coworkers. It is thus similar in spirit to Caldwell and Harmon (2019), who rely on past coworker networks to construct a measure of worker information about outside options. However, while we are interested in the flow of information from workers (regarding their ability) to managers and the poaching firms, Caldwell and Harmon (2019) focus instead on how information about outside options flows in the opposite direction, from hiring firms to previous coworkers. They also instrument job openings with trade shocks, leveraging a firm-level administrative trade register with product-firm-level exports. While a similar instrument would be helpful to our analysis, we do not have access to the required firm-level trade register in Brazil.

Table 1. Summary statistics of origin and destination firms and poached managers

	10th pct		**Median**		**90th pct**		**Mean**		
	Origin	Destination	Origin	Destination	Origin	Destination	Origin	Destination	Diff
Firm characteristics									
Productivity proxy (firm AKM FE)	-0.23	-0.23	0.06	0.09	0.38	0.42	0.07	0.09	0.02***
Avg. worker ability (worker AKM FE)	-0.60	-0.59	-0.29	-0.26	0.28	0.47	-0.21	-0.15	0.06***
Firm size (# workers)	73	63	328	230	2399	1353	971	565	-407***
Raided workers wage (2008 BRL)	624.90	655.48	1170.45	1238.68	3435.47	3812.70	1739.99	1865.84	125.85***
Poached manager characteristics									
Age	28.00		36.50		50.00		38.02		
Experience	7.00		17.00		34.00		19.00		
Ability	-0.70		0.06		1.15		0.15		
Industry									
Manufacturing							0.31	0.29	-0.02*
Services							0.29	0.31	0.02**
Retail							0.13	0.12	-0.01
Other							0.27	0.27	0.00
Poaching events	5722								

Note: Data from RAIS, poached manager cohorts 2010-2017. **Productivity proxy** is the firm wage premium, estimated using Abowd et al. (1999) two-way fixed effects. RAIS does not have productivity information, but Cornwell et al. (2021) linked RAIS with the Brazilian annual census of manufacturers and showed that there is a strong correlation between firm productivity and the wage premium. **Firm size** is the number of workers in the establishment. **Raided workers wage** is the average wage of the newly hired raided workers in the destination firm, in 2008 R$. **Industry** categories show the share of firms within each type of major industry group. **Age** is the manager's age in years at the time of poaching, and **experience** is the poached manager's total years of experience in the labor force (estimated as age - years of education - 6). **Ability** is the poached manager's worker fixed effect from Abowd et al. (1999).

7.2. **Empirical support to theoretical predictions.**

7.2.1. *Prediction 1 (poaching): When a firm poaches a manager from another firm, the poaching firm is more likely to also raid their workers.* The referrals literature suggests workers co-move between similar establishments even when there is no connection between them, but that workers who are more likely to know each other (that is, have overlapped in the same original workplace for longer periods) are more likely to move to the same firm. This co-movement is attributed to referrals (see Miller and Schmutte (2021) for Brazil). We find that workers are substantially more likely to follow a manager than a non-manager.

To explore the movement of workers between the firms of interest, we proceed as follows: (i) for all destination firms, we classify new hires as *raided* if a worker is from the same firm as the poached manager and was hired *after* the poaching event; (ii) we calculate the share of workers hired from the same firm as the poached manager from 9 months prior to the poaching event to 12 months after the event; (iii) we run the following specification:

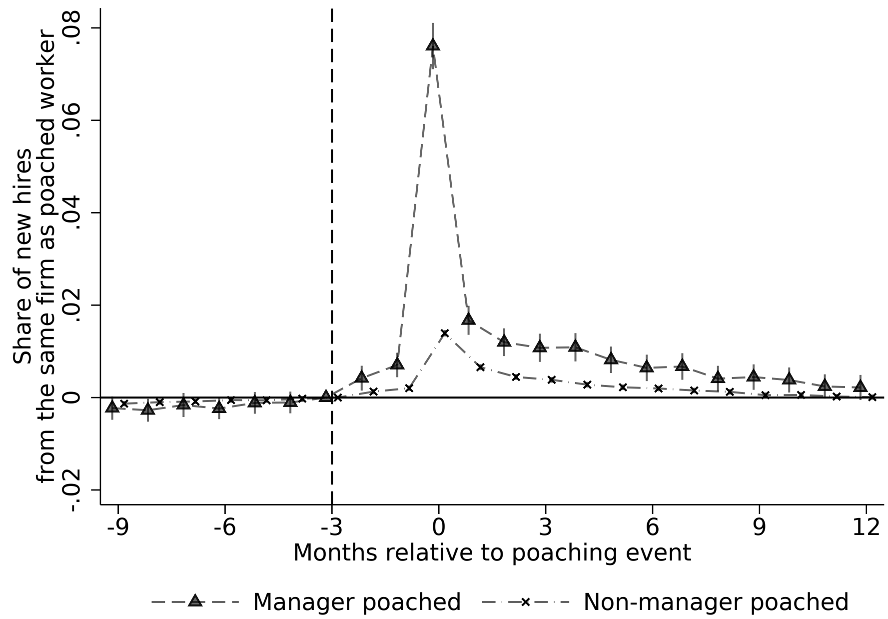
$$RaidedEmployees_{et} = \alpha + \sum_{k=-9}^{k=12} \delta_t \cdot \mathbb{1}[t = \kappa] + \gamma_e + \varepsilon_{et} \tag{8}$$

where $RaidedEmployees_{et}$ is either the share or the number of raided workers for poaching event e in relative period t, and γ_e are event fixed effects. δ_t are the coefficients of interest: each coefficient estimates the difference in the share or number of raided workers in the set of new hires in the destination firm between time t and the baseline period $t = -3$. We do this for two types of poaching events: manager to manager, and non-manager to non-manager.

Figure 4 plots the δ_t coefficients and shows the co-movement of new hires following a poaching event for the share of raided workers relative to all new hires within each of the 9 months preceding and 12 months following the poaching event. A negligible share of new hires at the destination are from the same origin as the poached manager in the months prior to the poaching event, but at $t = 0$, concurrent with the poaching of the manager, the share of new hires from the same origin establishment jumps to 8% higher and, though it reduces in the following months, the share of new hires that come from the same origin firm stays at a significantly higher relative rate for the next 6 to 12 months.[40] For the benchmark poaching events of non-managers,

[40]Figure C.4 in Appendix C repeats the exercise with the average number of workers hired from the same origin firm. The pattern and spike are similar and show that co-movement is substantial.

Figure 4. Prediction 1: Co-movement of workers following a poaching event (share of new hires)



Note: Data from RAIS, poached manager cohorts 2010-2016. This figure plots the coefficients from Equation 8 with the outcome variable as the share of raided workers relative to new hires in the destination firm. The event marked with triangles depicts when a manager was poached from the origin firm and hired as a manager in the destination firm. The event marked with an X depicts when a non-manager was poached from the origin firm and hired as a non-manager in the destination firm.

however, these patterns are much less pronounced. There is a slight increase in the share of newly hired workers from the same origin, but the increase when a manager is poached is much larger and sustains longer.

We can also compare the average incidence of raided workers between manager poaching events to non-manager poaching events. We consider three versions of the outcome variable: an indicator that takes a value of 1 if there was at least one raided worker between $t = 0$ and $t = 12$, the total number of raided workers in that period, and the share of raided workers relative to the total new hires within that period. We run the following regression, where $PoachedMgr_{et}$ is a dummy that takes a value of 1 when the event is a manager to manager poaching event and 0 when it is a non-manager to non-manager poaching event. We also include a control for destination firm size:

$$RaidedEmployees_{et} = \alpha + \beta_t PoachedMgr_{et} + \zeta_1 LnEmpl^d_{et} + \varepsilon_{et} \quad (9)$$

Table 2. Prediction 1: Co-movement of workers following a poaching event

	> 1 raided worker		# of raided workers		% raided new hires	
	(1)	(2)	(3)	(4)	(5)	(6)
Poached manager event = 1	0.283***	0.243***	4.126***	3.713***	0.020***	0.023***
	(0.007)	(0.007)	(0.144)	(0.139)	(0.001)	(0.001)
Destination firm controls						
Firm size		✓		✓		✓
Mean LHS	0.365	0.365	1.456	1.456	0.017	0.017
Obs	101302	101302	101302	101302	101302	101302
R-Squared	0.018	0.038	0.056	0.085	0.009	0.025

Note: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Data from RAIS. **Poached manager** refers to an event defined as the manager engaging in a direct job-to-job transfer between two different private firms with no unemployment period in between. The omitted category is a non-manager poaching event. Data used in the regressions are from event cohorts between 2010 and 2016. **Firm size** is the natural log of the number of employees at the time of the poaching event. **Raided workers** refers to workers from the same origin firm as the poached manager, who also moved to the same destination firm.

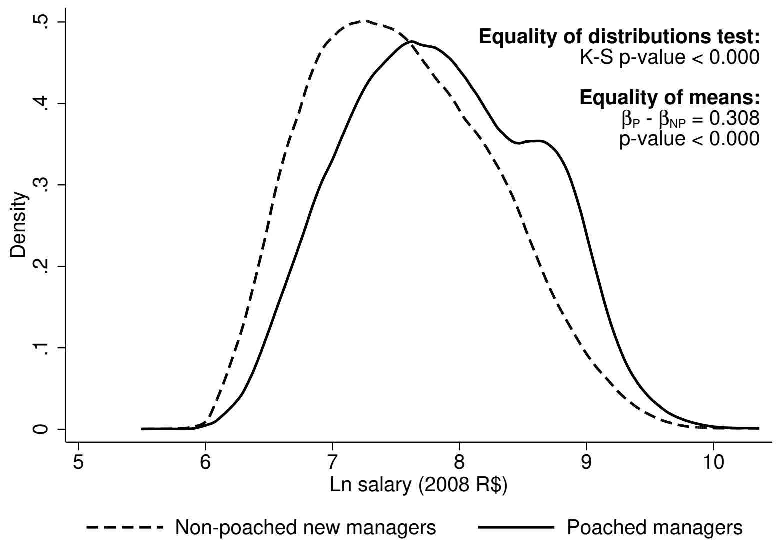
Table 2 reports the results. The coefficient in Column (1) suggests a managerial poaching event is 28 percentage points more likely to yield at least one raided worker. Controlling for firm size reduces this magnitude slightly to 24 percentage points. Columns (3) and (4) suggest, relative to non-managerial events, a managerial poaching event yields, on average, about 4 raided workers in total over the year following the transition event, or about 2% of new hires in the period (Columns 5 and 6).

7.2.2. *Prediction 2 (managerial compensation): Poached managers earn higher salaries.* Managers who are poached are slightly more likely to have higher overall earnings in the destination firm relative to the origin firm, but they earn substantially more than other newly hired managers at the destination firm within the same period.[41] In Figure 5 we compare poached managers with the managers who were hired in the same set of "poaching firms," but who were not poached (i.e., did not fit the criteria of poached manager outlined in Section 6.2). The distribution of the salaries of poached

[41] We do not impose that the manager must earn a strictly higher salary at the destination firm because "earnings" here can include on-the-job amenities or bonuses that might not be recorded in administrative filings. In our data, 56% of the poached managers earn a strictly higher salary in their next job. If we restrict the analysis to only those managers, our empirical results are stronger throughout.

managers stochastically dominates the distribution of non-poached new managers.[42] The distributions are significantly different from each other, as are the means.

FIGURE 5. Prediction 2: Probability distribution of manager starting salary at destination firm



Note: Data from RAIS, poached manager cohorts 2010-2016. Includes only new hires at destination firms following the poaching of a manager. Poached managers refer to managers who are poached based on the definition in Section 6.2 (solid line), and non-poached managers are all other managers hired who did not meet the poaching definition (dashed line). Manager starting salary deflated to R$ 2008. The distributions are significantly different at the 1% level based on a Kolmogorov-Smirnov test of equality of the distributions.

The regression analogue of this analysis compares all managers who were hired in the destination poaching firms around the same period (both poached managers and non-poached new managers). We run the following regression:

$$lnSalary_{ide} = \alpha + \beta_1 PoachedMgr_{ide} + \zeta_1 M_i + \varepsilon_{ide} \qquad (10)$$

where $PoachedMgr_{ide}$ takes a value of 1 if the manager i was poached in the period of event e by destination firm d, and a value of 0 if they were a "regular" manager hire. M_i is the set of controls for the hired managers, including experience and ability, ε_{ide} is an idiosyncratic error term, and β_1 is the coefficient of interest.

[42]See Appendix Figure C.5 for the cumulative distribution function. Further, the pattern is similar for the poached managers' ability. See Appendix Figure C.6.

Table 3 reports the results. Poached managers earn between 20-31% higher salaries than non-poached new managers hired by destination firms around the time of the poaching events. The raw correlation is about 31% in Column (1), controlling for manager experience does not change the relationship (Column 2), and controlling for manager ability reduces the poached manager premium to about 20%.

TABLE 3. Prediction 2: Manager starting salary at destination firm

	Outcome: ln(salary) at destination		
	(1)	(2)	(3)
Poached manager = 1	0.308***	0.305***	0.198***
	(0.012)	(0.012)	(0.010)
Manager controls			
Manager experience		✓	✓
Manager ability			✓
Obs	15500	15500	15500
R-Squared	0.044	0.049	0.332

Note: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Data from RAIS, poached manager cohorts 2010-2016. Includes only new hires at destination firms following the poaching of a manager. Poached managers refer to managers who are poached based on the definition in Section 6.2 (solid line), and non-poached managers are all other managers hired who did not meet the poaching definition (dashed line). Manager starting salary deflated to R$ 2008. The distributions are significantly different at the 1% level based on a Kolmogorov-Smirnov test of equality of the distributions. **Worker ability** (AKM fixed effects, a proxy of "ability") is estimated using data from 2003-2008 to avoid measure contamination. **Manager controls** include experience and ability.

7.2.3. *Prediction 3 (managerial compensation): The salary of a poached manager increases in the demand for information.* If the destination firm has a greater need for information, this information should be more valuable to them. We construct a set of proxies to measure how much information a firm is likely to need and value: destination firm size (number of employees) and employment growth rate. We explore these relationships by running the following regression:

$$lnSalary_{ide} = \alpha + \beta_1 \ln Size_{de} + \beta_2 GrowthRate_{de} + \zeta_1 M_{ioe} + \varepsilon_{ide} \tag{11}$$

with $lnSalary_{ide}$ being the natural log of the starting salary of poached manager i in destination firm d in event e. $lnSize_{de}$ is the natural log of the number of employees in the destination firm d at the time of the poaching event e. $GrowthRate_{de}$ is the annual growth rate of employment of the destination firm. M_{ioe} is the set of controls for the poached manager: the natural log of the poached manager i's salary in the origin firm o at the time of the poaching event e, as well as their experience and ability. ε_{ide} is an idiosyncratic error term. β_1 and β_2 are the coefficients of interest.

Table 4 reports the results. The first three columns include only events where there was at least one raided worker, and the final column includes all events. Columns (1) to (3) iteratively add manager-specific controls, which do not explain much of the variation. The fully specified model in Column (3) suggests that both measures of destination firm information demand are significantly positively correlated with poached manager salary. In Column (4), including events where there was no worker raid following managerial poaching does not substantially change the results.

7.2.4. *Prediction 4 (managerial compensation): The salary of a poached manager increases in the supply of information.* In principle, managers who have more and better information should command higher information rents. We measure the amount of information in the origin firm using size (number of employees), average worker ability, and the share of workers with whom the manager overlapped throughout their entire time at the firm.[43] We explore this prediction through the following regression:

$$\begin{aligned} lnSalary_{ide} = \alpha + \beta_1 \ln Size_{oe} + \beta_2 WorkerAbility_{oe} + \beta_3(\ln Size_{oe} \times WorkerAbility_{oe}) \\ + \beta_4 TenureOverlap_{ioe} + \zeta_1 M_{ioe} + \zeta_2 D_{de} + \varepsilon_{ide} \end{aligned} \tag{12}$$

where $lnSalary_{ie}$ is the natural log of the starting salary of poached manager i in destination firm d event e. $lnSize_{oe}$ is the natural log of the number of employees in the origin firm o at the time of the poaching event e. $WorkerAbility_{oe}$ is the average worker ability, measured by the AKM fixed effects in origin firm o at the time of the poaching event e. $TenureOverlap_{ioe}$ is the share of employees in the origin firm with whom the manager overlapped throughout their full term. M_{ioe} is the set of controls for the poached manager: the natural log of the poached manager i's salary in the origin firm o at the time of the poaching event e, as well as their experience and ability. D_{de} is a set of controls for the destination firm: the natural log of the

[43]See Figure C.7 in Appendix C for the cumulative distribution function of this tenure overlap measure.

Table 4. Prediction 3: Demand for information and poached manager destination salary

	Outcome: ln(salary) at destination			
	(1)	(2)	(3)	(4)
Destination firm				
Size (ln)	0.016***	0.015**	0.013**	0.015***
	(0.006)	(0.006)	(0.006)	(0.005)
Empl. growth rate	0.014**	0.017**	0.023***	0.012*
	(0.007)	(0.007)	(0.007)	(0.006)
Manager controls				
Manager salary at origin	✓	✓	✓	✓
Manager experience		✓	✓	✓
Manager ability			✓	✓
Obs	2864	2864	2864	5722
R-Squared	0.692	0.694	0.715	0.694

Note: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Data from RAIS. **Poached manager** refers to an event defined as the manager engaging in a direct job-to-job transfer between two different private firms with no unemployment period in between. **Origin firm** refers to the firm the manager was originally employed in, and was poached from. **Destination firm** refers to the firm the manager moved to, relative to the firm they were previously employed in. Data used in the regressions are from event cohorts between 2010 and 2016. **Worker ability and firm wage premia** (AKM fixed effects, a proxy of "ability") are estimated using data from 2003-2008 to avoid measure contamination. **Firm size** is the natural log of the number of employees. **Manager controls** include: poached manager origin firm salary, experience, and ability. **Raided workers** refers to workers from the same origin firm as the poached manager, who also moved to the same destination firm.

destination firm size and destination firm AKM fixed effect (wage premium). ε_{ide} is an idiosyncratic error term. β_1 to β_4 are the coefficients of interest.

Table 5 reports the results. The first five columns include only events where there was at least one raided worker, and the final column includes all events. All columns control for the managers' origin firm salary, so the coefficients capture the salary differential as managers move across firms. Column (1) includes the log of the origin firm size and average origin firm worker quality linearly, while Columns (2)-(5) account more flexibly for these by interacting the two, as a larger firm may have more

Table 5. Prediction 4: Supply of information and poached manager destination salary

	Outcome: Manager ln(salary) at destination					
	(1)	(2)	(3)	(4)	(5)	(6)
Origin firm						
Size (ln # empl)	0.012**	0.021***	0.023***	0.022***	0.018**	0.021***
	(0.005)	(0.007)	(0.007)	(0.007)	(0.007)	(0.005)
Avg worker ability	0.356***	0.179*	0.171*	0.074	0.064	0.008
	(0.030)	(0.102)	(0.102)	(0.099)	(0.099)	(0.059)
Size (ln # empl) × Avg worker ability		0.029*	0.029*	0.038**	0.041**	0.046***
		(0.016)	(0.016)	(0.016)	(0.016)	(0.010)
Manager tenure overlap			0.129***	0.100**	0.100**	0.114***
			(0.041)	(0.040)	(0.040)	(0.026)
Manager controls						
Manager salary at origin	✓	✓	✓	✓	✓	✓
Manager experience				✓	✓	✓
Manager quality				✓	✓	✓
Destination firm						
Destination firm size (ln)					✓	✓
Destination firm growth					✓	✓
Obs	2854	2854	2854	2854	2854	5697
R-Squared	0.708	0.708	0.714	0.730	0.732	0.715

Note: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Data from RAIS. **Poached manager** refers to an event defined as the manager engaging in a direct job-to-job transfer between two different private firms with no unemployment period in between. **Origin firm** refers to the firm the manager was originally employed in, and was poached from. **Destination firm** refers to the firm the manager moved to, relative to the firm they were previously employed in. Data used in the regressions are from event cohorts between 2010 and 2016. **Worker and firm wage premia** (AKM fixed effects, a proxy of "ability") are estimated using data from 2003-2008 to avoid measure contamination. **Firm size** is the natural log of the number of employees. **Controls** include: poached manager origin firm salary, experience, and ability, destination firm size (natural log of the number of employees), and wage premium.

high-ability workers. In all specifications, there is a positive and significant correlation between the level origin firm size and the destination manager's salary. Average worker quality is significant on its own (Columns 1, 2, and 3), but controlling for additional manager characteristics absorbs this variation. In the fully specified model in Column (5), firm size, the interaction with worker ability, and the measure of how much the manager "knows" (tenure overlap measure) remain significantly correlated with destination firm salary. In Column (6), including events where there was no worker raid following managerial poaching does not substantially change the results.

7.2.5. *Prediction 5 (managerial compensation): The salary of a poached manager increases in the raided workers' abilities.* The prior set of results showed that the information on potential raiding targets was valuable, but the realization of this information is also important. We explore these relationships by running the following regression:

$$\begin{aligned} lnSalary_{ide} = \alpha + \beta_1 RaidAbility_{de} + \beta_2 RaidN_{de} \\ + \beta_3(RaidAbility_{de} \times RaidN_{de}) + \zeta_1 M_{ioe} + \zeta_2 D_{de} + \varepsilon_{ide} \end{aligned} \tag{13}$$

with $lnSalary_{ide}$ denoting the natural log of the starting salary of poached manager i in destination firm d in event e. $RaidAbility_{de}$ is the average quality of raided workers measured by their average AKM fixed effect at the time of poaching. $RaidN_{de}$ is the natural log of the number of raided workers. M_{ioe} is the set of controls for the poached manager: the natural log of the poached manager i's salary in the origin firm o at the time of the poaching event e, as well as their experience and ability. D_{de} is a set of controls for the destination firm: the natural log of the destination firm size and destination firm wage growth. ε_{ide} is an idiosyncratic error term. β_1 to β_3 are the coefficients of interest.

We report the results in Table 6. Column (1) shows a strong positive correlation between the average ability of raided workers and the poached manager's salary. The magnitude and strength of the correlation are robust to manager characteristic controls (Columns 2 and 3). Column (4) includes an interaction of average quality and the log of the *number* of raided workers. The level variable of the number is significantly negative, while the interaction is positive. We interpret this as evidence that it is not how many workers, but how many *high ability* workers the poached manager brings that drives the higher salary—suggesting valuable information.

7.2.6. *Prediction 6 (talent reallocation): Managers are poached by more productive firms.* Our final two predictions relate to the more macro implications of poaching, starting with the stylized fact that poaching firms tend to be more productive and growing. Figure 6 reports the distribution of our firm productivity proxy (the AKM

Table 6. Prediction 5: Raided workers' ability and poached manager destination salary

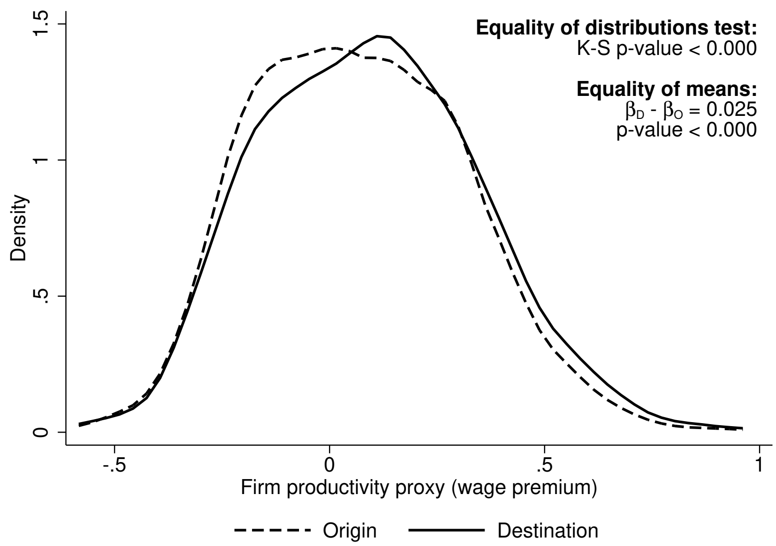
	Outcome: ln(salary) at destination			
	(1)	(2)	(3)	(4)
Ability of raided workers	0.145***	0.149***	0.122***	0.098***
	(0.016)	(0.016)	(0.015)	(0.019)
# raided workers (ln)				-0.033***
				(0.006)
Ability of raided workers				0.018*
× # raided workers (ln)				(0.011)
Manager controls				
Manager salary at origin	✓	✓	✓	✓
Manager experience		✓	✓	✓
Manager ability			✓	✓
Destination firm controls				
Destination firm size (ln)	✓	✓	✓	✓
Destination firm growth	✓	✓	✓	✓
Obs	2864	2864	2864	2864
R-Squared	0.702	0.705	0.722	0.728

Note: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Data from RAIS. **Poached manager** refers to an event defined as the manager engaging in a direct job-to-job transfer between two different private firms with no unemployment period in between. **Origin firm** refers to the firm the manager was originally employed in, and was poached from. **Destination firm** refers to the firm the manager moved to, relative to the firm they were previously employed in. Data used in the regressions are from event cohorts between 2010 and 2016. **Worker and firm wage premia** (AKM fixed effects, a proxy of "ability") are estimated using data from 2003-2008 to avoid measure contamination. **Firm size** is the natural log of the number of employees. **Controls** include: poached manager origin firm salary, experience, and ability, destination firm size (natural log of the number of employees), and wage premium.

firm wage premium). The distribution for the destination (i.e., poaching) establishments stochastically dominates the distribution for the origin firms.[44] The distributions are statistically different from each other, as are the means. We report the result of these tests in the top right of the Figure. Figure 7 shows that destination firms are growing in terms of employee counts with a spike around poaching a manager.

[44]See Figure C.8 in Appendix C for the cumulative distribution function.

FIGURE 6. Prediction 6: Probability distribution of firm productivity



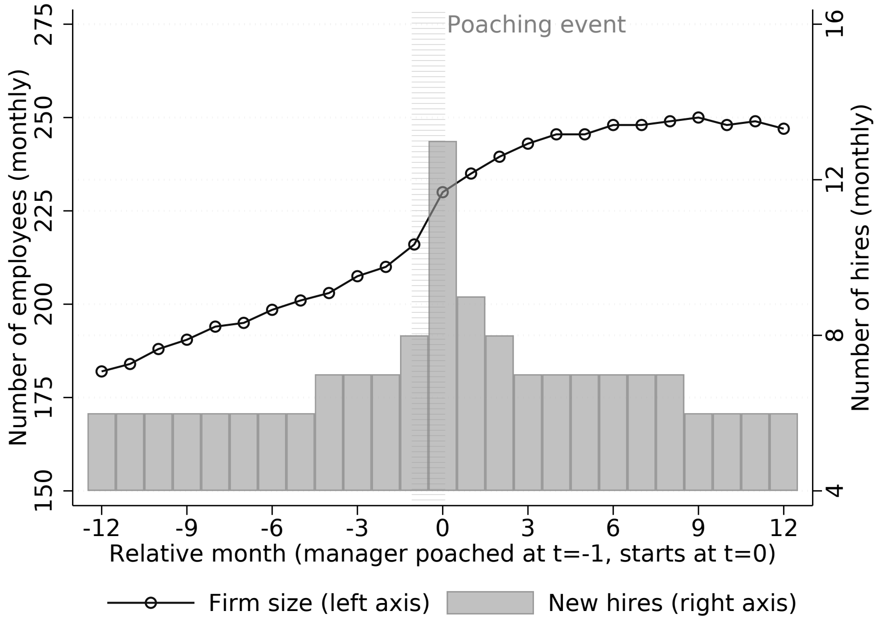
Note: Data from RAIS, poached manager cohorts 2010-2016. This figure plots the probability distribution of the Abowd et al. (1999) firm fixed effects (wage premia) for destination firms (i.e., poaching firms) in the solid line and origin firms in the dashed line. The distributions are significantly different at the 1% level based on a Kolmogorov-Smirnov test of equality of the distributions. As the RAIS data does not have a direct measure of firm productivity, we use the estimated wage premium as a proxy based on the strong correlation reported in Cornwell et al. (2021).

7.2.7. *Prediction 7 (talent reallocation): Raided workers are of higher ability than non-raided workers.* To consider the relative ability of raided workers, we compare all raided workers to others who were hired within the same firm, around the same period. Pooling all workers hired by destination firms within the same period, we run the following regression:

$$AbilityOutcome_{ide} = \alpha + \beta_1 RaidedW_{de} + \zeta_1 W_i + \zeta_2 D_{de} \varepsilon_{ide} \tag{14}$$

where $AbilityOutcome_{ide}$ is a measure of worker ability for worker i at destination firm d for poaching event e. The first proxy measure we use is the AKM worker fixed effect (Columns 1 and 2), but we also build a measure of "realized ability," under the assumption that firms are keen to retain their better workers for longer. The outcome for Columns (3) and (4) are thus an indicator for whether the worker was retained for at least one year, for Columns (5) and (6) whether the worker was retained for at least two years, and Columns (7) and (8) for at least three years. $RaidedW_{de}$ is an

Figure 7. Prediction 6: Destination firm growth



Note: Data from RAIS. This figure plots the median firm size of destination firms 12 months prior and 12 months following the poaching events. The left y-axis shows the monthly median number of employees in these firms, shown in the graph as circles. The right y-axis shows the median number of monthly new hires, shown in the graph as the gray bars.

indicator for whether the new hire was a raided worker. W_i is a control for worker experience, and D_{de} is the destination wage premium. β_1 is the coefficient of interest. Column (1) of Table 7 shows that a raided new hire has significantly higher ability on average, especially when controlling for experience (Column 2). This is also evident when looking at the distribution of ability in Figure 8.[45] Columns (3) to (8) show the likelihood of the employee being with the firm 1, 2, and 3 year(s) after being hired, and it is clear that raided workers are substantially and significantly more likely to still be with the firm for multiple years, relative to non-raided regular hires.

8. Alternative Explanations

In this paper, we provide a theory of the role that personnel-specific information held by managers plays in the labor market. The literature focuses on two potential alternative explanations for the co-movement of workers with their poached managers as

[45]See Figure C.9 in Appendix C for the cumulative distribution function. The pattern is similar for the raided workers' wages. See Figure C.10 in Appendix C.

Table 7. Prediction 7: Raided worker ability

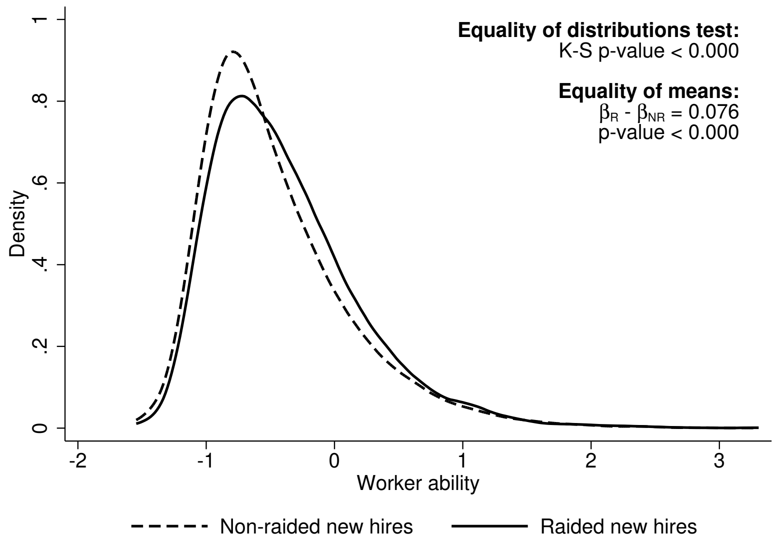
	Worker ability		Retained 1 yr		Retained 2 yrs		Retained 3 yrs	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Raided new hire = 1	0.100***	0.027***	0.201***	0.193***	0.163***	0.155***	0.135***	0.128***
	(0.006)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Controls								
Dest firm FE	✓	✓	✓	✓	✓	✓	✓	✓
Worker Experience		✓		✓		✓		✓
Mean LHS	-0.437	-0.437	0.474	0.474	0.277	0.277	0.182	0.182
Obs	95837	95837	241918	241918	212040	212040	174552	174552
R-Squared	0.229	0.540	0.251	0.253	0.278	0.281	0.279	0.282

Note: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Data from RAIS. Includes only new hires at destination firms following the poaching of a manager. Raided hires refer to non-managerial workers hired from the same origin firm as the poached manager. The omitted category is non-raided new hires, referring to all other workers hired at the same time but from different firms. Data used in the regressions are from event cohorts between 2010 and 2016. **Worker ability** (worker AKM fixed effect) is estimated using data from 2003-2008 to avoid measure contamination. **Retained 1 yr**, **Retained 2 yrs**, and **Retained 3 yrs** are binary indicators equal to 1 when a hired worker is still employed at the destination firm 1, 2, or 3 years after the hiring date, respectively. **Controls** include worker experience and destination plant fixed effects.

predicted by our model and observed in Brazil's formal sector. First, manager recommendations may resemble worker referrals, i.e., co-movement is driven by managers who refer workers in their network, neither drawing on detailed information nor being accountable for their performance. Second, the co-movement is a result of managerial favoritism towards workers for non-performance-based reasons. While we find evidence for these phenomena in Brazil's formal sector, neither is consistent with the presented patterns. The weight of the evidence of our empirical findings presented in Section 7 suggests that worker referrals and favoritism co-exist with, but are distinct from managerial poaching for personnel-specific information to fuel worker raids.

In exploring these potential alternatives, we repeat our core analysis for transitions where the poached manager was hired as a non-manager, and vice versa. We report these results in Table 8. Conceptually, if the poached manager was hired as a non-manager, they have the same level of *information* but lack *accountability*. Poached non-managers hired as managers, in turn, may have accountability but lack information. Our empirical results suggest these moves are, indeed, fundamentally different.

FIGURE 8. Prediction 7: Probability distribution of raided worker ability



Note: Data from RAIS, poached manager cohorts 2010-2016. Includes only new hires at destination firms following the poaching of a manager. Raided hires refer to non-managerial workers hired from the same origin firm as the poached manager (solid line). Non-raided new hires refer to all other workers hired at the same time but from different firms (dashed line). This graph plots the probability distribution of the worker fixed effect from an AKM decomposition (Abowd et al. (1999)), a proxy of worker ability. The distributions are significantly different at the 1% level based on a Kolmogorov-Smirnov test of equality of the distributions.

For ease of comparison, Columns (1) to (3) in Table 8 repeat the preferred specifications for manager to manager events that lend support to Predictions 3 to 5.

8.1. **Worker referrals.** Worker referrals are common and often encouraged by firms (Friebel et al., 2023). Figures 4 and C.4 in Appendix C provide evidence of co-movement between workers across firms. Its magnitude, however, is strikingly smaller than the co-movement of workers with their manager. We argue that this results from workers' lack of information and accountability when compared to managers.[46]

In terms of demand for information (Prediction 3), Column (4) repeats the specification in Column (1) for manager to non-manager and Column (7) for non-manager to manager events. The correlation between manager salary and destination firm size is similar for manager to non-manager moves, but the employment growth rate correlation halves in size for this group and is no longer significant. For non-manager to

[46]It is well documented that increasing accountability for workers through positive (Beaman and Magruder, 2012) or negative rewards (Heath, 2018) increases referral quality.

manager moves, both coefficients are very close to zero and not significant. This suggests that without accountability (manager to non-manager), the firm's demand for information, as measured by employee growth rate, no longer explains the variation in the (now) non-manager's salary. For the non-manager to manager event, the lack of information seems to be reflected in the near-zero coefficients in the correlation between our measures of information demand and the new manager's salary.

Considering the supply of information (Prediction 4), none of the coefficients in Columns 5 or 8 are significant. The coefficient sizes are not too different when poached managers lack accountability in non-managerial positions in the destination firm (Column 5), though firm size and average worker ability are much smaller when newly hired managers do not have information (Column 8).

As such, an explanation of simple worker referrals — lacking information and accountability — would not be consistent with our results about managerial compensation. Specifically, worker referrals convey valuable information about the match quality between a firm and worker (see, e.g., Montgomery, 1991; Granovetter, 1995; Miller and Schmutte, 2021). This information often results in productivity gains due to lower recruitment costs or lower attrition rates (Dustmann et al., 2016; Barr et al., 2019; Friebel et al., 2023) rather than superior worker ability (Burks et al., 2015; Brown et al., 2016). As a result, a theory of poaching for personnel-specific information better explains why managerial compensation increases in the ability of raided workers (Table 6), and why these are on average of superior ability (Figure 8).

8.2. **Non-performance based favoritism.** Another phenomenon that is consistent with worker raids is non-performance-based favoritism, i.e., hiring for reasons other than ability. Surplus diversion by means of favoritism may lead to distorted task assignments and hiring decisions (Bramoulle and Goyal, 2016). The ability to make idiosyncratic decisions, however, satisfies managers demanding authority and can be interpreted as a type of non-pecuniary remuneration (Prendergast and Topel, 1996).

Column (3) of Table 8 again repeats the preferred specification (Column 4) from Table 6, while Columns (6) and (9) describe non-manager to manager and manager to non-manager events. Considering events where the destination firm hires a manager and thus there is accountability (Columns 3 and 9), controlling for raided worker ability, simply raiding additional workers is correlated with a salary penalty for their newly hired manager. Further, in the non-manager to manager events, the ability of raided workers and the interaction term are not significant. This is consistent with the interpretation of favoritism as non-monetary compensation.

Table 8. Alternative explanations

	Manager to Mamager			Manager to Non-Manager			Non-Manager to Manager		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Destination firm									
Size (ln # empl)	0.013**	0.015**	0.027***	0.014**	0.012**	0.023***	0.001	0.005	0.011
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.009)	(0.009)	(0.009)
Empl. growth rate	0.023***	0.027***	0.031***	0.012	0.019**	0.017**	0.003	0.011	0.009
	(0.007)	(0.007)	(0.007)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Origin firm									
Size (ln # empl)		0.017**			0.014			0.009	
		(0.007)			(0.009)			(0.014)	
Avg worker ability		0.064			0.070			-0.036	
		(0.099)			(0.129)			(0.202)	
Size (ln # empl)		0.041***			0.030			0.042	
× avg worker ability		(0.016)			(0.021)			(0.033)	
Raided workers									
Ability of raided workers			0.098***			0.046**			0.018
			(0.019)			(0.020)			(0.028)
# raided workers (ln)			-0.033***			0.000			-0.024**
			(0.006)			(0.007)			(0.012)
Ability of raided workers			0.018*			0.052***			0.019
× # raided workers (ln)			(0.011)			(0.011)			(0.021)
Manager controls									
Manager salary at origin	✓	✓	✓	✓	✓	✓	✓	✓	✓
Manager experience	✓	✓	✓	✓	✓	✓	✓	✓	✓
Manager ability	✓	✓	✓	✓	✓	✓	✓	✓	✓
Obs	2864	2864	2864	2603	2603	2603	1260	1260	1260
R-Squared	0.715	0.730	0.728	0.624	0.635	0.634	0.671	0.681	0.677
Prediction	3	4	5	3	4	5	3	4	5

Note: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Data from RAIS. **Poached manager** refers to an event defined as the manager engaging in a direct job-to-job transfer between two different private firms with no unemployment period in between. **Origin firm** refers to the firm the manager was originally employed in, and was poached from. **Destination firm** refers to the firm the manager moved to, relative to the firm they were previously employed in. Data used in the regressions are from event cohorts between 2010 and 2016. **Worker and firm wage premia** (AKM fixed effects, a proxy of "ability") are estimated using data from 2003-2008 to avoid measure contamination. **Firm size** is the natural log of the number of employees. **Controls** include: poached manager's origin firm salary, experience, and ability.

However, in manager to manager events (Column 3), the interaction coefficient is positive and significant, suggesting that managerial salary is positively correlated with the number of raided workers *if* these are of higher ability, consistent with our theory of poaching and raids. Column (6), in turn, suggests that when there is information but not accountability, there is no correlation between salary and the number of raided workers, but a positive interaction. This is consistent with non-managers providing potentially informative referrals, but not being expected (or penalized) for poor suggestions.

In general, in the case of favoritism, the literature suggests that raided workers are of lower rather than higher ability. Patacchini and Mocanu (2024), for example, present evidence of how personal connections influence recruitment in Brazil's public sector. They find that a reform diminishing the recruiting discretion of government employees led to the hiring of higher-ability employees who were more likely to be promoted later on. As a consequence, our strong empirical results about the superior ability of raided workers (Figure 8), when compared to non-raided hires, are inconsistent with favoritism. Instead, it takes a theory of information acquisition, such as through managerial poaching, to explain the superior ability of raided workers.

Finally, the presence of both favoritism and managerial poaching for personnel-specific information conforms with Bandiera et al. (2009), who find that managers with fixed salaries are prone to hire among their social connections while performance bonuses discipline managers to hire high-ability workers. This logic is also consistent with favoritism being the driving force behind worker co-movements in the typically fixed salaried public sector (Patacchini and Mocanu, 2024), whereas in this paper information acquisition through poaching—as evidenced by managerial compensation highly sensitive to additional worker ability—is the dominant force in the private sector.[47]

8.3. **Common shock and amenities.** We now briefly outline a set of more general alternative explanations to the phenomenon we observe, though we do not find evidence that is consistent with our results being driven by any of these forces.

Common shock. Suppose there is a "common shock" between firms that increases the poaching of all workers and their salaries, such as a foray into a new business line or a new large contract. While such a shock would not necessarily mean there would be a spurious correlation between the poaching of a manager and the subsequent movement of other workers (that is, the positive shock could be precisely the reason the destination firm recruits managers who can facilitate raids), we re-run our

[47]For an alternative setting in which managerial information and favoritism co-exist see Ho and Huang (2024) who investigate which workers managers recommend for promotion.

manager salary prediction tables including a control for the number of raided workers throughout and the results are not substantially different.[48]

Attractive amenities. If the destination firms in our sample are simply better firms to work for, this might appeal to both managers and workers and thus explain co-movement as well as higher wages. To consider this option, we proxy for attractiveness by calculating firm wage growth and repeat the exercise in Prediction 1.[49] If the co-movement of workers is simply an artifact of attractive firms, the result should be entirely driven by these firms. It is not - the pattern of co-movement following a manager poaching event is remarkably similar across both types of firms.[50]

9. Discussion

In this paper, we highlight the importance of managerial poaching for optimal personnel policies, the functioning of the economy, and labor market regulation. In a stylized model of managerial poaching and worker raids with asymmetric employer learning, high-productivity firms poach managers to potentially raid high-ability workers. Drawing on data from Brazil's formal sector from 2003 to 2017, we find that managerial poaching with subsequent worker raids is a common phenomenon. In addition, we observe—consistent with our theoretical predictions—that poaching firms are more productive than others, and raided workers are of higher ability than non-raided, otherwise similar, workers. Therefore, our analysis suggests that managerial poaching serves as an important catalyst for efficient worker reallocation.

We show that the salary of a poached manager increases in the quality and quantity of their personnel-specific information, suggesting firms that are about to lose a manager take the potential subsequent loss of talent into account when making offers to their manager to remain with the firm. Therefore, it is essential for firms to evaluate their benefits of poaching a well-informed manager against the costs of successfully recruiting the manager away from their current employer.

From a market perspective, labor turnover is an important predictor of business dynamism and, therefore, the health of an economy. We argue that researchers and

[48]See Tables C.2, C.3, and C.4 in Appendix C.

[49]We calculate wage growth as follows: for all firms in the country, we calculate the annual wage growth of each employee that works in the firm for the whole year, and take the median worker-level wage growth as the firm's wage growth. We then build a regional comparison metric, where we take the average of the firm-level wage growth of the firms in the comparison region (all other firms with more than 50 employees within the same microregion-industry (Felix, 2022)). We classify firms as "high amenity" if their wage growth is above the wage growth of the comparison region at the time of poaching.

[50]See Figures C.11 and C.12 in Appendix C.

regulators alike need to pay special attention to managerial turnover, due to its multiplicative effect on efficient worker reallocation. Finally, our theoretical analysis suggests that reallocation through poaching is self-limiting in a setting with asymmetric employer learning. A current employer's information advantage results in information rents for poached managers, causing high-productivity firms to poach managers at inefficient rates. As a result, our findings suggest that labor market regulation restricting the movement of managers across firms, such as non-compete or non-solicitation agreements, is even more harmful than previously thought.

The analysis presented in this paper can be extended in several ways. In this first paper, we abstract from, for example, how managerial skill in evaluating worker talent and how complementarities among managers and their employees affect managerial poaching. Both of these extensions are interesting avenues of future research. Another fruitful area lies in analyzing how the effects of personnel-specific information held by managers vary across different labor markets.

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Appendix: For Online Publication

Appendix A provides formal proofs omitted from the paper, while Appendix B presents additional results pertaining to our theoretical model in Section 2. Appendix C collects additional empirical results, often relating to robustness arguments, while Appendix D contains our dynamic overlapping generations model.

A. Omitted Proofs

Note that in all proofs here and in Appendix D we invoke the sequential equilibrium refinement discussed in footnote 23 in Section 2. When, say, firm A decides to poach firm B's manager (or raids a worker), consider the highest salaries (wages) firms A and B are willing to pay, $\overline{w_A}$ and $\overline{w_B}$, and assume $\overline{w_A} > \overline{w_B}$.[51] In a sequential equilibrium, B cannot cease to bid at any $w < \overline{w_B}$ as it beliefs A may stop bidding with a small but positive probability. In this case, B strictly prefers to raise its bid.

Proof of Lemma 1: When retaining a_i, firm i's payoff π_i cannot exceed $\rho_i a_i - w - s$. Hiring a junior manager and worker accrues expected profits of $\rho_i \mathbb{E}[a] - w - s - t_w$. The claim follows. ■

Proof of Proposition 1: We first establish that B never poaches A's manager in equilibrium. Suppose first that A never poaches, but B poached m_A. Then B can raid a_A, $a_A \leqslant a_A^F$ for w_e since A prefers a junior replacement over a_A. Thus, from an ex ante perspective B's benefit of raiding $a_A = a_A^F$ is

$$\left(\rho_A a_A^F - w_e - t_w - s - t_m\right) - \left(\rho_A \mathbb{E}[a] - w - t_w - s_e\right) \tag{15}$$

simplifying to

$$\frac{\rho_B}{\rho_A}\left(w_e - w - t_w\right) + \left(s_e - s - t_m\right) - \left(w_e - w\right) < 0. \tag{16}$$

For $a_A > a_A^F$, the additional wage A is willing to pay to retain a_A exceeds B's additional benefit. As a result, B does not poach if A does not. Now assume A poaches with positive probability. Then there must be an a_P such that A, unaware of a_B, poaches if $a_A < a_P$. Note that $a_P \geqslant a_A^F$ as otherwise A always prefers hiring a junior worker over poaching m_B to potentially raid a_B. By the analysis above, B never wants to poach if $a_A \geqslant a_P$. Now consider $a_A < a_P$, i.e., A attempts to poach. If B attempts to poach as well, in the best case scenario in which it poaches successfully, it obtains m_A for s_e (as A goes for m_B anyway). Suppose both firms poached each other's manager. Then both firms are aware of a_A and a_B, and A hires a_B under

[51] This is always the case when firm A decides to poach/raid in Section 2 but not in the dynamic model in Appendix D. If it is not the case, the reverse argument applies.

the same conditions as if A had poached and B did not. As such, B can always do equally well by hiring m_A and potentially a_A after they were laid off. Moreover, when poaching B's outside option improves if $a_A > \mathbb{E}[a]$ relative to a junior worker replacement, causing it to charge a lower retention wage than $w_R(a_B)$. As a consequence, A increases a_P as it poaches more often. As a result, B does not poach if A does.

(1) Now suppose that $\rho_A > \rho_B$ and that A has poached m_B. A's benefit from raiding a_B then maximally amounts to

$$\begin{aligned} & \rho_A a_B - t_w - w_R(a_B) - \rho_A \mathbb{E}[a] + t_w + w \\ = \quad & (\rho_A - \rho_B)(a_B - \mathbb{E}[a]) - t_w, \end{aligned} \tag{17}$$

which is negative for ρ_A just exceeding ρ_B. The remainder of (1) follows trivially.

(2) The highest salary at which B would retain m_B is independent of ρ_A, whereas A's benefit of raiding $a_B > \max\{a_A, \alpha\left(a_A^F\right)\}$ increases unboundedly in ρ_A. This implies that there must be an a_P^* and ρ_A' such that A poaches if $a_A < a_P^*$ and $\rho_A > \rho_A'$.

(2a) Suppose that $a_A < a_A^F$. Then raiding a_B is beneficial for A if

$$\begin{aligned} & \rho_A \mathbb{E}[a] - w - t_w \geqslant \rho_A a_B - w_R(a_B) - t_w \\ \Leftrightarrow \quad & a_B \leqslant \mathbb{E}[a] + \frac{t_w}{\rho_A - \rho_B}. \end{aligned} \tag{18}$$

(2b) Observe that

$$\begin{aligned} & \rho_A a_A - w_e = \rho_A \alpha(a_A) - w_R(\alpha(a_A)) - t_w \\ \Leftrightarrow \quad & \alpha(a_A) = \frac{1}{\rho_A - \rho_B}\left[(\rho_A a - \rho_B \mathbb{E}[a]) - (w_e - w) + 2t_w\right]. \end{aligned} \tag{19}$$

(2c) follows from (2a) and (2b) above.

(3) Finally, suppose that $\rho_A \to \infty$. It is straightforward that, as a result, $a_P^* \to \overline{a}$. This is because A's benefit from gaining worker ability becomes arbitrarily large while its cost is fixed. As such, if ρ_A and a_B are 'large' ($\rho_A > \rho_A''$ and $a_B > a_B^C(\rho_A)$), and A hired a_B, this implies that $a_A \in [\underline{a}, \alpha^{-1}(a_B))$ and B prefers to hire A's laid off manager m_A to learn about a_A—the differential cost of hiring m_A and a junior manager is $s_e - s$—and hires a_A if $a_A > \mathbb{E}[a] + \frac{w_e - w}{\rho_B}$. Otherwise B hires a junior manager and junior worker if A poached m_B and raided a_B. ∎

Proof of Lemma 2: Equation (2) establishes the highest retention wage B is willing to pay over replacing its worker with a junior one. As Proposition 1 establishes, B never poaches A's manager, and if $\rho_A \leqslant \rho_A''$, never hires A's laid off employees. ∎

Proof of Proposition 2: (1) In the absence of poaching, managers are not replaced and earn s_e. In a poaching equilibrium (2a) junior replacement managers earn s, while (2b) the highest salary B is willing to pay a manager to prevent A from raiding a_B is the sum of the cost of its replacement $s + t_m$, and the value of the lost information if $a_B = \overline{a}$ accrues to $(w_e - w) + t_w + \rho_B(\overline{a} - \mathbb{E}[a])$. ■

Proof of Lemma 3: Observe that A always poaches successfully. As such, $\mathbb{P} = F(a^*_P)$. Equation 4 provides the salary A expects to pay m_B when poaching if $a_A < a^*_P$, $\hat{s}_P(a^*_P)$. If A poaches, it further does not incur the salary for a senior manager s_e but is subject to the managerial training cost t_m. In equilibrium, this cost of poaching m_B has to necessarily equal its benefit when $a_A = a^*_P$. The LHS of Equation (5) provides the benefit of poaching vs. not to when $a_A = a^*_P$. ■

Proof of Lemma 4: In the planner's problem, $w_R(a)$, as given by in Equation 2, is a welfare-innocuous transfer, but exactly accounts for B's costs from losing a worker of ability a due to a raid. The remainder of the left-hand side of Equation 6 accounts for A's benefits and costs from a raid. Additional costs and benefits are managerial training costs and the savings from B replacing their manager with a junior one, as given by the righ-hand side. ■

Proof of Proposition 3: (i) to (iv) follow from the discussion above and below the statement, Lemma 2 and Proposition 2. (v) It is straightforward to establish that the RHS of Equation 5 exceeds the RHS of Equation 6 for all values of a^*_P. Since the LHS of Equations 5 and 6 are identical and decrease in a^*_P, respectively $\hat{a_P}$, the claim follows. ■

Proof of Proposition 4: (1) This claim follows from the argument just above the statement of the Proposition. (2) and (3) follow from the discussion below the Proposition. ■

Proof of Proposition 5: (1), (2) and (3) follow from the discussion just below the Proposition. ■

B. Additional Theoretical Results

B.1. **A numerical example for the one worker case.** Consider the industry $(F, \rho_A, \rho_B, s, s_e, t_m, w, w_e, t_w) = (U[0, 10], .5, .1, .2, .25, .075, .1, .125, .03)$ with U denoting the uniform distribution. In equilibrium, A poaches if $a_A < a^*_P = 6.238$. It then replaces a_A with a junior worker if $a_A < a^F_A = 4.99$ and $a_B < \alpha(a^F_A) = 5.075$, retains its worker if $a_A \in [a^F_A, a_P]$ and $a_B \leqslant 1.25a_A - 1.163$, and raids a_B otherwise. Junior workers earn $w = .1$, retained workers $w_e = 0.125$, while the wages of raided workers range from .1375 to .63. Junior managers earn $s = .2$, retained managers $s_e = .25$, and the salaries of poached managers range from .325 to .83. The expected salary of a poached manager in equilibrium is $\hat{s}_P^* = 0.401$ and the probability of poaching $\mathbb{P} = \frac{a_P^*}{10} = .624$, whereas the efficient poaching level is given by $\hat{a_P} = 7.14$. Therefore, whenever A chooses not to poach m_B, it does so inefficiently about $\frac{.714-.6238}{1-.6238} \times 100 \approx 24\%$ of the time.[52]

B.2. **Equilibrium characterization in Section 4.1.**

$$\begin{aligned}\hat{s}_p(2\times 1) = \quad & s + t_m \\ + \quad & \frac{2F(a_P)\left[1-F(a_P)\right]}{\mathbb{P}\left(2\times 1\right)} \int_{\alpha(a_A^F)}^{\alpha(a_P)} \frac{F\left(\alpha^{-1}(a)\right)}{F(a_P)} \left(w_R(a) - w_e\right) dF(a) \\ + \quad & \frac{F(a_P)^2}{\mathbb{P}\left(2\times 1\right)} \int_{\alpha(a_A^F)}^{\alpha(a_P)} \left[1 - \left(\frac{F(a_P) - F\left(\alpha^{-1}(a)\right)}{F(a_P)}\right)^2\right] \left(w_R(a) - w_e\right) dF(a) \\ + \quad & \int_{\alpha(a_P)}^{\bar{a}} \left(w_R(a) - w_e\right) dF(a),\end{aligned} \tag{B.20}$$

where

$$\begin{aligned}\mathbb{P}\left(2\times 1\right) = \quad & 2F(a_P(2\times 1))\left[1 - F(a_P(2\times 1))\right] + F(a_P(2\times 1))^2 \\ = \quad & 2F(a_P(2\times 1)) - F(a_P(2\times 1))^2.\end{aligned} \tag{B.21}$$

Then, $a_P(2\times 1)$ is determined by

$$\begin{aligned}& \int_{\alpha(a_P(2\times 1))}^{\bar{a}} \left[\rho_A\left(a - a_P(2\times 1)\right) - \left(w_R(a) - w_e\right) - t_w\right] dF(a) \\ = \quad & \left(\hat{s}_P(2\times 1) - s_e\right) + t_m.\end{aligned} \tag{B.22}$$

Numerical example (cont.). Re-consider the industry $(F, \rho_A, \rho_B, s, s_e, t_m, w, w_e, t_w)$ $= (U[0,10], .5, .1, .2, .25, .075, .1, .125, .03)$. In equilibrium, A poaches if

$$\min\{a_{A,1}, a_{A,2}\} < a^*_{P(2\times 1)} = 6.236,$$

[52] Note that absolute numbers in this numerical example are meaningless. The large productivity gap between firms is necessary to drive poaching at a high rate when both firms have a single worker. Larger numbers of workers, however—such as in the dynamic model in Appendix D—significantly shrink the necessary productivity gap between firms for poaching attempts to take place.

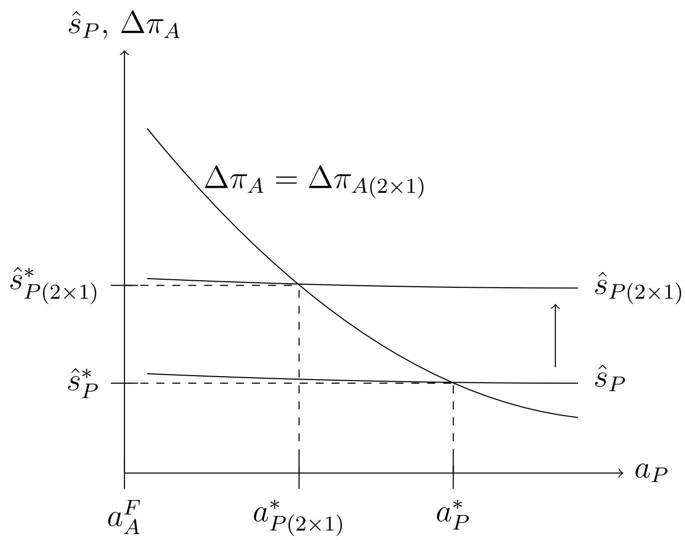


FIGURE B.1. The effect of an additional worker at firm A

where $a_{i,j}$, $i \in \{A, B\}$, $j \in \mathbb{N}$, denote the worker in firm i's j-th slot in period 1. Just as in the base model, it then replaces $\min\{a_{A,1}, a_{A,2}\}$ with a junior worker if $a_A < a^F_A = 4.99$ and $a_B < \alpha(a^F_A) = 5.075$, retains its worker if $\min\{a_{A,1}, a_{A,2}\} \in [a^F_A, a^*_{P(2\times1)}]$ and $a_B \leqslant 1.25a_A - 1.163$, and raids a_B otherwise. Junior workers earn $w = .1$, retained workers $w_e = 0.125$, while the wages of raided workers range from .1375 to .63. Junior managers earn $s = .2$, retained managers $s_e = .25$, and the salaries of poached managers range from .325 to .83. The expected salary of a poached manager is $\hat{s}_{P(2\times1)} = 0.402$ and the probability of poaching $\mathbb{P}_{(2\times1)} = 2\frac{a^*_{P(2\times1)}}{10} - \left(\frac{a^*_{P(2\times1)}}{10}\right)^2 = .858$. This illustrates Proposition 4 (1), (2), and (3). The probability of efficient poaching amounts to 91.8%. Therefore, whenever A chooses not to poach m_B, it does so inefficiently about 42% of the time, illustrating more severe welfare loss due to managerial information rents from asymmetric employer learning.

B.3. **Equilibrium characterization in Section 4.2.**

$$\begin{aligned}\hat{s}_P(1\times 2) = \quad & s + t_m \\ + \quad & \frac{2F(\alpha(a_A^F))\left(F(\alpha(a_P)) - F(\alpha(a_A^F))\right)}{F(\alpha(a_P)) - F(\alpha(a_A^F))} \int_{\alpha(a_A^F)}^{\alpha(a_P)} \frac{F\left(\alpha^{-1}(a)\right)}{F(a_P)} \left(w_R(a) - w_e\right) dF(a) \\ + \quad & \frac{\left(F(\alpha(a_P)) - F(\alpha(a_A^F))\right)^2}{F(\alpha(a_P))^2 - F(\alpha(a_A^F))^2} \int_{\alpha(a_A^F)}^{\alpha(a_P)} \frac{F\left(\alpha^{-1}(a)\right)}{F(a_P)} \left(w_R(a) - w_e\right) dF(a)^2 \\ + \quad & \frac{2F(\alpha(a_P))\left(1 - F(\alpha(a_P))\right)}{1 - F(\alpha(a_P))} \int_{\alpha(a_P)}^{\overline{a}} \left(w_R(a) - w_e\right) dF(a) \\ + \quad & \frac{\left(1 - F(\alpha(a_P))\right)^2}{1 - F(\alpha(a_P))^2} \int_{\alpha(a_P)}^{\overline{a}} \left(w_R(a) - w_e\right) dF(a)^2. \end{aligned} \tag{B.23}$$

Then, $a_P(1\times 2)$ is determined by

$$\begin{aligned} & \frac{\left(1 - F(\alpha(a_P))\right)^2}{1 - F(\alpha(a_P))^2} \int_{\alpha(a_P(1\times 2))}^{\overline{a}} \left[\rho_A\left(a - a_P(1\times 2)\right) - \left(w_R(a) - w_e\right) - t_w\right] dF(a)^2 \\ + \quad & 2F(\alpha(a_P)) \int_{\alpha(a_P(1\times 2))}^{\overline{a}} \left[\rho_A\left(a - a_P(1\times 2)\right) - \left(w_R(a) - w_e\right) - t_w\right] dF(a) \\ = \quad & \left(\hat{s}_P(1\times 2) - s_e\right) + t_m. \end{aligned} \tag{B.24}$$

Numerical example (cont.). Re-consider the industry $(F, \rho_A, \rho_B, s, s_e, t_m, w, w_e, t_w)$ $= (U[0,10], .5, .1, .2, .25, .075, .1, .125, .03)$. In equilibrium, A poaches if $a_A < a^*_{P(1\times 2)} = 6.516$. Just as in the base model, it then replaces a_A with a junior worker if $a_A < a_A^F = 4.99$ and $\max\{a_{B,1}, a_{B,2}\} < \alpha(a_A^F) = 5.075$, retains its worker if $a_A \in [a_A^F, a_{P(1\times 2)}]$ and $\max\{a_{B,1}, a_{B,2}\} \leqslant 1.25a_A - 1.163$, and raids $\max\{a_{B,1}, a_{B,2}\}$ otherwise. Junior workers earn $w = .1$, retained workers $w_e = 0.125$, while the wages of raided workers range from .1375 to .63. Junior managers earn $s = .2$, retained managers $s_e = .25$, and the salaries of poached managers range from .325 to .83. The expected salary of a poached manager is $\hat{s}^*_{P(1\times 2)} = 0.486$ and the probability of poaching $\mathbb{P}_{(1\times 2)} = \frac{a^*_{P(1\times 2)}}{10} = .652$. This illustrates Proposition 5 (1), (2), and (3). Finally, the probability of efficient

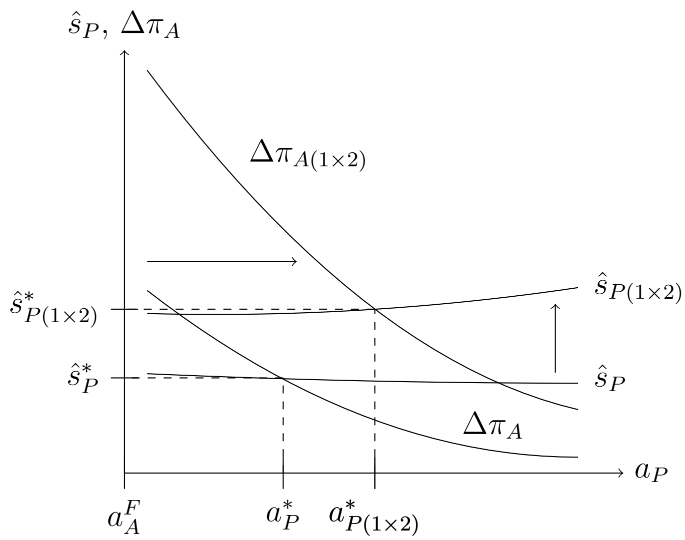


FIGURE B.2. The effect of an additional worker at firm B

poaching amounts to 76.1%. Therefore, whenever A chooses not to poach m_B, it does so inefficiently about 31% of the time, exemplifying that welfare loss increases in the number of worker slots at the less productive firm as well.

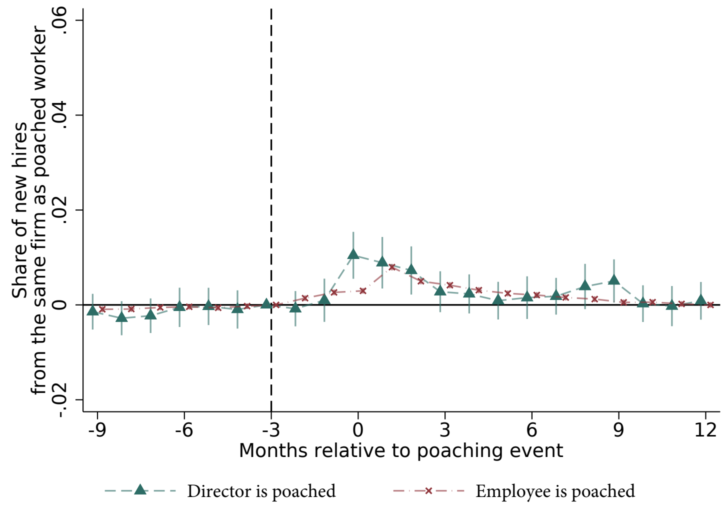
C. Additional Empirical Results

Table C.1. Summary of firm size in the Brazilian formal sector

Size category	1-5	6-10	11-20	21-50	50+
Number of people employed	4,998,001	3,626,883	4,131,962	5,394,015	28,146,028
Number of firms	2,296,508	479,185	285,344	174,041	107,401
Average wage	1,098.05	1,332.27	1,492.72	1,663.79	2,073.23
% female	46.09	42.84	42.11	39.90	37.55
% non-white	31.86	34.14	35.11	36.78	40.23
% of college educated	5.59	7.61	9.79	11.68	14.53

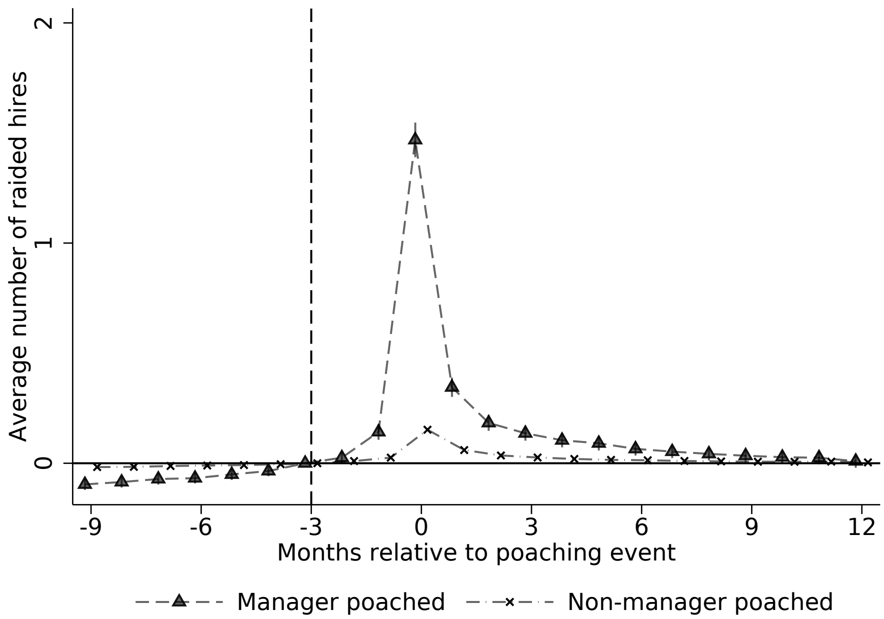
Note: Data from RAIS for example year 2013. Includes all firms in the dataset, and presents the total number of firms and people employed in firms within each size category: 1-5 employees, 6-10 employees, 11-20 employees, 21-50 employees and 50+ employees.

Figure C.3. Co-movement of workers following a director poaching event: share of new hires



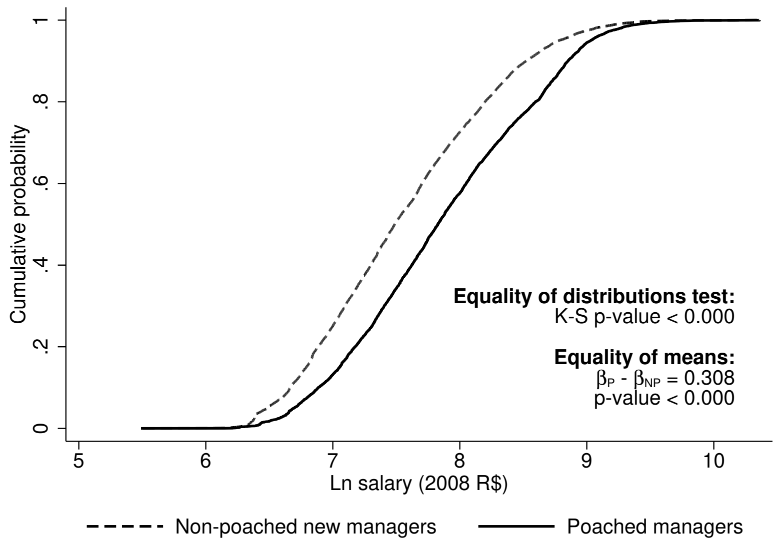
Note: Data from RAIS, poached director cohorts 2010-2016. The poaching event in this graph is when a *director* is poached, not a middle manager. This figure plots the coefficients from Equation 8 with the outcome variable as the share of raided workers relative to new hires in the destination firm. The event marked with triangles depicts when a manager was poached from the origin firm and hired as a manager in the destination firm. The event marked with an X depicts when a non-manager was poached from the origin firm and hired as a non-manager in the destination firm.

Figure C.4. Co-movement of workers following a poaching event (number of new hires)



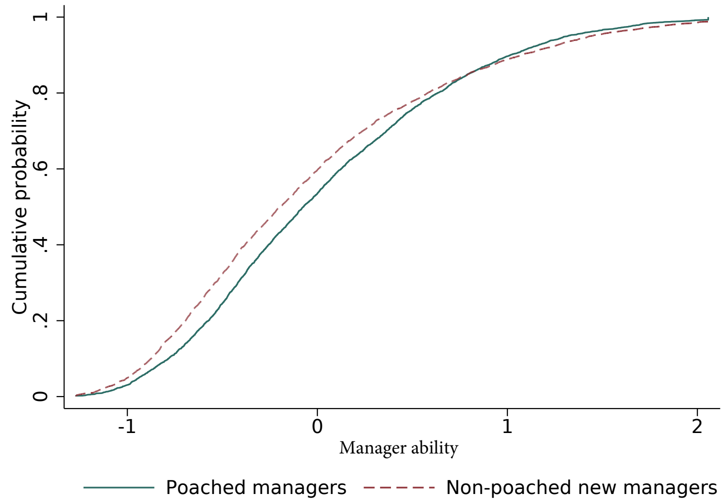
Note: Data from RAIS, poached manager cohorts 2010-2016. This figure plots the coefficients from Equation 8. The outcome variable is the number of raided workers in each month. The event marked with triangles depicts when a manager was poached from the origin firm and hired as a manager in the destination firm. The event marked with an X depicts when a non-manager was poached from the origin firm and hired as a non-manager in the destination firm.

Figure C.5. Cumulative distribution of manager starting salary at destination firm



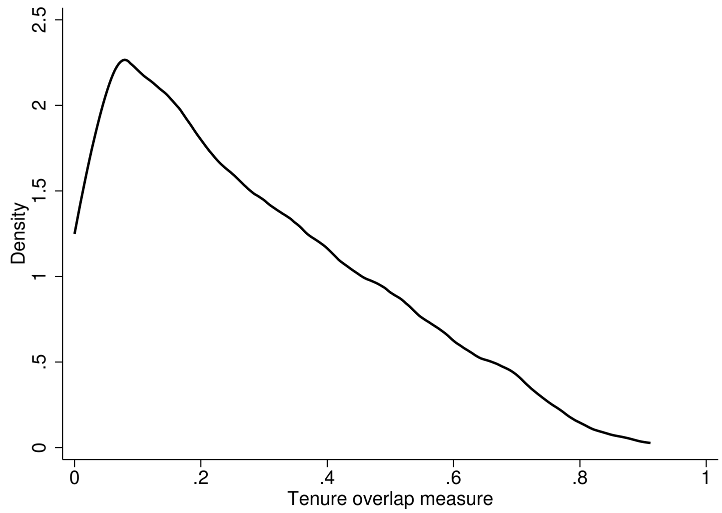
Note: Data from RAIS, poached manager cohorts 2010-2016. Includes only new hires at destination firms following the poaching of a manager. Poached managers refer to managers who are poached based on the definition in Section 6.2 (solid line), and non-poached managers are all other managers hired who did not meet the poaching definition (dashed line). Manager starting salary deflated to R$ 2008. The distributions are significantly different at the 1% level based on a Kolmogorov-Smirnov test of equality of the distributions.

Figure C.6. Cumulative distribution of manager ability



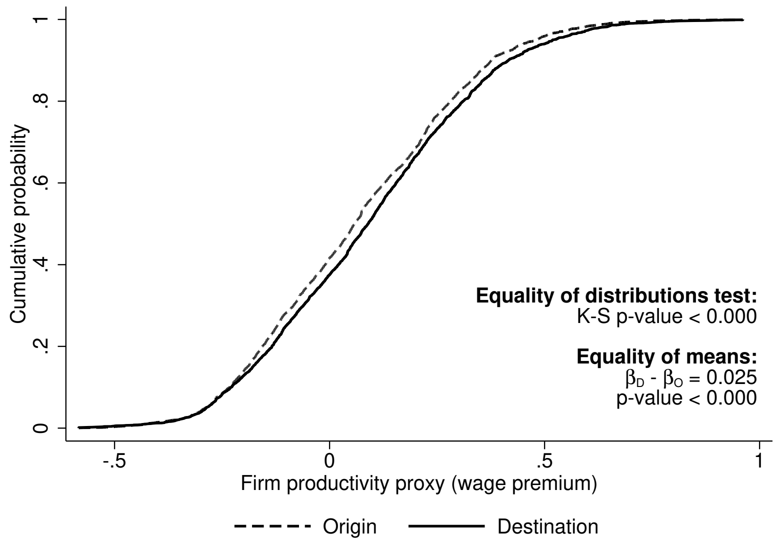
Note: Data from RAIS, poached manager cohorts 2010-2016. Includes only new hires at destination firms following the poaching of a manager. Poached managers refer to managers who are poached based on the definition in Section 6.2, and non-poached managers are all other managers hired who did not meet the poaching definition (i.e. were hired from unemployment or from firms smaller than 50 employees). The figure plots the cumulative distribution of the worker fixed effect from an AKM decomposition (Abowd et al. (1999)), a proxy of ability.

Figure C.7. Probability distribution of the share of workers the poached manager overlapped with throughout their time



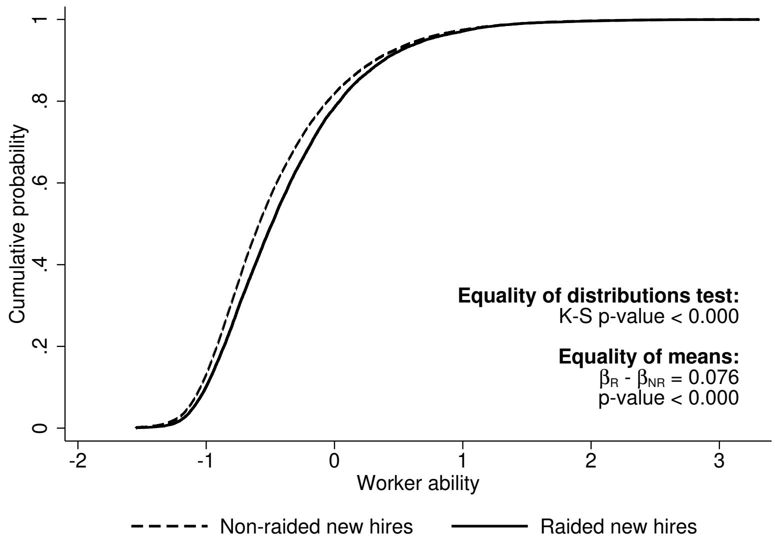
Note: Data from RAIS, poached manager cohorts 2010-2016. The tenure overlap measure is the share of workers with whom the poached manager overlapped throughout their entire time at the firm.

Figure C.8. Cumulative distribution of firm productivity



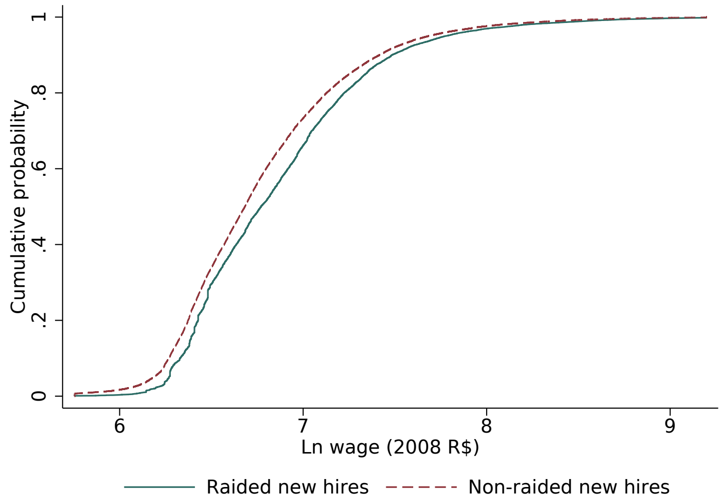
Note: Data from RAIS, poached manager cohorts 2010-2016. This figure plots the cumulative distribution of the Abowd et al. (1999) firm fixed effects (wage premia) for destination firms (i.e. poaching firms) in the solid line and origin firms in the dashed line. The distributions are significantly different at the 1% level based on a Kolmogorov-Smirnov test of equality of the distributions. As the RAIS data does not have a direct measure of firm productivity, we use the estimated wage premium is a proxy based on the strong correlation between these reported in Cornwell et al. (2021).

Figure C.9. Cumulative distribution of worker ability



Note: Data from RAIS, poached manager cohorts 2010-2016. Includes only new hires at destination firms following the poaching of a manager. Raided hires refers to non-managerial workers hired from the same origin firm as the poached manager (solid line). Non-raided new hires refer to all other workers hired at the same time, but from different firms (dashed line). This graph plots the cumulative distribution of the worker fixed effect from an AKM decomposition (Abowd et al. (1999)), a proxy of worker ability. The distributions are significantly different at the 1% level based on a Kolmogorov-Smirnov test of equality of the distributions.

FIGURE C.10. Cumulative distribution of worker wage



Note: Data from RAIS, poached manager cohorts 2010-2016. Includes only new hires at destination firms following the poaching of a manager. Raided hires refers to non-managerial workers hired from the same origin firm as the poached manager. Non-raided new hires refer to all other workers hired at the same time, but from different firms. The figure plots the cumulative distribution of worker starting wages (deflated to R$ 2008) at the destination firm.

TABLE C.2. Demand for information and poached manager destination salary

	Outcome: Manager ln(salary) at destination			
	(1)	(2)	(3)	(4)
Dest. firm size (ln)	0.067***	0.032***	0.031***	0.027***
	(0.011)	(0.006)	(0.006)	(0.006)
Dest. firm empl. growth rate	0.034***	0.024***	0.025***	0.029***
	(0.013)	(0.007)	(0.007)	(0.007)
Manager controls				
Origin wage		✓	✓	✓
Experience			✓	✓
Manager quality				✓
Event controls				
# raided workers (ln)	✓	✓	✓	✓
Obs	2864	2864	2864	2864
R-Squared	0.100	0.703	0.704	0.722

Note: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Data from RAIS.

Table C.3. Supply of information and poached manager destination salary

	Outcome: Manager ln(salary) at destination				
	(1)	(2)	(3)	(4)	(5)
Orig. firm size (ln)	0.023***	0.029***	0.027***	0.027***	0.022***
	(0.005)	(0.007)	(0.007)	(0.007)	(0.007)
Orig. firm avg worker quality	0.342***	0.216**	0.225**	0.115	0.102
	(0.030)	(0.101)	(0.100)	(0.099)	(0.098)
Orig. firm size (ln) × Orig. firm avg worker quality		0.021	0.020	0.031**	0.034**
		(0.016)	(0.016)	(0.016)	(0.016)
Manager controls					
Manager salary at origin	✓	✓	✓	✓	✓
Manager experience			✓	✓	✓
Manager quality				✓	✓
Destination firm					
Destination firm size (ln)					✓
Destination firm growth					✓
Event controls					
# raided workers (ln)	✓	✓	✓	✓	✓
Obs	2854	2854	2854	2854	2854
R-Squared	0.717	0.717	0.718	0.732	0.735

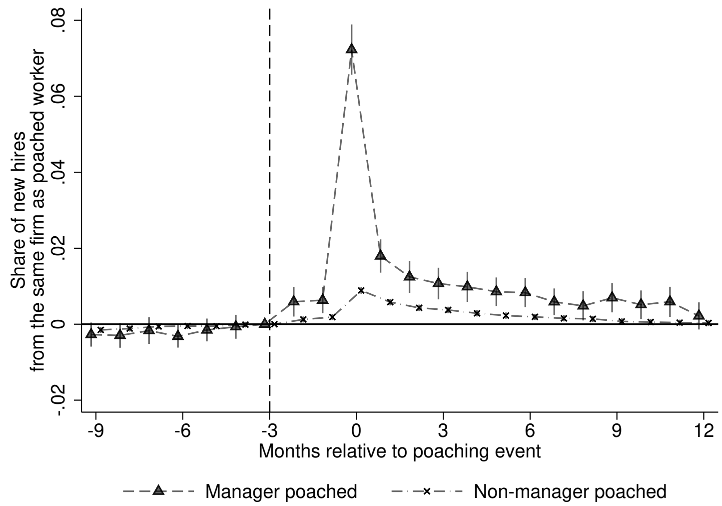
Note: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Data from RAIS.

TABLE C.4. Alternative explanations

	Manager to Manager			Manager to Non-Manager			Non-Manager to Manager		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Destination Firm									
Size (ln # empl)	0.027***	0.026***	0.028***	0.021***	0.019***	0.023***	0.017**	0.018**	0.019**
	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)	(0.006)	(0.009)	(0.009)	(0.008)
Empl. growth rate	0.029***	0.031***	0.030***	0.016*	0.022**	0.017*	0.003	0.008	0.003
	(0.007)	(0.007)	(0.007)	(0.009)	(0.010)	(0.009)	(0.008)	(0.008)	(0.008)
Origin firm									
Size (ln # empl)		0.022***			0.021**			0.018	
		(0.007)			(0.009)			(0.014)	
Avg worker ability		0.102			0.063			-0.036	
		(0.098)			(0.131)			(0.187)	
Size (ln employment)		0.034**			0.031			0.044	
× avg worker ability		(0.016)			(0.021)			(0.031)	
Raided workers									
# raided workers (ln)	-0.032***	-0.028***	-0.024***	-0.018***	-0.018***	0.003	-0.005	0.000	0.006
	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)	(0.008)	(0.008)	(0.012)
Ability of raided workers			0.101***			0.046**			0.018
			(0.019)			(0.020)			(0.028)
Ability of raided workers			0.017			0.051***			0.025
× # raided workers (ln)			(0.011)			(0.011)			(0.020)
Manager controls									
Manager salary at origin	✓	✓	✓	✓	✓	✓	✓	✓	✓
Manager experience	✓	✓	✓	✓	✓	✓	✓	✓	✓
Manager quality	✓	✓	✓	✓	✓	✓	✓	✓	✓
Obs	2864	2854	2864	2603	2392	2603	1260	1260	1260
R-Squared	0.722	0.735	0.730	0.626	0.636	0.634	0.714	0.723	0.715
Prediction	3	4	5	3	4	5	3	4	5

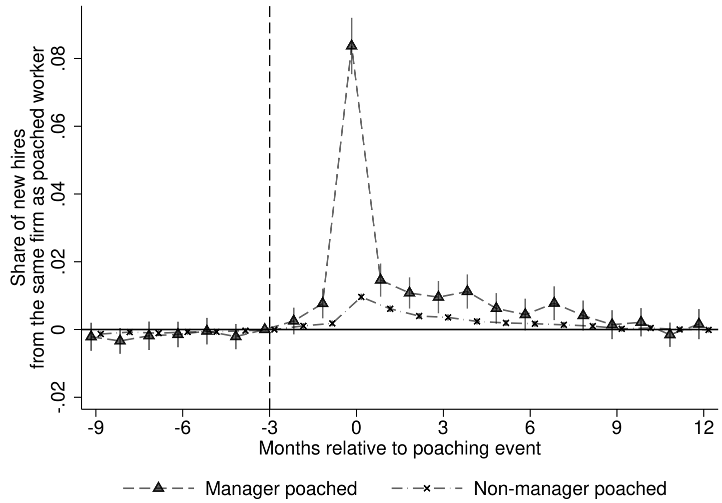
Note: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Data from RAIS.

FIGURE C.11. Poached managers and raided workers: "high wage growth" firms



Note: Data from RAIS, poached manager cohorts 2010-2016. This figure plots the coefficients from Equation 8 with the outcome variable as the share of raided workers relative to new hires in the destination firm, but only for the sample of destination firms that have been classified as having high wage growth relative to their local labor market. The event marked with triangles depicts when a manager was poached from the origin firm and hired as a manager in the destination firm. The event marked with an X depicts when a non-manager was poached from the origin firm and hired as a non-manager in the destination firm.

Figure C.12. Poached managers and raided workers: "low wage growth" firms



Note: Data from RAIS, poached manager cohorts 2010-2016. This figure plots the coefficients from Equation 8 with the outcome variable as the share of raided workers relative to new hires in the destination firm, but only for the sample of destination firms that have been classified as having low wage growth relative to their local labor market. The event marked with triangles depicts when a manager was poached from the origin firm and hired as a manager in the destination firm. The event marked with an X depicts when a non-manager was poached from the origin firm and hired as a non-manager in the destination firm.

D. A Dynamic Model

In this section we present and analyze a dynamic version of the model in Section 2 with (i) overlapping generations of managers and workers, (ii) arbitrary numbers of workers, and (iii) binary worker abilities, strengthening and refining our main results from Sections 3 and 4.

D.1. **Model setup.** Consider an infinitely repeated version of the model in Section 2 in which both firms have fixed but arbitrary numbers of worker slots, n_A and n_B respectively, and with managers and workers that live for 2 periods each. At the beginning of each period $\tau \in \mathbb{Z}$, events take place according to the time line from Section 2.

To simplify, we additionally assume throughout this section that (i) $F(\cdot)$ is degenerate and a worker's ability can take on two values, a_L and a_H, with $a_H > a_L$ and $p(a_H) = p_H$, and (ii) that

$$\rho_B p_H (a_H - a_L) > t_w - (w_e - w), \tag{D.25}$$

which ensures that both firms prefer replacing a low ability worker with a junior worker even for a single period.[53]

Finally, we introduce some additional notation for the analysis below. Let h_i^τ, $i \in \{A, B\}$, denote the number of firm i's high ability budding senior workers at the very beginning of period τ, r^τ the number of workers hired away from B by A (the 'raid') in period τ, and $\Delta\pi_i^\tau$ firm i's change in profits if A poaches $m_B^{\tau-1}$. Moreover, we denote firm i's *ex ante* expectation—the expectation when A is making its initial offer for $m_B^{\tau-1}$—as $\mathbb{E}_i(\cdot)$, and its *interim* expectation—the expectation right after one firm ceases to offer—as $\mathbb{E}_i^I(\cdot)$. Ex post realized values simply drop the expectation.

D.2. **Equilibrium analysis.** Below we present a characterization of equilibrium behavior in the infinite horizon managerial poaching game. The presented results strengthen the analyses in Sections 3 and 4. In the 2-period model, firm A when poaching pays twice for its additional production value, once through the poached manager's salary and once through the poached worker's wage. In addition it pays for the necessary training cost of all workers, either directly or through salaries/wages. In the infinite horizon model, this intuition persists. Since B is not aware of the number of A's openings, $n_A - h_A^\tau$, the highest retention salary B is willing to pay depends on its expectation thereof. As $n_A - h_A^\tau$ is the realization of a random process A may in fact pay more or less than twice, but strictly more than once, for additional

[53] Assuming (ii) equates to ρ_B being sufficiently large. If this is not the case, no poaching equilibrium may exist. If, however, there is a poaching equilibrium the qualitative results below are unaltered.

production value weighted by B's productivity when attempting to poach $m_B^{\tau-1}$. As a result, there is $\delta > 0$ such that A never attempts to poach if $\rho_A - \rho_B < \delta$.

As ρ_A increases, however, and the cost of poaching B's manager and raiding B's workers remains independent of ρ_A, there must be a value ρ'_A such that A attempts to poach if it expects that poaching its manager leads to raiding some high ability workers from B. In fact, as ρ_A increases further, A always attempts to poach if $n_A - h_A^\tau \geqslant 1$ due to the enormous option value of recruiting a high ability worker. However, as long as ρ_A is moderately larger than ρ_B, A does not always succeed when it attempts to poach a budding senior manager $m_B^{\tau-1}$ at the beginning of period τ. This is because B may overestimate the number of A's openings for high ability workers and/or have a large number of budding senior high ability workers at B. Since these quantities are unknown to its competitor before a poaching attempt takes place, B may be willing to retain its manager at a higher salary than A is willing to pay. It follows that even an unsuccessful poaching attempt raises managerial salary.

It further should be noted that additional worker slots at both firms, i.e., larger values for n_A and/or n_B, increase the expected frequency of poaching as well as the expected salary paid to poached managers. This is because an additional slot at firm A makes poaching more attractive in expectation as it causes A to have more openings. This in turn increases the expected production value lost by B in the case of poaching. Due to the differences in productivities, however, A's additional profit exceeds B's loss in expectation, causing a higher probability of poaching in a given arbitrary period. Poaching itself, however, is also reaffirming as more frequent poaching makes poaching more attractive in the future as B has to replace its workers with junior ones. Similarly, if n_B increases, A expects more high ability workers at B and the parallel argument applies. Also note that A always hires as many high ability workers as possible once it successfully poached B's manager as the cost per hired worker effectively declines (because managerial training cost is split more ways).

Finally, when attempting to poach, A is more than willing to pay for all social costs (B's lost production value, additional managerial training cost, additional worker training cost) establishing that it expects its additional production value to exceed these costs. As a consequence, poaching in expectation increases social welfare as it makes the sorting of workers across firms more assortative, i.e., more able workers are employed at more productive firms. Not only does social welfare increase in expectation, but so does A's profit. B, on the other always suffers if A attempts to poach, either through higher paid salaries or lost production value. The employees poached and raided by A, on the other hand, always benefit from poaching. Nevertheless, managerial poaching does not occur at the efficient rate, as evidenced by the discussion above implying that A may not successfully poach firm B's manager even if it does have openings and firm B high ability workers.

Proposition 6 below formalizes these results.

Proposition 6 (**Infinite horizon**). *Fix an industry* $(A, F, \rho_A, n_A, \rho_B, n_B, s, s_e, t_m, w, w_e, t_w)$.[54] *In equilibrium, firm B never poaches firm A's manager* $m_A^{\tau-1}$, $\tau \in \mathbb{Z}$. *There is* ρ'_A, $\rho'_A > \rho_B$, *such that*

(1) if $\rho_A \leqslant \rho'_A$, *a* ***no-poaching equilibrium*** *materializes: firm A never attempts to poach firm B's manager. Firm i,* $i \in \{A, B\}$, *always retains its senior manager, and retains a senior worker in period* τ *if and only* $a_i^{\tau-1} = a_H$, *and replaces them with a junior worker otherwise.*

(2) If $\rho_A > \rho'_A$, *a* ***poaching equilibrium*** *materializes: there is* $r^* \in [0, p_H \cdot \min\{n_A, n_B\}]$ *such that*

- *(a) firm A attempts to poach firm B's manager in period* τ *if* $m_B^{\tau-1}$ *is a junior manager and* $\mathbb{E}_A(r^\tau) > r^*$.
- *(b) Firm A does not always succeed when attempting to poach* $m_B^{\tau-1}$.
- *(c) If firm A poaches* $m_B^{\tau-1}$, *it raids* $\min\{n_A - h_A^\tau, h_B^\tau\}$ *of firm B's workers.*
- *(d) The average frequency of poaching increases in* n_A *and* n_B.
- *(e) The expected salary of a poached manager increases in* n_A *and* n_B, *and*
- *(f) the expected salary of a retained senior manager increases in* n_A *and* n_B.
- *(g) Poaching, on average, increases social welfare, but not to the efficient level.*
- *(h) Poaching, on average, benefits firm A. It always benefits poached managers and raided workers, and harms firm B.*

Proof of Proposition 6: First suppose B has poached A's manager and therefore knows the ability of A's workers. Assume $\rho_A = \rho_B$. Since retaining a worker is more valuable than raiding a worker due to t_w, B never raids a worker with ability a_H from A. Thus, B never poaches A's manager for $\rho_A \geqslant \rho_B$. The same argument, if $\rho_A - \rho_B$ is sufficiently small, i.e., $\rho_A < \rho'_A$, establishes (1).

Now assume that A has poached budding senior manager $m_B^{\tau-1}$ in period τ. Thus, A learns $a_{B,1}^{\tau-1}$ to $a_{B,n_B}^{\tau-1}$ and the workers' age. It can then raid B's budding senior workers with ability a_H at w_R. w_R represents the wage of a junior replacement, their training cost, the production value lost in τ, and dynamic costs (if a worker is poached, B

[54] Note that we augmented the description of an industry with the numbers of worker slots n_A and n_B.

hires a junior worker who then may be raided in $\tau+1$). As all workers are equally expensive at this interim stage, A raids as many workers as it needs, $n_A - h_A^\tau$, or as it can get, h_B^τ, if $h_B^\tau < n_A - h_A^\tau$. For if not, it would never attempt to poach $m_B^{\tau-1}$ in the first place, establishing (2) (c).

A's additional production value from raiding a high ability worker over a junior replacement for one period is

$$\rho_A \left(1 - p_H\right)\left(a_H - a_L\right),$$

which is strictly increasing in ρ_A. From A's period τ perspective, if it raids a high ability worker, it can match the $\tau+1$ production value from a junior worker hired in τ by hiring a junior worker in $\tau+1$ incurring additional cost of $t_w - (w_e - w)$, which is constant in ρ_A. Moreover, the interim cost of obtaining this additional production value is $w_R - w$, which is independent of ρ_A.

The salary A has to pay when poaching $m_B^{\tau-1}$ is $s_P = s + t_m - \mathbb{E}_B^I\left(\Delta\pi_B^\tau\right)$. Note that, in general, $\mathbb{E}_B\left(\Delta\pi_B^\tau\right) \neq \mathbb{E}_B^I\left(\Delta\pi_B^\tau\right)$ because $\Delta\pi_B^\tau$ is a function of r^τ, with B's expectation of the latter potentially affected by A's offers for $m_B^{\tau-1}$. Thus, A pays twice for the additional production value from raiding a high ability worker, once through their wage w_R and once in expectation through the poached manager's salary s_P. Nevertheless, crucially observe that both w_R and s_P are independent of ρ_A.

As $\Delta\pi_A^\tau$, on the other hand, strictly increases in ρ_A, there must be a smallest ρ_A at which A attempts to poach if $\mathbb{E}_A(r^\tau) = p_H \min\{n_A, n_B\}$. Note that $p_H \min\{n_A, n_B\}$ is the maximal value $\mathbb{E}_A(r^\tau)$ can take on. This occurs when A is aware that $\min\{n_A, n_B\}$ of B's period τ workers are junior workers, and $n_A - h_A^\tau \geqslant \min\{n_A, n_B\}$.[55] It is immediate to see that if A attempts to poach when $\mathbb{E}_A\left(r^\tau\right) = r$, then it attempts to poach whenever $\mathbb{E}_A\left(r^\tau\right) < r$ and that r^* decreases in ρ_A. This establishes the existence of ρ_A' together with (2)(a).

Suppose now that in period τ, $r^* < \mathbb{E}_A(r^\tau) < \mathbb{E}_B(r^\tau)$ and that $\mathbb{E}_B(r^\tau) - \mathbb{E}_A(r^\tau)$ is large. This may be the case because $n_A - h_A^\tau$ is small while h_B^τ is large. Then, A may cease to offer before B does, and B retains $m_B^{\tau-1}$, proving (2) (b).

Consider $\hat{s}_P$, the expected salary of a poached manager,

$$\mathbb{E}(s_P) = s + t_m - \mathbb{E}\left[\left(\mathbb{E}_B^I\left(\Delta\pi_B^\tau\right)\right)\right], \tag{D.26}$$

with $\mathbb{E}$ denoting the expectation over all $\tau \in \mathbb{Z}$. Note that $\mathbb{E}_B^I\left(\Delta\pi_B^\tau\right)$ directly decreases in n_A because $\mathbb{E}_B^I(n_A - h_A^\tau)$ increases B's expected profit loss, but by less than it increases A's expected profit gain due to $\rho_A > \rho_A'$. As such, the probability of

[55]This is the case if A raided enough high ability workers from B in period $\tau - 1$.

poaching in a given period increases. A higher probability of poaching then decreases, in expectation $h_A^{\tau+1}$ and increases $h_B^{\tau+1}$. As a result, both the direct and indirect effects of n_A on $\hat{s}_P$ and the likelihood of poaching are positive. A similar argument establishes the same for n_B. (2) (d) and (e) follow. Also, if A attempts to poach $m_B^{\tau-1}$ unsuccessfully, then $s(m_B^{\tau}) > s_e$ and (2) (f) follows.

The social cost of poaching comprises four components. (i) If A poaches, both firms incur a managerial training cost t_m, and (ii) both firms incur a worker training cost t_w per raided worker instead of only firm A when replacing its worker with a junior one. (iii) B expects to lose production value in τ by replacing a high ability with a junior worker. (iv) If A poaches in period τ, B has a budding senior manager again in the beginning of period $\tau + 1$. As such, poaching makes future poaching more likely increasing the frequency of costs (i), (ii) and (iii) to arise. However, when A attempts to poach, it expects its additional profit from poaching to exceed $2t_m + r^{\tau} t_w$ as it transfers $t_m + r^{\tau} t_w$ to $m_B^{\tau-1}$, t_w to each worker, and chooses to poach over retaining $m_A^{\tau-1}$ (if applicable) and hiring a junior worker incurring another t_m. In addition it transfers B's production value loss to the workers it raids. As a consequence, A expects its additional profit from poaching to exceed the sum of (i), (ii) and (iii) when poaching. Finally, (iv) if the frequency of these poaching costs increases, so does the frequency of the benefits at the same rate. Poached managers and raided workers earn more than their retained counterparts but poaching does not always occur if it is efficient. This establishes (2) (g) and (h). ■