A Theory of Partnerships*

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

July 2002

Abstract

We compare the costs and benefits of 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 explains 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.

*We thank Joseph Bankman, Tim Bresnahan, Darrell Duffie, Henry Hansmann, 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 (Tadelis). Email: jdlevin@stanford.edu and stadelis@stanford.edu.

1 Introduction

Modern economies exhibit a wide diversity of organizational forms: from closely held private firms to employee-owned partnerships and co-operatives 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 remained prominent in human-capital intensive professional services such as law, medicine, investment banking, management consulting, advertising, and accounting.

In this paper, we investigate an economic rationale for 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.[1] Our point of departure then is the observation that significant 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 sufficiently 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.

This basic story 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

[1] In practice of course, many partnerships combine productivity based compensation with straight profit sharing. Even in firms that use productivity measures, however, there is typically a significant amount of sharing. This is the case is law partnerships, for example. Aside from being consistent with a lay person's definition of partnership, our definition 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).

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 would like to maximize profits per partner. As was first observed in the classic work of Benjamin Ward (1958), this profit sharing makes a partnership relatively less inclined to expand its labor force in comparison to a corporation. Intuitively, existing partners will hesitate to bring in new employees unless they raise the average partner share and as result, partnerships may pass up hires whose marginal product is above the going wage. Given the distribution of talent in the labor market, this selectivity translates into a higher quality threshold for employment, and (to the extent that human capital plays an important role in production) higher quality product. In equilibrium, partnerships are both smaller than corporations and have higher average quality.

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 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 partnerships, while if market monitoring is weak, partnerships emerge as strictly more profitable than corporations.

In Section 4 we generalize our results to an environment in which salaries are correlated with ability. When higher ability workers have higher reservation wages, equal-sharing partnerships can unravel if the most able employees are not willing to engage in profit sharing. Corporations, which can more freely adjust compensation, do not suffer from this problem. We build on this observation to argue that labor market competition may disadvantage equal-sharing partnerships relative to corporations. To reach this conclusion, we rely on a simple extension of our basic model. A more complete analysis is done in Levin and Tadelis (2002), in which wage setting and industry structure are analyzed endogenously.

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. We discuss these in Section 5. There, 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 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 measurement in determining organizational form. Alchian and Demsetz, for instance, 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 such professionals will be less likely to be organized as traditional capitalist firms.

In his broad study of ownership patterns, Hansmann (1996) takes aim at this incentive 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 distribution 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).

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.[2]

The model we develop also relates to a large literature on labor-managed firms (see Bonin, Jones and Putterman, 1993, for a survey). This research, which builds on Ward's early paper, concentrates primarily on industrial cooperatives 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. Since corporations are more profitable in these models, the presence of partnerships must presumably be ascribed to an intrinsic taste for employee participation in decision making and control.

Two notable exceptions to this are Miyazaki (1984) and Kremer (1997). Miyazaki argues that labor-managed firms do a better job of insuring employees and as a result may emerge in the face of short-run financial difficulties, though they will convert back to a corporate form in the long run (see also Ben-Ner, 1984). Kremer (1997) argues that labor-managed firms enjoy tax advantages, but that re-distribution through majority voting distorts the effort choices of members.[3]

In our view, the "financial distress", "tax benefit" and "taste for participation" stories cannot possibly explain the observed distribution of partnerships. First, most existing partnerships in professional service industries started as partnerships, rather than converting in the face of financial distress, and many have been successful for years without switching to a corporate form. Second, and we will return to this in more detail, while partnerships have historically enjoyed some tax advantages relative to corporations, these have practically disappeared. Finally, with a few exceptions (for instance, the Washington state plywood firms studied by Pencavel and Craig, 1993), there are few labor-managed firms in the United States outside of professional services. Thus, to apply the most basic taste for participation story, one must posit that consultants and investment bankers care more about participation and less about profits than employees

[2]Kandel and Lazear (1992) argue that sociological motivators such as guilt and shame can often overcome the free-rider problem in partnerships that is stressed by Alchian and Demsetz and Holmstrom. A key observation in their paper is that peer pressure works best when partners are of similar type and ability — this grouping of similar types is an equilibrium outcome in our model.

[3]Hansmann (1996) also argues that co-operatives will face decision-making problems if their membership is heterogeneous. Hart and Moore (1996) provide a model in which voting leads to ineffiency in consumer co-operatives. Dow (1993) considers a model of bargaining over quasi-rents with specific physical or human capital that provides another explanation for employee ownership.

of manufacturing firms.

2 A Monopoly Model

2.1 Technology, Preferences and Information

Imagine a continuum of agents, of unit measure, who have access to a production technology and must decide on an organizational form. They can either organize as a corporation or as a partnership. We define a corporation in the standard neoclassical sense, as an entity that maximizes profits and must pay employees at least their reservation wage. In a partnership, members share profits equally. We think of the choice of organization as being made "behind the veil of ignorance" — that is, at some ex ante date when agents are symmetric and their productive abilities have yet to be realized. Because of this, optimal organizational form will maximize ex ante net economic surplus, which equals profits plus wages.

Once organizational form is chosen, agents realize their productive abilities. Abilities are distributed on the interval $[\underline{a}, \overline{a}]$ with continuous distribution $F(\cdot)$ and positive density $f(\cdot)$. Each agent has access to an outside labor market that pays a fixed wage $w \in (\underline{a}, \overline{a})$, independent of ability. We consider ability-dependent wages in the next section.

The production technology requires a fixed capital cost $K > 0$.[4] If a (measurable) set A of agents are employed, the firm can produce a quantity $|A|$ (the probability measure of A). Its product quality equals the average ability of agents in A:

$$q(A) = \frac{1}{|A|} \int_{\tilde{a} \in A} \tilde{a} dF(\tilde{a}) \, .$$

The market for the firm's services is composed of a large number of identical clients. Each places a value on the firm's services equal to the expected quality of service. Thus, if the market knows that the firm has employed a set A of agent, 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 μ. With

[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.

probability $1-\mu$, the market cannot assess quality and instead forms an expectation A^e. Thus, depending on the market's information the market 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 beliefs about these choices. When μ is higher, demand tracks more closely the firm's actual choices as opposed to the market's beliefs. We thus interpret μ 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 a rational expectations equilibrium) or alternatively that $\mu = 1$. The firm's economic profits, or revenues net of capital costs and employees' opportunity costs (wages), can be written as:

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

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 first-best efficient hiring decisions and employs the set $A^{FB} = [w, \overline{a}]$, then $\Pi\left(A^{FB}\right) > 0$. We also assume that if the firm simply hires every agent, it will make negative economic profits, i.e. $\Pi([\underline{a}, \overline{a}]) < 0$.

Given this description, we now characterize the *equilibrium* behavior of corporations and partnerships. We consider the following sequence of events. The agents first choose organizational form and learn their abilities. Once organizational form is announced, the market forms an expectation A^e of who will be employed. Given market beliefs, the firm makes hiring decisions and selects A, which the market then learns with probability μ. Finally, the market price is set and the firm produces. We consider the *rational expectations equilibrium* for both a corporation and a partnership, and then consider the optimal choice of organizational form.

2.2 Corporation Equilibrium

A corporation makes hiring decisions to maximize profits. Since agents command the same outside wage, and since 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 its optimal hiring strategy is to choose a threshold a and employ agents with abilities above a. A higher threshold decreases quantity but increases quality.

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

$$q(a) = \frac{1}{1 - F(a)} \int_a^{\overline{a}} \tilde{a} dF(\tilde{a}),$$

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

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

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

The first order condition for a to be an optimal threshold is that:

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

The corporation's optimal policy is to hire 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.[5]

In a rational expectations equilibrium, 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 equilibrium hiring threshold:

$$\mu a^C + (1 - \mu) p\left(a^C\right) = w. \tag{1}$$

There is a natural relationship between market monitoring and hiring decisions. With perfect monitoring ($\mu = 1$), profit maximization dictates efficient hiring, $a^C = a^{FB} = w$. As monitoring becomes less effective, the firm internalizes less of any drop in quality, leading to a lower equilibrium hiring threshold $a^C < a^{FB}$.

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

$$\pi(a^C, a^C) = \Pi(a^C) = \int_{a^C}^{\overline{a}} (a - w) \, dF(a) - K \, .$$

[5] If μ is sufficiently low, or beliefs are sufficiently optimistic, the first order condition may not hold for any $a \in [\underline{a}, \overline{a}]$. In this case, the unique solution is the corner solution $a = \underline{a}$.

The corporation will want to operate in equilibrium if and only if $\Pi\left(a^C\right) > 0$.[6]

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 three natural requirements: First, individual rationality suggests that partners should get a share of profits that exceeds w. Second, no majority of partners should want to dismiss a minority of partners. Third, the partnership should not want to increase its base by admitting more 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 $\varepsilon, \delta \geq 0$ such that a majority of probability measure $|A| - \varepsilon$ benefits by replacing a measure ε of members with a measure δ 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.[7] Therefore, given market beliefs, the stable partnership solves:

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

[6] This statement implicitly supposes a weak sequential rationality condition on how beliefs are formed in equilibrium. The subtlety is the following. If $\Pi\left(a^C\right) > 0$, there is of course an equilibrium in which the firm operates, but (for levels of $\mu < 1$) there may be as second Nash equilibrium in which the firm chooses not to operate, and this behavior is supported by the market's belief that if the firm did choose to operate it would make a sub-optimal hiring choice (for instance — hire only the least qualified workers). We maintain the natural assumption that if the market sees the firm in operation, it believes the firm will make optimizing decisions. This sequential rationality requirement gives a unique equilibrium.

[7] The key to seeing this is the following. If workers of ability a are included but those of ability $a' > a$

The first-order condition for this problem is:

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

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 solution.[8]

Combining partnership optimization with rational expectations yields an expression for the partnership's unique equilibrium hiring threshold a^P:

$$\mu a^P + (1-\mu)p\left(a^P\right) = p\left(a^P\right) - \frac{K}{1-F\left(a^P\right)}. \tag{2}$$

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's economic profits are equal to

$$\Pi(a^P) = [1-F(a^P)] \cdot [s(a^P, a^P) - w] \ . \tag{3}$$

The partnership will be viable only if $\Pi(a^P) > 0$.

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 level of 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

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, the would choose to do so.

[8] If μ is sufficiently low then it may be optimal for the partnership to choose $\underline{a}$.

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 $a^P > \underline{a}$). *Q.E.D.*

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 $\underline{\mu} \in (0,1)$ such that both the corporation and partnership will be profitable in equilibrium if and only if $\mu > \underline{\mu}$. If $\mu > \underline{\mu}$, the corporation sets a strictly lower equilibrium hiring threshold, i.e. $a^C < a^P$.*

Proof. By the definition of profits, for any $a \in [\underline{a}, \overline{a}]$,

$$\Pi(a) \gtreqless 0 \qquad \Leftrightarrow \qquad p(a) - \frac{K}{1-F(a)} \gtreqless w. \tag{4}$$

Notice that the LHS of both equilibrium conditions (1) and (2) is the same, and it is increasing in a. Furthermore, notice that for a given a, the RHS of (2) is greater (less) than the RHS of (1) if and only if profits are positive (negative). Combining (2) with (4) we obtain:

$$\Pi\left(a^P\right) \gtreqless 0 \qquad \Leftrightarrow \qquad a^P \gtreqless a^C,$$

and combining (1) with (4) we obtain:

$$\Pi\left(a^C\right) \gtreqless 0 \qquad \Leftrightarrow \qquad a^P \gtreqless a^C.$$

We conclude that for any given μ, $\Pi\left(a^P\right)$ has the same sign as $\Pi\left(a^C\right)$. That is, if the partnership obtains positive profits, so does the corporation and vice versa. To consider

whether either is profitable for a given μ, it thus 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 $a^C = \underline{a}$ and $\Pi(\underline{a}) \leq 0$. As a^C is strictly increasing in μ, and $\Pi(a)$ is strictly increasing in a on $[\underline{a}, a^{FB})$, then there exists some $\underline{\mu} \in (0,1)$ such that the corporation will operate for all $\mu > \underline{\mu}$. *Q.E.D.*

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

Proposition 3 *There exists some $\hat{\mu} \in (\underline{\mu}, 1)$ such that a partnership achieves strictly higher profits than a corporation if $\mu \in (\underline{\mu}, \hat{\mu})$, while a corporation achieves strictly higher profits than a partnership if $\mu \in (\hat{\mu}, 1]$.*

Proof. We know that $a^P > a^C$ for all $\mu \in (\underline{\mu}, 1]$, and that if $\mu = 1$, then $a^C = w$, so $\Pi\left(a^C\right)$ is maximal and greater than $\Pi\left(a^P\right)$. On the other hand, if

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

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

It is interesting to examine how changes in the environment affect the relative profitability of corporations and partnerships. In particular, consider an increase in the fixed costs of production, K. This will leave the corporation's hiring decision's unchanged, but give partnership's a stronger incentive to increase hiring (in order to spread the fixed cost across more employees). It follows that an increase in the fixed costs of production will tend to increase the range of μ's for which partnerships dominate corporations. This conclusion should be interpreted with some care, however. It does not imply, for instance, that partnerships are preferable if capital becomes more important as a marginal or variable factor of production.[9]

[9] It is not particularly hard to extend the model to more general production functions that depends on both capital and labor inputs. In this case, whether or not an increase in the importance of capital will tend to increase or decrease the range of μ's for which corporations dominate depends on the relationship between capital distortions and the direction in which labor decisions are distorted (they are distorted upward by a corporation, but potentially downward by a partnership).

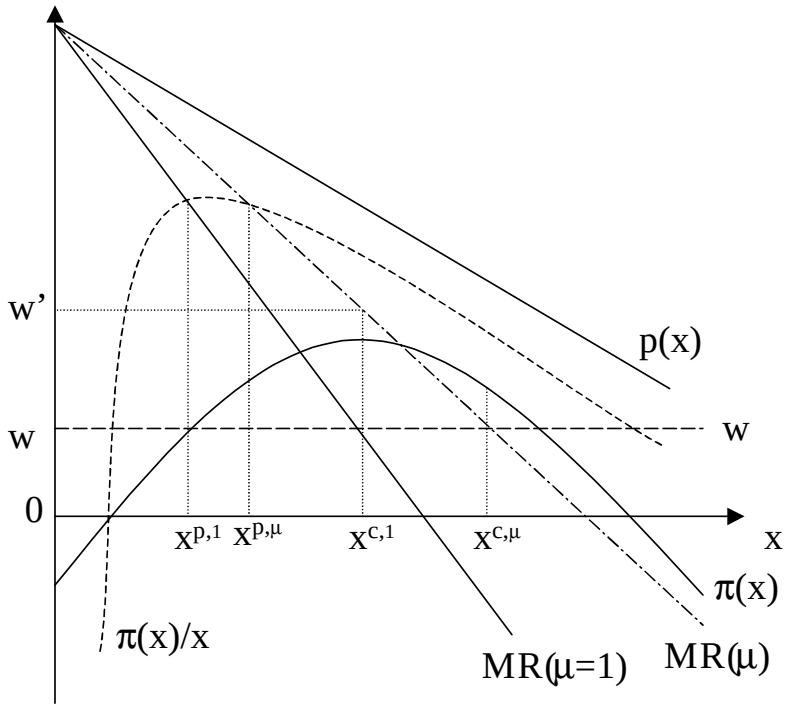
3.2 Discussion

Our results rest on three assumptions. First, there is a distribution of talent in the labor market, so that the marginal employee hired is of lower ability than the average hire. 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, but are not able to signal in other ways, for instance by paying above-market wages.

The first assumption, coupled with imperfect market monitoring, generates a trade-off in our model between quantity and quality. As we note in the next section, this trade-off in itself is not critical to our results in that profit sharing generates an incentive to select high quality employees even if the number of positions is fixed. A benefit of the present approach, however, is that the model can be tied in 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. Of course, any quantity $x \in [0,1]$ has a corresponding threshold $a(x) = F^{-1}(1-x)$. Let $p(x) \equiv p(a(x))$ be the market price when the market observes quantity (quality), and $p(x^e)$ be the price when the market does not and instead believes the hiring threshold is $a(x^e)$. The firm's costs, in terms of quantity, are $w \cdot x + K$. Letting $MR(x) \equiv \mu x + (1-\mu)\, p(x)$ denote the *rational expectations 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 rational expectations marginal revenue to the market wage w. In contrast, for a partnership, the equilibrium quantity x^P equates the rational expectations 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 $x^{C,1}$ and $x^{P,1}$. This is precisely the problem studied by Ward (1958) — as he observed more than four decades ago, the result is that the corporation earns higher profits.



Graphical illustration in price/quantity space

As μ drops below one, both a corporation and a partnership choose higher quantities (lower qualities). Consequently, the partnership's *total profits* are increasing, while the corporation's are decreasing. For some $\widehat{\mu}$ 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 μ drops below $\widehat{\mu}$ the partnership will be more profitable than the corporation , until the shutdown value of $\underline{\mu}$. Thus, with imperfect market information, the partnership's tendency toward being small compensates for the firm's incentive to reduce quality. The result is that a partnership is the more profitable form of organization.

The third assumption driving our result is that a partnership operates as a commitment to equal profit-sharing, while a corporation cannot commit to a specific wage policy. To see why this is important, suppose that the firm could commit to some $w' > w$. As seen in Figure 1, with $\mu < 1$ as suitable choice of w' can ensure that the equilibrium

quantity is $x = x^{FB}$ giving first-best profits. This particular commitment strategy might not increase profits, but it illustrates the general point that by committing to a high wage the corporation can guarantee a higher quality than $p(a^C)$.[10]

A commitment to paying even new or marginal employees above market wages seems difficult to maintain in practice however. A worker who is left unemployed due to the higher wage w' would be willing to accept an offer of $w + \varepsilon$ and would have no incentive to reveal this lower offer to the market. Thus, the market should rationally anticipate that firms will renege on their stated wage policy if possible, and hiring decisions will unravel to be those in the solution above. In contrast, organizational form is usually better observed. Once a partnership is formed and a charter is written, organizational changes are likely to be observed by the market.[11]

4 Labor Market Competition

The model assumes that outside wages are not sensitive to an agent's ability. As a result, firms have a very strong wage-setting position vis-a-vis talented employees. In this section, we relax this assumption. While our main results remain intact, some new insights emerge regarding the relationship between labor market competition and organizational form.

We approach the problem of competition for talented workers in two steps. We first consider the problem of equilibrium hiring when reservation wages depend on workers' abilities. We observe that corporations can adjust to this by raising the salaries of more talented employees (which lowers profits). In contrast, equal-sharing partnerships cannot adjust salaries in this way and as a result are susceptible to "unraveling" if the most able workers opt for higher outside salaries. We then ask under what conditions a partnership will be susceptible to acquisition by an outsider who would convert it to corporate form.

[10] There can be other mechanisms that play a similar role. For example, Enterprise Rent-a-Car has committed to hiring only college graduates, creating a reputation for high quality service.

[11] If parties organize as a partnership, equal sharing of profits is the legal default, but this default can be contracted around. As late as the 1950s, however, firms lost their legal partnership status for attempting to depart too radically from equal-sharing. Though things have changed over time, from a legal standpoint a partnership must specify some form of sharing among the partners.

4.1 Ability-Dependent Wages

To extend the model, suppose that wages are given by $w(a)$, where:

$$w(a) = \begin{cases} w & \text{if } a < \hat{a} \\ w + \lambda(a - \hat{a}) & \text{if } a \geq \hat{a} \end{cases}$$

Here, $w \in (\underline{a}, \overline{a})$ can be thought of a baseline salary available to any agent. The parameters $\hat{a} \in [w, \overline{a}]$ and $\lambda \in [0, 1]$ define the relationship between ability and reservation wages and hence proxy for a form of labor market competition. Our previous model corresponds to the case where $\lambda = 0$ (or $\hat{a} = \overline{a}$). A higher value of λ means a tighter relationship between reservation wages and a worker's marginal product — high ability workers can demand a larger fraction of their contribution. A lower value of $\hat{a}$ means that this relationship extends further down the ability spectrum.[12]

If a firm hires all workers in the set A, and the market correctly anticipates this decision, economic profits are:

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

With this more general formulation of wages, efficiency still dictates that all workers of ability $a \geq w$ be hired. So long as λ is sufficiently low ($\hat{a}$ sufficiently high), a firm that hires efficiently will be able to operate at a profit.

4.2 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 $w(a)$. This problem divides neatly into two cases. The first is where $\lambda \leq \mu$, so the marginal revenue from employing higher ability workers is greater than the additional wage. In this case, the corporation will employ all workers whose ability is above some threshold a. The optimal threshold solves:

$$\max_a \int_a^{\overline{a}} \left(\mu \tilde{a} + (1 - \mu)p^e - w(\tilde{a})\right) dF(\tilde{a}) - K.$$

This leads to a first order condition:

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

[12] In Levin and Tadelis (2002) we endogenize the wage $w(a)$ using a model with U-shaped average cost, and a free entry condition. The model also analyzes market equilibrium structure with free entry.

As before, the corporation hires up until the point that the marginal revenue from adding an employee of ability a just equals the wage. Combining this with the rational expectations equilibrium requirement that $p^e = p(a)$ gives an equation for the equilibrium hiring threshold:

$$\mu a + (1 - \mu)p(a) = w(a).$$

Thus if $\lambda \leq \mu$, it follows that the equilibrium hiring threshold must be precisely the same a^C as in our earlier formulation.

The second case for the corporation is that $\lambda > \mu$. In this case, the firm's greatest profit opportunities are from taking on lower quality employees. Given a market expectation p^e, the optimal policy is to hire all workers in an interval $[a, \hat{a}]$, where the threshold a solves:

$$\max_a \int_a^{\hat{a}} \left(\mu\tilde{a} + (1 - \mu)p^e - w(\tilde{a})\right) dF(\tilde{a}) - K.$$

Since $w(a) = w$ for all $a \leq \hat{a}$, the first order condition is:

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

The condition for rational expectations equilibrium is that the threshold a satisfy:

$$\mu a + (1 - \mu)\frac{1}{F(\hat{a}) - F(a)} \int_a^{\hat{a}} \tilde{a} dF(\tilde{a}) = w.$$

Simple algebra shows that the equilibrium threshold will be higher than the a^C derived in the model with constant wages, but that because the corporation passes up the most talented workers, the equilibrium quality is lower.

4.3 Partnership Equilibrium

To consider the problem of partnership formation, we first note that our definition of a stable partnership can be directly extended. Given an expectation p^e, a partnership A is stable if (i) the resulting partnership share is greater than the outside wage of each partner, and (ii) no majority in the partnership would benefit by dropping some measure δ of existing partners and replacing them with a measure ε of new partners, each of whom is willing to join.

It is easy to see that any stable partnership must be an interval.[13] In fact, if the distribution of abilities F is linear or convex, the unique stable partnership (if one exists) coincides exactly with the partnership that forms with constant wages.

Proposition 4 *The partnership comprised of agents in the interval* $[a^P, \overline{a}]$ *is stable if and only if* $s(a^P, a^P) \geq w(\overline{a})$. *If* F *is linear or convex, this is the unique stable partnership. If* F *is concave, a lower interval may be stable even if* $s(a^P, a^P) < w(\overline{a})$.

An important observation is that an increase in labor market competition affects partnerships quite differently from the way it affects corporations. While corporations react by paying their employees more — thus reducing total profits — the share offered by an equal-sharing partnership does not change. Moreover, while the corporation may be tempted to substitute lower ability but cheaper workers, the partnership still optimally seeks the highest ability workers. The problem faced by partnerships is that when the labor market distinguishes more clearly between agents of different abilities, profit redistribution becomes more difficult to sustain. As a result, a partnership may unravel as the best partners opt out. Under some conditions (F weakly convex), the unraveling is complete in the sense that once the $[a^P, \overline{a}]$ partnership is infeasible, all others are also infeasible.

4.4 Comparing Partnerships and Corporations

To compare partnerships and corporations when wages are ability-dependent, consider the case where $\lambda < \mu$. A corporation will generate higher economic profits if and only if:

$$\int_{a^C}^{\overline{a}} (a - w(a))dF(a) - K \geq \int_{a^P}^{\overline{a}} (a - w(a))dF(a) - K. \tag{5}$$

Beyond relative profitability, there is also the issue of absolute profits and feasibility. For a corporation to be profitable, it must be that the left hand side of (5) is positive, or alternatively that:

$$\Pi(a^C) \geq \lambda \int_{\hat{a}}^{\overline{a}} (a - \hat{a})dF(a).$$

[13] 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. Morever, as the previous share was greater than $w(a'')$ then the new share will certainly be greater than $w(a')$.

On the other hand, for the partnership to be feasible, not only must that the right hand side of (5) be positive, it must be that $s(a^P, a^P) \geq w(\overline{a})$, or alternatively that

$$\Pi(a^P) \geq \lambda[1 - F(a^P)]\,(\overline{a} - \hat{a})\,.$$

If $\hat{a} \geq a^P$, a clear comparison results between the two forms of organization. In this event, $w(a) = w$ for all agents who are employed by the corporation but not the partnership. As a result, the corporation is more profitable if and only if $\Pi(a^C) > \Pi(a^P)$, or equivalently if $\mu > \hat{\mu}$. Moreover, given $\mu > \hat{\mu}$, then for any level of λ at which a partnership is feasible, a corporation will also be feasible. At the same time, there will often be a range of values of λ for which only a corporation will be feasible. Moreover, such a range of λ's will typically occur even if $\mu \in (\underline{\mu}, \hat{\mu})$. In these situations, a partnership would in principle generate greater profits, but because of the unraveling problem, only a corporation will be feasible. In this sense, labor market competition disadvantages equal sharing partnerships.

If $\hat{a} \in [w, a^P]$, the comparison is slightly more complex. In this case, there is labor market competition even for those agents who would only be hired by a corporation. For this reason, an increase in λ will reduce corporation profits by more than it reduces partnership profits. If $\lambda = 0$, the corporation will be more profitable if and only if $\mu > \hat{\mu}$, but if $\lambda > 0$, the range of μ's for which the corporation is more profitable is reduced. At the same time, however, there is a competing effect due to feasibility. Given μ, an increase in λ increases the reservation wage of the highest type workers and hence promotes unraveling.. So there will again be regions of the parameter space for which a partnership is more profitable, yet only a corporation is feasible (including regions where $\mu < \hat{\mu}$).

When $\lambda > \mu$, the main difference is that because the corporation hires the most profitable employees rather than the best employees, its quality and hence equilibrium profits will be lower than if it also focused on hiring the best employees.[14] This tends to make partnerships preferable *provided they are feasible*. Of course, if the market returns to talent are quite high, it may well be the case that a partnership cannot induce the most talented workers to engage in equal sharing of profits. In particular, an increase in λ makes it less likely that a partnership will be feasible, but has no effect on a corporation

[14] Note that this difference could make partnerships more profitable than corporations under imperfect monitoring even if both organizations were constrained to hire a fixed number of employees. In this sense, the trade-off between quality and quantity discussed in the previous section is not essential for our basic comparative static.

which does not hire workers with abilities greater than $\hat{a}$.

4.5 Partnerships and Acquisitions

In our analysis so far, we have treated the choice of organizational form as an ex ante choice. In practice, however, existing organizations change their form — most often converting from partnership to corporate form. A natural way to incorporate this is to ask under what conditions a stable partnership would be willing to sell itself to a buyer who would convert the firm to corporate status.

The most stringent possible condition for a sale is that the acquiring party would have to offer a wage scheme $w(a)$ such that *every* member of the partnership would be willing to sell. Of course, having purchased the partnership, the acquiring party generally will have an incentive to hire additional agents. A partnership is *susceptible to entry* if an acquiring party can approach the partnership with an acceptable offer, make additional optimal hires, and given that the market correctly anticipates these additional hires, still make a positive profit.

Suppose for simplicity that all agents not employed by the partnership have reservation wage w. Once the acquiring party has purchased the partnership, it already employs all agents in the interval $[a^P, \overline{a}]$ so the only hiring that could be consistent with rational expectations is to hire all agents between $[a^C, a^P]$. Thus, the eventual economic profits (neglecting wages above w paid to past partners) are $\Pi(a^C)$. These must be sufficient to compensate members of the partnership for their foregone share above w. It follows that a stable partnership is susceptible to entry if and only if $\Pi(a^C) > \Pi(a^P)$, or in other words if $\mu > \hat{\mu}$.

Of course, if we depart from the stringent unanimity requirement, a corporate entrant might be able to skim only the best partners, leading to unraveling.. Although certain partnership covenants (such as non-compete clauses as we discuss below) might make it difficult to cream-skim, it is quite plausible that even for values of $\mu < \hat{\mu}$, the partnership may not be sustainable in the face of labor market competition.

At a practical level, an alternative to corporate buy-out that prevents unraveling would be for a partnership to depart from equal sharing and implement some form of productivity based compensation. This sort of change appears to have occurred in many law firms, as we discuss below.

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.

Table 1: Percent of business performed by legal organization*

Sector	% corp	% part.	% sole	% other
Retail Trade - 44-45	90.47	2.82	4.87	1.84
Transportation and Warehousing - 48-49	93.43	2.15	3.41	1.01
Professional, Scientific & Technical Services - 54	75.93	18.32	5.36	0.39
Offices of lawyers - 54111	39.96	47.51	12.28	0.25
Accounting, taxes, etc. - 5412	47.31	44.80	7.44	0.45
CPA offices - 541211	31.90	60.85	7.00	0.25
Tax return prep. - 541213	66.66	4.42	28.86	0.06
Architectural, engineering, etc. - 5413	92.35	4.33	3.08	0.25
Architectural services - 54131	82.42	9.18	8.29	0.11
Engineering services - 54133	94.42	3.68	1.45	1.67
Geoph. surveying & mapping - 54136	95.78	1.14	17.07	0.61
Mgmt, sci. & tech. consulting - 5416	80.25	15.95	3.12	0.68
Admin mngmnt cons. - 541611	68.74	28.42	2.25	0.58
HR & exec. search cons. - 541612	90.44	4.81	4.28	0.46
Process, dist. & log. cons. - 541614	84.07	12.72	1.53	1.68

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

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 μ sectors), but a significant number in professional, scientific and technical services.

Interestingly, within this last section, there is further variation that agrees with our model's predictions. Accounting is an interesting case. Among firms that offer individual tax form preparation (high μ), there are few partnerships, while a majority of CPA firms that perform complex accounting tasks (low μ) 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 case, 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. Interestingly, however, the past two decades 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-what-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 Mnookin (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. Interestingly, a second consequence of better in-house counsel suggested by Gilson and Mnookin is that firms become more discriminating consumers. In the context of our model, this could be seen a better monitoring (higher μ) 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 coincide with an increase in litigation awards and in some accounts to more "star" oriented firms. To the extent that this might allow some litigators 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, Lehmann 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 might also favor the corporate form.[15]

[15] Interestingly, 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.

5.2 Features of Partnerships

Capital Requirements

A notable feature of many professional service firms is that they are not capital-intensive.[16] 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.[17] 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 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. Thus, one story for why investment banks sold out their partnerships in the 1980s is that they felt compelled to raise capital and saw a sale to outside shareholders as the best avenue to do this. (Interestingly, 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

[16] 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.

[17] 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).

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. Many partnerships include some form of non-compete clause in their contracts.[19] One

[18] Kahn 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.

[19] A recent and highly publicized example is Arthur Andersen. These clauses are particularly common in medical practices. It is sometimes argues that non-compete clauses violate antitrust law, but interestingly an exception seems to be made for partnerships. For instance, in Rash v. Toccoa Clinic Med. Assoc., 253 Ga. 322, 320 S.E.2d 170 (1984), the Georgia Supreme Court ruled that professional partnership agreements 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 Toccoa, Georgia, for three years

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 one observes that non-compete clauses are generally signed at the late stage when employees join as partners or are promoted to partner.

In the context of our model, non-compete clauses might play a different role, namely to help 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 some uncertainty, however, a prospective partner might sign a non-compete clause that could eventually become binding in the event that lucrative outside opportunities arose. In such an environment, a non-compete clause can play an important role: by preventing the most able partners from leaving easily, they protect the partnership against the danger of unraveling.

5.3 Legal and Tax Issues

We now turn to a few issues concerning partnerships that are neglected in our modelling approach.

Limited Liability

A prominent feature of the traditional General Partnership is the unlimited liability of the partners. In theory, the presence of unlimited liability might make partnerships either more or less attractive as an organizational form. Unlimited liability places partners at increased risk of financial ruin, but it does provide 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 the partnership form rather than an explanation for its use. In particular, since the recent introduction of legal form options such as the limited liability partnership (LLP) and limited liability company (LLC), unlimited liability partnerships are rarely

(see Grady, 1997).

seen in the professional service.[20] Indeed, even prior to the introduction of these forms, partnerships were able to purchase liability insurance — although unfortunately we do not know of evidence on how widespread this was.

Taxes

Tax law also distinguishes between partnerships and corporations, and hence provides another possible motive for choosing an organizational form. A main distinction is that, relative to a corporation, partnerships are free from the corporate income tax and thus can avoid the "double taxation" that results from paying both this tax and individual taxes 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.)

However, while this distinction might be important for certain investment vehicles, it seems highly 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.[21]

Legal Constraints

While firms nearly always have freedom in choosing between organizational forms (see Hansmann, 1996, p. 85 for a discussion), there is one interesting 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 striking 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

[20] 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.

[21] 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.)

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.[22]

6 Conclusion

In this paper, we consider firms in which production is based on human capital. Relative to standard profit-maximizing corporation, profit sharing partnerships are more selective in hiring, resulting in a higher level of quality than is dictated by profit maximization. This quality commitment pays off if clients cannot perfectly observe in advance what they are buying.

We used this insight to show that in market's 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 model does not, however, address the internal structure of production in firms, in particular, the allocation of client work within a partnership or corporation. A step in this direction is taken by Garicano and Santos (2001).

Appendix

Proof of Proposition 4. Fix a market expectation p^e and consider a candidate partnership $A = [a, a']$ that satisfies:

$$\mu p(A) + (1 - \mu)p^e - \frac{K}{|A|} \geq w(a').$$

The left side of the inequality is the resulting partner share, so it implies that each individual is willing to participate. We consider whether this partnership would want to

[22] 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.

drop its worst members and replace them with better members. In particular, consider the alternative partnership $A^* = [a+\varepsilon, a'+\varepsilon']$, where $\varepsilon' > 0$ and $\varepsilon > 0$ is chosen so that:

$$F(a'+\varepsilon') - F(a+\varepsilon) \equiv F(a') - F(a),$$

that is so that $|A^*| = |A|$. If F is linear or convex, then $\varepsilon \geq \varepsilon'$ and furthermore $p(A^*) - p(A) \geq \varepsilon'$. As a result, the change increases the share of each partner by at least $\mu\varepsilon'$, while the increase in the outside wage of the highest ability partner is only $\lambda\varepsilon' \leq \mu\varepsilon'$. Thus, all agents in the interval $[a+\varepsilon, a']$ would like to make the change and those in $[a', a'+\varepsilon']$ would be willing to join.

Thus, if F is weakly convex, an upper interval $[a, \overline{a}]$ is the only possible stable partnership. We already have seen that $[a^P, \overline{a}]$ is the only choice consistent with both rational expectations and the optimal choice of a lower threshold for hiring. If $s(a^P, a^P) \geq w(\overline{a})$, this partnership is the unique stable partnership, and otherwise no partnership can be stable.

For the case where F is concave, consider the partnership that might emerge if the firm was constrained not to hire any agent of ability above a' for some $a' \in (w, \overline{a})$. We ask what partnership might form if the lower threshold for hiring is chosen to maximize the average partner share (a necessary condition for stability) and the market has rational expectations about the choice of this lower threshold.

The lower threshold a is found by equating the marginal profit from hiring a worker of ability a with the equilibrium share of the partnership $[a, a']$:

$$\mu a + (1-\mu)p([a,a']) = p([a,a']) - \frac{K}{F(a') - F(a)}$$

Denote the solution as $a(a')$. Of course, the partnership $[a(a'), a']$ could only operate if $s([a(a'), a']) \geq w(a')$. If F is weakly convex, or not "too concave," then if this inequality fails for some a' it will fail for all lower values of a'. However, if F is sufficiently concave, this participation inequality might hold for some a^*, but fail for all $a' > a^*$. In this case $[a(a^*), a^*]$ will be a stable equilibrium partnership, but no higher interval will be stable. *Q.E.D.*

References

Alchian, Armen and Harold Demsetz (1972) "Production, Information Costs, and Economic Organization," *American Economic Review*, (December) **62(5)**:777-795.

Altman Weil, Inc. (2000) *Compensation Systems in Private Law Firms*, Altman Weil Publications, Inc.

Ben-Ner, Avner (1984) "On the Stability of the Cooperative Type of Organization," *Journal of Comparative Economics*, (September) **8(3)**:247-60.

Bonin, John, Derek Jones, and Louis Putterman (1993) "Theoretical and Empirical Studies of Producer Cooperatives: Will Ever the Twain Meet?" *Journal of Economic Literature*, (September) **31(3)**:1290-1320.

Dow, Gregory (1993) "Why Capital Hires Labor: A Bargaining Perspective," *American Economic Review*, (March) **83(1)**:118-34.

Farrell, Joseph and Suzanne Scotchmer (1988) "Partnerships," *Quarterly Journal of Economics*, (May) **103(2)**:279-297.

Garicano, Luis and Tano Santos (2001) "Referrals," mimeo, University of Chicago.

Gilson, Ronald and Robert Mnookin (1985) "Sharing Among the Human Capitalists: An Economic Inquiry into the Corporate Law Firm and How Partners Split Profits," *Stanford Law Review*, **37(2)**:313-92.

Gilson, Ronald and Robert Mnookin (1989) "Coming of Age in a Corporate Law Firm: The Economics of Associate Career Patterns," *Stanford Law Review*, **41(3)**:567-95.

Grady, Kevin (1997) "Recent Developments on Non-Compete Covenants and other Physician Contracting Issues Under Georgia Law," Alston & Bird LLP, Atlanta, Georgia (http://www.alston.com/docs/Articles/199709/Kevin.htm)

Hansmann, Henry (1996) *The Ownership of Enterprise*, Harvard University Press.

Hart, Oliver and John Moore (1996) "The Governance of Exchanges: Members' Cooperatives versus Outside Ownership," *Oxford Review of Economic Policy,* Winter **12(4)**:53-69.

Hazard, Geoffrey and William Hodes (1989) *The Law of Lawyering: A Handbook on the Model Rules of Professional Conduct*, Prentice Hall Law & Business: New Jersey.

Holmstrom, Bengt (1982) "Moral Hazard in Teams," *Bell Journal of Economics,* Autumn **13(2):**324-340.

Kahn, Charles and Huberman, Gur (1988) "Two-Sided Uncertainty and "Up-or-Out" contracts," *Journal of Labor Economics*, October **6(4)**:423-444.

Kandel, Eugene and Edward Lazear (1992) "Peer Pressure and Partnerships," *Journal of Political Economy*, August **100(4)**:801-817.

Kremer, Michael (1997) "Why are Worker Cooperatives so Rare?" NBER Working Paper, No. 6118.

Levin, Jonathan and Steven Tadelis (2002) "Organizational Form and Market Structure," mimeo, Stanford University

Miyazaki, Hajime (1984) "On Success and Dissolution of the Labor-Managed Firm in the Capitalist Economy," *Journal of Political Economy*, October **92(5)**, 909–931.

Pencavel, John and Ben Craig (1993) "The Empirical Performance of Orthodox Models of the Firm: Conventional Firms and Worker Cooperatives," *Journal of Political Economy*, August **102(4)**:718–744.

Ward, Benjamin (1958) "The Firm in Illyria: Market Syndicalism," *American Economic Review*, September **48(4)**, 566–589.