Profit Sharing and the Role of Professional Partnerships*

Jonathan Levin and Steven Tadelis
Department of Economics
Stanford University
Stanford, CA 94305-6072
February 2004

Abstract

We compare the costs and benefits of profit-sharing partnerships relative to the corporate form of organization. We show that organizing as a partnership can be desirable in human-capital intensive industries where product quality is hard to observe. The theory explains the relative scarcity of partnerships outside of professional service industries such as law, accounting, medicine, investment banking, architecture, advertising, and consulting. It also sheds light on features of partnerships such as up-or-out promotion systems, the use of non-compete clauses, motives for profit sharing as well as recent trends in professional service industries. JEL codes: D20, D82, J54, L22.

*We thank Joseph Bankman, Tim Bresnahan, Darrell Duffie, Denis Gromb, Henry Hansmann, Oliver Hart, Tom Hubbard, Richard Levin, John Pencavel, Antonio Rangel, Pablo Ruiz-Verdu, Ilya Segal, Jan Zabojnik and Jeff Zwiebel for helpful discussions, and Pete Grossman for excellent research assistance. This research has been supported by the National Science Foundation, grants SES-0112129 (Levin) and SES-0079876 and SES-0239844 (Tadelis). Email: jdlevin@stanford.edu and stadelis@stanford.edu. This paper replaces a previous one titled “A Theory of Partnerships”.

1 Introduction

Modern economies exhibit a wide diversity of organizational forms: from closely held private firms to profit-sharing partnerships and cooperatives to investor-owned corporations. A fundamental economic problem is to understand the forces that lead to these different forms of organization and hence determine the structure of productive enterprise in the economy. One striking puzzle in this regard is the distribution of partnerships relative to corporations across industries. While the corporate form dominates across manufacturing, technology and many service industries, partnerships have been prominent in human-capital intensive professional services such as law, accounting, investment banking, management consulting, advertising, and medicine.

In this paper, we investigate an economic rationale for profit-sharing partnerships and their presence in the professional services. We take the defining feature of a partnership to be re-distribution of profits among the partners. Profit-sharing leads individuals to be particularly selective as to whom they take on as partners. This feature of partnerships assures clients of quality service. We show that as a result, if clients are concerned about quality and are in a relatively poor position to assess quality, then partnerships tend to be a preferable mode of organization relative to a profit-maximizing corporation.

Our model suggests that partnerships will emerge under some market conditions but not others. In particular, the theory predicts that partnerships will emerge when human capital plays a central role in determining product quality and when clients are at a disadvantage relative to firms in assessing the ability of employees. In our view, these conditions aptly characterize the professional services, but are a much worse description of manufacturing or technology industries where partnerships are quite unusual.

The basic theory is developed in Sections 2 and 3. We consider a simple model that focuses on the hiring policies of different organizations. Firms face a distribution of heterogeneous workers in the labor market and the ability of the employees that are hired determines the quality of the firm’s product. We assume that a corporation makes decisions with the intention of maximizing profits, while an equal-sharing partnership

1 In practice of course, many partnerships combine productivity-based compensation with straight profit sharing. Even when productivity measures are used, however, as if the case in many law firms, there is typically a significant amount of sharing. Aside from being a natural lay definition of partnership, our focus on profit sharing is also loyal to the Internal Revenue Service code. A partnership’s tax returns must show the names and addresses of each partner and each partner’s distribution share of income. An alternative and complementary view of partnerships would start with the allocation of control rights (see Hart and Moore, 1996). Interestingly, however, a joint undertaking merely to share expenses over jointly owned assets, or co-ownership of property that is maintained and leased, or rented, would not qualify as a partnership under the tax code (see IRS package 1065).
would like to maximize profits per partner. As was first observed by Benjamin Ward (1958), a profit sharing partnership is relatively less inclined to expand its labor force in comparison to a corporation. Intuitively, existing partners will hesitate to bring in new partners unless they raise the average partner share and as a result, partnerships may pass up hires whose net marginal contribution is positive. Given the distribution of talent in the labor market, this selectivity translates into a higher quality threshold for employment, resulting in a higher quality product. Thus, a partnership is more selective than a corporation and has higher quality. Our model uses the simplification of equal-sharing within the partnership, but the conclusion that partnerships will be more selective extends to a much broader class of sharing rules.

Into this simple model of organizational decision-making, we incorporate the possibility that clients may not be able to perfectly perceive product quality. This *imperfect market monitoring* is characteristic of many professional service industries. In the case of law or medicine, for example, clients may not be able to assess the quality of service for many years, if ever. We show that when there are no problems with market monitoring, a profit maximizing corporation hires efficiently while profit-sharing partnerships provide too high a level of quality. With less effective market monitoring, however, both corporations and partnerships are tempted to reduce quality and hire less able workers, hoping to benefit in the event that the market does not discern this loss of quality. Corporations consequently move away from efficient production as market monitoring deteriorates, generating less profits, but partnerships move closer to efficient hiring (though profits *per partner* decrease). This leads to our main result: if market monitoring is sufficiently reliable, corporations perform better than profit-sharing partnerships, while if market monitoring is weak, partnerships are strictly more profitable than corporations.

We generalize our results to an environment in which salaries are correlated with ability. First, in section 3.3 we assume an exogenous wage distribution where more talented workers command higher wages. The new twist is that if high ability workers have sufficiently high reservation wages, equal-sharing partnerships can unravel if the most able employees are not willing to engage in profit sharing. In Section 4 we develop a model where both salaries and organizational form are endogenously determined in a market equilibrium. We show that as in our single firm model, profit-sharing partnerships are more efficient when market monitoring is sufficiently imperfect. Competitive market pressure, however, can undermine the stability of partnerships even when they generate more profits than corporations. In such situations we argue that partnerships may have to adopt productivity-based compensation, consistent with observed trends in the professional service sector over the last two decades.

Beyond the cross-sectional prediction that partnerships should be most prevalent in
the professional services, our model generates a variety of more detailed implications for
the structure of partnerships. In Section 5, we show how common features of partnerships
such as up-or-out promotion systems and non-compete clauses can be interpreted as
part of a partnership's quality commitment mechanism. We also consider how physical
capital requirements or wealth limitations of prospective partners might favor a corporate
form. Finally, we connect the model with some recent trends away from the traditional
partnership structure in investment banking and law. To do this, we combine insights
from the basic model with our analysis of labor market competition.

Though the literature does not offer a commonly accepted reason for why partnerships
are observed in some industries but not others, several papers relate to this question.
Starting with the influential work of Alchian and Demsetz (1972), much research has
focused on the incentive aspects of profit-sharing and the role of productivity measure-
ment in determining organizational form. Alchian and Demsetz write that “[w]hile it
is relatively easy to manage or direct the loading of trucks by a team of dock workers
where input activity is so highly related in an obvious way to output, it is more difficult
to manage and direct a lawyer in the preparation and presentation of a case.” (p.786).
They conclude that professionals will be less likely to organize as capitalist firms.

In his broad study of ownership patterns, Hansmann (1996) takes aim at this incen-
tive hypothesis, arguing that “[i]n the service professions, where employee ownership is
the norm, the productivity of individual employees can be, and generally is, monitored
remarkably closely, because the quantity and quality of each individual’s inputs and outputs can be observed with relative ease.” (p. 70). Hansmann goes on to suggest that
“there must be other factors that are much more important in determining the distrib-
ution of employee ownership, since the types of firms in which employee ownership is
most common seem to be firms in which employee monitoring is relatively easy.” (p. 71).

Two recent articles suggest additional incentive roles that partnerships play in light
of market failures. Garicano and Santos (2003) argue that incentives to allocate client
work efficiently within a diverse group of partners are provided by the profit-sharing
feature of partnerships. Morrison and Wilhelm (2003) suggest that valuable mentoring
and on-the-job training is provided by senior partners when their stakes are illiquid, as
they are in professional partnerships.

Our theory departs from this line of research by emphasizing the effect of profit-
sharing on the selection of employees rather than on their motivation. The model does
allow a role for informational imperfections, but the monitoring problem is between
the firm and prospective clients rather than within the firm. That is not to say that incentive
problems are not important in the professional services or that there might not be
more effective financial compensation schemes than the equal sharing of profits (see for
instance Holmstrom, 1982). Rather, our emphasis on assembling talented employees is consistent with the view that financial compensation is just one aspect of motivation, and implicit incentives, reputation, and social pressure may be able to substitute for direct productivity-based pay in some cases.  

The model we develop also relates to a large literature on labor-managed firms. That literature, which builds on Ward’s early paper, concentrates primarily on industrial co-operatives rather than professional partnerships, with emphasis on the idea that labor-managed firms might react differently to input price changes or other shocks. Typically, the question of why one organizational form would be chosen over another is not considered. A notable exception is Miyazaki (1984), who argues that labor-managed firms do a better job of insuring employees. As a result, firms may convert to labor management in the face of short-run financial difficulties, but convert back to a corporate form in the long run.  

A problem with applying this story to the professional services is that most existing partnerships started as partnerships and have been successful for years without switching to a corporate form.

One can argue that some individuals prefer organizing as a partnership. However, given the paucity of labor-managed firms outside of professional services (the Washington plywood firms studied by Pencavel and Craig, 1993, are a rare exception), the most basic preference story implies that consultants and investment bankers systematically care more about being partners and less about profits than employees of manufacturing firms. Thus, our emphasis on market monitoring is valuable in that it generates predictions that are consistent with the cross-sectional choices of organizational form.

Finally, our paper relates to the literature on the organizational role of nonprofit firms. Hansmann (1980) suggested that “contract failure” is a primary reason for nonprofit firms, as they soften the incentives of managers to expropriate rents when these can easily be diverted. This idea has been demonstrated formally by Easley and O’Hara (1983) and Glaeser and Shleifer (2001). Easley and O’Hara take the view that the organization which maximizes social surplus will emerge because society is treated as a

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2 Kandel and Lazear (1992) argue that sociological motivators such as guilt and shame can often overcome the free-rider problem in partnerships. Legros and Matthews (1993) offer a thorough analysis of when free-riding is not severe in moral-hazard partnerships. Still, these papers do not offer insights into the cost-benefit analysis of different organizational forms with respect to some exogenous variation in the environment.

3 Hansmann (1996) also argues that co-operatives will face decision-making problems if their membership is heterogeneous. Hart and Moore (1996) and Kremer (1997) develop models in which majority voting leads to inefficiency in consumer and worker co-operatives respectively. Dow (1993) considers a model of bargaining over quasi-rents with specific physical or human capital that provides another explanation for employee ownership.
planner. Glæser and Shleifer have an approach more in line with ours, as they have the founder choose the organizational form. Thus, in their set-up the choice of nonprofit incentives is a commitment mechanism to ensure that surplus will not be diverted (i.e., high quality provided at a high price), just as the choice of profit-sharing is a commitment mechanism not to hire low quality employees in our model.

2 A Monopoly Model

2.1 Technology, Preferences and Information

Consider a continuum of agents, of unit measure, whose abilities are distributed on the interval \([a, \bar{a}]\) with continuous distribution \(F(\cdot)\) and positive density \(f(\cdot)\). Each agent has access to an outside labor market that pays a fixed wage \(w \in (a, \bar{a})\), independent of ability. As we show in the next section, the constant wage simplifies the analysis, but is not crucial to the main results.

The agents have access to a production technology that requires labor and a fixed capital cost \(K > 0\).\(^4\) If a (measurable) set \(A\) of agents are employed, the firm can produce a quantity \(|A|\) of services, equal to the probability measure of \(A\). A firm’s quality of service equals the average ability of agents in \(A\):

\[
q(A) = \frac{1}{|A|} \int_{\tilde{a} \in A} \tilde{a} f(\tilde{a}) d\tilde{a}.
\]

The market for the firm’s services is composed of a large number of identical clients. Each values the firm’s services at the expected quality of service. Thus, if the market knows that the firm has employed a set \(A\) of agents, willingness to pay is equal to

\[
p(A) = q(A).
\]

For many products, and certainly most professional services, consumers do not have perfect information about quality. We incorporate this informational asymmetry by assuming that the market observes the firm’s quality only with probability \(\mu\). With probability \(1 - \mu\), the market cannot assess quality and instead forms an expectation over the set of employees, denoted by \(A^e\). Thus, depending on the market’s information, the price commanded by the firm is either \(p(A)\) or \(p(A^e)\).

This simple formulation of information abstracts from important issues of signalling or reputation formation. Nevertheless, it captures the fundamental idea from such models that demand should depend both on the firm’s actual choices and on the market’s

\(^4\)This is a simple way of introducing increasing returns, a necessary condition for group production to dominate individual production. Other forms of increasing returns would suffice to yield our results.
beliefs about these choices. When $\mu$ is higher, demand tracks more closely the firm’s actual choices as opposed to the market’s beliefs. We thus interpret $\mu$ as a measure of informational efficiency or market monitoring.

When choosing employees, the firm faces an expected price:

$$\mu p(A) + (1 - \mu) p(A^e).$$

If the firm hires the set $A$, it will be able to sell a quantity $|A|$ of services irrespective of market monitoring.

Now suppose that the market correctly anticipates the firm’s hiring choices (as will happen in equilibrium) or alternatively that $\mu = 1$. The firm’s economic profits, or revenues net of capital costs and employees’ opportunity costs (wages) is:

$$\Pi(A) = \int_{a \in A} (a - w) f(a) \, da - K.$$

Economic profits are maximized by employing all agents with abilities $a \geq w$. To make the analysis interesting, we assume that if the firm makes this first-best efficient hiring decisions and employs the set $A^{FB} = [w, \bar{a}]$, then $\Pi(A^{FB}) > 0$. We also assume that if the firm simply hires every agent, it will make negative economic profits, i.e. $\Pi([w, \bar{a}]) < 0$.

Given this description of the production technology and the product market, we will characterize the equilibrium behavior of corporations and partnerships. We define a corporation in the standard neoclassical sense, as an entity that maximizes profits and must pay employees at least their reservation wage. We define a partnership as an organization in which members share profits equally.

Timing is as follows. Given the choice of organizational form, the market forms an expectation $A^e$ of who will be employed. The firm then makes hiring decisions (selects $A$), which the market learns with probability $\mu$. Finally, the price is set and the firm produces. We consider the perfect Bayesian equilibrium (PBE) for both a corporation and a partnership, and then consider the optimal choice of organizational form.

Our view is that organizational form will be chosen to maximize the equilibrium profits of the organization. A justification for this is basic arbitrage. If a partnership existed, but a corporation would generate more profits, an entrepreneur would be willing to buy out the partnership and convert it to a corporation. Conversely, if a corporation existed, but a partnership would generate higher profits, a group of agents would be willing to buy out the owners of the corporation and convert the firm to a partnership. This suggests that optimal organizational form will maximize net economic surplus, which equals profits plus wages.

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5 It is not important to assume that $\Pi([w, \bar{a}]) < 0$. Discarding of this assumption means that either form of organization will always be profitable, and our central results will remain intact.
2.2 Corporation Equilibrium

A corporation makes hiring decisions to maximize profits. As agents command the same outside wage (\( w \) is fixed), and the expected price that the firm can charge is increasing in the quality of its employees, it is easy to see that a corporation will select the most qualified agents. Thus the firm’s optimal hiring strategy is to choose a threshold \( a \) and employ agents with abilities above \( a \).

Slightly abusing our previous notation, let quality with threshold \( a \) be denoted:

\[
q(a) = \frac{1}{1-F(a)} \int_a^{\hat{a}} \int f(\hat{a}) d\hat{a},
\]

while quantity is \( 1 - F(a) \). With similar notational abuse, let \( p(a) \) denote the price if the market is informed about \( a \), and \( p(a^e) \) the price if the market has conjecture \( a^e \).

Given beliefs \( a^e \), the firm chooses its hiring threshold \( a \) to maximize expected profits:

\[
\pi(a, a^e) \equiv [1 - F(a)] [\mu p(a) + (1 - \mu) p(a^e) - w] - K.
\]

A necessary and sufficient condition for optimal hiring is that \( a \) satisfy the first-order condition,\(^6\)

\[
\mu a + (1 - \mu) p(a^e) = w.
\]

That is, a corporation optimally hires up to the point where the expected marginal product of the agent being hired is exactly equal to the wage. As the marginal product of each successive employee is decreasing, the hiring optimum is unique.\(^7\)

In a PBE, the market will correctly anticipate the firm’s hiring choice. If \( a^* \) is the firm’s hiring threshold, then in equilibrium, \( p(a^e) = p(a^*) \). Combining this with optimization yields the corporation’s unique equilibrium hiring threshold \( a^C \):

\[
\mu a^C + (1 - \mu) p(a^C) = w.
\] (2)

There is a natural relationship between market monitoring and equilibrium hiring. With perfect monitoring (\( \mu = 1 \)), profit maximization dictates efficient hiring, \( a^C =

\(^6\) Substituting \( q(a) \) for \( p(a) \) using (1), the FOC becomes, \( \pi'(a, a^*) \equiv f(a) [-\mu a - (1 - \mu) p(a^*) + w] - 0 \) and the second derivative

\[
\pi''(a, a^*) \equiv f(a) [-\mu a - (1 - \mu) p(a^*) + w] - \mu f(a)
\]

is negative when the FOC is satisfied because \( f(a) > 0 \) for all \( a \). Thus, even though \( \pi \) need not be globally concave, it does have a global maximizer.

\(^7\) If \( \mu \) is sufficiently low, or beliefs are sufficiently optimistic, the first order condition may not hold for any \( a \in [a, \hat{a}] \). In this case, the unique solution is the corner solution \( a - a \).
\( a^{FB} = w \). As monitoring becomes less effective, the firm internalizes less of any drop in quality, leading to a lower equilibrium hiring threshold \( a^C < a^{FB} \), and lower quality.

Should it choose to operate, the corporation’s equilibrium profits will be:

\[
\pi(a^C, a^C) = \Pi(a^C) = \int_{a^C}^{a^C} (a - w) d F(a) - K.
\]

The corporation will want to operate in equilibrium if and only if \( \Pi(a^C) > 0 \).

### 2.3 Partnership Equilibrium

In a partnership, each partner receives an equal share of profits. If the market’s expectation of hiring is \( A^e \), and a partnership is formed with a set \( A \) of partners, each partner obtains an equal share:

\[
s(A, A^e) \equiv \mu p(A) + (1 - \mu) p(A^e) - \frac{K}{|A|}.
\]

The first two terms are the price per unit of labor; the last term represents the capital cost divided among the partners.

Given that the market price decreases in quality, and that agents command a uniform outside wage, it seems reasonable that a partnership will choose a partnership threshold in the same way a corporation chooses an employment threshold. To obtain such a characterization, we introduce the notion of stability. A stable partnership satisfies two natural requirements: First, individual rationality suggests that partners should get a share of profits that exceeds their opportunity cost \( w \). Second, the partners should not want to dismiss any current partners or admit additional partners. Formally,

**Definition:** A partnership \( A \subset [\underline{a}, \overline{a}] \) is *stable* if \( s(A, A^e) \geq w \), and there do not exist small \( \varepsilon, \delta \geq 0 \) such that a mass \( |A| - \varepsilon \) of partners benefit by replacing a mass \( \varepsilon \) of members with a mass \( \delta \) of non-members, each of whom is willing to join.

A straightforward argument shows that the only stable partnership will be the interval of agents \([a, \overline{a}]\) that achieves the maximum share per partner, subject to this share being above \( w \).\(^8\) Therefore, given market beliefs, the stable partnership solves:

\[
\max_{a \in [\underline{a}, \overline{a}]} s(a, a^e) = \mu p(a) + (1 - \mu) p(a^e) - \frac{K}{1 - F(a)}.
\]

\(^8\)The key to seeing this is the following. If workers of ability \( a \) are included but those of ability \( a' > a \) are not, then all partners other than those of ability \( a \) would prefer to replace some or all of the partners of ability \( a \) with new partners of ability \( a' \). This raises the share per partner, so if agents were willing to participate in the earlier partnership, they will be willing to participate in the later one. This establishes that any stable partnership must be an interval \([a, \overline{a}]\). If all partners of ability \( a' > a \) could increase their share from dropping those of the lowest ability, they would choose to do so.
The necessary and sufficient first-order condition is (after some manipulation):

\[ \mu a + (1 - \mu)p(a^e) = \mu p(a) + (1 - \mu)p(a^e) - \frac{K}{1 - F(a)}. \]

The partnership hires up to the point where the marginal product of the last member is equal to the average profit share of the members already hired. As for the corporation, there is a unique optimum.\(^{3}\)

Combining partnership optimization with equilibrium beliefs yields an expression for the partnership’s unique equilibrium hiring threshold \(a^P\):

\[ \mu a^P + (1 - \mu)p(a^P) = p(a^P) - \frac{K}{1 - F(a^P)}. \tag{3} \]

Again, there is a clear relationship between market monitoring and hiring. As for a corporation, worse monitoring leads to a decrease in the hiring threshold.

The partnership will be viable only if its economic profits are non-negative, or,

\[ \Pi(a^P) = [1 - F(a^P)] \cdot [s(a^P, a^P) - w] \geq 0. \tag{4} \]

### 3 The Costs and Benefits of Partnerships

#### 3.1 Comparative Analysis

Our first result compares the hiring incentives of a corporation and a partnership.

**Proposition 1** For any market information \(\mu \in [0, 1]\), and any market beliefs that allow positive profits, a corporation chooses a lower hiring threshold than a partnership.

**Proof.** In solving both the corporation and partnership problems, we can restrict attention to choices of \(a\) for which \(\pi(a, a^e) \geq 0\). Observe that the partnership is willing to lower its threshold slightly below some level \(a\) if and only if:

\[ \mu a + (1 - \mu)p(a^e) \geq \mu p(a) + (1 - \mu)p(a^e) - \frac{K}{1 - F(a)}. \]

But if this holds, and \(s(a, a^e) \geq w\), then it must be that:

\[ \mu a + (1 - \mu)p(a^e) \geq w, \]

so the corporation also prefers to lower its threshold. Thus the corporation will choose a lower hiring threshold (and a strictly lower threshold if \(a^P > a\)). \(Q.E.D.\)

\(^{3}\) If \(\mu\) is sufficiently low then it may be optimal for the partnership to choose \(a^e\).
Proposition 1 has a natural logic that echoes Ward’s (1958) analysis. If adding a given agent increases the average economic profits per employee, then adding that agent must strictly increase the total economic profits. It follows that whatever hiring threshold a partnership sets, a corporation would prefer a lower threshold.

Our next result shows that this logic carries over from the firm’s optimization problem to the equilibrium problem, and furthermore that corporations and partnerships will make identical shut-down decisions in equilibrium.

**Proposition 2** There is some \( \mu \in (0,1) \) such that if \( \mu \leq \mu^* \) neither a corporation nor a partnership could be profitable in equilibrium. If \( \mu > \mu^* \), both could be profitable and the corporation sets a strictly lower equilibrium hiring threshold, \( a^C < a^P \).

**Proof.** By the definition of profits, for any \( a \in [a, a^P] \),
\[
\Pi(a) \gtrless 0 \iff p(a) - \frac{K}{1 - F(a)} \gtrless w. \tag{5}
\]
The LHS of both equilibrium conditions (2) and (3) is the same, and is increasing in \( a \). Furthermore, for a given \( a \), the RHS of (3) is greater (less) than the RHS of (2) if and only if profits are positive (negative). Combining (3) with (5) we obtain:
\[
\Pi(a^P) \gtrless 0 \iff a^P \gtrless a^C,
\]
and combining (2) with (5) we obtain:
\[
\Pi(a^C) \gtrless 0 \iff a^P \gtrless a^C.
\]
We conclude that for any given \( \mu \), \( \Pi(a^P) \) has the same sign as \( \Pi(a^C) \), implying that the partnership obtains positive profits if and only if the corporation does. To consider whether either is profitable it suffices to consider the corporation. If \( \mu = 1 \), then the corporation is profitable since \( a^C = a^{FB} \), and by assumption \( \Pi(a^{FB}) > 0 \). If \( \mu = 0 \), the corporation is not profitable since \( a^C = a \) and \( \Pi(a) \leq 0 \). As \( a^C \) is strictly increasing in \( \mu \), and \( \Pi(a) \) is strictly increasing in \( a \) on \( [a, a^{FB}] \), there exists some \( \mu^* \in (0,1) \) such that the corporation will operate for all \( \mu > \mu^* \).

As \( \mu \) decreases from 1 to \( \mu^* \), \( a^C \) decreases from \( a^{FB} \), and \( \Pi(a^C) \) decreases from maximal profits to zero, while \( a^P \) decreases from some level above \( a^{FB} \), so \( \Pi(a^P) \) first increases up to maximal, and only then decreases to zero. This gives our central result:

**Proposition 3** There exists some \( \tilde{\mu} \in (\mu, 1) \) such that a partnership achieves strictly higher profits than a corporation if \( \mu \in (\mu, \tilde{\mu}) \), while a corporation achieves strictly higher profits than a partnership if \( \mu \in (\tilde{\mu}, 1) \).
Proof. We know that \( a^P > a^C \) for all \( \mu \in (\mu, 1] \), and that if \( \mu = 1 \), then \( a^C = w \), so \( \Pi(a^C) \) is maximal and greater than \( \Pi(a^P) \). On the other hand, if

\[
\mu = \mu^P = \frac{K}{\Pi(w) + K},
\]

then \( a^P = w \), so \( \Pi(a^P) \) is maximal and \( \Pi(a^P) > \Pi(a^C) \). Since \( \Pi(\cdot) \) is concave, there is some \( \hat{\mu} \in (\mu^P, 1) \) such that \( \Pi(a^C) \geq \Pi(a^P) \) whenever \( \mu \leq \hat{\mu} \). Q.E.D.

3.2 Discussion

Our main comparative result rests on three assumptions. First, there is a distribution of talent in the labor market, so that the selection of employees matters to clients. Second, the market has imperfect information about the firm’s hiring decisions and the resulting quality of service. Finally, firms are able to commit to an organizational form of profit distribution, but are not able to make other commitments that affect employee selection, such as to pay above-market wages in return for an entry fee.

Given that wages are constant, the interplay of the first two assumptions can be tied neatly to the older literature on labor-managed firms and indeed, placed squarely in the context of standard monopoly theory. To see this, think of the firm as choosing a quantity \( x \) rather than a hiring threshold. Any quantity \( x \in [0, 1] \) has a corresponding threshold \( a(x) = F^{-1}(1 - x) \). Let \( p(x) = p(a(x)) \) be the market price when the market observes \( x \), and \( p^e \) be the price when the market does not and instead believes the hiring threshold is \( a^e \). The firm’s costs, in terms of quantity, are \( wx + K \). Letting \( MR(x) = \mu x + (1 - \mu) p(x) \) denote the equilibrium marginal revenue, we have a twist on the standard monopoly problem.

Figure 1 provides an illustration. For a corporation, the equilibrium quantity \( x^C \) equates the equilibrium marginal revenue to the wage \( w \). In contrast, for a partnership, the equilibrium quantity \( x^P \) equates the equilibrium marginal revenue to a partner’s share. When \( \mu = 1 \), a corporation is efficient, while a partnership is inefficiently small (i.e. of inefficiently high quality). The equilibrium choices with \( \mu = 1 \) are denoted in Figure 1 by \( x^C_\mu \) and \( x^P_\mu \). This is precisely the problem studied by Ward (1958) — as he observed more than four decades ago, the corporation earns higher profits.

As \( \mu \) drops below one, both a corporation and a partnership choose higher quantities (lower qualities). Consequently, the partnership’s total profits are first increasing towards the maximum, while the corporation’s are decreasing. For some \( \hat{\mu} \) both organizational forms will generate the same total profits, and this is given by the quantities \( x^C_{\hat{\mu}} \) and \( x^P_{\hat{\mu}} \) respectively. As \( \mu \) drops below \( \hat{\mu} \) the partnership will be more profitable.
than the corporation, until the shutdown value of $\mu$. Thus, with imperfect market information, the partnership’s tendency toward being selective compensates for the firm’s incentive to reduce quality. The result is that a partnership is the more profitable form of organization.

This interpretation might convey the impression that the link between quality and quantity is essential to the theory. This is not the case. Section 3.3 shows that when wages depend on ability, similar results obtain despite the fact that quality and quantity are not directly tied in equilibrium.

The final assumption driving our result is that a partnership is, by definition, committed to share profits, while a corporation is not. The assumption that organizational form can be a commitment to operate in a certain fashion is broadly consistent with the theoretical literature on organizations, where organizational form is seen as a long-term decision, not frequently revisited, in contrast to hiring and production choices. Note that the key is that a partnership pays its threshold employee more than his marginal product while a corporation pays its threshold employee precisely his marginal product. Therefore, the equal sharing of profits is not crucial. Indeed, regardless of how the infra-marginal partners distribute profits, the partnership will be more selective than a corporation so long as the marginal partner receives more than his marginal product. This is important to emphasize: equal profit sharing is not key, but some redistribution
of profits is.

In theory, firms may be able to find alternative commitment mechanisms to ensure quality, and there is no question that some do. In the context of our model, committing to pay every employee a wage $w' > w$ would ensure a higher hiring threshold. This transfers some profits to the employees, but in some cases could be desirable. This is, in fact, profit sharing in another guise. More generally, committing to screen employees using some rigorous screening mechanism, or committing to hire only applicants from top educational institutions, are potential imperfect ways to guarantee high quality. Indeed, in professional services we often see these strategies used in conjunction with profit sharing.

3.3 Ability Dependent Wages

So far we have made the simplifying assumption that all workers have the same reservation wage. If there is competition for workers, it is natural to think that more talented employees will command higher outside wages. We now consider the optimal hiring policy and choice of organizational form for a firm facing a set of workers whose wages increase with ability.

While our main results remain intact, some new insights emerge. For instance, a corporation no longer hires the most able workers, but those for whom the gap between marginal product and outside wage is largest. In contrast, partnerships do attempt to hire the most talented workers but are susceptible to "unraveling" if the most able workers prefer their outside salaries to sharing profits with less able workers. This section also demonstrates that the link between quality and quantity is an artifact of the constant wage assumption rather than an important element for our results.

Suppose wages are given by an increasing and continuous function $w(a)$.(In the next section we show how $w(a)$ might arise endogenously in market equilibrium.) If a firm hires all workers in the set $A$, and the market correctly anticipates this decision, economic profits are:

$$ \int_{a \in A} (a - w(a))dF(a) - K. $$

To ensure that hiring is meaningful for efficiency and profits, suppose that there exists some $\hat{a} \in (a, \bar{a})$ such that $a \geq w(a)$ for all $a \geq \hat{a}$ and $a < w(a)$ for all $a < \hat{a}$. Efficiency then dictates that a worker should be employed if and only if $a \geq \hat{a}$. As above, we assume that if a firm hires efficiently in equilibrium, it will make sufficient profits to cover its fixed costs.
3.3.1 Corporation Equilibrium

Given a market expectation $p^e$, the corporation’s optimal hiring policy is to employ all workers whose marginal product $\mu a + (1 - \mu)p^e$ is above their market wage $w(a)$. In certain non-generic cases, there may be a positive mass of agents whom the firm is just indifferent to hiring. Because of this, the optimal hiring policy need not be unique. Let $A(p^e, \mu)$ denote the collection of optimal hiring sets. If $A \in A(p^e, \mu)$, then

$$a \in A \Rightarrow \mu a + (1 - \mu)p^e \geq w(a)$$

and

$$a \in A \Leftarrow \mu a + (1 - \mu)p^e > w(a).$$

In equilibrium, the market correctly anticipates the firm’s hiring decision. Thus a set of workers $A$ corresponds to equilibrium hiring if $A \in A(p(A), \mu)$. While an equilibrium always exists in this more general setting, there may no longer be a unique equilibrium. For each $\mu$, we consider the equilibrium most favorable to the firm — this is also the equilibrium with highest quality.

**Proposition 4** There exists some $\mu \in (0, 1)$ such that a corporation is profitable in equilibrium if and only if $\mu > \mu$. Furthermore, a corporation’s equilibrium quality and profits are increasing in $\mu$. The corporation is efficient if $\mu = 1$.

The intuition for this result follows from considering the firm’s best response to a given market expectation. Consider the change in the profit from employing a worker of ability $a$ when market monitoring increases from $\mu$ to $\mu'$. The change is positive if $a > p^e$, and negative if $a < p^e$. That is, good workers become relatively more valuable and bad workers relatively less valuable when market monitoring increases. We show in the Appendix that this intuition can be extended to show that the average quality of employees hired in equilibrium increases with market monitoring.

3.3.2 Partnership Equilibrium

To consider the problem of partnership formation, we first note that our definition of a stable partnership is easily adopted to this more general environment, and it is easy to see that any stable partnership must be an interval.\(^\text{10}\) Indeed, in many cases, the

\(^{10}\)To see this, note that given any market expectation, if $a$ and $a''$ are included, but $a'$ is not, where $a < a' < a''$, then by replacing some or all members of ability $a$ with new partners of ability $a'$, the average share can be increased. Moreover, as the previous share was greater than $w(a'')$ then the new share will certainly be greater than $w(a')$. 

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stable partnership considered in the previous section will still be a stable partnership with ability dependent wages. Given $\mu$, let $a^P(\mu)$ be the equilibrium threshold partner from the previous section, i.e. that solves (3).

**Proposition 5** The partnership $[a^P(\mu), \overline{a}]$ is stable if and only if $s(a^P(\mu), a^P(\mu)) \geq w(\overline{a})$. More generally, for a given $\mu$, the interval $A = [a, a']$ is stable in equilibrium if and only if (i) $\mu a + (1 - \mu)p(A) = s(A, A)$, (ii) $s(A, A) = w(a')$ (or $\geq$ if $a' = \overline{a}$).

The important observation here is that ability dependent wages affect partnerships quite differently from the way they affect corporations. While a corporation may be tempted to employ low ability but cheap workers, a partnership will always want to add the highest ability workers. The problem faced by partnerships is that the highest ability workers may not want to engage in profit-sharing with agents who are less talented. As a result, a partnership may unravel as the best partners opt out. In some cases, this unraveling is complete: if the top partnership $[a^P, \overline{a}]$ is not stable, then no inferior partnership is stable.\(^{11}\)

### 3.3.3 Comparing Partnerships and Corporations

To compare partnerships and corporations for a given level of market monitoring, we focus on comparing the highest quality equilibrium corporation with the highest quality equilibrium partnership. In particular, we focus on the top partnership $[a^P, \overline{a}]$.

Putting aside the question of whether the top partnership is feasible (i.e. whether $s(a^P, a^P) \geq w(\overline{a})$), note that if $\mu = 1$, then the corporation is efficient, while the partnership is of higher than efficient quality. As $\mu$ decreases, Proposition 4 implies that the corporation’s quality and its profits also decrease. The partnership’s quality and partner share also decrease when $\mu$ decreases, but the partnership’s total profits first increase and then decrease. As in the previous section, there is some cut-off $\hat{\mu}$ such that a corporation is more profitable than a partnership if and only if $\mu \geq \hat{\mu}$. Again we expect to see the partnership form chosen when market monitoring is sufficiently imperfect.

The caveat to this comparison is that a partnership may not be feasible despite generating higher total profits than a corporation. In particular, a partnership of the highest ability agents will be stable in equilibrium only if $\mu$ is sufficiently high so that each partner’s share exceeds $w(\overline{a})$. In this sense, the model predicts that intense competition for the best agents will tend to favor the corporate form.

\(^{11}\)This is the case when if the distribution $f(a)$ is non-decreasing over $[a, \overline{a}]$. 

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4 Competition and Market Equilibrium

In this section we present a market equilibrium model in which organizational form, wages and market structure are endogenously determined. We show how competitive pressure undermine significant redistribution in partnerships even at the expense of efficient quality provision.

4.1 A Simplified Model

We use a simplified version of our model with three types of workers. As before, there is a unit measure of agents with outside option $w > 0$. A proportion $\pi_H$ have high ability $a_H > w$; a proportion $\pi_M$ have medium ability $a_M \in (w, a_H)$; and a proportion $\pi_L = 1 - \pi_H - \pi_M$ have low ability $a_L < w$. Technology is the same as before as is the specification of demand for services and market information. Surplus is maximized when all high and medium ability agents are employed, and the low ability agents are not. Thus, a firm that only includes high types has too high quality, and a firm that includes some low types has too low quality. Nevertheless, to allow for these possibilities in equilibrium, we assume that hiring only high types, or hiring all agents are both profitable configurations, and that the fixed costs are not so large that inefficiently small partnerships would necessarily want to admit more partners.

Assumption A1: $[\pi_H a_H + \pi_M a_M + \pi_L a_L] - w - K > 0$ (hiring everyone is profitable); $\pi_H(a_H - w) - K > 0$ (hiring only high-types is profitable); and $0 < K < \pi_H(a_H - a_M)$ (returns to scale are not too large).

As a starting point, it is useful to revisit the monopoly analysis with the simplified distribution of abilities. A full analysis is provided in the Appendix. There we prove the following proposition:

If we consider a single monopoly firm, Propositions 1-3 still apply. A corporation hires efficiently at $\mu = 1$, and may hire some low types for lower values of $\mu$. A partnership hires only high types at $\mu = 1$, and as $\mu$ drops, it adds medium and then low types.

The Appendix shows that there are two threshold levels for the partnership, $\mu^H > \mu^L$ such that if $\mu > \mu^H$ the partnership includes only the high types; for $\mu \in [\mu^L, \mu^H]$ it includes all the high and medium types (i.e., it is efficient); and for $\mu < \mu^L$ all types are partners. There are also two thresholds levels for the corporation, $\mu^{**} > \mu^*$, such that if $\mu \geq \mu^{**}$ the corporation is efficient and includes all high and medium types; if $\mu \in (\mu^*, \mu^{**})$ it also includes some (but not all) low types; and if $\mu \leq \mu^*$ all types are hired. The following summarizes the analysis in the Appendix.
**Proposition 6** In the three type monopoly model for the partnership equilibrium there exist thresholds $\mu^H > \mu^L$ such that if $\mu > \mu^H$ the partnership includes only the high types; if $\mu \in [\mu^L, \mu^H]$ it includes all the high and medium types (i.e., it is efficient); and if $\mu < \mu^L$ all types are partners. For the corporation equilibrium there exist thresholds $\mu^{**} > \mu^*$, such that if $\mu \geq \mu^{**}$ the corporation is efficient and includes all high and medium types; if $\mu \in (\mu^*, \mu^{**})$ it also includes some (but not all) low types; and if $\mu \leq \mu^*$ all types are hired.

It is easy to show (as before) that an equilibrium partnership provides quality at least as high as a corporation, i.e., $\mu^L < \mu^*$. In general, $\mu^H$ and the corporation thresholds cannot be ranked. Figure 2 provides an illustration when $\mu^H > \mu^{**}$. There are four regions of interest. In region I, $\mu > \max\{\mu^{**}, \mu^H\}$ so a corporation is efficient and a partnership is not. In region II both forms are efficient. In region III, a partnership is efficient and a corporation is not. In region IV both forms of organization are equally inefficient. If, in contrast to Figure 2, $\mu^H < \mu^{**}$ there exist values of $\mu$ for which a partnership is too selective, while a corporation is not selective enough.
4.2 Free-Entry Equilibrium

We now apply the three type model to analyze a competitive free entry equilibrium where both salaries and organizational form are determined endogenously. As before, partnerships will use equal sharing, and must be stable. Corporations can use any sharing rule, but cannot commit to pass up profitable hires, or to pay an employee more than his marginal product. A key point is that with competitive entry a corporation will have to redistribute its profits in a form of salaries above the outside wage \(w\).

Formally, a firm \(i\) is comprised of three components: the market beliefs about the firm, \(p^{i}\); the proportion of each type that the firm hires: \(\lambda^{i} = (\lambda^{i}_{L}, \lambda^{i}_{M}, \lambda^{i}_{H})\) where \(\lambda^{i}_{t} \in [0,1]\); and a type-dependent wage for each employee, \(w^{i} = (w^{i}_{L}, w^{i}_{M}, w^{i}_{H})\). As before, let \(w\) be the type-independent outside option. A market structure is a feasible collection of firms \(I\) satisfying \(\sum_{i \in I} \lambda^{i}_{t} \leq 1\) for all \(t \in \{L, M, H\}\).

Our definition of equilibrium will require all firms to hire optimally given market beliefs and competing offers. For this, let \(MR^{i}_{t} = \mu a_{t} + (1 - \mu)p^{i}\) denote the marginal revenue of a worker of type \(t\) to firm \(i\). For a corporation, a worker of type \(t\) is a profitable hire if \(MR^{i}_{t} \geq \max\{w^{-i}_{t}, w\}\). Optimality for a corporation requires that it make all strictly profitable hires, and no strictly unprofitable hires, and if \(\lambda^{i}_{t} > 0\) (some workers of type \(t\) are hired) then \(MR^{i}_{t} \geq w^{i}_{t} \geq \max\{w^{-i}_{t}, w\}\). Optimality for a partnership is similar, only the wage is an equal share and the condition for profitable hiring compares marginal revenue to the share.

**Definition 7** A market structure is a Free Entry Equilibrium (FEE) if it satisfies:

1. **Optimality:** Given \(w^{-i}, w,\) and \(p^{i}\), each firm \(i \in I\) hires optimally
2. **Correct beliefs:** \(p^{i} = q = E[a(\lambda^{i}_{L}, \lambda^{i}_{M}, \lambda^{i}_{H})]\)
3. **No Entry:** There is no potential entrant \((\lambda, \bar{w}, \bar{p})\) satisfying (1) and (2) above that could make strictly positive profits.

Part (3) states that there does not exist a profitable opening for a new firm. A potential entrant must arrive with correct client beliefs, and its behavior must be a best response to these beliefs and the behavior of the existing firms. A subtle issue concerns the wages an entrant has to pay to attract existing workers. We follow standard static equilibrium analysis and assume that to attract workers of type \(t\) from firm \(i\), the entrant has to offer a wage of at least \(w^{i}_{t}\).\(^{12}\)

\(^{12}\)A second possibility would be that once an entrant attracts some workers from a firm \(i\) at wage \(w^{i}_{t}\), then the incumbent firm \(i\) may become unsustainable, causing it to dissolve, and having its remaining employees willing to join the entrant for lower wages than \(w^{i}_{t}\). This would be a fragile solution concept since it will allow for too many possible entry deviations, and would in many cases cause non-existence of equilibrium with this definition of entry.
Because the fixed cost $K$ of production generates increasing returns, there can never be two corporations coexisting in a free-entry equilibrium. Whether or not there can be multiple partnerships in equilibrium depends on whether a firm composed only of medium type agents is profitable. The characterization of FEE is quite tedious when multiple partnerships are possible. For this reason we introduce Condition M.

**Condition M** $\pi_M(a_M - w) - K < 0$.

Under Condition M every free entry equilibrium involves a single incumbent firm. Because it faces a constant reservation wage $w$, this firm hires exactly as an equilibrium monopolist. In the Appendix, we provide an exact characterization of FEE under condition M. In what follows we convey the basic results.

Because the firm that emerges in FEE will hire as a monopolist (and generate the same net revenue to be shared among its workers, as Lemma A1 demonstrates) a useful reference point is the net profits (revenues net of outside option wages and fixed costs) that would be generated by an equilibrium corporation or equilibrium partnership in the *monopoly* model. Denote these profits by $\Pi^C(\mu)$ and $\Pi^P(\mu)$.

If given the parameters, a monopoly corporation would be more efficient than a monopoly partnership, $\Pi^C(\mu) \geq \Pi^P(\mu)$ then there is always an FEE with a single incumbent corporation. This corporation hires as a monopolist but has some flexibility in how it re-distributes net revenues among its workers. There is, however, a floor (above $w$) on the amount that it can pay its high ability agents to prevent them from breaking off and forming a partnership. Interestingly, a single corporation FEE can also exist even when a monopoly partnership would be more efficient. Such a corporation deters entry by a more efficient partnership by paying high ability agents more than medium ability agents, so that while medium types would like to break off and form an efficient partnership, high types do not want to join them.

A free-entry equilibrium with an active partnership can only exist if the partnership is (weakly) more profitable than a monopoly corporation, i.e. if $\Pi^P(\mu) \geq \Pi^C(\mu)$. This, however, is a necessary, but not sufficient condition for a partnership FEE because an entering corporation may be able to enter without hiring away all of the partnership's workers. In particular, the entering corporation may be able to skim off just the partnership's high ability workers. We provide such an example in the next section.

If Condition M fails it is also possible for there to be an FEE where two quality-ranked partnerships coexist. A necessary, but again not sufficient, condition for such an equilibrium to exist is that the two partnerships, taken together, generate greater profits than would a monopoly corporation. An example can be found in the Appendix.\footnote{The intuition is that once a top interval stable partnership is formed, it may be of too high quality so
4.3 The Effect of Competition on Sharing Rules

Perhaps the most interesting aspect of the competitive model is that, even though a monopoly partnership might be more efficient than a monopoly corporation, it may be impossible for the partnership to survive free entry. This suggests that an equal sharing partnership, if faced with the prospect of increased labor market competition may have to change its sharing rule to survive competitive pressure.

A numerical example demonstrates the point. Suppose that there are equal fractions of high, medium and low ability agents, \( \pi_L = \pi_M = \pi_H = 1/3 \), that \( w = 1/2 \), \( K = 1/4 \), and that \( (a_H, a_M, a_L) = (2, 1, 0) \). Using formulas derived in the Appendix, \( \mu^H = 3/4 \), \( \mu^* = 2/3 \), \( \mu^* = 1/2 \) and \( \mu^H = 1/4 \). For the purposes of the example, let \( \mu = 1/2 \) so that a monopoly partnership would be efficient and hire high and medium agents, while a monopoly corporation would inefficiently hire all agents. The efficient partnership pays a share \( s = 9/8 \). Perhaps surprisingly, it cannot fend off the entry of an inefficient corporation.

Consider a corporation that enters with market beliefs that it will hire all the high and low ability agents, so that \( p^e = 1 \). Its marginal profit from hiring high types is 
\[ \mu a_H + (1 - \mu) p^e - s = 3/8, \]
its marginal profit from hiring low types is 
\[ \mu a_L + (1 - \mu) p^e - w = 0, \]
while its marginal revenue from hiring medium types is 
\[ \mu a_M + (1 - \mu) p^e - s = -1/8. \]
So its optimal hiring behavior will make the market’s beliefs correct. Moreover, given this hiring strategy and beliefs, it makes a profit:

\[ \Pi = \pi_H(a_H - s) + \pi_L(a_L - w) - K = \frac{1}{24}. \]

While an efficient partnership cannot exist in an FEE, an inefficient corporation that hires all agents can. To see this, observe that such a corporation generates revenue of 1, leaving 3/4 for salaries after paying the fixed cost. So it can pay medium and low agents each a salary of \( w = 1/2 \) and pay high ability agents a salary \( w^H = 5/4 \), i.e. the remainder. A partnership that tries to enter cannot attract the high ability agents given this salary and it is easy to check that there is no possible profitable entry by a corporation.

The example demonstrates that even if an equal sharing partnership is an efficient form of organization, it may be susceptible to competitive attempts to attract its most talented partners. Competition brings salaries more closely in line with marginal product, that starting from the marginal agent who is not in the partnership, a second stable partnership of lower quality can be sustained. There may be several such partnerships that can achieve positive economic profits. Farrell and Scotchmer (1988) consider a cooperative game model of partnerships that generally results in quality ranked partnerships.
which in turn may lead to less efficient organizations in the face of imperfect market monitoring.

This suggests that if a partnership is subject to competitive pressure that did not previously exist, it might convert to corporate form by selling to an outside acquirer or making a public equity offering. Alternatively, competition might induce a change in the partnership’s compensation structure. That is, if market pressures threaten to skim the best partners, one response is to implement some form of productivity-based compensation. The danger of course is that as compensation becomes more productivity based, profit-sharing is reduced and there may be an incentive on the margin to bring in additional partners at lower compensation who would previously have been below the firm’s threshold. In this way, there is the possibility that competition will undermine a partnership’s commitment to quality service provision. This may shed some light on the changes that have occurred in many law firms in recent decades, as we discuss in the next section.

5 Discussion

In this section we relate the model to some stylized empirical facts and to some recent changes in professional service firms. We then discuss a few aspects of partnerships that are ignored by our model.

5.1 Partnerships in Practice

At the outset, we observed that partnerships have been the traditional mode of organization in the professional services despite being relatively rare in other industries. Our model explains this by showing that the combination of significant quality uncertainty on the part of clients and a close relationship between human capital and quality, two features that we believe characterize the professional services, make partnerships a desirable form of organization.

The theory suggests that when the quality of a service is harder to evaluate, this service is more likely to be supplied by partnerships. Some rough census numbers support this prediction. Table 1 reports statistics on the legal form of organization across sectors taken from the 1997 Economic Census. Consistent with casual empiricism, there are hardly any partnerships in retail trade, transportation and warehousing (high \( \mu \) sectors), but a significant number in professional, scientific and technical services.
Table 1: Percent of business performed by legal organization*

<table>
<thead>
<tr>
<th>Sector</th>
<th>% corp</th>
<th>% part</th>
<th>% sole</th>
<th>% other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail Trade - 44-45</td>
<td>90.47</td>
<td>2.82</td>
<td>4.87</td>
<td>1.84</td>
</tr>
<tr>
<td>Transportation and Warehousing - 48-49</td>
<td>93.43</td>
<td>2.15</td>
<td>3.41</td>
<td>1.01</td>
</tr>
<tr>
<td>Professional, Scientific &amp; Technical Services - 54</td>
<td>75.93</td>
<td>18.32</td>
<td>5.36</td>
<td>0.39</td>
</tr>
<tr>
<td>Offices of lawyers - 54111</td>
<td>39.96</td>
<td>47.51</td>
<td>12.28</td>
<td>0.25</td>
</tr>
<tr>
<td>Accounting, taxes, etc. - 5412</td>
<td>47.31</td>
<td>44.80</td>
<td>7.44</td>
<td>0.45</td>
</tr>
<tr>
<td>CPA offices - 541211</td>
<td>31.90</td>
<td>60.85</td>
<td>7.00</td>
<td>0.25</td>
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<tr>
<td>Tax return prep. - 541213</td>
<td>66.66</td>
<td>4.42</td>
<td>28.86</td>
<td>0.06</td>
</tr>
<tr>
<td>Architectural, engineering, etc. - 5413</td>
<td>92.35</td>
<td>4.33</td>
<td>3.08</td>
<td>0.25</td>
</tr>
<tr>
<td>Architectural services - 54131</td>
<td>82.42</td>
<td>9.18</td>
<td>8.29</td>
<td>0.11</td>
</tr>
<tr>
<td>Engineering services - 54133</td>
<td>94.42</td>
<td>3.68</td>
<td>1.45</td>
<td>1.67</td>
</tr>
<tr>
<td>Geoph. surveying &amp; mapping - 54136</td>
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<td>1.14</td>
<td>17.07</td>
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</tr>
<tr>
<td>Mgmt. sci. &amp; tech. consulting - 5416</td>
<td>80.25</td>
<td>15.96</td>
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<td>HR &amp; exec. search cons. - 541612</td>
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<td>4.81</td>
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<tr>
<td>Process, dist. &amp; log. cons. - 541614</td>
<td>84.07</td>
<td>12.72</td>
<td>1.53</td>
<td>1.68</td>
</tr>
</tbody>
</table>

* Source: U.S. Census Bureau, 1997 Economic Census report, Establishment/Firm Size, Legal Form

Note that within the professional service sector there is further variation that agrees with our model’s predictions. For instance, within accounting, firms that offer individual tax form preparation (high \( \mu \)) are unlikely to be partnerships, while a majority of CPA firms that perform complex accounting tasks (low \( \mu \)) are organized as partnerships. Another example is architectural and engineering firms. Architectural services are generally hard to evaluate relative to engineering and surveying services. Similarly in consulting, administrative and management consulting is relatively complex compared to process and production consulting, which in turn is harder to evaluate than human resource services (head hunting). Table 1 shows that in all these cases, the distribution of partnerships moves in accordance with our predictions.

**Recent Trends in the Professional Services**

The prevalence of partnerships in the professional services dates back at least to the beginning of the twentieth century. The past two decades, however, have seen striking organizational changes in some of these industries. We briefly discuss these changes in light of our theory.
Both anecdotal and empirical evidence suggests that law firms increasingly have moved away from the traditional method of lock-step or seniority-based profit-sharing (the “Cravath model”) in favor of productivity-based, “eat-whatever-you-kill” forms of profit-sharing (Altman Weil, 2000). These changes have made firms less like the partnerships we have modeled and more corporate — although it should be emphasized that even law firms that use productivity measures in compensation often do a great deal of redistribution. Our analysis suggests several possible explanations for this trend: redistribution may have become less sustainable due to competition in the labor market or changes in the returns to talent; alternatively, changes in market information might have made a commitment to equal-sharing less valuable.

Though we do not know of a comprehensive empirical study, there is some evidence of a competitive trend in the labor market for lawyers. One commonly referenced cause is the changing role of in-house counsel. Gilson and Mookin (1985) write that “twenty years ago, the chief in-house lawyer for a corporation was commonly viewed as a competent professional who probably would not quite measure up to partnership quality... Today, however, corporations regularly persuade important partners in major law firms to resign from the partnership to become general counsel.” (p. 382) To the extent that this change led to a more active market for senior lawyers, our analysis suggests that top lawyers in firms with equal-sharing compensation might credibly threaten to leave if compensation practices were not altered. A second consequence of better in-house counsel may be that firms become more discriminating consumers. In the context of our model this could be interpreted as better monitoring (higher $\mu$), an effect that would also push toward a more corporate form.

Beyond the changing role of in-house counsel, changes in the sharing structure of law partnerships have also coincided with an increase in litigation awards and in some accounts to more star oriented firms. To the extent that this might allow some partners to demand larger salaries — for instance, by threatening to start their own firms — this change could also lead to the sort of unraveling we considered in the previous section. Thus, a change in the returns to ability or specialty could provide another explanation for the move toward productivity-based compensation.

Law firms are not the only professional service firms to become more corporate in recent years. In the financial services industry, virtually all the major investment banks have sold their partnerships to outside investors. In the period from 1981 to 1986, these sales included Salomon Brothers, Lehman Brothers, Kidder Peabody, Bear Stearns, Dean Witter and Morgan Stanley. This remarkable transformation coincided with several changes in the industry — the introduction of trading in risky derivatives and the opening of international markets, which some argue required firms to have larger capital
bases, a much more mobile and competitive labor market, and rapid growth and then consolidation of the major firms. To the extent that our model relates the corporate form to a more competitive labor market and an increase in optimal firm size, the simultaneity of these changes seems consistent with our basic story. Below, we argue that increased capital requirements also favor the corporate form.\textsuperscript{14}

5.2 Features of Partnerships

\textit{Capital Requirements}

A notable feature of many professional service firms is that they are not capital-intensive.\textsuperscript{15} Thus, one might ask whether capital requirements are related to the distribution of partnerships across industries. Of course, the relationship is not perfect — in many low-capital industries, the corporate form is standard. For instance, the software industry has very low capital requirements, but very few partnerships.\textsuperscript{16} Still, the correlation suggests looking for a reason why partnerships might be at a disadvantage in raising capital. As it turns out, our model suggest a very simple reason why partnerships might have trouble at least raising equity finance.

To see why, suppose a partnership could sell a stake (e.g. a claim on some percent of profits) to outside shareholders. The immediate problem that arises is that these shareholders now have a different objective than the partners. While the partners want to keep average profitability high, the shareholders are interested in total profits — they are likely to want to expand the firm at the cost of lower quality. How this conflict plays out depends on how control is allocated, but it seems clear that such a conflict would be likely to have adverse consequences.\textsuperscript{17} Thus, one story for why investment banks sold out their partnerships in the 1980s is that they felt compelled to raise capital and saw

\textsuperscript{14}Many advertising partnerships sold out at a similar point in time (and there was significant growth in major firms). There also have been significant changes in the structure of medical practices. A full discussion of these changes is beyond the scope of this paper.

\textsuperscript{15}One notable exception is that some medical partnerships have significant investments in specialized equipment, though this equipment is sometimes leased. As we mentioned above, investment banks have become more capital intensive, a change that coincided with partnership sales.

\textsuperscript{16}See U.S. Census. In light of our model, software is a product that is relatively easy for the market to assess, despite the importance of human capital in its production. So a partnership arrangement would not have an important benefit. Enterprise software (large specialized programs) might be somewhat different, although typically the product is purchased in stages and can be tested before payments are made (unlike for instance medical care where quality may not be known for years if ever).

\textsuperscript{17}This assumes that outside shareholders buy a fixed fraction of the equity rather than join on as “passive” partners. However, there would be an incentive to lower quality even if outside shareholders bought partner shares because productive partners would feel less of a dilution effect from marginal hires.
a sale to outside shareholders as the best avenue to do this. (A main exception to the trend was Goldman Sachs, which was able to raise a significant amount of equity finance without dissolving its partnership.)

Up-or-Out Promotion Schemes

A common feature of many partnerships, particularly in law, is the use of up-or-out promotion schemes at the point when associates reach partner level. If we take a more dynamic view of our model, we can suggest a simple explanation for this. Specifically, imagine that firms do not learn the actual talent of employees immediately (when they are hired) but rather after some initial employment period. Under this interpretation, the hiring decision in our model can be interpreted as a promotion to partner decision. Indeed, in an earlier version of this paper, we used exactly this approach with young employees joining the firm at a low wage (an “entry fee”) and then being promoted to partner if they turned out to be above the threshold for promotion.

In this light, an up-or-out promotion scheme can be an integral part of a partnership’s commitment to guaranteeing the high quality of long-term employees. Because current partners will promote only the best associates to a full partner share, those that are not of extremely high quality will be let go even if they might make a positive contribution to the firm’s total profits. To the extent that partnerships can retain senior employees without promoting them to partner, some of the commitment to quality is lost. At the same time, if partnerships do less profit re-distribution (e.g. move toward more productivity-based compensation), the title of partner becomes less meaningful and the up-or-out system becomes less important.18

This interpretation seems consistent with recent trends in law firms. In many firms, changes in the compensation structure have been accompanied by a relaxation of the up-or-out system. As Gilson and Mnookin put it: “firms are creating new categories of employee lawyers ... permanent associate, staff lawyer, special council, non-equity partner, junior partner” (1989, p.567). The idea that an up-or-out system would become less attractive once the compensation scheme involved less strict re-distribution fits naturally with our theory.

Non-Compete Clauses

A non-compete clause in a labor contract specifies that if an employee leaves a firm, he cannot practice in the same profession within some time period and geographical location.

18Kahn and Huberman (1988) propose a different role for up-or-out schemes by showing that they can mitigate a form of hold-up involving human capital investment. However, they do not have results suggesting that we should see this form of promotion in partnerships but not corporations.
Many partnerships include some form of non-compete clause in their contracts. One interpretation stemming from incentive theory is that these clauses might be in place to mitigate hold-up problems in general human capital investment. For example, if a law firm makes a large investment to train an associate, this investment could be lost if the associate leaves and a non-compete clause might be useful to alleviate this hold-up. However, this account looks weak once we observe that these clauses are generally signed at the late stage of promotion to partner.

In the context of our model, non-compete clauses might play a different role, namely to prevent employees from taking up lucrative outside options rather than sharing profits with the other partners. In this account, the usefulness of such a clause turns on the employee not having precise knowledge of his future alternatives at the time of becoming a partner. If this were known, the worker would demand at least his outside wage as a condition for becoming a partner in a given firm. If there is uncertainty, however, a prospective partner might sign a non-compete clause that could eventually become binding in the event that attractive outside opportunities arose. In such an environment, a non-compete clause can play an important role: by hindering departure, they protect the partnership against the danger of unraveling.

5.3 Legal and Tax Issues

While our theory emphasizes functional differences between partnerships and corporations, there is also a distinction between partnerships and corporations as legal entities. In principle, a firm can legally be defined as a partnership without doing significant profit sharing. Similarly, a firm can legally be defined as a corporation yet implement significant profit sharing using wage bonuses. In practice, however, there is a significant correlation between the legal status and the lay distinction that we employ.

Our sense is that a firm’s choice of legal status tends to follow its functional organization. Nevertheless, a firm’s legal status may have liability, tax and regulatory

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19 A recent highly publicized example is Arthur Andersen. It is sometimes argued that non-compete clauses are a violation of antitrust law, but an exception seems to be made for professional partnerships. For instance, in Rash v. Tococa Clinic Med. Assoc., 253 Ga. 322, 320 S.E.2d 170 (1984), the Georgia Supreme Court ruled that partners should receive particular leeway to make mutually beneficial covenants as the partners are in an equal bargaining position. In particular, the court upheld an agreement that prohibited physicians in a medical practice from leaving to practice within twenty-five miles of Tococa, Georgia, for three years (see Grady, 1997).

20 Historically this was not the case. As late as the 1950s firms lost their legal partnership status for attempting to depart too radically from equal-sharing. Currently, if parties organize as a partnership, equal sharing of profits is the legal default, but this default can be contracted around.
consequences. In this section we briefly discuss these issues and argue that none of them can on their own explain the observed distribution of partnerships across industries.

Limited Liability

A prominent feature of the traditional General Partnership is the unlimited liability of the partners. In theory, unlimited liability might make partnerships either more or less attractive as an organizational form. It places partners at increased risk of financial ruin, but it provides clients with a strong signal of each partner’s belief in her own and her colleagues’ ability. In practice, unlimited liability seems to be a cost of partnerships rather than an explanation for their use. In particular, since the recent introduction of legal forms such as the limited liability partnership (LLP) and limited liability company (LLC), unlimited liability partnerships are rarely seen in the professional services.\textsuperscript{21} Indeed, even prior to the introduction of these forms, partnerships were able to purchase liability insurance — although unfortunately we do not have evidence on how widespread this was.

Taxes

Tax law also distinguishes partnerships from corporations, and hence provides another possible motive for choosing a partnership as one’s legal form of organization. A main distinction is that, relative to a corporation, partnerships are free from the corporate income tax and thus can avoid the “double taxation” on dividends. (Note that this distinction is relative to C-corporations — subchapter S-corporations, Limited Liability Companies and Sole Proprietorships are taxed in the same way as partnerships.)

This distinction is surely important for certain investment vehicles, but it seems unlikely to be the sole explanation for the observed distribution of partnerships across industries. In particular, the differential tax treatment applies in all sectors, rather than just the professional sectors. It is also relatively straightforward for C-corporations to distribute earnings in such a way that makes the double taxation problem all but disappear. Note also that once a company decides to issue stock and go public, it is taxed as a C-corporation regardless of its original legal form.\textsuperscript{22}

Legal Constraints

\textsuperscript{21}The LLC was introduced by Wyoming in 1977, but did not receive partnership (flow-through) tax treatment from the IRS until 1988, after which it was recognized in many states. The LLP was introduced in Texas in 1991 and most states rapidly followed.

\textsuperscript{22}Moreover, in recent years the tax code has evolved in such a way that corporations and partnership can practically face the same type of tax schedules given that they are carefully designed. (We thank Joe Bankman from the Stanford Law school for this information.)
While firms nearly always have freedom in choosing between organizational forms (see Hansmann, 1996, p. 85 for a discussion), there is one striking case where state law constrains organizational form. In most states, law firms are prohibited from having “layman” equity investors (though they need not be wholly owned by their practicing partners). A remarkable feature of these laws is that they are to some extent self-imposed — they stem directly from the guidelines of the American Bar Association, the professional association of lawyers.

In the ABA’s Model Rules for Professional Conduct, lawyers are prohibited from practicing in a for profit corporation if non-lawyers have decision stakes in the firm (rule 5.4(d)). This is part of a broader rule (5.4) that Hazard and Hodes (1989) interpret as “[protecting] clients by increasing the likelihood that they will receive competent professional services.” Our model is consistent with Hazard and Hodes in that we argue that partnerships will give rise to a higher quality than corporations. As we show, partnerships can also have the benefit of generating not just higher quality for clients, but higher profits for lawyers.\textsuperscript{23}

6 Conclusion

We consider firms in which production is based on human capital. Relative to standard profit-maximizing corporations, profit sharing partnerships are more selective in hiring, resulting in a higher level of quality than is dictated by profit maximization.\textsuperscript{24} This quality commitment pays off if clients cannot perfectly observe what they are buying. We used this insight to show that in markets where clients may not be able to monitor quality well, partnerships emerge as a desirable form of organization. We also discussed the impact of labor market competition in upsetting partnerships, and used the model to explain features of partnerships such as non-compete clauses and up-or-out promotion.

Our analysis leaves open an important issue. Namely, decision rights are not emphasized in our model because in an equal sharing partnership with no outside financing, all partners have the same objective. Once one moves away from strict equal sharing, the structure of decision rights and how partnerships are governed becomes an important topic for future research.

\textsuperscript{23}One might wonder why the industry would need regulation to ensure the partnership form if individual firms would choose it directly. If lawyers had some “collective reputation” that could be hurt by rogue firms, a centralized regulation would be desirable to ensure quality.

\textsuperscript{24}In describing their practice on their web page, the highly distinguished law firm Cravath, Swaine & Moore states that “Our hallmark is the quality of our service. We are not, and will never try to be, the largest law firm measured by number of lawyers.”
Appendix

Proof of Proposition 4. Given market expectation $p^*$ and monitoring $\mu$, define

$$Z(p^*, \mu) = \{ a : \mu a + (1 - \mu)p^* - w(a) = 0 \}$$

to be the set of agents who generate zero profit. If $Z(p^*, \mu)$ is zero measure, then there is a unique optimal hiring policy (which may be the null set). On the other hand, there may be non-generic cases where $Z(p^*, \mu)$ is of positive measure. In this case, $A(p^*, \mu)$ is set-valued. This is the one complicating factor in the arguments that follow.

To prove the proposition, it is convenient to define the mapping from expected quality to actual quality induced by optimal hiring. Let $\phi(p^*, \mu)$ denote the set of average qualities consistent with optimal hiring given $p^*$ and $\mu$. Thus, $p \in \phi(p^*, \mu)$ if and only if $p - p(A)$ for some $A \in A(p^*, \mu)$. The image $\phi(p^*, \mu)$ is single-valued (set-valued) whenever $A(p^*, \mu)$ is single-valued (set-valued).

Properties of $\phi$. We show that: (i) $\phi$ is convex-valued; (ii) $\phi$ is upper semi-continuous in $p^*$; and (iii) $\phi$ is increasing (in an appropriate sense) in $\mu$.

(i) $\phi$ is convex-valued. Fix $p^*$ and $\mu$. Suppose $p_1, p_2 \in \phi(p^*, \mu)$ and $A_1$ and $A_2$ are the corresponding optimal hiring sets. Then $A_1$ and $A_2$ differ only in which elements of $Z(p^*, \mu)$ they contain. Of course, if $Z(p^*, \mu)$ is zero measure, then $p_1 - p_2$. If not, then we can construct an optimal hiring set with any quality $p$ between $p_1$ and $p_2$ by including all agents in $A_1 \cap A_2$ along with an appropriate subset of $Z(p^*, \mu)$.

(ii) $\phi$ is upper semi-continuous in $p^*$. Consider a sequence $p_n \to p^*$ and a corresponding sequence $p_n \to p$ with $p_n \in \phi(p_n, \mu)$ for all $n$. Let $A_n$ denote the optimal hiring set associated with $p_n$. We want to show that $p \in \phi(p^*, \mu)$. (We will assume that for each $p_n$, the firm does want to hire some agents, but the argument is easily adapted to the case where no hiring is optimal.)

If there is a unique optimal hiring policy, the argument is straightforward. For each $a$, if $\mu a + (1 - \mu)p^* - w(a)$ is strictly positive or strictly negative, it will also be strictly positive or negative if $p^*$ is replaced by $p_n$ for $n$ sufficiently large. Thus the sets $A_n$ will converge to a set $A$ with $A \in A(p^*, \mu)$ and $p - p(A)$.

(Specifically, $A_n \to A$ if $\mathcal{L}\{A_n \cup A \} \to 0$, where $\mathcal{L}$ is the Lebesgue measure.) Things are slightly more complex if there are a positive mass of agents for whom $\mu a + (1 - \mu)p^* - w(a) = 0$ — i.e., if $Z(p^*, \mu)$ is of positive measure. In this case, to generate the limiting optimal hiring set $A$, we need to decide which subset of $Z(p^*, \mu)$ to include in $A$. To do this, let $A$ include all $a \in Z(p^*, \mu)$ if $p^* \to p^*$ from above, and let $A$ include no $a \in Z(p^*, \mu)$ if $p^* \to p^*$ from below. This ensures that the sets $A_n$ converge to a set $A \in A(p^*, \mu)$ and that $p_n \to p - p(A)$.

(iii) $\phi$ is increasing in $\mu$ in the following sense: if $\mu' > \mu$, $p \in \phi(p, \mu)$, and $p' \in \phi(p, \mu')$, then $p' \geq p$. To see this, let $A$ and $A'$ be optimal hiring sets associated with $p$ and $p'$. Now, note that starting from monitoring $\mu$, and any expectation $p^*$, the returns to hiring worker $a$ increase when monitoring increases to $\mu'$ if and only if $a > p'$. Specifically, suppose $p' - p = p(A)$. Then if $a \in A \setminus A'$, it must be that $a \leq p(A)$, while if $a \in A \setminus A'$, then $a > p(A)$. The result is immediate. Moreover, a similar argument implies that if $p' \in \phi(p', \mu')$ and $p \in \phi(p^*, \mu)$ then $p \leq p'$.

Equilibrium Comparative Statics. Given $\mu$, there is an equilibrium corporation of quality $p$ if and only if $p \in \phi(p, \mu)$ and the firm makes sufficient profits given expectation $p$, monitoring $\mu$ and optimal hiring to cover fixed costs. Using this fact, we show that (i) equilibrium quality is increasing in $\mu$; and (ii) equilibrium profits are increasing in $\mu$.

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(i) **Equilibrium quality increases in** $\mu$. Given the continuity of $\phi$ in $p^*$, and the monotonicity of $\phi$ in $\mu$, arguments analogous to those in Milgrom and Roberts [1994] imply that the highest fixed point of the map $\phi(\cdot, \mu') : [0, 1] \rightarrow [0, 1]$ is at least as high as the highest fixed point of the map $\phi(\cdot, \mu)$ if $\mu' > \mu$. Thus the quality of the highest quality equilibrium corporation is increasing in the accuracy of monitoring. This will apply for any two values $\mu'$ and $\mu$ where the firm chooses to operate in equilibrium. As we note below, for sufficiently low $\mu$, the firm may simply choose not to operate in equilibrium.

(ii) **Equilibrium profits increase in** $\mu$. Suppose $\mu' > \mu$ and $A, A'$ are the highest quality equilibrium corporations associated with $\mu'$ and $\mu$. We show that if $a \not\in A \setminus A'$ then $a$ makes a negative contribution to equilibrium profits, while if $a \in A \setminus A'$, then $a$ makes a positive contribution to equilibrium profits.

Suppose that $a \in A \setminus A'$. Then $\mu a + (1 - \mu)p(A) - w(a) \geq 0$ but $\mu' a + (1 - \mu')p(A') - w(a) < 0$. Combining these two inequalities with the just-established fact that $p(A') \geq p(A)$, we obtain $a < p(A')$. As a consequence $a < p(A')$. But then

$$0 > \mu a + (1 - \mu)p(A') - w(a) \geq \mu a + (1 - \mu)a - w(a) - a - w(a).$$

Conversely, suppose that $a \in A' \setminus A$. Then $\mu a + (1 - \mu)p(A) - w(a) < 0$ and $\mu' a + (1 - \mu')p(A') - w(a) \geq 0$. Combining these inequalities with the fact that $p(A') > p(A)$ implies that $a > p(A')$. But then

$$0 \leq \mu a + (1 - \mu)p(A') - w(a) < \mu a + (1 - \mu)a - w(a) - a - w(a).$$

Thus equilibrium profits are higher at $\mu'$ than at $\mu$.

It follows that ignoring the recovery of fixed costs, equilibrium profits are increasing in $\mu$. If $\mu - 1$, the corporation hires efficiently and by assumption can operate profitably. For sufficiently low $\mu$, the corporation may not be able to cover fixed costs. In particular, there may exist some $\mu$ such that if $\mu < \mu$, a corporation will not operate in equilibrium while for values of $\mu$ above $\mu$, the corporation will choose to operate in equilibrium and quality and profits will increase with $\mu$. Q.E.D.

**Proof of Proposition 5.** Fix $\mu$ and consider the partnership $[a^F(\mu), \pi]$. Assume first that $s(a^F(\mu), a^F(\mu)) \geq w(\pi)$. Then $s(a^F(\mu), a^F(\mu)) \geq w(\pi)$ for any $a \not\in [a^F(\mu), \pi]$ so no partner wants to leave. Moreover, by the arguments in Section 2.3, the partners do not want to add or subtract members implying that the partnership is stable. Conversely, if $s(a^F(\mu), a^F(\mu)) < w(\pi)$, then at least some partners (i.e. the best) want to leave, so the partnership $[a^F(\mu), \pi]$ is not stable.

For the second part of the Proposition, fix a market expectation $p^*$ and a level of market monitoring $\mu$ and consider a candidate partnership $A - \{a, a'\}$. If the partnership is stable, then existing partners must not want to expand just below $a$ or contract just above $a$, that is:

$$\mu a + (1 - \mu)p^* = s(A, A')$$

Moreover, it must be the case that the best partner is willing to participate, $s(A, A') \geq w(a')$ but that no better agent would want to participate $s(A, A') < w(a^*)$ for any $a^* > a'$ (because $w(\cdot)$ is continuous, this means that if $a' < \pi$, then $s(A, A') - w(a')$. This means conditions (i) and (ii) are necessary for equilibrium stability.

Conversely, if conditions (i) and (ii) hold, given a market expectation $p^* - p(A)$, the collection of agents $A$ will not want to dismiss any members nor add any individual $a'' < a$. Moreover, because $w(\cdot)$ is increasing, no individual $a'' > a'$ is willing to join. Q.E.D.

**Proof of Proposition 6.** We analyze the corporation and partnership equilibrium in turn, then compare them.
CORPORATION EQUILIBRIUM. Because all types command the same wage \( w \), a corporation prefers to hire high types first, then medium, then low for any market expectation about quality. Moreover, if the corporation operates in equilibrium, it must be that \( p' - p > w \), so a profitable corporation necessarily hires all high and medium types in equilibrium. Therefore we focus on the decision of what proportion \( \lambda_L \) of low types to hire:

\[
\max_{\lambda_L \in [0,1]} \Pi(\lambda_L) \equiv [\pi_H + \pi_M + \lambda_L \pi_L] \left( \mu \frac{\pi_H a_H + \pi_M a_M + \lambda_L \pi_L a_L}{\pi_H + \pi_M + \lambda_L \pi_L} \right) + (1 - \mu)p' - w \right) - K.
\]

The marginal profit of additional low types is:

\[
\frac{d\Pi(\lambda_L)}{d\lambda_L} = \mu a_L + (1 - \mu)p' - w,
\]

which is decreasing in \( \mu \) provided that \( p' \geq w > a_L \). Of course in equilibrium:

\[
p' - p(\lambda_L) = \frac{\pi_H a_H + \pi_M a_M + \lambda_L \pi_L a_L}{\pi_H + \pi_M + \lambda_L \pi_L}.
\]

There are three possible equilibrium outcomes corresponding to: \( \lambda_L = 0 \), \( \lambda_L = 1 \) and \( \lambda_L \in (0, 1) \). The first case, where no low types are hired, is an equilibrium if \( d\Pi/d\lambda_L \leq 0 \) evaluated at \( \lambda_L = 0 \) and \( p' - p(\lambda_L = 0) \). These conditions are satisfied whenever:

\[
\mu \geq \mu^* = \frac{\mu H(a_H - w) + \mu M(a_M - w)}{\pi_H(a_H - a_L) + \pi_M(a_M - a_L)}.
\]

The second case, where \( \lambda_L = 1 \) so all agents are hired, is an equilibrium if \( d\Pi/d\lambda_L \geq 0 \) evaluated at \( \lambda_L = 1 \) and \( p' - p(\lambda_L = 1) \). These conditions are satisfied whenever:

\[
\mu \leq \mu'^* = \frac{\pi H(a_H - w) + \pi M(a_M - w) + \pi L(a_L - w)}{\pi_H(a_H - a_L) + \pi_M(a_M - a_L)}.
\]

where \( \mu^* < \mu'^* \) by inspection.

Finally, if \( \mu \in (\mu^*, \mu'^*) \), there is an equilibrium where \( d\Pi/d\lambda_L = 0 \) for some \( \lambda_L \in (0, 1) \) and \( p' - p(\lambda_L) \). In this case, the equilibrium condition is:

\[
\mu a_L + (1 - \mu)p(\lambda_L) = -w = 0.
\]

As \( p(\cdot) \) is decreasing in \( \lambda_L \) and the left hand side is decreasing in \( \mu \), the equilibrium quality of the firm will be increasing in \( \mu \) over the range \((\mu^*, \mu'^*)\).

PARTNERSHIP EQUILIBRIUM. Because all partners are paid the same share, a partnership (like the corporation) always wants to add high types first, then medium types, then low types. Because each high type generates the same marginal revenue and allows the partnership to spread the fixed cost over a larger set of agents, a partnership will want to add all high types for any market expectation. So the relevant decision is to choose the proportion \( \lambda_M \) of medium types to hire, and, if \( \lambda_M = 1 \), the proportion \( \lambda_L \) of low types to hire. The objective is to maximize the average profit share:

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\[ \max_{\lambda_L, \lambda_M \in [0,1]} s(\lambda_L, \lambda_M) \equiv \mu \left[ \frac{\pi_H a_H + \lambda_M \pi_M a_M + \lambda_L \pi_L a_L}{\pi_H + \lambda_M \pi_M + \lambda_L \pi_L} \right] + (1 - \mu)p^* - \frac{K}{\pi_H + \lambda_M \pi_M + \lambda_L \pi_L} \]

The marginal benefit of hiring additional medium types, assuming no low types are hired is:

\[ \frac{ds}{d\lambda_M} \bigg|_{\lambda_L=0,\lambda_M} = -\mu a_M + (1 - \mu)p^* - s(0,\lambda_M). \]

while the marginal benefit of hiring additional low types, assuming all medium types are hired is:

\[ \frac{ds}{d\lambda_L} \bigg|_{\lambda_L,\lambda_M=1} = -\mu a_L + (1 - \mu)p^* - s(\lambda_L,1). \]

In equilibrium, of course:

\[ p^* - p(\lambda_L, \lambda_M) = \frac{\pi_H a_H + \lambda_M \pi_M a_M + \lambda_L \pi_L a_L}{\pi_H + \lambda_M \pi_M + \lambda_L \pi_L}. \]

The partnership’s problem is convex in the choice variables \( \lambda_L \) and \( \lambda_M \). That is, holding the market expectation fixed, if the partnership wants to hire an initial medium type, it will want to hire all medium types. The reason is that every medium type generates the same marginal revenue \( \mu a_M + (1 - \mu)p^* \), but the share per partner increases with the number of hires because the fixed costs are spread more widely.

Consequently, there are three possible equilibrium outcomes: the partnership hires only high types, so \( \lambda_L - \lambda_M = 0 \); the partnership hires both high and medium types, so \( \lambda_L = 0 \) and \( \lambda_M = 1 \); and the partnership hires all agents, so \( \lambda_L = \lambda_M = 1 \).

The first possibility, that the partnership hires only high types, is an equilibrium if \( ds/d\lambda_M \leq 0 \) evaluated at \( \lambda_L - \lambda_M = 0 \) and \( p^* - p(0,0) \). These conditions are satisfied whenever:

\[ \mu \geq \mu^H - \frac{K}{\pi_H (a_H - a_M)}, \]

where \( \mu^H < 1 \) by Assumption A1.

The second possibility, that the partnership hires high and medium types is an equilibrium if \( \mu < \mu^H \) and also \( ds/d\lambda_L \leq 0 \) evaluated at \( \lambda_L = 0, \lambda_M = 1 \) and \( p^* - p(0,1) \). These conditions are satisfied whenever:

\[ \mu^H > \mu \geq \mu^L - \frac{K}{\pi_H (a_H - a_L) + \pi_M (a_M - a_L)}, \]

where \( \mu^L < \mu^H \) by inspection.

The last possibility is that the partnership hires all agents. This occurs whenever \( \mu < \mu^L \).

**Comparison of Corporation and Partnership Equilibria.** The basic argument of Proposition 1, that for any market expectation \( p^* \) and market monitoring level \( \mu \), a corporation will provide lower quality than a partnership, remains unchanged in the three-type setting. The argument is precisely the same. Adding an additional agent on the margin brings in some set amount of marginal revenue, costs the corporation \( w \) and costs a viable partnership a share \( s \geq w \).

This argument implies that the threshold \( \mu^* \) below which the corporation will hire all agents is above that of the corresponding partnership threshold \( \mu^L \), which can also be checked by noting that A1 implies:

\[ \mu^* - \mu^L = \frac{a_H \pi_H + a_M \pi_M + a_L \pi_L - w - K}{\pi_H (a_H - a_L) + \pi_M (a_M - a_L)} > 0. \]
The final question of interest is whether \( \mu^H \) can be compared systematically to either \( \mu^* \) or \( \mu^{**} \). The answer is that it cannot without further parametric assumptions. Q.E.D.

Characterization of Free-Entry Equilibria

To characterize free-entry equilibria (FEE) we first consider the case where a profitable firm must hire at least some high ability agents; that is, Condition M holds: \( \pi_M(a_M - w) < K \). In this case, a free-entry equilibrium can have at most one active firm.

**Lemma A1**  
Assuming Condition M, any free-entry equilibrium involves a single active firm, either partnership or corporation, that hires exactly as in the monopoly model.

**Proof.** Condition M implies that if there are several active firms, each must hire some \( H \) type agents. Suppose there are two (or more) partnerships. The partnership with (weakly) higher share can add the \( H \) type agents of the other partnership and increase its share even more, so current hiring cannot be optimal. Similarly, if there is an active partnership and an active corporation, then either the partnership can profitably add the corporation’s \( H \) type agents, or the corporation is paying a salary \( w_H \) that exceeds the partnership’s share. In the latter case, for the corporation to hire some \( H \) types it must be that \( \mu a_H + (1 - \mu) p \geq w_H > s \). Thus, the corporation can attract all the high types from the partnership at the wage \( w \in (s, w_H) \) and increase its profits. Finally, if there are at least two active corporations, there must be room for an entrant that hires all agents employed by the two corporations and saves on fixed costs.

The last part of the Lemma is immediate: because the incumbent firm faces a constant competing wage \( w \) on the margin, in equilibrium it must hire just as in the monopoly model. Q.E.D.

We now characterize the conditions under which there is a free-entry equilibrium with a single operating corporation or a single operating partnership. To do this, we make reference to the equilibrium corporation and equilibrium partnership in the monopoly model, so a small amount of notation will be useful.

Let \( \Pi_C(\mu) \) be the equilibrium profits of a monopoly corporation:

\[
\Pi_C(\mu) - \pi_H(a_H - w) + \pi_M(a_M - w) + \lambda_C^H \pi_L(a_L - w) - K,
\]

where \( \lambda_C^H = 0 \) if \( \mu > \mu^{**} \); \( \lambda_C^H \in (0,1) \) if \( \mu \in (\mu^*,\mu^{**}) \); and \( \lambda_C^H = 1 \) if \( \mu < \mu^* \).

Let \( \Pi_P(\mu) \) be the profits of a monopoly partnership:

\[
\Pi_P(\mu) - \pi_H(a_H - w) + \lambda_P^H \pi_M(a_M - w) + \lambda_P^L \pi_L(a_L - w) - K,
\]

where \( \lambda_P^H \) equals 0 if \( \mu > \mu^H \) and 1 otherwise, and \( \lambda_P^L \) equals 0 if \( \mu > \mu^L \) and 1 otherwise. Let \( s(\mu) \) be the corresponding partnership share:

\[
s(\mu) = w + \frac{\Pi_P(\mu)}{\pi_H + \lambda_P^H \pi_M + \lambda_P^L \pi_L}.
\]

We now state two key necessary conditions for the existence of corporation or partnership FEEs. Intuitively, a necessary condition for a corporation to exist in FEE is that an entering partnership cannot
attract its high ability workers. Let \( MR_t - \mu a_t + (1 - \mu)p^C \) denote the marginal revenue of a type \( t \) worker in the monopoly corporation, where \( p^C \) is the corporation quality. The following condition ensures corporation retention:

**Condition C:** \( \min\{MR^H, w + \frac{M^C(\mu)}{\pi_H}\} > s(\mu) \)

Condition C says that the share of the monopoly partnership is less than the highest wage a monopoly corporation can pay the \( H \)-types.

A second important condition concerns whether an efficient partnership composed of high and medium ability agents could lose its \( H \)-type agents to an entering corporation.

**Condition P:** There do not exist \( \hat{\nu}, \lambda_L > 0 \) such that: (1) \( \hat{\nu} - (\pi_H a_H + \lambda_L \pi_L a_L)/(\pi_H + \lambda_L \pi_L) \); (2) \( \mu a_H + (1 - \mu)\hat{\nu} - s(\mu) > 0 \) and also \( \mu a_L + (1 - \mu)\hat{\nu} \geq w \) and \( \lambda_L \leq 1 \) with the last two inequalities satisfying complementary slackness; and (3) \( \pi_H(a_H - s(\mu)) + \lambda_L \pi_L(a_L - w) - K > 0 \).

This condition guarantees that, given an existing efficient partnership, a corporation cannot profitably enter by hiring away the \( H \)-types and some \( L \)-types, but not the \( M \)-types.

We now proceed to characterize FEE.

**Case 1: \( \mu \geq \mu^H \)**

**Proposition A1** Let \( \mu \geq \mu^H \). There exists a single corporation free-entry equilibrium if and only if condition C holds and a single partnership free-entry equilibrium if and only if condition C fails.

**Proof.** First observe that if \( \mu \geq \mu^H \) then the monopoly partnership is inefficient. If Condition C fails, there cannot be a corporation FEE because the corporation would necessarily pay less than \( s(\mu) \) so the monopoly partnership could enter. Moreover, the monopoly partnership is an FEE because any entering corporation would necessarily hire as a monopoly given that medium and low types would have reservation wage \( w \). But an entering monopoly corporation could not attract the high types to leave the partnership, by failure of condition C.

On the other hand, if condition C holds there cannot be a partnership FEE because a corporation could enter, hiring as a monopolist and attract the partnership members. Moreover, there is a corporation FEE in which the corporation hires as a monopoly and dispenses all of net revenue to its worker tilting the payments as much as possible to high ability agents. Specifically, the corporation pays high types their maximal wage \( w_H - \min\{MR^H, w + \frac{M^C(\mu)}{\pi_H}\} > s(\mu) \) and pays lower types as follows. If \( w_H - w + \frac{M^C(\mu)}{\pi_H} \), then \( w_M = w_L = w \), while if \( w_H > MR^H \), medium types get \( w_M = \min\{MR^M, w + \frac{M^C(\mu)}{\pi_M(MR^H - w)}\} \) and low types get \( w_L = \max\{w, \frac{M^C(\mu)}{\pi_L(MR^H - w)}\} \). Given this wage schedule, an entering partnership cannot attract the \( H \)-types by condition C while an entering corporation would necessarily hire the same set of agents and therefore make zero profits. \( \square \)

**Case 2: \( \mu \leq \mu^L \)**

**Proposition A2** If \( \mu \leq \mu^L \), then both a single monopoly corporation and a single monopoly partnership are FEE.
Proof. Because $\mu^L \leq \mu^*$, both the monopoly partnership and monopoly corporation hire all agents in this range. The partnership is an FEE because any entering corporation necessarily hires all agents (note that if a corporation entered with the market believing it would hire only high and medium agents its incremental revenue from hiring the low agents would be the same as the partnership's, so it would hire them) and hence makes zero profits. There is also a corporation FEE where the active corporation hires all agents and pays out net revenue to the workers exactly as in the previous proof (note that if $\mu \leq \mu^L$, then Condition C holds). \hfill Q.E.D.

Case 3: $\mu \in (\mu^L, \mu^H)$

Proposition A3 If $\mu^L < \mu < \mu^H$, there is a single corporation FEE if and only if Condition C holds and a single partnership FEE if and only if Condition P holds.

Proof. If Condition C holds, there is a corporation FEE where the corporation hires as a monopolist and pays exactly as in the proof of Proposition A1. Verifying the FEE is identical. A useful point to note is that if $\mu^* < \mu^H$ then for $\mu \in (\mu^*, \mu^H)$ a monopoly corporation is efficient and Condition C is satisfied, so a corporation FEE exists. On the other hand, if Condition C fails, an incumbent corporation hiring as a monopolist is certainly vulnerable to partnership entry, so there is no corporation FEE.

For the partnership FEE case, note that an entering corporation cannot profitably enter by hiring the high, medium and potentially some low entrants because it could make at most zero profits. Nor could it hire just the high agents because if the market believed it would do this, it would certainly want to add some medium agents as its marginal revenue from hiring them would exceed that of the partnership that did hire them. So the relevant entering corporation to consider is one that hires high and low ability agents, which is exactly the case prevented by Condition P. \hfill Q.E.D.

A natural question in this case is whether either Condition C or P must hold. It turns out that, if $\alpha_M < (\pi_H a_H + \pi_L a_L)/(\pi_H + \pi_L)$, one can construct examples where neither holds, so there is no FEE. The basic idea is that a corporation can enter with H and L types hires if there is an existing partnership, but if there is a corporation incumbent it hires all the medium type agents lowering its marginal revenue for the high types below what an efficient entering partnership can offer them. Thus the problem for both organizations is that they cannot pay their high ability agents enough. Strikingly, a way to overcome this is for an organization to operate as a corporation but with the H types as owners. An interesting extension, beyond the scope of this paper, is to investigate conditions under which market competition forces firms to give productive agents ownership shares in order to retain them.

Multi-Firm Equilibria

Above we characterized FEE in the case where Condition M holds so there is at most one incumbent firm in any free-entry equilibrium. The analysis when Condition M fails is similar, though there are more cases to check. The main point of difference is that there can potentially be an FEE with multiple active firms. Of course, the existence of fixed costs means that two corporations can never coexist in equilibrium (because profits could be made by consolidating and reducing the fixed cost), but there is a possibility of having multiple quality-ranked partnerships. Here we develop a simple numerical example of this phenomenon.

Consider parameters $\pi_L - \pi_M - \pi_H - 1/3$, $\alpha_H - 4$, $\alpha_M - 3$, $\alpha_L - 0$, $w - 2$, and $K - 1/9$. From the above definitions, $\mu^L - 1/7$ and $\mu^* - 3/7$, while $\mu^L - 1/27$ and $\mu^H - 1/3$. We will show that whenever $\mu \in (1/3, 5/12)$, there is an FEE with two quality-ranked partnerships.
First, note that if $\mu > \mu^H - 1/3$, a high ability partnership pays a salary $s^H - a_H - K/\pi_H - 11/3$ and will not want to add medium ability partners. A medium ability partnership, paying a share $s^M - a_M - K/\pi_M - 8/3$ can therefore still form. Such a partnership has no incentive to hire low ability agents because:

$$\mu a_L + (1 - \mu)a_M - 3(1 - \mu) < \frac{8}{3} - s^M.$$ 

If these two partnerships exist, another partnership cannot enter. Consider instead entry by a corporation. If a corporation enters with beliefs $p^*$, its marginal profit from hiring different agents is:

$$MP(L) = MR(L) - w - \mu \cdot 0 + (1 - \mu)p^* - 2$$
$$MP(M) = MR(M) - s^M - \mu \cdot 3 + (1 - \mu)p^* - 8/3$$
$$MP(H) = MR(H) - s^H - \mu \cdot 4 + (1 - \mu)p^* - 11/3$$

If $5/12 \geq \mu \geq 1/3$, the gain to hiring medium types is greatest, then the gain to hiring low types, and the gain to hiring high types is smallest. An entering corporation that hires only medium types, however, would duplicate the existing partnership and make zero profits. Moreover to hire the high types an entering corporation must hire all the low types. But hiring all agents is not a profitable entry strategy because total profits are negative (equal to $-1/9$) after paying the high and medium types their partnership shares. □
References


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