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Abstract
Workers learn from the tasks they perform, and in the process, they accumulate human capital that is potentially portable. Companies that cannot commit to specific task allocations may assign employees to tasks that reduce retention costs and do not maximize productivity. Equity partnerships may achieve efficient task allocation by distributing control and profit among partners, thus improving productivity. This analysis provides a novel rationale for the widespread presence of partnerships in professional service industries, their shift toward performance-based remuneration, and the conditions under which partnerships are more efficient than corporations with frictions like wealth constraints, risk aversion, and asymmetric information.

JEL Classification: D20, D86, J44, J54, L20, M50.

Keywords: Task Allocation, Retention, Control Rights, Partnerships.

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1 Introduction

In professional service industries like law, engineering, accounting, and medicine, retaining skilled employees is an important matter: these industries not only rely more on human capital than others but also feature higher turnover rates - fully 63.3% in 2019, according to the U.S. Bureau of Labor Statistics, compared with an average 45% in the rest of the U.S. economy. When moving across firms, workers carry the human capital they have acquired. The portion that may also benefit their new employers is referred to as portable (Groysberg et al., 2008; Groysberg, 2010). This encompasses portable, productive skills and any expertise that may affect their employers' performance, such as client networks or relationships with valuable collaborators or suppliers developed in past employment. Hence, task assignment has a relevant impact on workers' human capital acquisition and career paths, as stated by McKenna and Maister (2010): "Junior staff [...] are at the early stages of a career, and need one thing above all: the chance to develop and build their skills. How well skills are built depends upon [...] the work assignment system that decides what projects they get to work on" (p.221).

Firms use diverse contractual tools to retain their best employees, such as wage bonuses, noncompete clauses, and perks. One common strategy is *hoarding*, namely, assigning talented workers to tasks that make them less attractive to competitors in the labor market, as in Waldman (1984), Bernhardt (1995), Mukherjee and Vasconcelos (2018), and Haegele (2024), thus limiting their outside options and consequently their retention wage.[1]

This paper analyzes whether the organizational design of firms affects the efficiency of talent allocation. In professional service industries, many firms are organized as partnerships in which some workers (partners) participate in the productive process and acquire control and cash flow rights,[2] unlike corporations, where a sole owner has all control and cash flow rights.

[1]Ellingsen and Kristiansen (2022) describe the impact of portability on managers' competitive compensation schemes. Further implications of firms' competition for workers' human capital are adverse effects on the quality of corporate governance (Acharya and Volpin, 2010) and on firms' ability to provide insurance to their employees (Acharya, Pagano, and Volpin, 2016 and Pagano and Picariello, 2023).

[2]IRS data on the number of professional partnerships in the U.S. highlight a significant increase in the last ten years, with an average growth rate of 5.6% per year.

I address two questions. First, will a profit-maximizing corporation efficiently allocate workers across tasks that differ in their potential to develop portable human capital? Second, if the firm is organized as a partnership rather than a corporation, will it assign tasks more efficiently, and how will it design partnership contracts in a competitive labor market with portable human capital?

To answer these questions, I analyze a model in which firms produce their output through two tasks: one with a talent-sensitive production technology and the other with a talent-insensitive one. Importantly, tasks convert workers' talent into output using on-the-job human capital accumulation. The first task is assumed to give access to more portable human capital than the second. This assumption is motivated by the fact that the more talent-sensitive the output is, the more the worker executing it is crucial in the production process. Hence, if a competing firm poaches the worker, the latter can replicate a significant fraction of what she used to produce in the previous firm, as it depends significantly on herself. If the output is less talent-sensitive, this depends mainly on the firm's characteristics, such as physical capital, specific practices, team production processes, and corporate culture. As a result, when a worker dealing with such a task leaves the current employer, she can replicate a smaller fraction of what she used to produce in the previous company. Groysberg (2010) provides evidence of such a phenomenon in the U.S. financial sector, for instance, showing that analysts executing tasks alone are better at replicating their performances when moving to other companies. This is not the case for analysts working in teams, showing that team-based performances yield less portable human capital to analysts specializing in a smaller fraction of the production process. In contrast, those dealing with a task independently acquire broader knowledge and the ability to solve more problems.

Generally, the more talent-sensitive task could be a coordinating or monitoring task, in which problem-solving skills are relevant to produce the output, whilst the other task could be thought of as a routine task in which the worker adds little of her ability to the output realization process which mainly hinges on firm's features. The skills used to manage, monitor, coordinate, solve problems, and perform less routine-based tasks are highly portable. Indeed, Sullivan (2010) shows empirical evidence that managerial occupations provide industry-specific human capital. In contrast, routine occupations provide occupation-specific human capital, which is less portable than the former. Yamaguchi (2012) provides empirical evidence that occupations involving

relatively complex tasks are more talent-intensive, making them more remunerative for employees performing them. This, again, points towards the relevance of talent in performing more complex, non-routine tasks, which tend to provide more portable human capital.

In the model, a firm employs a worker whose talent is observable to everyone in the industry but not verifiable in court, as it is potential rather than actual productivity. Since tasks differ in the talent-sensitivity of their output, task assignment will depend on workers' talent and, therefore, be noncontractible. First, the efficient (surplus-maximizing) task assignment rule that a central planner would choose is derived. However, if labor contracts are bilaterally incomplete in that neither firms nor workers can commit to agreements, corporations assign tasks inefficiently to reduce retention costs. Specifically, the task allocation rule is such that the threshold on talent above which a worker is assigned task A is larger than the efficient one. The magnitude of this inefficiency depends on the portability of the human capital acquired while performing each of the two tasks. This result highlights a tradeoff between value creation and value extraction: inefficiently assigned workers to the less talent-sensitive task would create more value if assigned to the more talent-sensitive one. However, shareholders would not capture enough value from the latter due to high retention costs. As firms affect how workers convert their talent into actual productivity through task assignment, they waste the talent of those workers who are inefficiently assigned less talent-sensitive tasks. Such waste of talent entails a loss of surplus for society.

I compare task assignments in a corporation controlled by a sole owner with those in an equity partnership, where prospective partners purchase equity, get control rights, and earn dividends. A partner chooses task allocation to maximize the profit to be shared. Since she produces revenue but imposes no direct retention cost at the production stage, a sufficient condition for efficient task allocation in partnerships is that a worker who would have been inefficiently assigned to the low-sensitivity task in a corporation should be made partner. This condition is satisfied in equilibrium if the owner gets little private benefits of control from running the firm as a sole owner. If this is the case, the owner offers a partnership contract to the workers to extract the additional surplus generated by more efficient task assignments via the price of the equity they purchase.

Hence, the model predicts that if labor contracts are bilaterally incomplete and economic institutions are such that firm owners cannot extract substantial benefits from control, partnerships assign tasks more efficiently than corporations and are more productive.

Next, the paper describes benchmark contracts that decentralize the efficient task allocation in different settings: one in which workers can commit not to leave the employer after task allocation and human capital accumulation (for instance, because their labor contract contains a binding noncompete clause); and another in which firms commit to task allocation, to minimum wages, or to compensation schemes such that they pay negative base wages before task assignment, pay workers with equity and give them full delegation on task allocation. In these cases, task allocation is efficient, but several conditions are required to be feasible, whereas, in partnerships, there are no commitment requirements, as partnership agreements are self-enforced.

Some frictions may impair the feasibility and efficiency of partnerships. Some of these are analyzed: wealth constraints, heterogeneous firm productivity, workers' risk aversion, and asymmetric information.

Wealth constraints may prevent prospective partners from acquiring an equity stake if they cannot borrow due to credit rationing. As a result, wealthier employees become partners earlier than the less wealthy (but possibly more talented) ones and thus have better career profiles in partnerships.

If firms differ in the productive technology they adopt, the more productive ones retain partners more easily than less productive competitors. Thus, the former should be organized as partnerships, whereas the less productive may not generate enough profits to retain partners via sustainable dividends and may, therefore, be organized as corporations.

When firms' profits are uncertain, employees' risk aversion may impair the organization as a partnership. While salaried workers are shielded against losses by limited liability, partners are not: not only do they earn a share of profit, but they also share in the firm's liabilities. As a result, sufficiently risk-averse employees require excessive profit shares to become partners and stay with the firm, as they forgo the risk-free income they would get as salaried workers in a corporation. This phenomenon could be mitigated by organizing the firm as a limited liability partnership, in which partners get a predetermined income, irrespective of the profit generated.

Thus, limited liability partnerships (LLP) should be more likely established in riskier industries where firms' earnings are volatile.

Finally, consider the case where a worker's talent is asymmetrically observed in the labor market so that only the worker and the current employer can perfectly observe it, while outsiders may not. In this scenario, asymmetric information may improve or reduce the owner's incentive to organize the firm as a partnership, thus implementing efficient task allocation. Specifically, if the worker has lower talent than its expected value in the market, asymmetric information reduces the owner's incentive to organize the firm as a partnership; if, instead, the worker has greater talent than the market's expectation, asymmetric information improves the owner's incentive to make a partnership. In this case, the owner may extract greater rents by leaving a lower profit share to the partner whose talent is expected to be lower than the actual value.

Two modifications to the baseline model are proposed to verify the robustness of its main results and to derive further predictions. First, consider a setup where the firm employs two workers instead of one. In this scenario, financial frictions a partner may face to sell her equity upon leaving the current firm and competition in the labor market yield an interesting result concerning partners' remuneration. Namely, suppose the partner faces some friction while selling her equity share (i.e., she does not obtain all the value of such equity), and the labor market is competitive. In that case, partners do not obtain homogeneous dividends as compensation but earn a share of profit increasing with their talent. Such compensation is similar to an "*eat-what-you-kill*" sharing rule entitling the more productive partners to larger shares of the profit (i.e., to more cash flow and control rights). This result is consistent with both systematic and anecdotal empirical evidence showing that many partnerships in professional service industries have been adopting this type of productivity-based remuneration instead of seniority-based schemes (Levin and Tadelis, 2005)

The second extension introduces further benefits from making a partnership on top of the paper's focal point, i.e., efficient task assignment. Such benefits increase with the partner's talent. One could think of them as savings from not having to incentivize a salaried worker to exert unobservable effort (as partnerships have been shown to remove moral hazard issues by the extant literature) or managerial input by talented partners who make decisions they would not have taken as salaried workers. This framework provides sufficient and necessary conditions for the most talented workers

(i.e., those whose talent is above the cutoff for being assigned task A in a corporation) to become partners. Specifically, the result concerning efficiency resembles that in the baseline model, stating that if the firm's owner extracts sufficiently low private benefits of control, the firm is organized as a partnership and assigns tasks efficiently. However, if private benefits of control improve, the owner may not be willing to organize a partnership to improve efficiency in task allocation. Nevertheless, she may optimally partner with a highly talented worker.

The paper is structured as follows. Section 2 reviews the relevant literature. Section 3 sets up the basic model. Section 4 describes the firm's optimal wage and task allocation policies if the owner organizes it as a corporation. Section 5 shows the optimal task allocation and partnership contracts if the firm is a partnership. Section 6 shows the optimal organizational design strategy for the owner. Section 7 analyzes how corporations can attain efficient task allocation. Section 8 proposes some frictions that may impair the feasibility and efficiency of the partnership organizational form. Section 9 introduces two extensions of the baseline to verify the robustness of its main results. Section 10 concludes.

2 Related Literature

This paper contributes to two research strands: the optimal allocation of talent within firms and organizational design and control allocation.

Organizational task allocation has been analyzed in settings with asymmetric information among firms. Waldman (1984) models a competitive labor market in which only the current employer observes workers' abilities. The other firms observe only task assignments and use this information as a signal of workers' ability. As a consequence of asymmetric information, the employer allocates tasks inefficiently. Bar-Isaac and Levy (2022) study a model of career concerns in which the firm manipulates workers' visibility in the labor market to affect their outside options. However, this process is independent of task allocation. Dato et al. (2021) provide experimental evidence of talent misallocation within firms when employers can effectively conceal workers' talent via task assignment. In all these papers, in equilibrium, firms retain their employees. The present paper differs from the previous ones as it posits that all firms in the economy observe workers' talent but that the development of their human capital depends on the task they perform, as in Rajan and Zingales (1998) and

(2001) so that the firm can reduce retention costs by assigning some workers to tasks at which they acquire less portable human capital. Hence, allocation inefficiency persists when workers' talent is observable in the industry, but task allocation is not contractible. Observing workers' talents is insufficient to obtain efficient outcomes unless the employer can commit to a specific task allocation, affecting human capital accumulation and, thus, workers' subsequent productivity.

This paper also relates to the labor economics of human capital acquisition and its firm-specificity. Key contributions are Becker (1964), Rosen (1972), Acemoglu and Pischke (1998), Moen and Rosen (2004), and Franco and Filson (2006) for analysis of human capital mobility and the cost of its accumulation. Unlike those papers, this one considers a model in which human capital specificity depends on the task a worker is assigned. The employer can manipulate human capital accumulation via task allocation to lower the retention wages commanded by workers with highly portable human capital. More specifically, this paper contributes to the more recent literature, reorienting the literature on human capital away from the classical dichotomy between firm-specific and general human capital towards an approach focused on task-specific human capital, including Gibbons and Waldman (2004), Lazear (2009) and Gathmann and Schönberg (2010). These papers provide theoretical and empirical support for the relevance of task-specific human capital in explaining phenomena such as cohort effects, job design, promotions, and wage profiles. This paper focuses on how the specificity of human capital affects task allocation and organizational design.

Within the literature on organizational design, this paper relates to work comparing partnerships and corporations. Levin and Tadelis (2005) argue that partnerships abound in professional service industries because non-specialist clients cannot perfectly observe the quality of the product (for instance, a patient cannot tell whether a medical diagnosis is correct, nor can a plaintiff honestly evaluate a lawyer's technical advice). The authors show that firms set up partnerships to signal the quality of their output. They assume partners share profits equally to maximize average profits instead of the total, thus optimally hiring the most productive workers. The theoretical framework in this paper differs in several respects. First, the quality of the product is observable. Second, it drops the assumption that partners share profits equally, as there is no asymmetric information problem to tackle. The results show that (with

more than one employee) the retention motive implies that partners should receive not the average profit but a share proportional to their productivity.

Most work on the economics of partnerships focuses on moral hazard: Alchian and Demsetz (1972) emphasize the incentive for partners to work hard even if their performance is complex to monitor; Farrell and Scotchmer (1988) show that many law firms have few partners because the best do not want to share profits equally with less productive partners; Garicano and Santos (2004) show that a partnership can favor the transmission of human capital between senior and junior partners; Morrison and Wilhelm Jr. (2004) study the reasons why some companies switch from partnership to the corporate organizational form, arguing that technological progress has diminished the importance of knowledge transmission between cohorts of partners. Kaya and Vereshchagina (2014) show that the organizational form affects the tradeoff between workers' complementarities and free-riding in a setting with production in teams.

Cooley, et al. (2020), show that firms' organizational form affects the allocation of talent across firms. The authors focus on contractual commitment as the main difference between partnerships and public companies. In a directed search model, if the match quality between employers and employees deteriorates over time, partnerships retain workers, while corporations let them go, thus reducing losses. Consequently, when firms are organized as corporations, workers move to competing companies where they can be more productive, thus increasing the surplus generated and favoring competition for talent in the labor market. In this paper, the authors study how limited commitment could affect productivity. Still, a crucial difference is that Cooley, et al. (2020) impose heterogeneity in commitment across organizations, whilst in this paper, corporations and partnerships are compared, keeping contracts bilaterally incomplete so that more commitment and more efficient production realize as an equilibrium outcome in partnerships.

The model presented hereby predicts that firm owners are willing to organize the firm as a partnership, thus sharing control and payoff rights if the private benefits of control are not too large. Thus, this paper is also linked to papers describing, both theoretically and empirically, the role of institutions limiting the extraction of private benefits of control in determining firms' strategies, such as La Porta et al. (1999), Dyck and Zingales (2004), Pagano and Picariello (2024).

Finally, this paper connects to the literature on incomplete contracts and control rights, dating back to Grossman and Hart (1986), Hart and Moore (1988) (1990), and

Aghion and Tirole (1997). Here, contracts are characterized by bilateral incompleteness: firms cannot commit to task allocation, and workers cannot commit to staying with their employer. These frictions generate inefficient talent allocation. However, transferring control rights to some workers does not suffice to produce efficient task assignments, as employees, too, can hold the employer up. Hence, in this paper, not only should some workers be granted control rights, but they should also get payoff rights and be remunerated according to their productivity in order to be retained.

3 The Model

Consider a model describing organizational design and task assignment in a competitive labor market. A firm employs a worker to produce its output, which is positive insofar as the worker stays with the firm. Before production takes place, the firm's owner chooses the organizational design of the firm, which can be structured either as a corporation (in which she is the sole owner) or as an equity partnership (in which she shares control and payoff rights with the worker who buys equity in the firm). Only workers' participation in production is needed to generate output.[3] The output price is normalized to 1. In the production process, the worker is assigned to either of two heterogeneous tasks. While performing such a task, she acquires more or less portable human capital, allowing her to reproduce the output in a different firm. Notably, the model features bilateral contract incompleteness: on the one hand, since talent is nonverifiable, the owner cannot commit to task assignment (e.g., using wage back-loading); on the other hand, the worker cannot commit to staying with the incumbent employer upon receiving more attractive offers.

Timing. The timeline of the model consists of four stages.

- At $t = 1$, the owner chooses to organize the firm as a corporation or an equity partnership. In the latter case, she makes a take-it-or-leave-it offer of a partnership contract to the worker, who can accept it or not. If the worker rejects the offer, the firm is organized as a corporation.

[3]Picariello (2019) drops this assumption to study the interaction between promotions (or task allocation) and workers' incentives to acquire more or less firm-specific human capital in competitive labor markets. In such a framework, talent allocation plays a dual role: on the one hand, it can reduce mobility; on the other, it constitutes an incentive for workers to exert effort to acquire human capital.

- At $t = 2$, if the company is organized as a corporation, the owner assigns a task to the worker; if the firm is organized as a partnership, the partner chooses to assign herself the task.[4] The worker (or partner) acquires the human capital necessary to execute the task.

- At $t = 3$, competing firms make poaching offers to the worker (or partner) in a competitive labor market. If the firm is organized as a corporation, the current employer can make counteroffers to retain the worker. The worker (or partner) decides to stay with the current employer or leave. If she leaves, the firm will not generate output and will be inactive.

- At $t = 4$, the production process is completed (whether this happens in the first employer or a poaching firm depends on whether there was retention in the previous stage).

In what follows, I detail the features of the model.

Preferences, Information, and Talent. The firm's owner and the employee are risk-neutral; the latter gets utility from consumption, i.e., from her earnings. The worker has talent $y \in Y := [0\,,\,\bar{y}]$. talent is assumed to be observed by everyone in the economy. However, it is nonverifiable.[5]

Notice that talent y represents *potential* productivity known at the beginning of the game and that the worker develops while handling her task in the firm. Specifically, a worker develops her talent into an output only after on-the-job training, yielding human capital. One could think of this as the case of a young employee who has dealt with several tasks during a probation period to evaluate her talent but has not accumulated sufficient human capital to execute any of them. Hence, she needs more specific training after task allocation, as often happens in some firms' junior or graduate programs. The assumption of talent non-verifiability rests on the difficulty of enforcing contracts based on potential productivity.

[4] Allowing the partner to choose her own task is without loss of generality as if in the partnership, the firm's owner too were to choose task allocation, she would opt for the efficient one.

[5] As will be shown later, this assumption implies that poaching offers can depend on talent, so the worker may have better outside options when she is more talented. This feature of the model is tantamount to allowing the worker to leave the current employer not only to join a competing firm but also to start up a spin-out firm as an entrepreneur, which is an empirically relevant option in professional service industries as shown by Campbell et al.(2012). Section 8.4 shows how asymmetric information about talent outside the current firm affects the results of the model.

Organizational Design. Before task allocation and production process take place, the firm's owner chooses the organizational design of the firm denoted as $\mathcal{D} = \{corporation, partnership\}$. In a corporation, the owner has all the control and payoff rights, so she assigns a task to the worker to maximize the firm's profit. In an equity partnership, the owner shares ownership and control rights with the partner. Let $\phi : Y \to \mathbb{R}$ denote the price of the equity the worker purchases from the owner to become a partner paid upon accepting the partnership contract and $s : Y \to [0, 1]$ be the partner's share of the firm's profit the latter earns at the end of the production process if she stays with the current firm.[6] When organizing the firm as a partnership, the owner offers the worker a take-it-or-leave-it partnership contract $\{\phi, s\}$. The worker then faces the decision $P = \{accept, reject\}$. If the worker accepts the contract, she becomes a partner. Otherwise, the firm is organized as a corporation. If the worker is indifferent between accepting or not the partnership contract, she breaks the tie by accepting.

Let the firm's owner enjoy a private non-monetary benefit of control $\beta \geq 0$ if the firm is active and productive, and she is the sole owner. In contrast, in a partnership, she gets $(1 - s)\beta$, reflecting that she may be unable to run the firm how she sees fit and might have to bargain over strategic choices with the partner.

Tasks and Human Capital. The firm produces its output by means of two tasks labeled $i = \{A, B\}$. These differ along two dimensions: talent-sensitivity of the output generated and the portability rate of the skills acquired while performing the task. Specifically, task A produces y and gives access to human capital with portability rate $\theta_A \in (0, 1]$; task B produces $x \in (0\,,\,\bar{y})$ and gives access to human capital with portability rate $\theta_B \in [0\,,\,\theta_A)$. Hence, task A generates a talent-sensitive output and yields the worker performing it more portable skills. In contrast, task B has a talent-insensitive, constant output and delivers less portable skills to the worker executing it.[7] For the sake of simplicity and exposition, the production functions of the two tasks are pretty stylized; one could think of both tasks as talent-dependent but at

[6]The assumption that partnership contracts are contingent on talent is without loss of generality. In the baseline model with one worker and a competitive labor market, the firm's owner is indifferent between offering such contracts or task-based ones. Section 9.1 analyzes a version of the model with 2 workers and shows that the owner finds it optimal to offer talent-based (rather than task-based) partnership contracts to retain partners at $t = 3$.

[7]If one assumes that $\theta_B > \theta_A$, all the paper's main results would still hold, although the inefficiencies discussed below would be reversed.

different degrees (as in Gibbons and Waldman, 2006 and Dato et al., 2021). For instance, less talent-depending tasks could be team tasks in which the output depends on the team's performance and not on the individual's talent or tasks in which the firm owner dictates some guidelines on how to perform them or to solve problems, leaving little room to the worker's initiative. Alternatively, the distinction between tasks might not imply different job titles, but alternative ways of performing them. According to Lazear (2009), job design combines several tasks and ways to solve problems that generate firm-specific "blends" rather than jobs. From this perspective, the firm may decide whether to ask the worker to perform the same job in one way or another. Asking the worker to perform the whole job gives her access to a broader range of skills, allowing her to solve more problems or manage and monitor the whole production process, implying that she may do it as well in a competing firm.

The assumption that the human capital acquired via task A is more portable is motivated by the fact that the output is correlated with innate talent and can, therefore, be produced by the same worker in other firms rather than depending on the firm's technology or other factors specific to the incumbent employer (such as culture, team production, and physical capital). Examples of tasks such as those in the model may be found in a law firm, where one may be trained as an attorney who goes to court, whose talent affects the outcome of trials, and how to build up strategies to win cases. Such a worker has access to the firm's network of clients and can win cases in any legal company. Alternatively, the firm may train the employee as a back office legal assistant tasked with preparing legal documents, conducting basic research, and managing case files based on predefined instructions from lawyers. If the latter were to leave her current employer, she would carry far fewer clients than an attorney and may be less productive when moving to a company with different lawyers and routines. [8]More generally, task A could be thought of as a task in

[8]Another example is given by a job description from a leading accounting company, stating that "[...]audit manager[s] [are] responsible for overseeing internal operating controls, processes and practices. They may also recommend changes and enhancements to existing policies and controls to make sure they are current, adequate, functional, and utilized in accordance with standards established by the government and the company. Some Audit Managers will manage a team of junior auditors or accountants, reviewing their works and providing guidance." It is immediate to see that an audit manager executes a less routine-based task than junior auditors and accountants who are, de facto, managed by the former, who make relevant decisions so that the output of her division hinges mostly on her talent rather than the other workers. Furthermore, if the manager were to leave, her skills would be more portable than those of an accountant, who would be used to follow the manager's directions and may not necessarily be able to follow another manager's input without facing significant training costs. Another example emerges when comparing a data entry

which the worker's initiative and ability to coordinate, monitor, solve problems, and manage are crucial to the production process, whereas task B is a routine-based task. Sullivan (2010), Groysberg (2010), and Yamaguchi (2012) provide empirical evidence suggesting that managerial and non-routine tasks yield more portable human capital than routine-based ones.

In the model, the worker must be assigned a task for the production process to take place. Such a task is denoted i^c in a corporation and is chosen by the firm's owner; the task is denoted i^p in a partnership and is chosen by the partner. Once assigned to a task, the worker accumulates human capital to (possibly) convert her talent into productivity. When leaving the firm, a worker assigned to task i acquires only the human capital necessary to execute that task. That is, workers allocated to task B cannot be poached to execute task A immediately, and vice versa, as they need retraining for the new task. This is a consequence of the assumption that workers need on-the-job training to learn how to execute a certain task and to develop their talent in output.[9]

Poaching and Retention. After task allocation, the worker (or partner) acquires the human capital needed to do her job, but before the end of the production process, a competing firm bids a poaching wage offer denoted

$$w_p^{\mathcal{D}} : Y \times i^{\mathcal{D}} \to \mathbb{R}^+$$

where the superscript $\mathcal{D}$ refers to the organizational design of the incumbent employer. In a corporation, the firm's owner can make a counteroffer

$$w_r : Y \times i \to \mathbb{R}^+$$

clerk against a data analyst. The former follows repetitive procedures, often using company-specific databases or software systems, whereas the latter's performance depends on her ability to interpret data, derive insights, and apply analytical frameworks. Hence, a data analyst's analytical talent, problem-solving, and critical thinking are crucial and are more portable across firms than a data entry clerk's skills.

[9]Notice that before task allocation, the worker has not yet accumulated the needed human capital to execute either task. Her productivity changes after task assignments and consequential human capital accumulation. Hence, allowing firms to poach the worker before task allocation would not change the model results if the worker can also leave after having accumulated human capital, as firms are all identical and solve the same profit maximization problem when assigning tasks to workers.

to retain the employee who, observing the poaching and the retention offers, decides whether to stay with the current employer or leave for another firm. Such decision is labeled $R^c : \{w_p^c, w_r\} \to \{stay, leave\}$. If $w_r = w_p^c$, the worker stays with the current employer. Note that the current employer cannot avoid poaching offers. Hence, the worker has no commitment to stay, and she will leave the firm if it does not match the poaching offer.

If the firm is a partnership, the partner's decision to stay or leave is $R^p : \{w_p^p, s\} \to \{stay, leave\}$. If the partner is indifferent between *stay* and *leave*, she decides to stay. Upon leaving, the partner sells her equity stake on the financial market at a price $p_e : s \times \pi^p \to \mathbb{R}$.

Profits. After the poaching and retention stage, the firm completes its production process. If the worker is retained, a corporation generates a profit denoted

$$\pi^c : Y \times i^c \times R^c \to \mathbb{R}.$$

If the worker leaves the current firm, $\pi^c = 0$ and the production process is not completed.

If the firm is a partnership, the firm's profit upon partner retention is denoted

$$\pi^p : Y \times i^p \times R^p \to \mathbb{R},$$

and it is zero if the partner accepts a poaching offer.

Equilibrium. The equilibrium concept of this game is *subgame perfect Nash equilibrium* (SPNE) and is given by the following plan of actions:

$$\{\mathcal{D}, i^c, w_p^c, w_r, R^c, \phi, s, P, i^p, w_p^p, p_e, R^p\}.$$

3.1 Efficient Task Allocation

As a benchmark, consider the task allocation rule that maximizes social welfare. Since all players have linear utility from money, and wages redistribute surplus from the firm's owner to the worker, social welfare is equal to the output produced.

Given the production functions in the two tasks and the continuity of y, the efficient task assignment is a cutoff rule such that a worker is more productive on

task A, namely, if $y \geq x$. Hence, if a worker is at least as productive on tasks A and B, she should be assigned to the more talent-sensitive task.

4 Corporation

Let us first consider the case in which the owner organizes the firm as a corporation, deriving the optimal poaching and retention wages as well as the task allocation rule in this scenario by solving the model by backward induction.

4.1 Poaching and Retention Wages

First, focus on $t = 3$ when competing firms make poaching offers w_p^c to the worker, and the current employer bids a wage w_r to retain her. Since talent is observable across firms and tasks differ in the human capital the worker acquires while executing them, optimal wages will depend on these two components.

Lemma 1 (Optimal Wages)**.** *If the worker is assigned to task A, the optimal poaching and retention wage offers are*

$$w_r = w_p^c = \theta_A y.$$

If the worker is assigned to task B, the optimal poaching and retention wage offers are

$$w_r = w_p^c = \theta_B x.$$

For such wage offers, the incumbent employer always retains the worker.

The proofs of all propositions, lemmas, and corollaries are in Appendix A.

Due to the competitiveness of the labor market, firms willing to poach the worker will offer her marginal productivity. However, since both tasks provide the worker with partially portable human capital, the incumbent employer can always optimally match poaching offers, thus retaining the worker and obtaining a positive rent.

4.2 Task Allocation

At $t = 2$, the employer assigns a task $i^c = \{A\,,\, B\}$ to the worker by considering the profit earned in either of the two possible scenarios.

Proposition 1 (Optimal task allocation)**.** *If the worker cannot commit to staying with the incumbent employer after task assignment and the firm cannot commit to task assignment, the profit-maximizing task allocation rule is such that a worker is assigned task A if*

$$\hat{y} = \frac{(1-\theta_B)x}{(1-\theta_A)} \geq x$$

and task B otherwise.

If, after having accumulated valuable human capital, the worker can leave the incumbent employer, the latter sets an inefficient allocation rule. To see this, suppose the worker has talent $y \in [x, \hat{y})$; she could be assigned to task A (being more productive than on task B), but she is not. Such a worker's productivity cannot offset the spread between $\theta_A y$ and $\theta_B x$, that is, the wage needed to retain her at $t = 3$ if working on task A is relatively too high. Specifically, owing to high retention costs, the firm's owner would not capture much of the value created by this worker when she is assigned task A. The firm strategically matches this worker with a less portable task to lower retention costs.

This outcome does not maximize total surplus: some talent is used and developed inefficiently. If workers are matched with task B, they cannot work on task A in another firm, although they would be potentially good at it. If θ_A increases, ceteris paribus, the threshold value $\hat{y}$ rises. As in Waldman (1984), the severity of allocative inefficiency decreases in the firm-specificity of workers' human capital. In the model presented hereby, however, the inefficiency does not require informational asymmetries across firms, as it stems from the impossibility of designing enforceable talent-contingent contracts.

5 Partnership

Consider now the case in which the owner organizes the firm as an equity partnership, deriving the optimal partnership contract offered to the prospective partner at $t = 1$, task allocation in this organizational framework at $t = 2$, and the partner choice on whether to stay with the current firm or leave for a competitor at $t = 3$.

5.1 Poaching and Retention

After task allocation, at $t = 3$, competing firms try to poach the partner. If the latter accepts the poaching offer, she earns w_p^p and the value of her equity stake that she sells on a competitive financial market. If the partner decides to stay in the partnership, she earns the dividend $s\pi^p$. Hence, if the firm's owner wishes the partnership to be "stable" (i.e., not to be broken after task assignment due to the partner's poaching and in which the production process is completed), she needs to make sure that the following *interim participation constraint* (IPC) holds:

$$s\pi^p \geq w_p^p + p_e. \tag{IPC}$$

Namely, the dividend the partner earns by remaining with the firm should be at least equal to the sum of the poaching wage offered by a competing firm and the price of her equity stake sold on a competitive financial market.

5.2 Task Allocation

If the worker accepts the role of partner, she chooses her task. In this case, two scenarios may happen: the partner may or may not be retained at the subsequent stage of the game.

Lemma 2 (Task Allocation in Partnership)**.** *The partner chooses:*

- *task A if $y \geq x$ and task B otherwise, if the partnership contract fulfills the interim participation constraint;*
- *task A if $y \geq y' \equiv \frac{\theta_B x}{\theta_A}$ and task B otherwise, if the partnership contract does not fulfill the interim participation constraint;*

This lemma describes the optimal task allocation in a partnership for any possible partnership contract the firm's owner may offer. If the partner's dividend in the current firm exceeds her outside option after acquiring human capital, she will choose the task efficiently. If she expects to leave the firm in the subsequent stage of the game, she aims to maximize her outside productivity instead of her productivity in the firm. Since task A yields more portable human capital than task B, the partner is incentivized to choose the former inefficiently, even though task B would better

suit her talent. She does so by setting the minimum level of talent to choose task A below the efficient threshold.

5.3 Partnership Contracts

If the owner wishes to organize the firm as an equity partnership, she offers the worker the contract $\{\phi, s\}$. If the worker accepts to become a partner, she must pay the equity fee ϕ, which should be designed accordingly. To this end, the optimal equity price must fulfill the following *willingness-to-pay* (WTP) condition:

$$\phi \leq s\pi^p - w_r^c. \tag{WTP}$$

The above condition states that the worker should be willing to buy equity to become a partner in the firm if the price of such equity does not exceed the difference between the dividend she will earn after the production process in the partnership and the retention wage she would earn as a salaried worker in a corporation (namely, the payoff she would receive by rejecting the partnership contract).

Then, if the firm's owner is willing to organize the firm as a stable partnership, she chooses a pair $\{\phi, s\}$ to maximize her objective function

$$\phi + (1 - s)(\pi^p + \beta) \tag{1}$$

subject to the (WTP) and the (IPC) constraints.

Proposition 2 (Optimal partnership contracts)**.** *If the owner wants to organize the firm as an equity partnership, she proposes the following schedule:*

- *if the worker has talent $y < x$, she offers $\{\phi^*, s^*\} = \{0, \theta_B\}$;*
- *if the worker has talent $y \in [x, \hat{y})$, she offers $\{\phi^*, s^*\} = \{\theta_A y - \theta_B x, \theta_A\}$;*
- *if the worker has talent $y \geq \hat{y}$, she offers $\{\phi^*, s^*\} = \{0, \theta_A\}$.*

  Such contracts are designed to encourage workers to become partners and stay with the current firm after task allocation.

This contractual scheme fulfills the (WTP) and (IPC) constraints. Hence, the firm's owner is better off incentivizing the partner to stay and conclude the production process. This also affects task allocation in a partnership.

Corollary 1. *A firm organized as a stable partnership allocates talent efficiently.*

If the worker has talent $y \in [x, \hat{y})$ task assignment is efficient, and this generates more surplus with respect to the case in which the firm is a corporation. Such surplus accrues to the owner through the price of equity ϕ, which is then positive. Differently, task allocation does not vary with the organizational design if the worker's talent is such that $y \notin [x, \hat{y})$. Hence, the equity price is zero, as there is no surplus gain. Otherwise, the worker would not accept the partnership contract offer and would rather remain a salaried worker in the firm organized as a corporation.

6 Optimal Organizational Design

The owner chooses the firm's organizational design at $t = 1$. She compares her payoff in a corporation and in a stable equity partnership to do so.

Proposition 3 (Optimal organizational design)**.** *The owner organizes the firm as an equity partnership if the worker has talent $y \in [x + \theta_A\beta, \hat{y})$; otherwise, she prefers organizing the firm as a corporation.*

Intuitively, the firm's owner does not find it profitable to partner with a worker who would be efficiently matched with a task in a corporation. By doing so, she would lose private benefits from control without gaining additional surplus. Instead, the owner optimally organizes a partnership with a worker who would be assigned to task B inefficiently in a corporation and will instead work on task A when becoming a partner. Indeed, note that as the private benefits of control converge to zero, task allocation converges to the fully efficient rule.

Corollary 2. *The threshold $x+\theta_A\beta \leq \hat{y}$ if and only if $\beta \leq \bar{\beta} \equiv \frac{(\theta_A-\theta_B)x}{\theta_A(1-\theta_A)}$ with $\frac{\partial\bar{\beta}}{\partial\theta_A} > 0$, $\frac{\partial\bar{\beta}}{\partial x} > 0$, and $\frac{\partial\bar{\beta}}{\partial\theta_B} < 0$.*

This corollary specifies that the firm's owner is willing to partner with a worker with talent $y \in [x + \theta_A\beta, \hat{y}]$ if the private benefit of control she earns is not too

significant. Indeed, β represents the cost of giving up some control rights to the partner, which entails some restrictions in running the firm as the owner sees fit. Notice that this indirectly affects productive efficiency insofar as for sufficiently large private benefits of control, the owner may not be incentivized to offer a partnership contract to the worker, thus impairing efficient task assignment. Therefore, the model predicts that in economies where the firm's owner can extract more private benefits of control from sole ownership, there will be fewer partnerships and, thus, less efficient talent allocation. La Porta et al. (1999) and Dyck and Zingales (2004) show that the value of private benefits of control an owner can extract varies significantly across countries. More specifically, these works highlight the relevance of institutional factors in shaping the amount of private benefits that can be extracted (which negatively correlates with factors such as the development of the legal system and the protection of shareholders). In this respect, the model presented hereby describes how the quality of legal institutions and corporate governance standards may affect firms' organizational design and task assignment. Pagano and Picariello (2024) show that by limiting the extraction of private benefits of control, corporate governance standards induce firms to appoint better managers. This result could be interpreted as a more efficient use of talent within firms. Instead, this paper shows that better corporate governance standards should induce the owner to organize the firm as a partnership, thereby improving talent allocation and development. Furthermore, the private benefits of control are usually significant in family firms (as empirically shown by Lemos and Scur, 2019), and owners may be willing to forgo efficient strategies to benefit family members. In the model hereby presented, private benefits of control are negatively correlated with productivity but through a different channel, as the firm would be less willing to organize the firm as a partnership, which would induce more efficient productivity than a corporation. Thus, in this respect, the model also predicts that family businesses are more likely to be organized as corporations rather than partnerships and, more generally, at the very least, if making partner a family member were to preserve the owner's private benefits of control, non-family members would be kept as salaried employees.

Importantly, the cutoff $\bar{\beta}$ is increasing with θ_A and x and decreasing with θ_B. In fact, if the human capital acquired on task A becomes relatively more portable than that on task B, task assignment is more inefficient in a corporation as $\hat{y}$ increases. An increase in x has the same effect so that the surplus the firm's owner can obtain by organizing the firm as a partnership rather than a corporation increases: if the worker

were highly talented, she could be inefficiently assigned task B in a corporation and by making him a partner, the surplus $\theta_A y - \theta_B x$ that accrues to the owner increases. In other words, if the worker has a better outside option when assigned to task A, on the one hand, task assignment in a corporation is more inefficient, but on the other, the owner has a stronger incentive to make a partnership, which may then improve efficiency. Thus, the model predicts that if there is fierce competition in the labor market or high portability of the skills acquired on a task, firms' owners should be eager to organize their firms as partnerships, even if private benefits of control are not modest.

7 Efficient Task Allocation in Corporations

Corporations assign tasks inefficiently if tasks differ in the talent sensitivity of their output and the portability of the human capital acquired to execute them in a framework with bilateral contract incompleteness. In the baseline model, firms cannot commit to task allocation, and workers cannot commit to staying with their employer after task allocation and human capital accumulation. As an alternative to organizing the firm as a partnership, consider relaxing one incompleteness assumption at a time to demonstrate that when either party can commit to an agreement, efficient task allocation can occur in a corporation.

7.1 Workers' Commitment

Suppose the worker can commit to staying with the incumbent employer after task allocation, possibly because labor contracts feature strong, enforceable non-compete clauses [10] but could still decide to be unemployed, earning a reservation wage $w_0 \geq 0$.

Proposition 4 (Efficiency with worker's commitment)**.** *Task allocation is efficient in a corporation if the employer and the employees can sign labor contracts limiting workers' mobility.*

[10] Non-compete clauses are legal tools prohibiting workers from leaving the employer to work for a competing firm for a certain period of time. These clauses impose diverse constraints and are heterogeneously enforced. In the United States, for instance, some states, such as Massachusetts, enforce these clauses very strictly, whereas others, like California, do not.

Intuitively, in this framework, the firm's owner pays the worker a fixed wage independent of the assigned task. Thus, the firm considers only employees' marginal productivity while allocating tasks, leading to an efficient outcome. The cutoff talent for allocating task A is $y^* = x$, which maximizes the social welfare.

Workers' commitment not to leave the incumbent employer is greater if competition in the labor market is less severe. Specifically, this may happen if labor contracts embed strictly enforced non-compete clauses. In the extreme case in which there is no competition for workers after task assignment, corporations assign tasks as efficiently as partnerships. The model accordingly predicts that more firms should be organized as partnerships in industries where competition for workers is fierce. To test this result, one could use the fact that non-compete clauses are heterogeneously enforced. In the United States, for instance, the strictness of enforcement has varied over the years in some states, as detailed by Marx et al. (2009) and Bishara (2011).

7.2 Firms' Commitment

To analyze this case, slightly modify the baseline model: (i) add a stage in the timeline before $t = 1$ denoted $t = 0$ in which the firm needs to hire the worker from a competitive labor market by offering a wage w_1; (ii) at $t = 0$ the worker's talent is unknown to everyone in the economy and becomes publicly observed only at $t = 1$ after the worker undergoes a probation period in the firm that hires her; (iii) worker's talent is verifiable, so the employer can credibly commit to task allocations contingent on talent at the hiring stage. The following proposition describes the optimal task assignment in this scenario.

Proposition 5 (Efficiency with firm's commitment)**.** *If the worker's talent is verifiable, the employer optimally commits to the efficient task assignment rule.*

Intuitively, when bidding competitively to hire the worker, the firm can attract her by offering the highest total expected surplus possible as a lifetime wage. Efficient task allocation allows such an offer, so firms deviating from this contract would not attract the workers and would be inactive. Since the contract, including task allocation, is enforceable, the firm cannot violate it at the task allocation stage. This result yields an interesting empirical prediction: firms providing more talent-sensitive services should be organized as partnerships, while those providing more

routine services should be organized as corporations, since talent is, by definition, difficult to verify.

This result parallels that of Levin and Tadelis (2005), namely that if the quality of service is hard to evaluate, then firms operating in that sector are more likely to be organized as partnerships.[11] Though similar, the result in this paper is driven by a different mechanism: competition in the labor market. To distinguish this prediction from that of Levin and Tadelis (2005) empirically, one should expect to observe the verifiability of workers' output to be associated with partnerships only in competitive labor markets and in economies where firm owners' extraction of private benefits of control is constrained by institutional or contractual devices. Hence, more complete labor contracts, increase the efficiency of task assignment within corporations. This could imply more efficiency in corporations than in partnerships, more so if firm owners can extract large private benefits of control, which may limit efficiency even in partnerships.

Another device through which corporations may attain efficient task allocation is the possibility of committing to a sufficiently sizable minimum wage.

Proposition 6 (Efficiency with a minimum wage)**.** *Task allocation is efficient if the firm can commit to a minimum wage* $\underline{w} \geq \theta_A x > \theta_B x$.

Implementing such a minimum wage policy would reduce the firm's profit as it would overpay the worker assigned to task B, who would earn more than her productivity outside the current firm. If a firm owner could choose to implement such a minimum wage, she would not do so, or at least she would not set it so high. Hence, a social planner should determine and impose a minimum wage. However, it is uncommon to observe minimum wages imposed in professional service industries. Usually, these policies aim to provide sufficient remuneration for unskilled workers, while workers in professional services tend to be among the top earners in the wage distribution.

[11] Levin and Tadelis (2005) provide several examples, using data from the 1997 US Economic Census. One is the legal profession, in which about 48% of companies employing attorneys who perform more talent-sensitive tasks are organized as partnerships, compared with only 6% of other legal and paralegal service firms, which employ legal practitioners primarily engaged in routine services such as title handling. Another example is accounting, comprising both tax preparation firms, delivering more automated (software-based) services and financial accounting CPA firms, providing more talent-sensitive services; 67% of tax preparation work was done by corporations, 61% of financial accounting work by partnerships.

Another possible scenario in which a corporation could attain efficient task allocation replicates the features of an equity partnership: the worker receives a compensation package composed of a base wage and a share of profit, and she is given autonomy in choosing the task to perform. Before task allocation, let the firm's owner choose whether to remunerate the worker with a wage $w_0 \in \mathbb{R}$ and a share of the profit generated by the firm $s \in [0, 1]$, or keep choosing task allocation and offering retention wages when the worker receives a poaching offer..

Proposition 7 (Efficiency with share compensation and delegation)**.** *If the firm fully delegates the decision on task allocation to the worker with ability $y \in [x, \hat{y})$ and offers a base wage*

$$w_0 = \frac{\theta_A(1-\theta_A)\beta - (\theta_A - \theta_B)x}{1-\theta_A} < 0, \;\; \forall \beta \leq \frac{(\theta_A - \theta_B)x}{(1-\theta_A)\theta_A} \equiv \bar{\beta},$$

before task assignment and a share of profit $s = \theta_A$ at the end of the production process, task assignment is as efficient as in a partnership.

If the owner fully delegates task choice to the worker and pays a negative base wage and a dividend, a corporation can attain efficient task allocation. However, the timing of payments matters, as if both w_0 and s were paid after production, the firm's owner's choice on whether to offer such a contract would not depend on w_0. It would be as inefficient as when she provides retention wages in response to poaching offers. Hence, w_0 must be paid before the task assignment occurs. Such a scenario requires several assumptions to hold together. First, if a partnership would be more efficient than a corporation (i.e., if $\beta \leq \bar{\beta}$), then the firm should pay the worker a negative wage w_0 upfront in order to obtain at least the same efficiency as in a partnership while organizing the firm as a corporation. This would violate the limited liability that usually holds for salaried workers but not partners. Such a schedule is tantamount to asking the worker to buy the equity, which yields her the dividends she gets at the end of the production process. However, when firms offer equity as part of compensation packages, workers do not necessarily pay for it (unlike in equity partnerships, where prospective partners are asked to contribute to the firm's capital-buying equity). Henceforth, the worker needs to compensate the employer for the more portable human capital she acquires with efficient task allocation compared to inefficient task allocation. Such a situation is equivalent to one in which workers pay for their training. According to Becker (1964), workers should pay for portable

training, whereas firms should be charged for specific training. However, Acemoglu And Pischke (1998) and (1999) show that workers should pay for portable training only if they operate in a competitive labor market. However, when frictions may generate a wage compression between skilled and unskilled workers, the firm should pay for such training (this is the case, for instance, of German firms paying for their employees' apprenticeship programs). The baseline model in this paper assumes perfect competition among potential poachers, yet the employee acquires partially portable skills while working for the incumbent employer firm, so depending on the ranking of the portability rates of the human capital acquired for the two tasks, wages may be more or less compressed. Determining who should optimally pay for the worker's skill acquisition process would not be immediate.

Finally, the owner's commitment to fully delegate task choice to the worker is crucial. Otherwise, the owner would be incentivized to hold the worker up, collecting the negative base wage and allocating the worker inefficiently to maximize her payoff. Hence, this solution would also require the owner to be willing to delegate task allocation (this may not be the case if, for example, she were to lose private benefits of control by doing so). Such commitment is needed since standard equity used to compensate workers may not necessarily deliver control rights, and in many cases, firms compensate workers with non-voting equity shares.

All in all, a scheme in which workers compensate the firm for their training in exchange for more efficient task assignment could be implemented in a corporation; however, if the firm owner cannot commit to task assignment or to fully delegating it to the worker, she will have the incentive to renege this agreement and to implement the profit-maximizing task allocation. Differently, organizing the firm as a partnership would entail efficient task assignment without any commitment on the worker's or firm's side and without the intervention of a social planner.

8 Frictions in Partnership Design

Let us now consider some factors that may possibly impair the feasibility of an equity partnership. To deliver clear predictions on the impact on efficiency in task assignment of possible frictions in the organizational design process, let us focus on the case where the worker has talent $y \in [x, \hat{y}]$, so as to determine the role of frictions on the efficiency of task allocation.

8.1 Wealth Constraints

So far, the worker has been assumed to be able to pay for her equity stakes. But this may not be the case if she is subject to wealth or borrowing constraints. [12]

Let $\omega > 0$ denote the worker's observable wealth at $t = 1$, i.e., when she may receive a partnership contract offer. To focus on the most interesting case, let $\omega \in (0, \theta_A x)$. In this scenario, in drafting partnership contracts, the owner faces the following willingness-to-pay constraint:

$$\phi \leq min\{\omega,\, s\pi^p\} \tag{WTP}$$

and the usual interim participation constraint. The following proposition states the optimal partnership contract offer and the condition under which the owner finds it optimal to organize the firm as a partnership:

Proposition 8 (Organizational design with wealth constraints)**.** *If the worker has wealth* $\omega \in (0,\, (\theta_A - \theta_B)x)$,

1. *if* $\beta < \frac{\omega}{\theta_A}$, *the firm's owner offers a partnership contract* $\{\phi^*, s^*\} = \{\omega, \theta_A\}$ *and organizes the firm as a partnership if the worker has talent*

$$y \geq \hat{y} + \frac{\theta_A \beta - \omega}{1 - \theta_A} \equiv y'. \tag{2}$$

2. *If* $y < y'$ *or* $\beta \geq \frac{\omega}{\theta_A}$, *the owner organizes the firm as a corporation.*

When the worker has a wealth constraint, the owner cannot extract all the surplus generated by efficient task allocation, as the maximum price of equity is ω, which leaves some rents to the partner. As a consequence, the firm's owner finds it unprofitable to make a worker with talent below the cutoff y' partner, as the extra value generated by efficient task allocation cannot compensate for the discounted equity price at which the owner sells. Hence, in the presence of wealth constraints, task allocation is as inefficient as in a corporation if the private benefits of control are large or if the worker's wealth is low.

[12] Even allowing for borrowing, the worker's willingness to invest in the partnership may be constrained by time preferences.

The modified model predicts that wealth-constrained workers should not become partners unless they are exceptionally talented. In contrast, wealthier workers should have steeper career paths than equally talented but less wealthy ones. This is particularly relevant in economies with severe wealth inequality: poorer workers may not become partners and so waste their talent in inefficiently assigned tasks. Conversely, wealthier (or less credit-constrained) workers do become partners, thus earning even more and widening the wedge between their wealth and that of those who cannot become partners. This inefficiency would be mitigated in the presence of arrangements to promote credit access for young workers so as to allow them to buy equity shares in partnerships.[13]

Finally, in a framework in which workers decide how much effort to exert at the training stage, in the presence of wealth constraints, the objective of becoming partners may provide young workers with incentives to work hard so as to accumulate enough wealth to purchase their partnership stake. Such a mechanism may explain why young non-partners often work overtime in professional services.

8.2 Heterogeneous Firms

In the baseline model, all firms produce using the same technology. Yet firms may adopt heterogeneous productive technologies or strategies affecting their profitability.[14] To account for productive heterogeneity, change two assumptions of the baseline model: (i) assume a duopoly in the labor market at $t = 3$, with firms indexed $f = \{1, 2\}$; (ii) assume one firm uses talent in a more productive way than the other, say because its technology fits workers' talent better or because its scale is larger and thus it has a larger network of clients so that such firm can generate greater profits for given talent. Specifically, let workers assigned to task A in firm 1 produce αy, while those assigned to the same task in firm 2 produce y. Let $\alpha \leq 1$, so that a worker allocated to task A in firm 2 generates a greater revenue than she would in firm 1. This heterogeneity affects the worker's outside option at $t = 3$, and the incumbent

[13]Becker (1964) makes a similar argument in discussing the impossibility of credit-constrained workers to pay for their on-the-job training.

[14]Firms' profitability is affected not just by productive technologies but also by such features as the size of the pool of clients, corporate culture, and management practices, as shown by Bloom and Van Reenen (2007).

employer may need to pay too much to retain her. In this framework, the following results hold:

Proposition 9. *If firms differ in productivity, and the human capital needed to execute task A is sufficiently portable, i.e., $\theta_A \geq \alpha$, the less productive firm cannot be organized as a partnership.*

Intuitively, since a worker dealing with task A produces more in firm 2, firm 1 faces high retention wages. Suppose the human capital necessary to execute task A is sufficiently portable compared to the marginal productivity of talent in firm 1 (i.e., $\theta_A \geq \alpha$). In that case, this cannot be organized as a stable partnership. Not only is the competing firm more productive, but the amount of human capital the partner carries along upon departure is so large that she cannot be retained even if offered the whole profit – partnership thus becomes unfeasible (i.e., it would require $s^* > 1$).

This extension predicts that only the most productive (or the larger) firms may be organized as partnerships, as only they can produce profits high enough to retain partners. Instead, the least productive (or smaller) should be organized as corporations and allocate tasks inefficiently across workers if competitive pressure is fierce due to high asset portability. This outcome, in turn, increases the performance differential between partnerships and corporations, as the most productive firms, being organized as equity partnerships, also have more efficient task allocation and thus develop their employees' skills more efficiently.

8.3 Risk Aversion

Another friction that can play against partnerships is workers' risk aversion. While partners share in the firm's profits and losses, non-partner employees usually have limited liability, earning a fixed wage irrespective of the firm's performance. To model this further friction in the formation of partnerships, consider a setting in which the firm's profit is uncertain, for instance due to demand volatility. Two states of the

world are possible. In one, the firm generates the usual profit, in the other no profit:[15]

$$\pi^p = \begin{cases} y & \text{with probability } p \in (0,1), \\ 0 & \text{otherwise .} \end{cases}$$

The employee has utility over earnings $u(w)$, with $u' > 0, u'' < 0$ and $u(0) = 0$, so that she is risk averse. When drafting partnership contracts, the firm's owner maximizes the objective function

$$\phi + (1 - s)(py + \beta), \tag{3}$$

subject to the willingness-to-pay constraint

$$\phi \leq pu(sy) \tag{WTP}$$

and the interim participation constraint

$$pu(sy) \geq u(\theta_A y). \tag{IPC}$$

Note that after task assignment and human capital accumulation, the partner has a safe outside option of leaving for a competing firm organized as a corporation and earning a certain wage $\theta_A y$. In order to retain the partner, therefore, dividends in the two states of the world should be such that the utility from their certainty equivalent is at least equal to the utility obtained from this outside option. This implies that it is necessary to offer $s^* > \theta$ and that the probability of producing a positive profit p is sufficiently high. Both p and s should be greater the more risk-averse the prospective partner is. However, the partnership is feasible if each partner's share of profit is $s \leq 1$, while the optimal share s^* satisfying the interim participation constraint of a sufficiently risk-averse worker may exceed 1: the more risk-averse the worker is, the larger is the share s^* required for retention at the interim stage, and the more likely it is that such share exceeds 1, thus impairing the feasibility of a stable partnership.

Differently, if the firm is organized as a *limited liability partnership* (LLP), so that partners are insured against the risk of receiving no dividend, the interim participa-

[15] In this simplified framework, the company does not suffer losses, but in the real world partnerships' losses are generally borne by all partners. Allowing for negative profits would not change the qualitative results.

tion constraint is

$$u(spy) \geq u(\theta_A y). \tag{4}$$

In this scenario, the partner earns a fixed, positive amount irrespective of profit, and by the concavity of the worker's utility function, the amount of profit needed to retain a partner, denoted by s^{**}, is smaller than that granted without insurance. Hence, ceteris paribus, organizing the firm as a limited liability partnership favors stability and is therefore feasible even in scenarios where regular partnerships would not be. As an example, suppose that in order to retain the partner at the interim stage in a regular partnership, it is necessary to offer a share of profit s^* slightly greater than 1. In this case, the stable partnership is not feasible; insuring the partner against profit volatility would drive this share up to $s^{**} < 1 < s^*$, so the limited liability partnership is feasible but that with unlimited liability is not.

However, if workers are sufficiently risk averse or if the probability p of earning a positive profit is too low, even a limited liability partnership becomes unfeasible (i.e., $1 < s^{**} < s^*$). In this case, the only possible organizational form is the corporation.

This yields an empirical prediction concerning not only the distribution of partnerships across and within industries but also risk-sharing within partnerships: more firms should adopt the limited-liability partnership form (or pay fixed dividends, regardless of profit) in industries where profits are more volatile or when the workforce is more risk-averse. Even at the hiring stage, more risk-averse workers may prefer limited-liability partnerships, which would offer more stable career profiles: organizational form may thus affect workers' selection across industries and organizations.

8.4 Asymmetric Information

Let the workers' talent be observable only within the current firm but not by competing external firms. Outside firms cannot observe the worker's talent with probability $\rho \in [0, 1]$, and in this case, they only know its distribution: $y \sim U[0, \bar{y}]$. With probability $1 - \rho$, instead, competing firms can perfectly observe the worker's talent (as in the baseline model) so that ρ denotes the degree of informational asymmetry across firms. In this scenario, competitors observe task allocation and form a belief about the worker's talent, similar to the setup in Waldman (1984) and Dato et al. (2021). Asymmetric information about the worker's talent also affects task assignment in a corporation. Specifically, labor market competition and asymmetric

information imply that if the worker is allocated to task B, her outside option is constant and independent of talent. In contrast, if the worker is assigned to task A, her outside option depends on the talent and the degree of asymmetric information in the economy.

Lemma 3. *If the firm is organized as a corporation, the profit-maximizing allocation rule is such that a worker is assigned task A if*

$$y \geq \frac{2(1-\theta_B)x + \theta_A \rho \bar{y}}{2(1-\theta_A) + \theta_A \rho} \equiv \hat{y}$$

and task B otherwise.

Asymmetric information worsens the inefficiency in task allocation ceteris paribus. Indeed, the cutoff $\hat{y}$ is increasing with ρ. Intuitively, this happens because

To focus on the impact of asymmetric information on optimal organizational design and efficiency, let $y \in [x, \hat{y}]$.[16] In this case, task assignment is efficient as in the baseline model, and therefore, the firm's owner maximizes the usual objective function subject to the *willingness-to-pay* constraint

$$\phi \leq sy - \theta_B x, \tag{WTP}$$

and to the *interim participation constraint*

$$sy \geq \theta_A \left[\rho \left(\frac{x + \bar{y}}{2} \right) + (1-\rho) y \right] + p^e.$$

The solution to this problem is a contract offer to define a stable partnership, allowing to determine the equilibrium organizational design

Proposition 10. *If there is asymmetric information about the worker's talent across firms, the firm's owner offers a partnership contract*

$$\{\phi^*, s^*\} = \left\{ \theta_A \left[\rho \left(\frac{x + \bar{y}}{2} \right) + (1-\rho) y \right] - \theta_B x \ , \ \frac{\theta_A}{y} \left[\rho \left(\frac{x + \bar{y}}{2} \right) + (1-\rho) y \right] \right\}.$$

[16] This is without loss of generality as also considering partners with ability $y \notin [x, \hat{y})$ does not change the results of this version of the model compared against the baseline version with symmetric information. Namely, the owner would only make a partnership if the worker has talent $y \in [x, \hat{y})$.

The firm's owner organizes the firm as a partnership if the worker has talent

$$y \geq \frac{x + \theta_A\beta(1-\rho) + \sqrt{[x + \theta_A\beta(1-\rho)]^2 + 4\theta_A\beta\rho\left(\frac{x+\bar{y}}{2}\right)}}{2} \equiv y', \tag{5}$$

with $y' \leq \hat{y}$ *if* $\beta < \bar{\beta} \equiv \frac{(\hat{y}+x)\hat{y}}{\rho\left(\frac{x+\bar{y}}{2}\right)+(1-\rho)\hat{y}}$.

This proposition determines the optimal cutoff on the worker's talent so that the owner will be willing to offer her a partnership contract. As in the baseline model, the owner is willing to organize the firm as an equity partnership, making task allocation efficient if the private benefits of control she obtains from running the firm are not too large. Qualitatively, this resembles the result obtained in Proposition 3. However, the degree of asymmetric information too determines the owner's incentive to organize the firm as an equity partnership and, thereby, productive efficiency.

Corollary 3. *More asymmetric information induces the owner to increase the worker's minimum talent for which she offers a partnership contract if* $(\frac{x+\bar{y}}{2}) \geq x + \theta_A\beta$; *otherwise, asymmetric information induces the owner to lower the talent required for the worker to receive a partnership contract offer.*

Intuitively, when information about the partner's talent is more severely asymmetric (i.e., when ρ is large), poaching offers are closer to the partner's expected talent than the actual one. In this scenario, potential poachers expect task allocation to be efficient in a partnership; henceforth, their expectation is based on the efficient threshold rule for the assignment of task A ($y \geq x$). At the same time, the firm's owner wishes to extract the largest possible rent from the partner; for this reason, she compares the talent threshold value used in the case of perfect information ($x + \theta_A\beta$) against the partner's expected ability in the labor market. If $\frac{x+\bar{y}}{2} > x + \theta_A\beta$ the partner would be increasingly "overpaid" as ρ increases. Hence, compared to the rent produced in a corporation, the productive benefit from making this worker partner would be low compared to the implied retention costs. Hence, the owner has an incentive to increase the cutoff above its value with perfect information to improve the rent extraction in a partnership. If, instead, the cutoff $x + \theta_A\beta$ is greater than the partner's expected talent, the owner sets y' below the cutoff value with perfect information, and increasingly so as ρ increases, since she "underpays" the partner and extracts an increasing rent as information becomes more severely asymmetric while improving productivity due to efficient task assignment.

9 Robustness and Extensions

Let us now consider two extensions of the baseline model to analyze the robustness of its predictions concerning the optimal organizational design: (i) we consider a scenario with 2 workers in the firm; (ii) let the partner add a benefit proportional to her talent to the firm's profit.

9.1 Two Workers

To study whether having more than one worker has an impact on the efficiency of task allocation in a partnership, as well as on contract design, consider the case in which the firm employs 2 workers with talent $y_i \in [x, \hat{y}]$, and with $y_1 < y_2$.[17] Importantly, with two workers, the firm's owner can offer different partnership contracts: ϕ and s may be designed to be either task-contingent or talent-based, task being verifiable, differently from one's talent. This strategic choice is irrelevant in a framework with one worker as the firm's owner would be indifferent between these two types of contracts (which would be equal). Hence, to focus on the most interesting results, consider the case where the owner is willing to organize a stable partnership, i.e., one in which all partners are retained. Since upon one partner's departure, the firm may still produce a positive output, in this scenario, the value of the equity a departing partner sells on the financial market is not zero; let there be some frictions in the financial market (e.g., transaction costs, discounting, or heterogeneous bargaining power between sellers and buyers) so that the partner who leaves the current firm loses a share $\tau \in [0, 1]$ of the value of the equity sold. If the firm is organized as a corporation, the model yields the same results as in the case with one worker, so that the workers analyzed hereby are inefficiently assigned to task B, and the firm's owner earns a payoff

$$2(1 - \theta_B)x + \beta.$$

[17] All the results presented in the baseline version of the model for workers with $y \notin [x, \hat{y})$ hold for this setup, too. Hence, let us restrict our attention to the talents for which workers would be assigned inefficiently to task B in a corporation to analyze the most interesting results. Moreover, all the qualitative results presented in this section hold even increasing the number of workers in the firm.

Consider now the case in which the firm's owner organizes the firm as a stable equity partnership.[18] When designing partnership contracts, the owner can choose whether to make them contingent on the partner's chosen task or talent. The main difference between these two contracts is that if they are task-dependent, ϕ and s are the same for all partners working on the same task, whereas with talent-based contracts, these differ across heterogeneous workers. In the latter case, let $s_i = s(y_i)$ and $\phi_i = \phi(y_i)$.

Proposition 11 (Optimal partnership contracts with two workers)**.** *The firm's owner optimally offers talent-contingent partnership contracts*

$$\{\phi_i^* \, , \, s_i^*\} = \left\{ \frac{\theta_A y_i \sum_{k=1}^{2} y_k}{y_i + \tau y_j} \, , \, \frac{\theta_A y_i}{y_i + \tau y_j} \right\}$$

if $\theta_A \leq \frac{(1+\tau^2)y_1y_2+\tau(y_1^2+y_2^2)}{2y_1y_2+\tau(y_1^2+y_2^2)}$*, otherwise the partnership is not feasible.*

If feasible, the firm is organized as an equity partnership if

$$\sum_{i=1}^{2} y_i - 2x \geq \theta_A \beta \sum_{i=1}^{2} \left(\frac{y_i}{y_i + \tau y_j} \right).$$

The above proposition shows that with two prospective partners, the firm's owner may not manage to retain them both if θ_A is sufficiently large compared to their productivity. Specifically, larger portability implies better outside options for partners who thus require larger profit shares for the retention scope. However, suppose the sum of the shares needed to retain partners exceeds the firm's total profit. In that case, it may be impossible to organize the firm as a partnership (as then the owner should pay out of her pocket the residual amount exceeding the firm's profit). However, when designing the firm as an equity partnership is a viable option, the owner always prefers offering talent-based contracts rather than task-based ones. The rationale is that with task-based contracts, she should provide the same contract to every partner, and if she aims at retaining all of them, she should tailor the contract to retain the most productive one. In this scenario, she ends up overpaying the least productive one, thus reducing the rent that the owner can extract, thereby reducing

[18] If the owner were to retain only one of the workers, the results would not change compared to the case with one worker.

her incentive to organize the firm as a partnership. As a result, the firm's owner prefers offering talent-based partnership contracts.

When choosing the optimal organizational design, the firm's owner, as in the baseline model, has a greater incentive to partner with workers if the private benefits of control she extracts from governing the firm are sufficiently low.

Corollary 4. *The equity shares of heterogeneous partners are (i) increasing with their talent, (ii) decreasing with the other partner's talent, (iii) decreasing with financial frictions, (iv) increasing with the portability of skill. (v)Furthermore, financial frictions improve the difference between partners' shares.*

This version of the model delivers some interesting predictions. It is immediate to see that more talented partners are entitled to greater shares of the firm's profit since contracts are talent-contingent. More so if their skills are highly portable, this result is akin to an *eat-what-you-kill* scheme instead of an equal sharing partnership. Indeed, a system in which all partners are entitled to the same share of profit, if viable, would entail greater retention costs and may even fail in attaining the retention scope. Hence, competition in the labor market calls for more talent (or performance)-contingent earnings for partners who can leave their current firm. This leads to the empirical prediction that in industries where talent is scarce, firms compete more fiercely for workers, or where their human capital is more portable, one should observe more significant heterogeneity in partners' shares. Getting back to the examples of more talent-sensitive tasks yielding more portable human capital, it should be the case that partners dealing with tasks involving problem-solving and crucial decisions or whose individual performance is essential in determining the firm's output, should have more shares in the partnership than partners dealing with routine tasks, or whose individual performance is less relevant for profit realization.

Financial frictions τ, too, play a crucial role in determining optimal equity stakes for partners. Specifically, if upon reselling her equity shares, a partner receives their full value (i.e., if $\tau = 0$), her incentive to leave at $t = 3$ is stronger. Therefore, when partner equity is highly liquid, the owner must offer a greater share s_i to retain the partner. However, as friction τ increases, the partner's outside option decreases, and thus, a lower s_i is needed to retain her at the poaching stage. Interestingly, if the friction τ increases, reducing the liquidity of partners' equity, every partner's share in the firm reduces. However, the shares of more talented partners decrease more slowly than those of less talented ones. As a result, financial frictions amplify heterogeneity

in partners' stakes by entitling the most talented ones to greater dividends. Thus, this version of the model predicts that if partners' equity shares are highly illiquid (i.e., τ is large), more talented partners will earn more than the least talented ones, thus amplifying the performance contingency of partnership contracts and earnings. This may be the case if strict *partner buyout agreements* are in place so that a departing partner cannot freely sell her stakes on the financial market but needs to resell them to the firm's owner (or the remaining partners) at a predefined price, which may not necessarily reflect her talent and be highly discounted compared to the competitive one she could raise absent frictions. Thus, when such agreements are in place, one should observe greater variance in heterogeneous partners' equity shares (and dividends). If there are no frictions in the financial market, i.e., $\tau = 0$, the firm is organized as an equal sharing partnership, as all partners are entitled to the same share θ_A of profit, irrespective of their talent. To sum up, financial frictions in the resale process of partners' equity, talent heterogeneity, and competition in the labor market induce partnerships to adopt a performance-contingent sharing rule rather than an equal sharing one. Most existing literature posits equal profit sharing among partners (for instance, Levin and Tadelis, 2005). Here, instead, workers have heterogeneous talent so that the best partners have better outside options (higher returns to talent) than the less productive. Hence, to ensure stability, partners must earn a share of the profit at least proportional to their talent. This is an "eat-what-you-kill "sharing rule, linking each partner's payoff to the revenue or profit produced for the firm.

9.2 Benefits from Partnership

The baseline model provides a rationale for the widespread diffusion of partnerships in industries featuring fierce competition for talent and in which workers can carry portable skills, such as professional services. The framework features bilateral contract incompleteness, which induces the firm's owner to allocate workers inefficiently in a corporation. Organizing the firm as a partnership is then introduced as a possible solution to the misallocation problem. However, since issuing equity to create a partnership is costly and the most (and the least) talented workers would be efficiently assigned a task in a corporation, the model yields the prediction that it is optimal for the firm's owner to make a partnership only with workers with "intermediate" talent (i.e., those with $y \in [x, \hat{y})$). However, in reality, partnership selection standards often

require that the best performers be made partners. For the model to provide this result, one should consider further aspects of the production process in partnerships (which have been abstracted from thus far in order to focus on the solution to the inefficient allocation problem)

One could imagine the worker producing an uncertain positive output with a probability proportional to her effort. Such a view echoes the interpretation provided by Alchian and Demsetz (1972), highlighting that organizing the firm as a partnership may alleviate moral hazard issues due to better internal monitoring.

Another viewpoint, initiated by Hansmann (1996), stresses the importance of collective decision-making in partnerships. One could think of an extension of the baseline model embedding such partners' managerial input in the firm since they acquire control rights, allowing them to make various decisions about the firm.

Let the partner add Δy to the output of the current firm, irrespective of the task she picks, and with $\Delta \geq 0$. Such improvement could represent the savings from resolving a moral hazard issue, which would be more expensive to tackle the more talented the worker is (since more talented workers may produce a positive output even when shirking). Without loss of generality, let Δy be firm-specific so that it is not reflected in poaching offers.[19] To focus on the most interesting results, let (i) $\theta_A + \theta_B \geq 1$ and (ii) $\Delta \geq \frac{\hat{y}-x}{\bar{y}-\hat{y}}$. The first parametric assumption implies intuitively that the issue of portability is sufficiently relevant either because θ_A is sufficiently larger than θ_B or because the two are quite large (θ_A still being larger than θ_B). The second parametric assumption, instead, implies that the benefit from making the most talented workers partners should be at least equal to the benefit of allocating workers efficiently to tasks, which is instrumental to this section in which we aim to describe which conditions are needed to make the best workers partners.

The resolution of the model proceeds as in the baseline model. Suppose the firm is organized as a corporation. In that case, the model yields the same results as those in Section 4, concluding that a corporation inefficiently assigns task A to the worker if her talent is at least equal to $\frac{(1-\theta_B)x}{1-\theta_A}$. The model changes when the firm is a partnership.

[19] Relaxing this assumption would not change the results provided later on the optimal organizational design choice.

Lemma 4. *If the owner wants to organize the firm as an equity partnership, she adopts the following schedule:*

- *if the worker has talent $y < x$, she is offers $\{\phi^*, s^*\} = \{0, \frac{\theta_B x}{x+\Delta y}\}$;*
- *if the worker has talent $y \in [x, \hat{y})$, she is offers $\{\phi^*, s^*\} = \{\theta_A y - \theta_B x, \frac{\theta_A}{1+\Delta}\}$;*
- *if the worker has talent $y \geq \hat{y}$, she is offers $\{\phi^*, s^*\} = \{0, \frac{\theta_A}{1+\Delta}\}$.*

  Such a contract schedule induces the worker to become a partner and is sufficient to retain her.

As in the baseline model, the firm's owner designs partnership contracts to retain the partner in equilibrium. A partnership can assign tasks and produce more efficiently than a corporation. It remains to verify under what conditions the owner is willing to choose such an organizational design instead of the corporation.

Proposition 12. *1. The firm's owner optimally organizes the firm as an equity partnership if*

$$\beta \leq \frac{\Delta(1+\Delta)\bar{y}}{\theta_A}, \tag{6}$$

and as a corporation otherwise.

2. Task allocation in partnership is more efficient than that in a corporation if

$$\beta \leq \frac{[(1+\Delta)(1-\theta_B) - (1-\theta_A)](1+\Delta)x}{\theta_A(1-\theta_A)} < \frac{\Delta(1+\Delta)\bar{y}}{\theta_A}. \tag{7}$$

3. Whenever the firm is a partnership, the owner offers a partnership contract to the worker if she has talent $y \geq \hat{y}$.

Intuitively, the above proposition stresses again the trade-off between productive benefits stemming from organizing the firm as a partnership and the private benefits of control the owner needs to forgo if she shares control rights with a partner. However, differently from the baseline model, introducing a different source of benefits in partnerships, on top of a more efficient task allocation process, yields further empirical predictions. In this new setup, whenever it is optimal to organize the firm as a partnership, the owner is willing to make a partnership offer to a worker with talent $y \geq \hat{y}$ (who would have been efficiently assigned to task A even in a corporation). Hence, the most talented workers would become partners, which is an

empirically relevant result, as the top performers are usually made partners. More so if the private benefits of control that the owner can extract while being the firm's sole owner are small enough. Furthermore, as the private benefits of control reduce, the owner is willing to make a partnership also with workers with talent smaller than $\hat{y}$, thus improving productivity by means of more efficient task allocation. This result echoes that in Proposition 3, stating a negative correlation between private benefits of control and the owner's incentives to create an partnership assigning tasks more efficiently than in a corporation.

10 Conclusions

Retaining skilled workers is important in professional service industries, where firms rely more heavily on workers' human capital. Workers accumulate human capital on the job, and in doing so, they may also benefit competing firms: the more portable human capital they acquire, the more attractive they become in the labor market, and the more productive the economy as a whole is.

In the model presented here, firms produce via tasks differing in the talent-sensitivity of output and in the portability of the human capital that workers accumulate on the job. Labor contracts are bilaterally incomplete: neither can firms commit to task allocation based on non-verifiable talent, nor can employees commit to staying with a firm after acquiring portable human capital. In this framework, a profit-maximizing corporation, to lower retention costs, assigns some workers to tasks on which they accumulate less portable human capital than they would in a partnership. As a result, workers' talent is not developed efficiently.

Partnerships emerge as a more effective organizational form for optimizing task assignment, mainly when labor contracts are bilaterally incomplete and owners derive limited private benefits from control. Specifically, in an equity partnership, prospective partners purchase equity in the firm, acquiring control and payoff rights and implying efficient task assignment. Partners are assigned optimally to the tasks where they are most productive, maximizing dividends. This outcome constitutes a novel explanation for the evidence that many firms adopt the partnership organizational form in professional service industries.

The findings offer a rationale for the widespread presence of partnerships in professional service industries and how their intrinsic features, such as shared control and dividends, enable efficient task assignment without the need for extensive contractual commitments. The paper identifies conditions under which partnerships may falter, including wealth constraints, firm productivity heterogeneity, risk aversion, and asymmetric information. These frictions highlight the practical challenges of implementing partnerships and suggest that alternative mechanisms, such as limited liability partnerships, may mitigate inefficiencies.

Extensions to the baseline model enrich the analysis by exploring scenarios with multiple workers and additional partnership benefits, such as alleviating moral hazard or improving managerial input. These results provide further empirical consistency with observed trends in professional service industries, where productivity-based remuneration schemes and selective partnering with highly talented individuals are common practices.

Future research could empirically validate these findings across industries and firms and examine how evolving labor market dynamics may influence the advantages of partnerships compared to corporations.

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Appendix - Proofs

Proof of Lemma 1

Proof. First, consider the optimal poaching wage w_p^c. If the worker is assigned to task A, she will produce $\theta_A y$ upon leaving the current employer for a competing firm. If a competing firm successfully poaches such worker, its profit will be

$$\theta_A y - w_p^c \tag{8}$$

so that competition á la Bertrand in the labor market implies that a firm offering a poaching wage $w_p^c < \theta_A y$ makes no profit, as it will not attract the worker, since any competitor may bid a wage infinitesimally larger than this and manage to hire the worker. If, instead, the firm were to offer $w_p^c > \theta_A y$, it would make losses. Hence, the optimal poaching offer is $w_p^c = \theta_A y$ when the firm tries to poach a worker assigned to task A in a competing firm.

If the worker is assigned to task B, her output outside the current employer is $\theta_B x$. If a competing firm poaches such worker, it will generate a profit

$$\theta_B x - w_p^c \tag{9}$$

As for the case of a worker assigned to task A, competition á la Bertrand in the labor market implies that the only optimal poaching wage offer for a worker assigned to task B is $w_p^c = \theta_B x$.

Consider now the optimal retention wage offer the incumbent employer proposes to the worker. For any possible task assignment i^c, if the incumbent employer offers $w_r < w_p^c$, she does not retain the worker, and her firm makes zero profit. In order to retain the worker, the incumbent employer must offer $w_r \geq w_p^c$. If the worker is assigned to task A, the firm's owner payoff is

$$y - w_r + \beta; \tag{10}$$

if the worker is assigned to task B, the owner's payoff is

$$x - w_r + \beta; \tag{11}$$

Note that in both cases, the profit is linearly decreasing with retention wages. Hence, it is optimal for the incumbent employer to offer the minimum wage needed to retain the worker. Namely, the optimal retention wage offers are

$$w_r = \theta_A y \tag{12}$$

if the worker is assigned to task A, and

$$w_r = \theta_B x \tag{13}$$

if the worker is assigned to task B, recalling that whenever the worker is indifferent between poaching and retention offers, she stays with the incumbent employer.

■

Proof of Proposition 1

Proof. The corporation profit from assigning the worker to task A is given by

$$\pi^c = y - \theta_A y + \beta \tag{14}$$

whereas, when assigning the worker to task B is

$$\pi^c = x - \theta_B x + \beta. \tag{15}$$

Comparing (14) and (15), it is immediate to see that the employer finds it more profitable to assign the worker to task A if

$$y \geq \frac{(1-\theta_B)x}{1-\theta_A} \equiv \hat{y} \tag{16}$$

which is greater than x since $\theta_A > \theta_B$. ■

Proof of Lemma 2

Proof. First, consider the case in which the partner is retained in equilibrium. In this scenario, after having paid the equity price, the partner chooses a task to maximize

her dividend, which is sy if she works on task A and sx otherwise. It is immediate to see that the partner chooses task A if her talent is $y \geq x$. Namely, task assignment is efficient.

If, instead, the partner is not retained in equilibrium, if she chooses task A, her payoff is $\theta_A y + p_e$; if she chooses task B, her payoff is $\theta_B x + p_e$. Notice that the price of equity p_e reflects the value of the dividend it would yield when the worker leaves the firm, but in that scenario, the firm generates zero profits and $p_e = 0$. Hence, the partner chooses task A if $y \geq \frac{\theta_B x}{\theta_A}$ which is smaller than x.

■

Proof of Proposition 2

First, consider the owner's problem when designing partnership contracts inducing a stable partnership, i.e., such that the (IPC) is satisfied.

1. Let $y < x$. In this case, the profit of the partnership is $\pi^p = x$ and the owner's problem is

$$\underset{\{\phi,s\}}{max}\ \phi + (1-s)(x+\beta)$$

subject to:

$$\phi \leq sx - \theta_B x, \tag{WTP}$$

$$sx \geq \theta_B x + p_e. \tag{IPC}$$

Recall that if the partner leaves the firm, this generates $\pi^p = 0$ hence, $p_e = 0$. Let λ be the Lagrange multiplier associated with the WTP constraints and μ the one associated with the IPC. The Lagrangian function for this problem is thus

$$\mathcal{L} = \phi + (1-s)(x+\beta) - \lambda(\phi - sx + \theta_B x) + \mu(sx - \theta_B x).$$

The Kuhn-Tucker conditions for this maximization program yield:

$$\lambda = 1 \Rightarrow \phi = (s - \theta_B)x$$

and

$$\mu = \frac{\beta}{x} > 0 \Rightarrow s = \theta_B.$$

So, the optimal contract is $\{\phi^*, s^*\} = \{0, \theta_B\}$ and the owner's payoff in this scenario is

$$(1 - \theta_B)(x + \beta) \tag{17}$$

2. Let $y \in [x, \hat{y})$. The partner chooses task A. Hence the partnership makes profit $\pi^p = y$, and the owner's problem is

$$\underset{\{\phi,s\}}{max}\ \phi + (1 - s)(y + \beta)$$

subject to:

$$\phi \leq sy - \theta_B x, \tag{WTP}$$

$$sy \geq \theta_A y + p_e. \tag{IPC}$$

Again, $p_e = 0$ and the The Kuhn-Tucker conditions for this maximization program yield:

$$\lambda = 1 \Rightarrow \phi = sy - \theta_B x$$

and

$$\mu = \frac{\beta}{y} > 0 \Rightarrow s = \theta_A.$$

So, the optimal contract is $\{\phi^*, s^*\} = \{\theta_A y - \theta_B x, \theta_A\}$ and the owner's payoff in this scenario is

$$\theta_A y - \theta_B x + (1 - \theta_A)(y + \beta) \tag{18}$$

3. Let $y \geq \hat{y}$. In this case, the profit of the partnership is $\pi^p = y$ and the owner solves

$$\underset{\{\phi,s\}}{max}\ \phi + (1 - s)(y + \beta)$$

subject to:

$$\phi \leq sy - \theta_A y, \tag{WTP}$$

$$sy \geq \theta_A y + p_e. \tag{IPC}$$

The Kuhn-Tucker conditions for this maximization program yield:

$$\lambda = 1 \Rightarrow \phi = (s - \theta_A)y$$

and

$$\mu = \frac{\beta}{y} > 0 \Rightarrow s = \theta_A.$$

The optimal contract is $\{\phi^*, s^*\} = \{0, \theta_A\}$ and the owner's payoff is

$$(1 - \theta_A)(y + \beta) \tag{19}$$

To determine whether the owner is willing to retain the partner in equilibrium, consider now the optimal partnership contract that does not fulfill the (IPC) for any value of the worker's talent.

(a) Let $y < y' \equiv \frac{\theta_B x}{\theta_A}$. In this scenario, the partner chooses task B, and after the task assignment, she leaves the current firm, thus earning $\theta_B x$. Note that in this scenario, the (IPC) is not fulfilled, namely $sx < \theta_B x$; however, upon the partner's departure, the firm generates zero profits, and since it is inactive, the owner enjoys no private benefit of control, so that the only payoff she gets is ϕ. The worker is willing to pay such a fee to become a partner and choose her task if $\phi \leq \theta_B x - \theta_B x = 0$. It is immediate that the (WTP) constraint binds in equilibrium. Hence, in this case, the owner gets zero payoffs. Since $y' < x$ and (17) is strictly positive, it is immediate to see that if the worker has ability $y < \frac{\theta_B x}{\theta_A}$, the owner optimally designs a partnership contract to retain her.

(b) Let $y \in [y', x)$. In this case, everything works as in the previous case, except that the (WTP) constraint is now

$$\phi \leq \theta_A y - \theta_B x \tag{20}$$

and since the owner's payoff is ϕ, the (WTP) condition is binding, and the owner's payoff is

$$\theta_A y - \theta_B x. \tag{21}$$

Comparing (17) and (21), one can see that the firm's owner optimally designs a partnership contract that fulfills the (IPC) if

$$(1 - \theta_B)(x + \beta) \geq \theta_A y - \theta_B x$$

which is met, as, in the case analyzed, $x > y > \theta_A y$.

(c) Let $y \in [x, \hat{y})$. This case is analogous to the previous one, but now the partner is efficiently assigned to task A, although leaving the current firm. Hence, the firm's owner earns a payoff $\phi = \theta_A y - \theta_B x$. By inspecting (18), one can see that the optimal partnership contract fulfills the (IPC) if $(1 - \theta_A)(y + \beta) \geq 0$ which is certainly met.

(d) Let $y \geq \hat{y}$. In this case, the worker is willing to pay the partnership fee only if $\phi \leq 0$ as her payoff does not improve with respect to the one she would earn in a corporation. Hence, the firm's owner earns a zero payoff, whilst, by retaining the partner, she would earn the payoff in (19), which is strictly positive. As a result, the owner optimally designs partnership contract offers aimed at retaining the partner in equilibrium.

Proof of Proposition 3

Proof. Consider the owner's strategic choice of the organizational design at $t = 1$. She compares the payoff she would get by organizing the firm as a corporation against what she earns in a partnership.

- If the worker has talent $y < x$, the owner organizes the firm as a partnership if

$$(1 - \theta_B)(x + \beta) \geq (1 - \theta_B)x + \beta. \tag{22}$$

  This inequality is trivially never met for any $\beta \geq 0$.

- If the worker has talent $y \in [x, \hat{y})$, the owner organizes the firm as a partnership if

$$\theta_A y - \theta_B x + (1 - \theta_A)(y + \beta) \geq (1 - \theta_B)x + \beta \iff y \geq x + \theta_A \beta.$$

- If the worker has talent $y \geq \hat{y}$, the owner organizes the firm as a partnership if

$$(1 - \theta_A)(y + \beta) \geq (1 - \theta_A)y + \beta,$$

  which is never met for $\beta \geq 0$.

■

Proof of Corollary 2

The firm's owner makes a partnership with a worker with talent $y \in [x, \hat{y})$ if $y \geq x + \theta_A\beta$. However, note that this is feasible only if $x + \theta_A\beta < \hat{y} = \frac{(1-\theta_B)x}{1-\theta_A}$. This inequality holds if $\beta < \frac{(\theta_A-\theta_B)x}{\theta_A(1-\theta_A)} \equiv \bar{\beta}$.

Consider now the impact of θ_A, θ_B, and x on $\bar{\beta}$. The derivative of the cutoff with respect to θ_A is

$$\frac{\partial\bar{\beta}}{\partial\theta_A} = \frac{(\theta_A^2 - 2\theta_B\theta_A + \theta_B)x}{[\theta_A(1-\theta_A)^2]}. \tag{23}$$

This derivative is positive for any possible value of θ_A, as $4\theta_B(\theta_B - 1) < 0$.

The derivative with respect to θ_B is given by

$$\frac{\partial\bar{\beta}}{\partial\theta_B} = -\frac{x}{\theta_A(1-\theta_A)} < 0. \tag{24}$$

Finally, the derivative with respect to x is

$$\frac{\partial\bar{\beta}}{\partial x} = \frac{\theta_A - \theta_B}{\theta_A(1-\theta_A)} > 0. \tag{25}$$

Proof of Proposition 4

Proof. Consider the possibility that employer and employee sign a contract in which the latter can commit not to leave the firm for a competitor after task allocation. However, the worker should still decide whether to work or be unemployed, thus earning a fixed reservation wage $w_0 \geq 0$. In this framework, at $t = 3$, the firm's owner does not need to offer a retention wage against poaching offers but must match the reservation wage regardless of task allocation. Now, by backward induction, the firm's owner allocates the worker to task A if:

$$y - w_0 \geq x - w_0 \Rightarrow y \geq x.$$

Therefore, the employer allocates all workers with talent $y \geq x$ to task A and all the others to task B in a competitive equilibrium with no labor market competition after task allocation. ■

Proof of Proposition 5

Proof. If talent is verifiable, so that task allocation is contractible at $t = 0$, the employer offers long-term contracts

$$\left\{w(y^*)\,,\, w_r^c(y^*)\,,\, (y^*)\right\},$$

where y^* denotes the optimal threshold. Let talent be ex-ante distributed according to $F(y)$, with $\frac{\partial F(y)}{\partial y} = f(y)$. If the firm hires the worker, its ex-ante expected profit is

$$\pi = \int_0^{y^*} x dF(y) + \int_{y^*}^{\bar{y}} y dF(y) - \mathbb{E}(w_2^i).$$

At the hiring stage, the worker's expected lifetime utility is

$$U = w_1 + \mathbb{E}(w_2^i).$$

Since firms bid competitively to hire the worker, they will offer all the surplus they expect to generate (those who do not do so will not manage to attract the worker and will be inactive, producing no revenue):

$$w_1 = \pi \Rightarrow U = \int_{y^*}^{\bar{y}} y dF(y) + F(y^*)x \tag{26}$$

and the first-order condition

$$xf(y^*) - y^* f(y^*) = 0$$

delivers the task allocation that maximizes workers' lifetime expected utility:

$$y^* = x \tag{27}$$

By committing to the efficient task allocation rule the firm can attract a worker at the hiring stage ■

Proof of Proposition 6

Proof. Let the firm commit to paying the worker a minimum wage $\underline{w} \geq \theta_A x > \theta_B x$ after task allocation. Then, at $t = 3$, the worker earns $w = \max\{\underline{w}, w_r, w_p^c\}$. As shown in Lemma 1, in equilibrium $w_r = w_p^c$, which is equal to the worker's productivity ina competing firm.

First, consider a worker with talent $y' < x$. If assigned to task A, such worker will produce $\theta_A y' < \theta_A x$, so that she would earn the minimum wage $\underline{w}$ as a remuneration. It is immediate that if the worker has talent $y' < x$, she will earn $\underline{w}$ irrespective of the task she is assigned to and will be assigned to task B as it is the task where she is more productive.

Consider then the case of a worker with ability $y' \geq x$. If her talent is such that $\theta_A y' \in [\theta_A x, \underline{w}]$, she earns the minimum wage irrespective of task assignment. As a result, this worker is assigned to task A. If instead y' is such that $\theta_A y' > \underline{w}$ she earns $\underline{w}$ upon being assigned task B and $w_r = \theta_A y'$ otherwise; hence, such worker is assigned to task A if

$$(1 - \theta_A)y' \geq x - \underline{w} \iff y' \geq \frac{x - \underline{w}}{(1 - \theta_A)} \tag{28}$$

Since $y' > x$, condition (28) is satisfied if $\frac{x-\underline{w}}{(1-\theta_A)} \leq x \iff \underline{w} \geq \theta_A x$. ■

Proof of Proposition 7

Proof. • First, consider the case where w_0 is paid after task allocation together with s. If the contract is designed to retain the worker at $t = 3$, it must satisfy

$$sy + w_0 \geq \theta_A y \tag{29}$$

if $i^c = A$ and

$$sx + w_0 \geq \theta_B x \tag{30}$$

otherwise. Then, at the task allocation stage, the worker chooses task A if $sy + w_0 \geq sx + w_0$,, i.e., if $y \geq x$, which is the case, as we are considering $y \in [x, \hat{y})$. At this point, when choosing the optimal share of profit to be paid

out to retain the worker, the firm maximizes her objective function

$$(1-s)y - w_0$$

subject to (29). The Kuhn-Tucker condition with respect to s for this problem implies that (29) binds at optimum so that the owner earns a payoff

$$(1-\theta_A)y. \tag{31}$$

Note that if the owner were not to retain the worker at $t = 3$, the firm would generate zero profits, and the owner would get a payoff of $-w_0$, which clearly implies that she prefers retaining the employee.

Finally, consider whether the firm's owner is willing to offer this kind of contract instead of offering a spot retention wage to match poaching offers. The owner offers $w_0 + s$ instead of w_r^c iff $(1-\theta_A)y \geq (1-\theta_B)x \iff y \geq \hat{y}$, implying that efficient task allocation is not attained.

- Consider now the case in which w_0 is paid before task allocation, while $s\pi^c$ accrues, by definition, after the production process. If the contract is designed to retain the worker at $t = 3$, it must satisfy

$$sy \geq \theta_A y \tag{32}$$

if the worker picks task A and

$$sx \geq \theta_B x \tag{33}$$

otherwise. At the task allocation stage, the worker chooses task A if $sy \geq sx$,, i.e., if $y \geq x$, which is the case, as $y \in [x, \hat{y})$. When choosing the optimal share of profit to be paid out in order to retain the worker, the owner maximizes her objective function

$$(1-s)y - w_0$$

subject to (32). The Kuhn-Tucker condition with respect to s for this problem implies that (32) binds at optimum so that the owner earns a payoff

$$(1-\theta_A)y - w_0. \tag{34}$$

Note that if the owner were not to retain the worker at $t = 3$, the firm would generate zero profits, and the owner would get $-w_0$ as a payoff; thus, she prefers retaining the employee.

Finally, consider whether the firm's owner is willing to offer such a compensation package instead of offering a spot retention wage to match poaching offers. The owner offers $w_0 + s$ instead of w_r^c if $(1-\theta_A)y - w_0 \geq (1-\theta_B)x \iff y \geq \hat{y} + w_0$. This scheme induces the same task allocation as in a partnership if

$$\hat{y} + w_0 = x + \theta_A\beta \iff w_0 = \frac{(1-\theta_A)\theta_A\beta - (\theta_A - \theta_B)x}{1-\theta_A} \tag{35}$$

and $w_0 \leq 0 \iff \beta \leq \frac{(\theta_A-\theta_B)x}{(1-\theta_A)\theta_A} \equiv \bar{\beta}$, namely, if the partnership is more efficient than a corporation.

■

Proof of Proposition 8

Proof. First, solve the owner's maximization program when drafting partnership contracts

$$\underset{\{\phi,s\}}{Max}\ \phi + (1-s)\pi^p$$

subject to:

$$\phi \leq \omega, \tag{WTP}$$

$$sy \geq \theta_A y + p^e. \tag{IPC}$$

As in the baseline model, since $\pi^p = 0$ if the partner is poached, $p^e = 0$. Let λ be the Lagrange multiplier associated with the WTP constraints and μ that is associated with the IPC. The Lagrangian function for this problem is thus

$$\mathcal{L} = \phi + (1-s)y - \lambda(\phi - \omega) - \mu(\theta_A - s).$$

The Kuhn-Tucker conditions for this maximization program yield:

$$\lambda = 1 \Rightarrow \phi = \omega$$

and

$$\mu = y \Rightarrow \mu > 0 \Rightarrow s = \theta_A.$$

Hence, the optimal contract is $\{\phi^*, s^*\} = \{\omega, \theta_A\}$. The worker definitely accepts such a contract, as it yields her a strictly positive rent compared to the wage she would earn in a corporation. The owner instead earns an equilibrium payoff

$$\omega + (1 - \theta)(y + \beta), \tag{36}$$

if she designs the contract so as to organize a stable partnership. If, instead, she were to design a contract such that the partner would leave at the poaching stage, her payoff would be ω, which is smaller than (36). Hence, in equilibrium, the firm's owner finds it optimal to design contracts that make the partnership stable.

Consider now the optimal organizational design. Organizing the firm as a corporation, the owner would earn $(1 - \theta_B)x + \beta$. Hence, a partnership is preferred to a corporation if

$$\omega + (1 - \theta)(y + \beta) \geq (1 - \theta_B)x + \beta \iff y \geq \hat{y} + \frac{\theta_A \beta - \omega}{1 - \theta_A} \equiv y'.$$

Recall that we are considering a worker with talent $y \in [x, \hat{y})$, hence the partnership is feasible if $y' \leq \hat{y}$, namely, if $\beta < \frac{\omega}{\theta_A}$.

■

Proof of Proposition 9

Proof. Let us analyze whether firm 1 can be organized as a feasible partnership: the firm's owner maximizes payoff

$$\phi + (1 - s)(\alpha y + \beta)$$

subject to the WTP constraint

$$\phi \leq s\alpha y - \theta_B x \tag{WTP}$$

and the interim participation constraint

$$s\alpha y \geq \theta_A y + p^e. \tag{IPC}$$

As usual, $p^e = 0$ and both constraints bind in equilibrium. The optimal partnership contract is $\{\phi^*, s^*\} = \left\{\theta_A y - \theta_B x,\ \frac{\theta_A}{\alpha}\right\}$.

The optimal share s^* is feasible (i.e., $s^* < 1$) if $\theta < \alpha$ and is not otherwise. ■

Proof of Lemma 3

By the same reasoning adopted to prove Lemma 1, one gets that, in a corporation, if a worker is assigned to task A, she gets

$$w_r^c = w_p^c = \theta_A \left[\rho\left(\frac{y+\bar{y}}{2}\right) + (1-\rho)y\right]$$

Note that y is the cutoff level of talent such that it is equally profitable to assign the worker to task A or task B. If the worker is assigned to task B, instead, she gets

$$w_r^c = w_p^c = \theta_B x$$

which is independent of talent, hence unaffected by asymmetric information.

At this point, the firm's owner sets the allocation cutoff rule so that she assigns task A to the worker if

$$y - \theta_A \left[\rho\left(\frac{y+\bar{y}}{2}\right) + (1-\rho)y\right] \geq (1-\theta_B)x \tag{37}$$

yielding the condition

$$y \geq \frac{2(1-\theta_B)x + \theta_A \rho \bar{y}}{2(1-\theta_A) + \theta_A \rho} \equiv \hat{y}.$$

Proof of Proposition 10

Using the same reasoning adopted to prove Lemma 2 and Proposition 2, task assignment in a partnership is efficient, as it is optimal to retain the partner in equilibrium.

Then the firm's owner offers a contract $\{\phi^*, s^*\}$ that maximizes the objective function

$$\phi + (1-s)(y+\beta)$$

subject to the *willingness-to-pay* constraint

$$\phi \leq sy - \theta_B x$$

and the *interim participation constraint* (with $p^e = 0$

$$sy \geq \theta_A$$

The Kuhn-Tucker conditions for this optimization program imply that the to constraints bind, so that in equilibrium

$$\{\phi^*, s^*\} = \left\{\theta_A\left[\rho\left(\frac{x+\bar{y}}{2}\right) + (1-\rho)y\right] - \theta_B x \ , \ \frac{\theta_A}{y}\left[\rho\left(\frac{x+\bar{y}}{2}\right) + (1-\rho)y\right]\right\}.$$

The owner's payoff when organizing the firm as an equity partnership is then

$$y - \theta_B x + \left\{1 - \left[\frac{\theta_A}{y}\rho\left(\frac{x+\bar{y}}{2}\right) + (1-\rho)y\right]\right\} \tag{38}$$

whereas if the firm is organized as a corporation, the owner's payoff is

$$(1-\theta_B)x + \beta. \tag{39}$$

Comparing (38) against (39) one gets that the former is greater if

$$y^2 - [x + \theta_A\beta(1-\rho)]y - \theta_A\beta\rho\left(\frac{x+\bar{y}}{2}\right) \geq 0 \tag{40}$$

This associated equation for the above second-degree inequality yields two roots:

$$y^o = \frac{x + \theta_A\beta(1-\rho) - \sqrt{[x+\theta_A\beta(1-\rho)]^2 + 4\theta_A\beta\rho\left(\frac{x+\bar{y}}{2}\right)}}{2},$$

and

$$y' = \frac{x + \theta_A\beta(1-\rho) + \sqrt{[x + \theta_A\beta(1-\rho)]^2 + 4\theta_A\beta\rho\left(\frac{x+\bar{y}}{2}\right)}}{2}.$$

Inequality (40) is met if $y \leq y^o$ or $y \geq y'$. However, $y^o < 0$, and since $y \in [x, \hat{y})$, the owner's payoff with a partnership exceeds the one with a corporation if $y \geq y'$, provided that $y' < \hat{y}$, which is true if and only if

$$\beta < \bar{\beta} \equiv \frac{(\hat{y} + x)\hat{y}}{\rho\left(\frac{x+\bar{y}}{2}\right) + (1-\rho)\hat{y}}.$$

Proof of Corollary 3

To prove this corollary, differentiate y' with respect to ρ :

$$\frac{\partial y'}{\partial \rho} = \theta_A\beta\left\{\frac{2\left(\frac{x+\bar{y}}{2}\right) - [x + \theta_A\beta(1-\rho)]}{\sqrt{[x + \theta_A\beta(1-\rho)]^2 + 4\theta_A\beta\rho\left(\frac{x+\bar{y}}{2}\right)}} - 1\right\}. \tag{41}$$

The derivative in (41) is positive if

$$\frac{x + \bar{y}}{2} \geq x + \theta_A\beta$$

Proof of Proposition 11

As in the baseline model, task allocation is efficient along the equilibrium path in which the owner designs a stable partnership (i.e., one in which all partners are retained). While designing partnership contracts, the firm's owner can make these contingent on prospective partners' talent or task and maximizes her objective function

$$\sum_{i=1}^{2} \phi_i + \left(1 - \sum_{i=1}^{2} s_i\right)\left(\sum_{k=1}^{2} y_k + \beta\right) \tag{42}$$

In this scenario, if a partner leaves the firm, she sells equity at p^e, which is not necessarily zero since the firm would still earn a positive profit due to the presence of another partner. Specifically, $p^e = (1-\tau)y_j$ is the value partner i receives when

selling her equity stake, recalling that τ is a transaction cost from sale due to frictions in the financial market.

1. First, consider the case in which the owner offers talent-based contracts to prospective partners. In this scenario, the constraints to consider are (42): *willingness-to-pay* constraints

$$\phi_i \leq s_i \sum_{k=1}^{2} y_k - \theta_B x \ \ \forall i, \tag{WTP}$$

and *interim participation constraints*

$$s_i \sum_{k=1}^{2} y_k \geq \theta_A y_i + (1-\tau) y_j \ \ \forall i, j \text{ and } j \neq i \tag{IPC}$$

The Kuhn-Tucker conditions for this problem imply $\lambda_i = 1$, where λ_i is the Lagrangian multiplier for worker i's (WTP) constraint, and $\mu_i = \frac{\beta}{\sum_{k=1}^{2} y_k + (1-\tau) y_j}$, where μ_i is the Lagrangian multiplier associated with worker i's (IPC). These first-order conditions determine that all constraints bind at optimum so that the contract offer for prospective partner i embeds

$$s_i^* = \frac{\theta_A y_i}{y_i + \tau y_j}, \tag{43}$$

and

$$\phi_i^* = \frac{\theta_A y_i \sum_{k=1}^{2} y_k}{y_i + \tau y_j} - \theta_B x. \tag{44}$$

Talent-based partnership contracts are feasible if $\sum_{i=1}^{2} s_i^* \leq 1$, i.e., if

$$\theta_A \leq \frac{(1+\tau^2) y_1 y_2 + \tau (y_1^2 + y_2^2)}{2 y_1 y_2 + \tau (y_1^2 + y_2^2)} < 1.$$

If this condition is not met, the firm's owner will not offer them and organize the firm as a corporation.

Conditional on feasibility, by offering these contracts, the firm's owner earns a payoff

$$\sum_{k=1}^{2} y_k - 2\theta_B x + \left[1 - \theta_A \sum_{i=1}^{2} \left(\frac{y_i}{y_i + \tau y_j} \right) \right] \beta. \tag{45}$$

2. Consider now the case in which the firm's owner offers a task-based partnership contract to each prospective partner. In this scenario, all partners working on a certain task receive the same contract offer.

   The constraints to be considered while designing the optimal contract are the *willingness-to-pay* constraint

$$\phi \leq s \sum_{k=1}^{2} y_k - \theta_B x \tag{WTP}$$

   and the *interim participation constraint* yielding

$$s \geq \max \left\{ \frac{\theta_A y_1}{y_1 + \tau y_2} \, , \, \frac{\theta_A y_2}{y_2 + \tau y_1} \right\} = \frac{\theta_A y_2}{y_2 + \tau y_1} \text{ as } y_2 > y_1.$$

   Again, the Kuhn-Tucker conditions for the maximization program with respect to ϕ and s are such that the two constraints bind at optimum, hence the optimal partnership contract features

$$s^* = \frac{\theta_A y_2}{y_2 + \tau y_1}, \tag{46}$$

   and

$$\phi^* = \frac{\theta_A y_2 (y_1 + y_2)}{y_2 + \tau y_1} - \theta_B x. \tag{47}$$

   Task-based partnership contracts are feasible if and only if $2s^* \leq 1$, namely, if $\theta_A \leq \frac{y_2 + \tau y_1}{2 y_2} < 1$. The owner will not offer them otherwise. By offering such contracts, the firm's owner earns a payoff

$$\sum_{k=1}^{2} y_k - 2\theta_B x + \left[1 - \frac{2\theta_A y_2}{y_2 + \tau y_1} \right] \beta. \tag{48}$$

Notice that

$$\frac{(1+\tau^2) y_1 y_2 + \tau (y_1^2 + y_2^2)}{2 y_1 y_2 + \tau (y_1^2 + y_2^2)} > \frac{y_2 + \tau y_1}{2 y_2} \iff (y_2 - \tau y_1)(y_1^2 + y_2^2) > (y_1 - \tau y_2) 2 y_1 y_2$$

which is met, since $y_2 - y_1 > \tau (y_1 - y_2)$, and $(y_2 - y_1^2) > 0$.

Hence, if talent-based partnership contracts are feasible, task-contingent agreements are also feasible. By comparing (45) against (48), one can see that the former

is greater since $y_2 > y_1$, implying that the owner finds it optimal to offer talent-contingent partnership contracts when she can choose between the two types of agreements.

Proof of Corollary 4

As shown in Lemma 2, if the owner offers a partnership contract aimed at retaining the partner at $t = 3$, the partner chooses task A if her talent is $y \geq \hat{y}$ and task B otherwise. If instead the partner is not retained at $t = 3$, she chooses task A if $y \geq y' \equiv \frac{\theta_B x}{\theta_A}$ which is smaller than x. Let us now verify in equilibrium what kind of contract the owner will offer.

(i) Consider the impact of agent y_i on s_i^*:

$$\frac{\partial s_i^*}{\partial y_i} = \frac{\theta_A \tau y_j}{(y_i + \tau y_j)^2} > 0. \tag{49}$$

(ii) The impact of y_j on s_i^* is given by

$$\frac{\partial s_i^*}{\partial y_j} = -\frac{\tau \theta_A y_i}{(y_i + \tau y_j)^2} < 0. \tag{50}$$

(iii) The effect of financial frictions τ on s_i^* is

$$\frac{\partial s_i^*}{\partial \tau} = -\frac{\theta_A y_i y_j}{(y_i + \tau y_j)^2} < 0. \tag{51}$$

(iv) The impact of portability θ_A on s_i^* is

$$\frac{\partial s_i^*}{\partial \theta_A} = \frac{y_i}{y_i + \tau y_j} > 0. \tag{52}$$

(v) Note that $s_2 - s_1 = \frac{\theta_A \tau (y_2^2 - y_1^2)}{y_1 y_2 (1+\tau^2) + \tau (y_2^2 + y_1^2)}$, and thus

$$\frac{\partial (s_2 - s_1)}{\partial \tau} = \frac{\theta_A (y_2^2 - y_1^2) y_2 y_1 (1 - \tau^2)}{[y_1 y_2 (1 + \tau^2) + \tau (y_2^2 + y_1^2)]^2} \geq 0 \iff \tau \leq 1. \tag{53}$$

Proof of Lemma 4

First, consider the owner's problem when designing partnership contracts inducing a stable partnership, i.e., such that the (IPC) is satisfied. In this scenario, the partner chooses task A if $y \geq x$ and task B otherwise.

1. Let $y < x$. In this case, the profit of the partnership is $\pi^p = x + \Delta y$ and the owner's problem is

$$\underset{\{\phi,s\}}{max}\ \phi + (1-s)(x + \Delta y + \beta)$$

subject to:

$$\phi \leq s(x + \Delta y) - \theta_B x, \tag{WTP}$$

$$\phi \leq s(x + \Delta y) - \theta_B x, \geq \theta_B x + p_e. \tag{IPC}$$

Recall that if the partner leaves the firm, this generates $\pi^p = 0$; hence, $p_e = 0$.

The Kuhn-Tucker conditions for this maximization program imply that both constraints bind so that the optimal contract is $\{\phi^*, s^*\} = \{0, \frac{\theta_B x}{x+\Delta y}\}$ and the owner's payoff in this scenario is

$$(1-\theta_B)x + \Delta y + \left(1 - \frac{\theta_B x}{x + \Delta y}\right)\beta \tag{54}$$

2. Let $y \in [x, \hat{y})$. The partner chooses task A. Hence the partnership makes profit $\pi^p = (1+\Delta)y$, and the owner's problem is

$$\underset{\{\phi,s\}}{max}\ \phi + (1-s)[(1+\Delta)y + \beta]$$

subject to:

$$\phi \leq s(1+\Delta)y - \theta_B x, \tag{WTP}$$

$$s(1+\Delta)y \geq \theta_A y + p_e. \tag{IPC}$$

Again, $p_e = 0$ and the The Kuhn-Tucker conditions for this maximization program yield imply that the constraints bind at optimum; thus the optimal contract is $\{\phi^*, s^*\} = \{\theta_A y - \theta_B x, \frac{\theta_A}{1+\Delta}\}$ and the owner's payoff in this scenario is

$$(1+\Delta)y - \theta_B x + \left(1 - \frac{\theta_A}{1+\Delta}\right)\beta \tag{55}$$

3. Let $y \geq \hat{y}$. In this case, the profit of the partnership is $\pi^p = (1+\Delta)y$ and the firm's owner solves

$$\underset{\{\phi,s\}}{max}\ \phi + (1-s)[(1+\Delta)y + \beta]$$

subject to:

$$\phi \leq s(1+\Delta)y - \theta_A y, \tag{WTP}$$

$$s(1+\Delta)y \geq \theta_A y + p_e. \tag{IPC}$$

The Kuhn-Tucker conditions for this maximization program imply that both constraints bind in equilibrium. Hence, the optimal contract is $\{\phi^*, s^*\} = \{0, \frac{\theta_A}{1+\Delta}\}$ and the owner's payoff is

$$(1+\Delta)y - \theta_B x + \left(1 - \frac{\theta_A}{1+\Delta}\right)\beta. \tag{56}$$

In order to determine whether the owner is willing to retain the partner in equilibrium, consider now the optimal partnership contract that does not fulfill the (IPC) for any value of the worker's talent. When the partner expects is not retained in equilibrium, she chooses task A so that $\theta_A y \geq \theta_B x \iff y \geq \frac{\theta_B x}{\theta_A} \equiv y'$ which is smaller than x.

(a) Let $y < y'$. In this scenario, the partner chooses task B, and after the task assignment, she leaves the current firm, thus earning $\theta_B x$. Note that in this scenario, the (IPC) is not fulfilled, namely $sx < \theta_B x$, and since the owner's objective function is decreasing with s, she sets $s = 0$. However, upon the partner's departure, the firm generates zero profits, and since it is inactive, the owner enjoys no private benefit of control, so the only payoff she gets is ϕ. The worker is willing to pay such a fee to become a partner and choose her task if $\phi \leq \theta_B x - \theta_B x = 0$. It is immediate that the (WTP) constraint binds in equilibrium. Hence, in this case, the owner gets zero payoffs. Since $y' < x$ and (54) is strictly positive, it is immediate to see that if the worker has ability $y < \frac{\theta_B x}{\theta_A}$, the owner optimally designs a partnership contract to retain her.

(b) Let $y \in [y', x)$. In this case, everything works as in the previous case, except that the (WTP) constraint is now

$$\phi \leq \theta_A y - \theta_B x \tag{57}$$

and since the owner's payoff is ϕ, the (WTP) condition is binding, and the owner's payoff is

$$\theta_A y - \theta_B x. \tag{58}$$

Comparing (54) and (58), one can see that the firm's owner optimally designs a partnership contract that fulfills the (IPC) since $x > y > \theta_A y$.

(c) Let $y \in [x, \hat{y})$. This case is analogous to the previous one, but now the partner is efficiently assigned to task A, although leaving the current firm. Hence, the firm's owner earns a payoff $\phi = \theta_A y - \theta_B x$. By inspecting (55), one can see that it is optimal to retain the partner.

(d) Let $y \geq \hat{y}$. In this case, the worker is willing to pay the partnership fee only if $\phi \leq 0$ as her payoff does not improve with respect to the one she would earn in a corporation. Hence, the firm's owner earns a zero payoff, whilst, by retaining the partner, she would earn the payoff in (56), which is strictly positive. As a result, the owner optimally designs partnership contract offers aimed at retaining the partner in equilibrium.

Proof of Proposition 12

To prove this proposition, first consider the conditions under which the owner wants to make a partnership contract offer to the worker, given the latter's talent.

- If the worker has talent $y < x$, the firm's owner optimally organizes the firm as an equity partnership if

$$(1 - \theta_B)x + \Delta y + \left(1 - \frac{\theta_B x}{x + \Delta y}\right)\beta \geq (1 - \theta_B)x + \beta,$$

delivering a quadratic inequality $(\Delta y)^2 + \Delta x y - \beta \theta_B x \geq 0$ with two possible roots: $y' = -\frac{x + \sqrt{x^2 + 4\beta\theta_B x}}{2\Delta} < 0$ and $y_0 = \frac{\sqrt{x^2 + 4\beta\theta_B x} - x}{2\Delta} > 0$. The quadratic inequality is satisfied if $y \leq y' \cup y \geq y_0$, but since y' is negative we are considering

$y \geq 0$, the only solution for the inequality is $y \geq y_0$. Such condition may be met if

$$y_0 < x \iff \beta < \frac{\Delta(1+\Delta)x}{\theta_B} \tag{59}$$

- If the worker has talent $y \in [x, \hat{y}]$, the firm's owner organizes the firm as an equity partnership if

$$(1+\Delta)y - \theta_B x + \left(1 - \frac{\theta_A}{1+\Delta}\right)\beta \leq (1-\theta_B)x + \beta.$$

Such condition is met if $y \geq y_1 \equiv \frac{(1+\Delta)x+\beta\theta_A}{(1+\Delta)^2}$. Given the interval of talent values considered, this condition is feasible if

$$y_1 \in [x, \hat{y}] \iff \beta \leq \min\left\{\frac{\Delta(1+\Delta)x}{\theta_A}, \frac{[(1+\Delta)(1-\theta_B)-(1-\theta_A)](1+\Delta)x}{\theta_A(1-\theta_A)}\right\} \tag{60}$$

- If the worker has talent $y > \hat{y}$, the firm's owner organizes the firm as an equity partnership if

$$(1+\Delta)y - \theta_B x + \left(1 - \frac{\theta_A}{1+\Delta}\right)\beta \geq (1-\theta_A)y + \beta.$$

Such condition is met if $y \geq y_2 \equiv \frac{\beta\theta_A}{\Delta(1+\Delta)}$, and such condition is feasible if

$$y_2 \in [\hat{y}, \bar{y}] \iff \beta \leq \min\left\{\frac{\Delta(1+\Delta)\bar{y}}{\theta_A}, \frac{\Delta(1+\Delta)(1-\theta_B)x}{\theta_A(1-\theta_A)}\right\}. \tag{61}$$

Let us now rank the cutoffs defined above.

- Since $\theta_A > \theta_B$, it is immediate to see that $\beta_0 \equiv \frac{\Delta(1+\Delta)x}{\theta_A} < \frac{\Delta(1+\Delta)x}{\theta_B} \equiv \beta_1$.
- Since $\theta_A + \theta_B \geq 1$, it will also be the case that $\beta_1 \leq \frac{\Delta(1+\Delta)(1-\theta_B)x}{\theta_A(1-\theta_A)} \equiv \beta_2$.
- The cutoff β_2, in turn, is such that $\beta_2 < \frac{[(1+\Delta)(1-\theta_B)-(1-\theta_A)](1+\Delta)x}{\theta_A(1-\theta_A)} \equiv \beta_3$, since $\theta_A > \theta_B$.
- Finally, since $\Delta \geq \frac{\hat{y}-x}{\bar{y}-\hat{y}}$, one gest that $\beta_3 \leq \frac{\Delta(1+\Delta)\bar{y}}{\theta_A} \equiv \beta_4$.

Comparing this ranking of cutoffs against the conditions described in (59),(60), and (61) describes the owner's optimal organizational design strategy.

- If $\beta \in \left[0, \beta_0\right]$, make a partnership if $y \geq y_0$ with $y_0 \in (0, x)$. In this case, task allocation is efficient in a partnership.

- If $\beta \in \left(\beta_0, \beta_1\right]$, make a partnership if $y \in [y_0, x] \cup y \in [y_1, \bar{y}]$ with $y_1 \in (x, \hat{y}]$. In this case, the task allocation rule is more efficient than the one used in a corporation.

- If $\beta \in \left(\beta_1, \beta_2\right]$, make a partnership if $y \geq y_1$. Task allocation is more efficient than in a corporation.

- If $\beta \in \left(\beta_2, \beta_3\right]$, make a partnership if $y \in [y_1, \hat{y}] \cup y \in [y_2, \bar{y}]$ with $y_2 > \hat{y}$. Partnership assigns tasks more efficiently than corporation.

- If $\beta \in \left(\beta_3, \beta_4\right]$, make a partnership if $y \geq y_2$. Task allocation is inefficient irrespective of the organizational design.

- If $\beta > \beta_4$, organize the firm as a corporation and assign tasks inefficiently.