

Partnership Firms, Reputation, and Human Capital*

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Abstract

In human capital intensive industries where it is difficult to contract upon the training effort of skilled agents a socially suboptimal level of training may occur. We show how partnership organisations can overcome this problem by tying human and financial capital. Partnerships are illiquid and partners must stay with the firm until clients discover their type and update the firm's reputation. This renders unskilled agents, who will adversely affect reputation, unwilling to accept partnerships. Skilled agents therefore train the next generation so as to ensure that there is an adequate market for their own shares. We comment upon the salient differences between partnerships and joint stock firms.

KEY WORDS: Partnership, on-the-job training, human capital, collective reputation.

JEL CLASSIFICATION: J24, J41, L14, L22.

1. Introduction

In this paper we examine problems associated with on-the-job development and inter-generational transfer of human capital. We focus on tacit human capital that does not lend itself to codification or to arms-length exchange.¹ We envision such human capital including client relationships, a personal reputation for fair dealing, and certain forms of knowledge that, without further scientific development, cannot be codified. For example, a personal reputation is not a fungible asset and even firm reputations have limited fungibility.² Similarly, many elements of law, management consulting, investment banking and even accounting remain arts in spite of the best efforts of professional schools to codify practice.

¹Michael Polanyi (1966) draws the distinction between tacit and explicit knowledge. Daniel Bell (1973) identifies scientific advances that increase capacity for codifying theoretical knowledge as a driving force in industrial development.

²See Steven Tadelis (1999) on the latter point.

Skilled agents preserve such human capital by augmenting the human capital of unskilled agents under their guidance. In a world with perfect information, unskilled agents would be prepared to borrow against their future income to pay for such mentoring. We assume, however, that in practice mentoring is costly for senior agents, that their effort is unobservable, and hence that mentoring is noncontractible. The problem is more severe in team production where individuals have incentives to free ride on the mentoring efforts of their peers. In this setting, agents prefer after being mentored not to mentor the next generation, and simply to enjoy the rent which their own human capital generates. In other words, a classic time-consistency problem arises in the labour markets: while every agent would be prepared in exchange for receiving mentoring today to commit to mentoring the next generation of workers, he is *ex post* unwilling to do so.

Against this background we argue that partnership organizations have features that prevent senior workers from selling their labour to the highest bidder, and thus from avoiding mentoring obligations in settings where production requires development of tacit human capital. As a corollary to this argument, the transition from partnership to public, joint stock ownership can be understood in part as a response to codification of what previously was tacit human capital. With this transition the benefits of partnership organization decline relative to the financial risk-sharing benefits of public, joint stock ownership. Our argument focuses on two dimensions along which partnerships and publicly-traded firms differ. These two properties, combined with adverse selection in the labour market for associates who fail to receive partnership offers, are sufficient conditions for our results.

Firstly, partnership stakes are extremely illiquid. Once an agent accepts a partnership, he leaves on terms which are set by his peers. Partnerships demand fixed and often long-term commitments and early exit terms can be punitive, including being sued by the remaining partners for lost wages associated with the early withdrawal of human capital.³ Publicly-traded firms use a variety of contractual mechanisms to bind financial capital and human capital but enforcement is compromised by legal jurisdictional differences and the ease of establishing market values for equity stakes.

³A less extreme approach was taken by Marvin Bower, who led McKinsey & Co. for several decades following James McKinsey's death in 1939 and "stipulated that new partners should buy out old partners at the book value rather than the much higher market value of their shares, making it less attractive for old partners to sell out." (*The Economist*, March 22, 1997, Management Consultancy Survey, p.19). Similarly, until 1996 Goldman Sachs permitted retiring partners to withdraw only between 25 and 50 percent of their accumulated capital within the first year of retirement with the remainder to be withdrawn over five years. The firm's management committee reserved the right to extend the payout schedule and did so in 1996 in the wake of large trading losses (William J. Wilhelm, Jr. and Joseph D. Downing, 2001, chapter 7).

Secondly, partnerships deal primarily in human capital-intensive production of experience goods. Clients observe the quality of the partnership's human capital only after their business relationship is well advanced. Hence they depend upon their past experiences or the partnership's reputation to determine the fees they are willing to pay. Loss of reputation can be quite costly and even fatal to partnerships. Arthur Andersen's recent collapse in response to fallout from its role in the Enron scandal suggests that even well-established organizations of this sort are fragile. Although similar arguments can be applied to publicly-traded firms, we believe that they generally carry less force.

In Section 2 we incorporate these features in a simple model of an infinitely-lived firm. All agents are born without human capital. Organizations hire these unskilled agents as "associates" and experienced "partners" augment associates' human capital through mentoring. An associate who has acquired human capital is offered the option to acquire an illiquid equity stake in the firm. If an associate remains unskilled then he is fired. Although partners learn the quality of their hires during the associate stage, outsiders are unable to distinguish between skilled and unskilled agents without employing them. Outsiders can however make inferences from the partnership's promotion decisions.

In equilibrium, only unskilled agents are not promoted to partner so the labour market treats as unskilled any associate not promoted to partner. This gives the partners the leverage needed to persuade new partners to accept illiquid equity-based contracts. Once they have done so, holdup threats are held at bay until clients discover their ability. If a partner is discovered to be unskilled clients react by withdrawing their trust from the firm and its fee income and value drop. Unskilled agents know that if they accept an illiquid partnership the firm will lose its reputation before they leave, and hence that they will experience a capital loss on their partnership share.⁴ They therefore refuse to accept a partnership. Skilled partners anticipate this effect and they mentor new associates to ensure that there is a market for their partnership shares.

Our model requires one of the parties to an exchange of partnership stakes to experience a delayed reputational cost if an unskilled agent is promoted. In our simple model of two period careers the seller retires immediately after the transaction and so the buyer bears the cost. We outline in the conclusion an alternative approach in which the partnership phase of a career lasts two periods: in this case the reputational costs of promoting an unskilled associate are born by the

⁴Even if it were possible to sell the stake outside the firm, doing so would send a poor signal and would result in a loss of client trust.

mentoring partner in the final stage of his career.

The paper contributes to a voluminous literature on the form and function of business organizations. Henry Hansmann (1996) provides an extensive overview of this literature with particular attention to the structure of private partnerships and other producer cooperatives. With these institutional features in mind, we accept the two dimensions outlined above along which partnerships differ from publicly-traded firms as constraints on our analysis. Our goal is to demonstrate that variation along these dimensions can give rise in certain circumstances to an optimal level of human capital production; we do not attempt to derive an unconstrained optimal corporate structure. Our approach is further distinguished from much of the existing literature in that we focus not on free-riding in output but rather on the preservation of the organization.

Structurally, the model is in the spirit of Jacques Cremer's (1986) analysis of an infinitely-lived organization serving as a mechanism for coordinating the interests of overlapping generations of finite-lived agents. The analysis of the time inconsistency problem in developing human capital complements the literature on efficiency wages (see for example Carl Shapiro and Joseph E. Stiglitz, 1984) where senior workers face the threat of being fired after having earned less than their marginal product at early stages of their careers.

The interaction in our model between the younger generation's need for education and the older generation's reliance upon the value of their shares for retirement income is similar to Antonio Rangel's (2003) paper on forward and backward intergenerational goods. As in Rangel's paper, the older generation is incentivised to make a forward investment in the younger generation's human capital by the threat that the younger generation will not later make a reciprocal backward investment in their partnership shares. Unlike Rangel, however, punishment phases in our model cannot be of finite duration, and the agents who make backward investments in our model receive shares in return and hence benefit from them.

Tadelis (1999) shows in a model of pure adverse selection how the reputation attached to traded names may convey information about their owners. In later work (Tadelis, 2002) he extends his model to incorporate moral hazard, in which case the value accruing to a traded name provides incentives. The tradeability of names upon which Tadelis' conclusions rely rests upon an assumption that name trades are unobservable. A consequence of this is that names cannot separate good from bad agents. In contrast high reputation partnerships in our model will never attract low quality partners, as they will be unable to avoid detection by anonymously selling their stake in the firm.

Incentives in our model are therefore provided by a mechanism which is closer to David M. Kreps' (1990): agents work hard so as to ensure that there is a market for their partnership stake. Unlike Kreps however, we incorporate adverse selection and in our model the future quality of partners is determined by the effort level of today's.⁵ The importance of partnership reputations is also discussed by Heski Bar-Isaac (2003), who shows how an agent with an established reputation can commit to work hard by forming a partnership with a junior agent of unproven quality.

Our emphasis upon the illiquidity of partnership stakes complements a recent literature which highlights the role played in partnerships by profit-sharing. Joseph Farrell and Suzanne Scotchmer (1988) show that an equal profit-sharing rule limits the size of partnerships and hence may be inefficient. Other authors have examined the role of redistribution rules which do not require equal shares. Jonathan Levin and Tadelis (2002) argue that profit sharing imposes a higher quality threshold on new partners than on employees in public corporations. Thus partnership organizations dominate where product quality is hard to observe. Luis Garicano and Tano Santos (2003) argue that partnerships, by imposing *ex ante* profit sharing rules, can improve incentives for agents to redirect jobs to those who are best placed to undertake them. Alternatively redistribution measures might be advanced as means of rewarding workers for investing in firm-specific human capital in spite of their negative effect on incentives toward effort (see Bengt Holmström, 1982, and Armen A. Alchian and Harold Demsetz, 1972).

In contrast, our results require shared reputation rather than shared profits.⁶ Moreover, *human capital explicitly is not firm-specific in our model* and yet there remains a role for the partnership in promoting inter-generational transfer of tacit human capital. We contend that this is more likely the partnership's dominant function in professional services industries where human capital is readily transferrable (as evidenced by the high level of mobility among employees) and where routinely some partners are more equal than others.

⁵Johannes Hörner (2002) also discusses the incentive effect of reputations. In his model, competitive forces provide customers with an outside option and hence incentivise effort even in firms with a strong reputation. We rely instead upon the outside options which able employees have when their firm loses its reputation.

⁶Although every partner in our model has an equal equity stake, this feature does not drive our results. When partners are clearly paid less than the reputation of the partnership is not placed on the line by their promotion. The most able partners earn supernormal fees, as in our model, and billing at this level *does* risk the partnership's reputational capital and so is consistent with our reasoning. Moreover, the upper limit on partnership size which emerges endogenously in our model is a consequence of free-riding amongst partners rather than of the equal sharing rule.

2. Model

We consider a discrete time model of an infinitely lived firm. Agents in the model have two-period careers. They are able in the first period to augment their human capital, in which case we refer to them in the second period as *skilled*. Agents become skilled by working with a skilled agent who mentors them. Learning is costless, but mentoring is costly for skilled agents.

The per-period product of an unskilled agent (one without human capital) is w_l and the per-period product of a skilled agent is $w_h = w_l + \Delta w > w_l$. Note that non-human capital has no productive role: this assumption allows us to focus upon incentives for mentoring. Any agent can sell his labour in a competitive market but in the absence of information, a firm discovers an agent's type only by employing him.⁷ We assume that all agents are risk neutral and that the per period risk free interest rate is r .

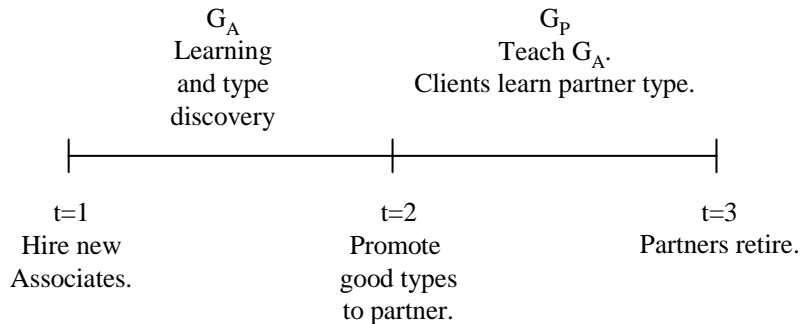


Figure 1: Career path of a partner.

At each date there are two generations of employees in the partnership: associates and partners. Figure 1 shows the career path of an agent whose career stretches from time 1 to time 3 and who remains with the partnership throughout his career: the respective generations to which he will belong are labelled G_A and G_P . For specificity we describe the career path of an agent who is hired at time 1.

At time 1 there are N partners in generation G_P and one associate is hired per partner.⁸ Every associate starts his career with no personal wealth and with no skills. Associates are paid a first period wage of w_A . Associates who are monitored acquire human capital at time 2; we describe

⁷This establishes the agent's outside option. We do not assume that the partnership has to compete for new hires.

⁸We demonstrate in section 3.3.iv that for low enough w_l , mentoring is incentive compatible only when $N > 1$, so the partnership cannot be of unit size.

below the process by which this takes place.⁹

At time 2 associates learn their own type (skilled or unskilled) and partners learn the type of every associate. This information is not revealed to agents outside the partnership. They can only deduce agents' types by inference from the time 2 promotion decision.

Some associates receive time 2 take-it-or-leave-it offers to join the partnership. We assume that every partner has one share in the business and that the retiring partners are constrained to offering their shares to incoming partners at the same price. Other associates are fired and work elsewhere in the second period of their career.

The shares acquired by new partners are illiquid. In practice, partners can leave the partnership early, but to do so is costly because exit terms are determined by the defector's peers. In the interests of model parsimony, and without significant loss of generality, we assume that early exit is impossible.¹⁰ Partners have two roles: they interact with clients, and they are expected to mentor new associates. When partners mentor associates they experience a disutility (cost) of c . In exchange, partners earn a wage w_P .

A partner's associate will become skilled if and only if the partner spends c on mentoring. We assume for two reasons that it is impossible to contract upon mentoring effort. Firstly, a failure to mentor is revealed only through the associate's time 2 skill level, and this is hard to prove in court. Secondly, mentoring is in practice a team activity: although professional partnerships commonly assign at least temporary responsibility for an associate to a specific partner, collaborative efforts amongst work teams and their periodic restructuring generally expose associates to multiple partners.¹¹ In practice it is therefore difficult to prove which partner is responsible for a failure of training.

We assume that mentoring is socially optimal:¹²

$$c < \frac{\Delta w}{1+r}. \quad (1)$$

Equation 1 implies that each associate would willingly borrow c against future earnings in order

⁹The only role in our model for associates is learning. It would be a simple matter to augment the model so that partners required their assistance, but to do so would complicate the presentation without adding additional insights.

¹⁰A more complete model might allow for early exit to occur in response to (unobservable) liquidity shocks. The associated contract design issues are studied in a venture capital setting by Philippe Aghion et al. (2000): they are not germane to our discussion.

¹¹See Robert G. Eccles and Dwight B. Crane (1998), who describe how in investment banking partnerships it was common for teams of product specialists to collaborate both with one another and with various client relationship managers as well as to come into contact with partners involved primarily in management functions.

¹²Training augments the human capital of the next generation and enables them to train their successors. Since each generation of agents is identical, training is optimal if and only if it is valuable on a per-generation basis.

to pay for mentoring. We assume however that this is impossible because the partner's decision to mentor is noncontractible. Skilled agents therefore face a mentoring externality: they cannot rely upon the marketplace to compensate them for their mentoring effort. Thus they would prefer to sell their services (at w_h) to the highest bidder when their mentoring ends and to avoid mentoring new associates.

Clients cannot observe *ex ante* the type of the partner with whom they are dealing, although they learn this in the course of their relationship and they know it *ex post*; this information percolates to the other clients of the partnership.¹³ Because partner type is revealed only through an ongoing relationship, this information is not verifiable in a court and so is not contractible. Client fees cannot therefore be contingent upon observations of partner type. They are contracted *ex ante* and are paid *ex post*. Observations of partner type can however affect future contracts and we show below how they affect clients' future willingness to pay for services rendered.

At time 3 clients learn partner types, and partners determine which associates are offered partnerships, and upon what basis. Retiring partners are paid a dividend and then sell their shares.¹⁴

In this setting, we define a partnership equilibrium as follows:

DEFINITION 1 *A partnership equilibrium consists of a share price P at which new partners acquire a partnership stake, wages w_A , w_P and a rule relating realised partner quality to future willingness to pay w such that:*

(PE1) *w is the expected next period productivity of partners;*

(PE2) *New associates wish to join the firm;*

(PE3) *Skilled associates wish to enter the partnership;*

¹³It is reasonable to assume that performance information would become common knowledge over several generations. In the interests of tractability we assume that it is shared immediately.

¹⁴In practice, retiring partners do not literally sell their stakes to incoming partners nor is there necessarily a one-for-one mapping between incoming and outgoing partners. However, we do believe it is reasonable to think of the firm intermediating the purchase and sale of equity stakes by incoming and outgoing partners. It is not uncommon for incoming partners to borrow from the partnership to fund their initial capital contribution. From the retiring partner's perspective, there is no standard mechanism for cashing out. In the investment banking industry, where production often involves putting capital at risk, it was common for the retiring partner's capital stake to be withdrawn over an extended period rather than in a lump sum upon retirement. In the case of Goldman Sachs, prior to the firm's public offering retiring partners essentially entered a fixed-term debt-for-equity swap with the firm providing for staged withdrawal of capital and a fixed return on capital over the withdrawal period. Finally, a tendency toward existing partners stepping down to make way for new partners is often seen as a sign of health (see Wilhelm and Downing, 2001, chapter 7 for a discussion of this element of the Goldman Sachs culture). It will become apparent that such mechanisms are consistent with equilibrium in our model.

(PE4) *Unskilled associates do not wish to enter the partnership;*

(PE5) *New partners elect to mentor associates.*

Partnership equilibria overcome the time consistency problem identified above. When new associates enter the firm, they receive mentoring but commit themselves to provide mentoring in the future if they become skilled. Thus in equilibrium, the partnership is a device for incubating and transferring human capital that cannot be exchanged at arms length.

3. Existence of Equilibria

Like standard repeated game models, ours supports a “bad equilibrium” in which training is not anticipated and hence is not performed (e.g., Cremer, 1986). In this section we demonstrate that in addition it supports the desirable partnership equilibrium.

In a partnership equilibrium, each agent behaves according to rules PE1-5, given that all other agents do so. Constraining P to be a constant as in definition 1 is without loss of generality. It simply implies that each generation of partners extracts from the partnership in salary and dividends precisely what is added during its tenure by the associates and partners. The precise value of P will depend upon bargaining between outgoing and new partners which is outside the scope of this paper: without loss of generality, we assume that P is the fair value of the company.

3.1. Client Fees

We now state the rule which gives as a function of realised partner quality the fee w_C which clients are willing to pay:¹⁵

$$w_C = \begin{cases} w_h, & \text{if all partners in every preceding period were skilled;} \\ w_l, & \text{otherwise.} \end{cases} \quad (2)$$

It is helpful to think of this rule in terms of institutional reputation. Call a partnership “trustworthy” if $w_C = w_h$ and “untrustworthy” otherwise. When a trustworthy firm is revealed to have promoted an unskilled associate to partner it is regarded henceforth as untrustworthy. Condition PE1 implies that in equilibrium, untrustworthy firms deserve their reputations. The fees which

¹⁵It turns out that this is the *unique* rule which is consistent with rational expectations. Any reputational equilibrium must be sustained by a rule which punishes a single bad experience with a temporary reduction in fees. As we show below, any trained agents will respond to such a withdrawal by refusing partnerships. Future generations will never be trained and so clients will never again pay w_h .

they can charge are reduced accordingly. We show that this concern for loss of reputation (being downgraded from trustworthy status) ensures that mentoring (PE5) and promotion (PE3-4) strategies are first best. We therefore formalise the notion that partnerships are repositories of collective reputations.

In the remainder of this section we show that when client fees are determined by rule (2), trustworthy firms are in a partnership equilibrium. To do so we firstly examine the properties of an untrustworthy firm. This establishes the equilibrium consequences of failing to mentor associates, and of low quality agents accepting promotion. We then demonstrate that the consequences are sufficiently costly to provide the incentives required to maintain a partnership equilibrium.

3.2. Untrustworthy firms

We prove firstly that mentoring will not occur in untrustworthy firms. Since partnerships will not in equilibrium become untrustworthy, we need an assumption about the off equilibrium path beliefs which outside firms will hold concerning human capital levels within a partnership firm which is discovered to have an unskilled partner. We need only the weak assumption that they will assign a positive probability to the event that at least one of the firm's associates has been mentored.¹⁶

A skilled agent who accepts a partnership in a firm immediately after it is deemed to be untrustworthy will by rule (2) earn w_l in the final period of his career; if he resigns then our belief assumption above implies that he will earn at least marginally more than w_l from the competitive

¹⁶This assumption is required only to ensure that for skilled agents in untrustworthy firms, resignation is *strictly* preferred to promotion to partner and hence is not critical. This belief assessment is consistent for each stage game in the sense of Kreps and Robert Wilson (1982). To see this, consider a stage game with n partners which follows one in which every retiring partner was revealed to be skilled. Define the strategy set π^m for this stage as follows: skilled partners mentor with probability $1 - \frac{1}{m}$, skilled associates accept promotion with probability $1 - \frac{1}{m}$ and unskilled agents do so with probability $\frac{1}{m}$. Retiring partners attempt to promote n partners, starting with skilled members of the partnership and then if necessary offering promotion to others. Customers set prices according to rule 2. Now denote by μ_j^m the probability assigned by the customers that at least one associate has been mentored, given that $j < n$ partners are revealed in this stage game to be unskilled. We know that j of the retiring partners did not train. μ_j^m is consistent with Bayes' rule provided

$$\begin{aligned} \mu_j^m &= \sum_{i=1}^{n-j} \left\{ (i \text{ of previous generation mentored}) \sum_{k=1}^i (k \text{ skilled promoted}) P \{ \text{at least one mentors} | k \text{ promoted} \} \right\} \\ &= \sum_{i=1}^{n-j} \sum_{k=1}^i \binom{n-j}{i} \left(1 - \frac{1}{m}\right)^i \left(\frac{1}{m}\right)^{n-j-i} \binom{i}{k} \left(1 - \frac{1}{m}\right)^k \left(\frac{1}{m}\right)^{i-k} \left(1 - \left(\frac{1}{m}\right)^k\right). \end{aligned}$$

Then π^m is strictly mixed and tends towards the sequentially rational strategy set (PE2 - 5) which we describe in the paper, and for every j , $\mu_j^m \rightarrow 1$ as required. Moreover, it is easy to check that the beliefs derived from π^m using Bayes' rule for the number of skilled agents in the next stage tends towards the beliefs used in the body of the paper: in other words, our equilibrium is sequentially rational.

outside labour market. He therefore leaves the firm. Unskilled agents are pooled in the outside labour market with skilled agents and hence they also choose to leave the firm.

The firm will therefore consist in the future only of unskilled agents earning w_l , so that the threat embodied in rule (2) is time consistent. Furthermore, since employees are extracting the whole of their per-period product, the value of the firm will be 0.

3.3. Trustworthy Firms

If an unskilled agent becomes a partner in a trustworthy firm then the illiquidity of his partnership share ensures that he will remain a partner long enough for clients to learn his type. The firm is then relabelled as untrustworthy. We now demonstrate that this threat is sufficiently potent to enforce requirements PE3-5 and hence, when associate wages are chosen to satisfy PE2, to sustain a partnership equilibrium.

To prove this we assume that all agents in the current generation act in accordance with rules PE3-5 and that all agents in future generations are expected to do likewise. We show that no agent has an incentive to deviate from this behaviour. Then the assumption about future generations is rational and the economy is in a partnership equilibrium. We begin by determining the associate wage offered in this case.

(i) Associate Wages

Since the share price P is a constant, each partner's total equilibrium income from salary and dividends must be the sum of net income from associates and his own marginal product, or $w_l - w_A + w_h$. In the second period of their careers, associates become skilled and earn this quantity less their cost c of mentoring new associates. If they do not join the partnership they earn w_l , so that a new associate's outside option is to earn w_l in both periods of his life. The new associate's participation, or individual rationality (IR), constraint PE2 can therefore be written as:

$$w_A + \frac{w_l - w_A + w_h - c}{1 + r} \geq w_l \frac{2 + r}{1 + r},$$

or

$$w_A \geq w_l - \left(\frac{\Delta w - c}{r} \right). \quad (\text{AIR})$$

Since agents are born without wealth, we assume¹⁷

$$w_A \geq 0. \tag{AssBC}$$

Finally, we assume that

$$w_l < c. \tag{3}$$

Equations 1 and 3 together imply that $w_l < \frac{\Delta w - c}{r}$ and hence that at any non-negative wage every agent strictly prefers working for the partnership to his outside option.¹⁸ Therefore partners offer new associates the following wage:

$$w_A = 0, \tag{4}$$

and new associates satisfy PE2 by accepting it.

(ii) Share Price

At the end of each period the shareholders in the firm (the partners) are each paid a dividend equal to their production during the period plus that of their associate: $w_h + w_l - w_P$. Since trustworthy firms remain trustworthy in equilibrium, the per share *ex div* firm value is therefore

$$P = P_{TR} \equiv \frac{w_h + w_l - w_P}{r}. \tag{5}$$

(iii) Acceptance of Promotion

Now consider a skilled agent invited to join the partnership at share price P . As a consequence of partnership opacity the labour market is unable to tell whether he is skilled but, since in equilibrium all skilled agents accept promotion, it will assume if he leaves that he is of low quality.¹⁹ Agents who do not join the partnership are therefore offered wage w_l . Alternatively, the skilled agent may obtain utility $w_h + w_l - c$ by accepting the partnership. Accepting the partnership is therefore optimal (and PE3 is satisfied) if and only if

$$c < w_h, \tag{6}$$

¹⁷We ignore subsistence requirements. Incorporating them into the budget constraint would complicate our notation but would have no material effect upon our conclusions.

¹⁸This assumption is consistent with the casual observation that, notwithstanding their low (hourly-adjusted) current salaries, associates of the most reputable professional partnerships can expect super-normal lifetime earnings. Wilhelm and Downing (2001, chapter 7) make this argument with respect to a partnership stake in Goldman Sachs and suggest that, in line with our model, associates would bid (accept negative wages) for employment (and training) were it not for informational friction.

¹⁹This is an off-equilibrium path belief: it is again consistent in the Kreps and Wilson (1982) sense, using the strategies π^m defined in footnote 16.

which follows immediately from assumption 1.

The associate has no wealth and so must finance his partnership stake. However, it is crucial to our argument that he be unable to signal his quality to the labour market through the raising of finance. We demonstrate in section 3.3.iv that, irrespective of his ability, the most a partner can lose in equilibrium is $\frac{P_{TR}}{N}$. Provided $r > \frac{1}{N}$ he can finance this amount from his lifetime earnings as a partner. We assume that this is the case and that retiring partners (but not associates offered partnership) can credibly convey associate quality to a financier.²⁰ Retiring partners can therefore arrange a package coupling promotion to the partnership with the necessary financing and thus prevent independent borrowing against the offer to signal a new partner's quality.

Suppose instead that an unskilled agent is offered a partnership stake. He knows that his acceptance will cause the firm to become untrustworthy and hence that (assuming as usual that his end of period dividend will equal the net cashflows generated during his partnership) his share will have value 0. Until clients determine that he is unskilled, the firm is treated as trustworthy and he and all of the other partners earn a wage w_h . His end of period income is therefore $w_h + w_l$, compared to the outside option of w_l and he accepts a partnership at share price P if and only if $-P(1+r) + w_h + w_l \geq w_l$, or²¹

$$P \leq P_{USK} \equiv \frac{w_h}{1+r} < P_{TR}. \quad (7)$$

Next we demonstrate that in equilibrium retiring partners will not offer shares at this price. It follows that at the prevailing share price no unskilled agent will enter the partnership, so that PE4 is satisfied.

(iv) The Mentoring Decision

If a skilled partner elects to mentor associates, he derives utility $w_h + w_l - c$ from his stake in the firm. If he is the only partner who shirks mentoring responsibility then by assumption his shirking will not be observable but only $N - 1$ associates will have their human capital augmented.

The argument in the preceding section implies that the partnership can either promote $N - 1$

²⁰In a richer model such as that outlined in the conclusion with career paths exceeding two periods the least cost financing alternative would be for junior partners to borrow from active senior partners who are best positioned to assess the borrower's quality and to monitor the loan.

²¹Note that, since all partners pay the same price for their shares, an attempt to sell shares at P_{USK} will immediately reveal to skilled partners that an unskilled agent is entering the partnership and hence that the exit share price will be 0. Since their time 2 outside option is equal to that of the unskilled agents, they will be prepared to accept this price.

partners at share price P_{TR} and remain trustworthy, or that it can promote N partners at share price P_{USK} , in which case the firm will after one further period become untrustworthy. The income from the former strategy exceeds that from the latter precisely when

$$(N - 1) \frac{w_h - w_P + w_l}{r} \geq N \frac{w_h}{1 + r},$$

or

$$w_P \leq \frac{N(N - (1 + r))}{(N - 1)(1 + r)} (w_h + w_l) + w_l \frac{Nr}{(N - 1)(1 + r)}.$$

The multiplier of w_h in this expression exceeds 1 for $N \geq 2$. Since $w_P < w_h$ this condition is satisfied. In other words, if a partner shirks his mentoring responsibility the firm optimally reduces the number of partners rather than accepting an incompetent partner (as anticipated in section 3.3.iii, this proves PE4).

Mentoring is subject to a free-rider problem among partners. A partner who shirks mentoring retains the entire associated utility gain c while the losses associated with his behaviour are shared equally amongst the partners. If the number of partners is reduced from N to $N - 1$ the per partner share value declines by $P_{TR} - \frac{N-1}{N}P_{TR} = \frac{P_{TR}}{N}$. This loss is experienced at the end of the partner's career, while the mentoring cost is incurred immediately. Thus partners mentor associates rather than suffer this loss if and only if $c \leq \frac{P_{TR}}{N(1+r)}$, or precisely when

$$N \leq \frac{P_{TR}}{c(1 + r)}. \quad (8)$$

Condition (8) places an upper bound on the size of the partnership which rules out partners free-riding on one another. It confirms the natural intuition that the size of the partnership in equilibrium is larger when the present value of a partner's interest in sustaining a reputation for being trustworthy is large relative to the cost of doing so. Thus we might expect to observe larger partnerships in settings where client service and mentoring are highly complementary. Alternatively, if the disutility of mentoring is inversely related to the quality of associate hires we might expect firms for whom the constraint (8) bites to invest more heavily in screening new associates. In general, if condition (8) is satisfied, the equilibrium requirement PE5 also is satisfied.

The preceding discussion is summarised in proposition 2.

PROPOSITION 2 *Suppose that conditions (6) and (8) are satisfied. Then wages $w_A = 0$ and $w_P < w_h$ with the client payment rule 2 together constitute a partnership equilibrium.*

4. Conclusion

In this paper general human capital is augmented through mentoring, but mentoring effort is neither observable nor contractible. Although mentoring is welfare increasing, unskilled junior agents are unable to contract with skilled senior agents for mentoring effort. Moreover, it is impossible for them to make an *ex ante* commitment to perform mentoring after their own mentoring is completed.

We demonstrate that these problems can be overcome in a partnership. Our argument rests upon two important characteristics of partnerships. Firstly, partnership stakes are illiquid: partnership is a long-term commitment. Secondly, partnerships rely in the face of asymmetries of information upon reputational capital.

In equilibrium only unskilled agents are not promoted to partner. This gives the partners the leverage needed to persuade new partners to accept illiquid equity-based contracts. Once they have done so they cannot immediately sell themselves to the highest bidder and they must stay with the firm long enough for clients to discover their ability. If a partner is discovered to be unskilled clients react by withdrawing their trust from the firm and its fee income and value drop. Unskilled agents know that if they accept an illiquid partnership the firm will lose its reputation before they leave, and hence that they will experience a capital loss on their partnership share. They therefore refuse to accept a partnership. Skilled partners anticipate this effect and they mentor new associates to ensure that there is a market for their partnership shares.

Our argument rests upon the costs experienced by the partner if he fails to mentor. In our model these arise because an unskilled associate will refuse promotion. This feature yields our results cleanly, but it is not essential. For example, consider a richer model in which careers last for three periods, of which the last two are spent as a partner. In this case, suppose that junior partners have few shares and are responsible for training. They can then purchase more shares and spend one period as a senior partner before cashing out and retiring. With small probability an unskilled junior partner could learn on the job and become skilled. In such a model the cost to an unskilled junior partner of reputation loss would be relatively low; an unskilled associate would therefore accept promotion in the hope of acquiring skill as a junior partner. The training partner, who in this model could have private knowledge of the associate's skill, would however experience a significant loss as a senior partner in the high probability event that the junior's lack of skill caused a reputational loss. He would therefore block the unskilled associate's promotion.

In this case, the agent who fails to train bears the associated costs because he is a senior partner when the partnership's reputation is damaged. Provided that partnership stakes remain illiquid and partnerships continue to rely upon reputational capital, our results are therefore robust to extensions which allow for the possibility that unskilled associates might accept promotion.

What prevents a publicly-traded, joint stock firm from replicating the incentives that we identify with partnerships? In our model, the most important distinguishing feature of the partnership is the inseparability of human and financial capital, which causes unskilled agents to refuse promotion. In joint stock firms financial capital is supplied by investors who are typically distinct from the employees who supply human capital.

A joint stock company could attempt to mimic the illiquidity of the partnership contract through the use of non-compete contracts which attempted to limit employee mobility by preventing them from selling their human capital to the firm's direct competitors. However, unskilled agents without a capital exposure would not be discouraged by such a contract from accepting promotions. This would cause the mechanism which we have outlined to unravel. Moreover, considerable uncertainty surrounds the enforceability of non-compete contracts and they may induce undesirable self-selection amongst incoming employees who have private information about their own ability.

Unskilled agents might be dissuaded from accepting promotion in joint stock firms if it was contingent upon the purchase of shares in the firm. As we have argued in this paper, this policy will only be successful when skilled agents cannot use the signal which promotion sends to earn their marginal product in the labour market. Restricted stock programs approximate our mechanism by requiring executives to hold or to acquire nontransferable stock that vests only with continued employment. In some instances, the firm lends the employee funds for the express purpose of acquiring such shares. Generally, when restricted shares vest they convert to unrestricted shares. Our analysis suggests that vesting periods should correspond with the time horizon over which the senior employee's commitment to mentoring is demonstrated and might benefit further from conversion on terms set by insiders. Finally, the potential for unravelling is diminished when human capital is firm-specific.

Given the difficulties in replicating the incentives created by the partnership, we conclude that joint stock companies will be most effective in industries where human capital is not dependent upon noncontractible and costly mentoring, or where it is hard to transfer human capital between firms. In the latter case, mentoring can be incentivised by requiring new managers to buy special

shares in the company which they cannot easily redeem before retirement. Firms in other industries, such as law and stockbroking, will be more effectively organised as partnerships.

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