Rat Race Redux: Adverse Selection in the Determination of Work Hours in Law Firms

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By Renée M. Landers, James B. Rebitzer, and Lowell J. Taylor *

This paper describes an organizational setting in which professional employees are required to work inefficiently long hours. The focus of our investigation is large law firms. The income sharing that characterizes legal partnerships creates incentives to promote associates who have a propensity to work very hard. Law firms use indicators of this propensity—especially an associate's record of billable hours—in promotion decisions. Reliance upon work hours as an indicator leads to a "rat-race" equilibrium in which associates work too many hours. We find evidence in support of this conclusion with data we collected from two large law firms. (JEL J16, J2, J44)

According to textbook economic theory, market competition forces firms to link work hours tightly to the preferences of individual employees. Firms that more closely match the hours preferences of their employees will find that they can attract desirable employees at a lower wage. Conventional theory therefore predicts that most individuals will be working the utility maximizing number of hours conditional on their wages.

In this paper, we suggest that work hours may be determined through a process quite different from that described by the textbook model. In particular, some firms may use willingness to work long hours (or other performance measures that entail long work hours) as an *indicator* of some valuable, yet hard to observe, characteristics of employees. When this indicator plays a role in determining hiring or promotions, issues of adverse selection may appear in the determination of work hours. Employees desiring short hours will have an incentive to camouflage themselves as long-hour workers—perhaps by agreeing to more work hours than they would otherwise desire at their current wage. Firms will respond

by establishing work norms with hours long enough to discourage a short-hour employee from pretending to be a long-hour employee. The result of this process is that employers may require too many work hours from employees. Employers also may not be able to adjust these hours quickly or easily as more short-hour employees enter the labor market.

George Akerlof (1976) first proposed the idea that adverse selection can lead to overwork in his paper "The Economics of Caste and of the Rat Race and Other Woeful Tales."[1] Akerlof's demonstration that overwork equilibria are possible was presented in a self-consciously unrealistic example. This may have created the unfortunate impression that the rat-race equilibrium was an interesting theoretical example of market failure, but one having little connection to the operation of actual labor markets. In this paper we seek to make the case for the empirical relevance of rat race equilibria to a potentially large number

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[1] Bengt Holmström (1982) develops a similar idea in the context of a signaling model, while Douglas Gale (1992) studies a model with both signaling and adverse selection processes. Rebitzer and Taylor (1995a) describe equilibrium overwork in the context of an efficiency wage model. The general idea that workers face constrained hours appears also in papers by John C. Ham (1982, 1986), who provides convincing empirical evidence that many individuals are constrained to work hours which they do not find optimal. In contrast to our study, Ham focuses on workers who are constrained to work too few hours.

of professional and managerial jobs. We do this by developing and testing a model of adverse selection in work hours for a particular type of business organization, large law firms.

Law firms share two characteristics that make them a convenient vehicle for the study of adverse selection in work hours. First, law firms have a simple internal structure. In general there are only two broad classes of professionals in the firm, associates (who are the firm's employees) and partners. The key promotion in the firm involves the decision to allow associates to purchase an equity stake in the enterprise.

The second important feature of law firms is that there is nearly always some degree of revenue sharing among partners. The sharing of revenues among partners makes each individual partner's income dependent on the willingness of other partners in the firm to work hard. Since the money making activities of other partners are hard to observe directly, there are strong incentives to allow into the partnership only those associates with a *propensity* to work very hard. In this setting it is natural to expect law firms to develop mechanisms to screen out associates inclined towards short hours. We will argue that, in large law firms, this mechanism takes the form of a stringent work norm that requires associates to work inefficiently long hours.[2]

This last claim is of particular importance for the study of lawyers because the legal profession, like many other professions in the United States, is experiencing a demographic revolution. In 1967 women constituted about 3 percent of the attorneys in the United States. This figure fluctuated between 2 and 5 percent until 1975. By 1987, 16.2 percent of lawyers were female. Currently about 40 percent of the graduates from law schools are female (Sherwin Rosen, 1992 Table 1, Figure 1 and p. 222). Adapting to this shift in the labor force is a central issue for law firms. As Rosen put it, "... in many ways, the story of the legal profession ... in the 1970's and 1980's is the entry of women; the huge increase in women ... represents one of the largest demographic changes ever observed in American professions" (p. 222).

The recent influx of women does not appear to have depressed work hours in the legal profession.[3] A 1984 survey found that 35 percent of lawyers in private practice worked 200 or more hours per month. A follow-up survey in 1990 found that 50 percent worked 200 or more hours per month (American Bar Association, 1991 p. 22, Table 19). This change in hours has occurred even though a large proportion of lawyers are married to spouses who work in professional jobs.[4]

The paper proceeds as follows: in the next section (Section I) we present a model of the determinants of work hours in a law firm where partners use hours as an indicator when making promotion decisions. In Section II we offer an empirical investigation of our model using data we collected from two large law firms. In the conclusion we consider the relevance of rat-race models to the determination of work hours in other professional and managerial settings.

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[2] The argument in this paper is similar in some respects to that developed in Juliet B. Schor's (1991) book, *The Overworked American*. We, like Schor, contend that competitive forces can lead to persistent overwork. We differ from Schor, however, in two important and interrelated ways. First, we attribute overwork to a specific microeconomic mechanism quite different than those in Schor's writings. Second, our model suggests that overwork is most likely to appear in professional and managerial settings. Schor, in contrast, makes the claim that overwork is ubiquitous.

[3] A downwards inflexibility of hours may be characteristic of other labor markets employing highly educated professionals. Mary T. Coleman and John Pencavel (1993a, b) document that annual hours for white men and women with 16 or more years of schooling have increased over the past five decades—a time during which hours for the less educated have fallen.

[4] Of attorneys graduating law school after 1967, 79 percent were married and/or living with a significant other in 1990. Of these spouses, 49 percent were working full-time and 17 percent part-time. These working spouses appeared to have demanding jobs: 18 percent were lawyers and 49 percent were in some other profession (American Bar Association, 1991 Tables 58, 62 and 63). This same survey found that part-time or reduced hour work was very uncommon in law firms. Only 7 percent of associates and 3 percent of partners worked part-time. In contrast, roughly 23 percent of lawyers in solo practice work part-time (American Bar Association Table 28, p. 26).

I. Adverse Selection and the Determination of Work Hours

A. Attorneys and Firms

In this section we examine the determination of work hours in the context of a simple model. We suppose there are two types of attorneys. These attorneys are equally productive, and differ only with regard to preferences over leisure.[5]

All attorneys participate in the labor market for two periods. In each period utility is a function of consumption, c, and hours worked, h. Consumption in a period equals that period's earnings. The discount rate is r. For simplicity we specify utility in a period to be

$$(1) \qquad u_t(c, h) = c - b_t h^2$$

where $t = 1$ or 2 indexes the individual's type. We let $b_1 > b_2$, so that type-2 individuals place a lower weight on the disutility of work than do type-1 individuals.

There are two distinct ways in which legal services can be produced. Attorneys can always work in a spot market, for example self-employment, in which an hour of work results in the production of m_1 units of output. In a competitive spot market the wage will be $w_1 = m_1$. Given the specified utility function, optimal work hours for each type t will be

$$(2) \qquad h_t^* = \frac{w_1}{2b_t}.$$

At the optimal hours, h_t^*, consumption is $w_1 h_t^*$ and utility is

$$(3) \qquad u_t(c^*, h_t^*) = \frac{w_1^2}{4b_t}.$$

The second way in which legal services can be produced is somewhat more in volved. There are some aspects to the

production of legal services that are best accomplished by attorneys working in small teams, and we suppose that there are a limited number of such partnerships in the market. One might think of them as an oligopolistic fringe to the otherwise competitive market for legal services. Partnerships will exist only if output per hour for the partners is higher than in the spot market. We introduce this productivity differential by writing output per hour for an individual working in the team as $m_2 > m_1$. As we will discuss shortly, partners hire additional attorneys as employees of their firm and these "associates" have productivity m_1.

To keep notation manageable we will suppose that the optimal size of each partnership is two. For the moment, think of the two partners as having jointly purchased the partnership at the beginning of the period, with each paying X for his share of the firm. The partners agree to divide evenly both the output for the period and the revenue from the sale of the partnership at the beginning of the next period.[6] Once in a partnership, the optimal work decision for one partner, say individual A, is the number of hours, h_A, that solves

$$(4) \qquad \max \frac{m_2}{2}(h_A + h_B) - b_A h_A^2,$$

where h_B represents the hours chosen by the other partner.

Obviously, the return to being a partner in this context depends not only on an individual's type, but on the type of the other partner. This interdependency suggests that a partner will always prefer being paired with a type-2 individual (who will be inclined to work long hours and produce more output) over a type-1 individual. Let $V_{s,t}$ be the utility a type-s individual gets from being in a

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[5] Throughout this paper we follow the conventional practice of referring to nonmarket work activities as leisure. It should be clear, however, that our usage of the term leisure includes such important and nonleisurely activities as child and elder care.

[6] Sharing rules among partners is a widely acknowledged feature of law firm compensation. Reasons commonly cited for these rules include: risk pooling, equity constraints across partners, and problems of attributing revenue to the actions of a single partner (see, e.g., Ronald Gilson and Robert Mnookin, 1985; and Kevin Lang and Peter-John Gordon, forthcoming).

partnership with a type-t individual net of the utility of a job in the spot market. Then, using (3) and (4),

$$(5) \quad V_{s,t} = m_2^2[1/16b_s + 1/8b_t] - w_1^2/4b_s.$$

Given $b_1 > b_2$, we have $V_{2,2} > V_{2,1}$ and $V_{1,2} > V_{1,1}$. Any attorney will always prefer to be paired with a type-2 partner.

An implication of (5) is that the value of a partnership position depends crucially on the individual's type, and also on what type one partner thinks the other partner might be. From the viewpoint of a prospective partner, the higher the probability that the other partner is type 2, the higher will be the amount he will be willing to pay for a position in the partnership. This, in turn, leads current partners to put in place a mechanism that ensures it is common knowledge that all prospective buyers of the partnership are type-2 individuals.

B. Equilibrium with Observable Type

In this section we establish a baseline equilibrium in which workers' types are observable. Each firm is presumed to have two partners who are attorneys in the second period of their career. Firms employ L associates who are first-period attorneys. At the end of each period the partners sell the firm to the two highest bidders among the junior associates in a competitive auction.[7] This auction corresponds to the nearly ubiquitous practice of promoting the next cohort of partners from the current cohort of associates.[8]

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[7] In what follows we assume that the two highest bidders are certain to purchase the firm. Alternatively, the model can be expressed as a lottery in which the bidders purchase the firm with some probability less than 1. Introducing a lottery into our setup does not change our central conclusions about the nature of the labor market equilibrium or the determination of work hours.

[8] In this model the auctioning of the law firm is a convenient device for ensuring that the current generation of partners has an interest in maximizing the discounted present value of future net income produced by the firm. The purchase of the firm by new partners is most easily imagined as an outright exchange of cash for equity and some firms do literally require partners to "buy into the partnership." The actual transaction, however, need not take this form and in most cases it does not. In our two period

In equilibrium either type of attorney can accept positions in the spot market, earning wage $w_1 = m_1$. Only type-2 workers, however, are offered positions as associates in the partnerships. This sorting follows directly from equation (5). As associates, the two types of individuals are perfect substitutes. Partners, however, are concerned not only about current production, but also about the future value of their firm. This value is maximized if type-2 workers exclusively are allowed to bid for the firm, and if it is common knowledge that this will be the firm's policy. Given the assurance that both partners will be type-2, the steady-state market price of a partnership, X, will solve

$$(6) \qquad X = V_{2,2} + \frac{X}{1 + r}$$

where, using (5),

$$V_{2,2} = \frac{3m_2^2}{16b_2} - \frac{w_1^2}{4b_2}.$$

We assume $V_{2,2}$ is positive; the existence of partnerships is efficient.[9]

In this equilibrium, type-2 workers are indifferent between the various jobs available. Type-1 workers find positions in the spot market. Importantly for our analysis, all attorneys work their preferred number of hours, with type-2 attorneys working longer hours than type-1's.

C. Does Incomplete Information Change the Equilibrium?

In this section we ask if the full-information equilibrium pertains when types are unobservable. We start by supposing that the equilibrium does exist; that is, we think about an equilibrium in which type-2 workers exclu-

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model, the new partners could "purchase" the firm by accepting reduced salaries. If we complicated the model by allowing partners to stay for a number of periods, the purchase of the firm could also take the form of a steep salary-tenure profile for partners.

[9] This will be the case if the level of productivity in a partnership exceeds that of the spot market jobs by enough, that is, if $m_2 > \sqrt{4/3}m_1$.

sively accept positions as associates and bid for partnerships, and all associates work optimal hours. We adopt the Michael Rothschild and Joseph E. Stiglitz (1976) equilibrium concept: the full information equilibrium exits when no actor can increase utility by deviating from the behavior specified in the equilibrium, when this actor takes others' behavior as given.

Consider associates first. A type-2 worker clearly cannot benefit from accepting the jobs normally held by type-1 workers, which pay w_1 at hours h_1^*. Suppose, though, that a "maverick" type-1 attorney were to accept a job as a junior associate by pretending to be a type-2 individual. For this maverick there would be a loss in utility in the first period, because the associate would be working longer hours than would be optimal. On the other hand, the associate could purchase a partnership for the second period of his or her career by bidding the going price of X, and be assured of getting paired with a type-2 individual. The cost to the maverick in the second period of such a strategy is just the opportunity cost of owning the partnership period for one period, $rX/(1 + r)$, which from (6), is $V_{2,2}$. On the other hand, the benefit of being matched with a type-2 individual in a partnership is $V_{1,2}$.

If $V_{1,2} < V_{2,2}$, we do indeed have an incomplete information equilibrium that corresponds to the complete information equilibrium. This inequality describes a "no envy" case. A type-1 individual would not be interested in accepting a position held by a type-2 individual even if by doing so the type-1 individual could fool the employer into thinking he or she was a type-2 individual. A far more interesting case is where $V_{1,2} > V_{2,2}$.[10] In this instance it may increase the utility of a type-1 individual to adopt the maverick strategy. This "envy" case will occur when the maverick's utility

loss from overwork in period 1 is less than the present value of $V_{1,2} - V_{2,2}$, that is, when

$$\frac{V_{1,2} - V_{2,2}}{1 + r} > u_1(w_1 h_1^*, h_1^*) - u_1(w_1 h_2^*, h_2^*),$$

or equivalently, using (2), (3) and (5), when

$$(7) \quad \frac{w_1^2(b_2 - b_1)}{b_2}$$

$$> \frac{-1}{(1 + r)}[w_1^2 - (m_2/2)^2].$$

The right-hand side of expression (7) is negative by construction (see footnote 10). Thus, if b_1 is not too much larger than b_2, inequality (7) holds. Expression (7) gives us our first important result: there exist conditions under which it will be profitable for a type-1 worker to seek associate positions that are occupied by type-2 workers in the perfect information equilibrium. The full information equilibrium cannot pertain in this case.

Although the full information equilibrium cannot apply when inequality (7) holds, one might suspect that a market in which there were only a very few type-1 workers would achieve an equilibrium not very much different from the perfect information case. In particular, we ask if long-hour attorneys might still work the utility maximizing number of hours when the number of short-hour attorneys is small.

Consider this proposed "equilibrium." Each partnership hires associates who work h_2^* hours in period 1, at the competitive wage w_1. Then at the end of the period the firm is auctioned off to the highest bidders. Suppose that there are so few type-1 workers in the market that any one firm expects at most one type-1 worker, and the probability of this happening is θ, which is close to zero. So long as hours remain at h_2^*, the value of the firm to each partner will suffer a small discrete decline, from $X = rV_{2,2}/(1 + r)$ to $\bar{X} = r[(1 - \theta)V_{2,2} + \theta V_{2,1}]/(1 + r)$.[11]

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[10] This inequality will prevail if $2m_1 > m_2$. A tempting, but incorrect, interpretation of this inequality might be that the envy case is less likely in very rich firms where m_2 is large. To clarify this point, we note that in the case where there were P partners, $V_{1,2} > V_{2,2}$ when $Pm_1 > m_2$. We have not modeled the determinants of P in this paper. If, as seems reasonable, P were an increasing, concave function of m_2, then the envy case would be more likely as m_2 increases.

[11] The change in firm value is $r\theta[V_{2,2} - V_{2,1}]/(1 + r)$. Substituting from expression (5), we can express $V_{2,2} - V_{2,1}$ in terms of model parameters as $m_2^2[(b_2)^{-1} - (b_1)^{-1}]/8 > 0$.

Again using the Rothschild-Stiglitz definition, we note that this outcome can be an equilibrium only if no actor has the incentive to alter his or her behavior. Consider though, a firm that increases by some small amount the number of hours it requires of junior associates so that the new level of hours is $h_2^* + \Delta h$ and pays a wage $(w_1 + \Delta w)$ high enough to induce type-2 individuals to accept such positions. The change in the firm's labor cost for its L associates is

$$(8) \qquad L(h_2^* + \Delta h)\Delta w.$$

Because utility of a type-2 individual is the same for this offer as in the spot market,

$$(9) \quad (w_1 + \Delta w)(h_2^* + \Delta h)$$
$$- b_2(h_2^* + \Delta h) = u_2(w_1 h_2^*, h_2^*),$$

which implies (using (2) and (3)),

$$(10) \qquad \Delta w(h_2^* + \Delta h) = b_2(\Delta h)^2.$$

Substituting (10) into (8) thus shows the policy of increasing hours will cost the firm $Lb_2(\Delta h)^2$. Firms thus suffer a decrease in profits as a result of their new hours policy, but this decrease is *second order*.

If this decrease in net income were the sole effect of increasing work hours, no single firm would have an incentive to require hours greater than h_2^*. A firm that extends its required hours, however, also imposes a first-order cost on any type-1 worker who wishes to work for the firm. Type-1 workers will therefore seek employment at the other firms that continue to offer positions with hours set to h_2^*. Thus a small increase in hours will ensure that the firm will have only type-2 workers in its associate pool. The net result is a discrete increase in the value of the firm that is described in footnote 11. For a sufficiently small change in hours, the increase in firm value *must* exceed the loss in net income. This reasoning is the basis for our second major result: in situations where short-hour attorneys might wish to become partners in firms, any individual firm will benefit by increasing hours some amount above h_2^*, the level that would prevail in the complete information case. Put

differently, in the "envy" case described by expression (7), equilibrium *cannot* be characterized by partnerships in which most associates work the utility maximizing number of hours (conditional on the wage).

D. *A Separating Equilibrium*

Having ruled out a pooling equilibrium in which associates work optimal hours, we describe an alternative separating equilibrium that can exist in a labor market with unobservable types. Suppose all firms adopt the strategy of offering a wage, hours package $(\tilde{w}_2, \tilde{h}_2)$ that will be accepted by type-2 workers exclusively. Such offers must be set so as to meet (1) the "participation constraint," that type-2 workers are willing to take the jobs, and (2) the "separating condition," that type-1 workers will not accept the positions. We state these two conditions formally by the following inequalities:

$$(11) \qquad u_2(\tilde{w}_2\tilde{h}_2, \tilde{h}_2) \geq u_2(w_1 h_2^*, h_2^*)$$

and

$$(12) \quad \frac{1}{1+r} \left\{ V_{12} - r\tilde{X}/(1+r) \right\}$$
$$\leq u_1(w_1 h_1^*, h_1^*) - u_1(\tilde{w}_2\tilde{h}_2, \tilde{h}_2)$$

where $\tilde{X}$ is the price of a partnership in the proposed separating equilibrium.[12]

Expressions 11 and 12 describe an equilibrium if any firm in the separating equilibrium prefers offering the wage—hours packages $(\tilde{w}_2, \tilde{h}_2)$, as defined by (11) and (12), to simply abandoning the separating strategy and accepting the possibility of selling the partnership in the next period to type-1 workers. We consider this issue in three steps.

Our first step is to find the value of the partnership, $\tilde{X}$, in the separating equilibrium. We let the firm choose $\tilde{w}_2$ and $\tilde{h}_2$ so that inequalities (11) and (12) are binding.

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[12] Note that $r\tilde{X}/(1 + r)$ is just the opportunity cost of holding the partnership for one period.

Then substituting from (2), (3) and (5) into (11) and (12) we find after rearranging terms that

$$(13) \quad \frac{r\tilde{X}}{1+r} = \left\{ \frac{m_2^2}{16b_1} + \frac{m_2^2}{8b_2} - \frac{w_1^2}{4b_1} \right\}$$

$$- (1+r)\left\{ \frac{w_1^2}{4b_1} - \frac{w_1^2}{4b_2} - b_2\tilde{h}_2^2 - b_1\tilde{h}_1^2 \right\}.$$

The second step is to observe that when it is common knowledge that future partners will be type 1, the value of the firm, say X', must solve

$$(14) \quad \frac{rX'}{1+r} = V_{1,1} = \frac{3m_2^2}{16b_1} - \frac{w_1^2}{4b_1},$$

where the expression for $V_{1,1}$ comes from (5).

The third step is to establish that $\tilde{X}$ exceeds X'. To demonstrate this final step, we note that the implication of (13) and (14) is

$$(15) \quad \frac{r}{1+r}(\tilde{X} - X') = \frac{m_2^2}{8}\left\{ \frac{1}{b_2} - \frac{1}{b_1} \right\}$$

$$+ (1+r)\left\{ \frac{w_1^2}{4}[b_2^{-1} - b_1^{-1}] \right.$$

$$\left. + [b_1 - b_2]\tilde{h}_2^2 \right\}.$$

The right-hand side of (15) must be positive. A partnership operating in a separating equilibrium will *never* wish to abandon the separation strategy in favor of letting type-1 workers into its pool of associates.[13]

We have thus demonstrated that in situations where short-hour attorneys might wish to become partners in the elite oligopolistic fringe of law firms, there can exist a separating equilibrium. A key feature of this equilibrium is that associates are required to work more hours than they would otherwise wish to work at the going wage.

E. *Discussion*

We have argued that the income sharing characteristic of partnerships creates strong incentives to screen potential partners for their *propensity* to work hard. When an associate's record of hours worked are used as an indicator in promotion decisions, a separating equilibrium may pertain in which associates are required to work more hours than they would if they were simply maximizing utility conditional on the current wage.

This separating equilibrium is clearly inefficient relative to the full information case. Of more interest is the finding that the equilibrium can be inefficient even given information constraints. This point is most easily established if we consider the effect of a maximum hours law when the proportion of type-1 ("short-hour") workers in the economy (θ) is close to zero. A maximum hours law that prohibits hours in excess of h_2^* makes it impossible for firms to maintain a separating equilibrium. Type-1 attorneys are made better off by this law because they gain access to previously unobtainable partnerships that offer them higher utility than jobs in the spot market. Long-hour workers are indifferent to the passage of the law because they continue to receive reservation utility. Since type-1 associates are made better off and type-2 associates are indifferent to a maximum hours law, the separating equilibrium will be inefficient in cases where the law improves the position of the partners who currently own the firm.

In the absence of the maximum hours law, a *single* firm abandoning stringent work norms will be certain to attract only short-hour attorneys and we have already demonstrated that the costs of such a move will always exceed the benefits. Things are different, however, under a law compelling *all* firms to simultaneously abandon the separating equilibrium. In this case, the failure to screen out short-hour workers will reduce the value of the firm to each partner by $r\theta[V_{2,2} - V_{2,1}]/(1+r)$.[14] When θ is sufficiently small, current partners will indeed find it profitable to *simultaneously*

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[13] In adverse selection models separating equilibria can sometimes be broken by a firm offering a pooling contract at wages low enough to make such a contract profitable (David M. Kreps, 1990 pp. 642–43). Equation (15), however, rules out this possibility.

[14] This expression is discussed in footnote 11.

reduce their work norms. A maximum hours law would, in this situation, make current partners better off without making any of the associates worse off.[15]

Our model of adverse selection in the determination of work hours need not be limited to professional partnerships. Rat-race equilibria can be expected in any group where the following three criteria hold: (1) the members of a group benefit from the productive activity of other group members, (2) the output of the group can be significantly influenced by the work effort of individual members, and (3) members of the group have the ability to establish work norms. Criteria 2 suggests that adverse selection in hours may be particularly likely in groups using o-ring type production technology. In these groups complementarites among employees are such that small differences in an individual's level of performance can generate large differences in the value of output produced by the group.[16] Teams of professionals developing new products with short product life cycles (for example, software engineers) may therefore be especially likely to be characterized by excessive work norms. Rat-race effects might also appear in the competition for managerial positions in hierarchical settings where the actions of managers high up in the hierarchy have a multiplicative effect on output through their influence on employees lower down in the hierarchy (Rosen, 1982).

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[15] Joseph Farrell and Suzanne Scotchmer (1988) also find that the equal sharing rules of partnerships can lead to inefficiencies. In contrast to our model, the partners in Farrel and Scotchmer differ according to (observable) ability. Income sharing causes a flow of revenues from high ability partners to low ability partners. The high ability partners therefore want to work only with lawyers whose ability is at least as great as theirs. Firms can be assured of hiring only attorneys with a given ability level if the size of the firm is restricted. Small firms, however, will not be able to exploit relevant economies of scale. Firms stay at inefficiently small sizes because hiring more partners leads to a transfer of income from incumbent high ability attorneys to the newly entering, low ability attorneys. Thus the sharing of profits among partners causes the private returns from restricting firm size to exceed the social returns.

[16] Michael Kremer (1993) argues that "o-ring" production functions are ubiquitous and can account for a very long list of otherwise anomalous features of labor markets.

Our separating equilibrium also has the property that increases in the number of short-hour attorneys will *not* lead to a shortening of associate hours in law firms. In our model, the number of hours required of associates in law firms is invariant with respect to the proportion of the workforce desiring short hours. We can get even stronger results if we allow the wage in the self-employment sector to fall as the number of short-hour attorneys increase. In this situation, the gain from pretending to be a long-hour attorney increases and firms will have to make the work norm more stringent to discourage short-hour applicants. Thus firms may respond to an increase in the number of short-hour attorneys by *increasing* the minimum number of acceptable work hours for associates.

A final feature of the separating equilibrium concerns the distribution of access to partnerships. In comparison to the hypothetical economy where excessive hours are limited by law or by custom, rat-race equilibria offer reduced access to partnerships for attorneys who are unwilling to endure excessive work hours early in their careers.

II. An Empirical Investigation of Work Hours in Large Law Firms

The preceding section described how adverse selection in the competition for positions in legal partnerships could lead firms to require excessive work hours of associates. In this section we report the results of an empirical investigation of the determination of associate work hours in large law firms.

A. *The Data*

We collected data for this study in a survey of associates and partners at two major law firms in a large Northeastern city.[17] The sur-

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[17] The survey was conducted during the summer of 1993. Three waves of questionnaires were distributed at Firm 1 and, on the advice of management, two waves were distributed at Firm 2. The ultimate response rates at the firms were nearly identical. To conceal the identity of participating firms and survey respondents, all analysis is conducted with pooled data.

veys asked all associates on a partnership track about their work hours, billable hours, and attitudes towards work hours. A total of 216 surveys were distributed and 133 were returned, for a response rate of 62 percent. A simultaneous survey questioned the partners at these firms about the decision to promote associates to partners. We distributed 188 surveys and received responses from 64.4 percent of the partners in our sample.

Column 1 of Table 1 presents descriptive statistics for our sample of associates. The average associate was 32 years old with a job tenure of 3.6 years. A sizable proportion of the sample (70.7 percent) were married or living with a significant other, and 32.6 percent had children. The average annual salary of associates was $79,154. In contrast the average annual salary of partners was $247,067.

Rows 8–13 present different measures of work hours. Rows 8a–8c present the distribution of billable and nonbillable hours worked per month. Associates in the 25th percentile worked 180 hours per month. The median associate works 200 hours per month. Associates in the 75th percentile worked 220 hours per month.[18] Rows 9a–9c present the distribution of monthly billable hours. The 25th percentile, mean and 75th percentile were respectively 150, 160 and 180 hours billed per month.[19] The monthly hours figures in rows 8a–9c included both part-time and full-time attorneys. In our sample of 133 associates only 6.8 percent worked part-time (see row 10). All of these part-timers were women with children. The average monthly work hours of these part-time women was 140.

Rows 11 and 12 present data on weekend work patterns. In an average week, 30.3 per-

TABLE 1—DESCRIPTIVE STATISTICS OF ASSOCIATES INCLUDED IN THE SURVEY

	Sample of associates
1. Percent male[a]	57.1
2. Mean year graduated law school[a]	1989
3. Mean age (years)[a]	31.8
4. Mean tenure (years)	3.6
5. Percent married	70.7
6. Percent with children	32.6
7. Mean annual salary (dollars)	79,154
8. Hours worked per month:[b]	
a. 25th percentile	180
b. 50th percentile	200
c. 75th percentile	220
9. Hours billed per month:	
a. 25th percentile	150
b. 50th percentile	160
c. 75th percentile	180
10. Percent working part-time	6.8
11. Percent working weekend days in an average week:	
a. 0 days	30.3
b. 0.5 days	47.7
c. 1 days	20.5
d. 1.5 days	1.5
e. 2 days	0
12. Percentage working weekend days in a busy week:	
a. 0 days	0.8
b. 0.5 days	10.7
c. 1 days	38.9
d. 1.5 days	26.0
e. 2 days	23.7

[a] The differences between respondents and nonrespondents were small in magnitude and statistically insignificant. The fraction male of the nonrespondents (identified by name) was 58.5 percent. The average age and year of law school graduation for nonrespondents (obtained from the Martindale-Hubbell law directory) were 32.8 and 1988 respectively.

[b] In comparison, the 25th, 50th and 75th percentile for hours worked in the entire U.S. workforce aged 20–40 was 40 hours per week. For those aged 20–40 with at least six years of college the comparable figures were 40, 40 and 50 hours per week, respectively. (These calculations were made using data on usual hours worked at primary job from the Current Population Survey Outgoing Rotation Group Annual Merge Files for 1991. For a description of these files see D. Feenberg [1992].)

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[18] The distribution of the total monthly work hours for partners was: 25th percentile, 175 hours; 50th percentile, 195 hours; 75th percentile, 200 hours. This pattern of partners working slightly fewer hours than associates holds when examining billable hours, fraction part-time, and weekend hours. While our model predicts that associates will be working "too many hours" it makes no clear prediction about the relative hours of associates and partners.

[19] Billable hours had a strong linear relationship to total work hours. Regressing hours on billable hours yielded the following equation: Total Hours = 35.4 + 0.998(Billable Hours) $R^2 = 0.62$.

cent of the associates did not work weekends at all, 47.7 percent worked half a weekend day, 20.5 percent worked a whole day and 1.52 percent worked one and a half weekend days.

None of the associates surveyed worked two full weekend days during a typical week. During a busy week things were different. Only 0.76 percent did not work weekends during a busy week, 10.7 percent worked half a day, 38.9 percent worked a whole day, 26 percent worked one and a half days and 23.7 percent worked both weekend days.

B. *Hours Preferences, Hours Worked, and Promotion*

The distinguishing feature of the rat-race equilibrium is that many individuals, in our case associates in law firms, will be working more hours than would be utility maximizing given the wage.

Specifically associates in our model would like to work h_2^* hours at the going wage, but will be required to work $\tilde{h}_2 > h_2^*$ hours. In principle, such overworked employees could be identified by asking individuals whether they would like to reduce their current work hours given their current wage. If hours constraints are prevalent, however, this question would require respondents to consider a hypothetical option that they may not have anticipated when making their consumption plans. This means that employees who might otherwise desire shorter hours may previously have made financial commitments expecting an income level achieved only at the current (and excessive) level of work hours. These financial commitments (which include things like mortgage payments, car loans, and school tuition payments for children) would preclude a downward adjustment in work hours at the current wage.

For these reasons we adopted an alternative, but closely related, approach to identifying overwork. Rather than asking how associates would adjust current hours given their current wage, we asked how they would adjust hours over the coming year in response to a wage increase close to one they could have reasonably anticipated. Specifically, we asked associates to consider a *hypothetical* five-percent change in work hours over the coming year. We then asked each respondent to "indicate which of the following alternatives you would be most likely to choose: (1) decrease hours by 5 percent with no change in accompanying

income over the coming year, (2) keep hours the same over the coming year with a 5-percent increase in income, or (3) increase hours by 5 percent over the coming year with a 10-percent increase in income." [20] The results are reported in column 1 of Table 2. Nearly two thirds (65.41 percent) of the associates indicated that they would prefer *reducing* work hours and keeping income unchanged over the coming year. Only 25.56 percent of respondents wanted to keep hours unchanged and enjoy a 5-percent increase in income. Similar ratios hold for associates with children and slightly higher ratios hold for married associates whose spouse works full-time. This pattern is what we would expect in our adverse selection model where associates are at $\tilde{h}_2$ rather than h_2^*.

The statistics reported in Table 2 might be consistent with the conventional labor supply model if a large fraction of associate lawyers are on the backwards bending portion of their labor supply curves. Upon reflection, however, this interpretation seems implausible. First, the labor supply elasticity implicit in choosing to reduce hours is -1. This is roughly 10 times the labor supply elasticities reported in the literature. [21] Second, the backwards bending labor supply story suggests that associates should cut back their hours each year as their wages rise. In the firms we surveyed, salaries increased at roughly 7 percent per year (see the log salary equations presented in column (1) of Table 3), but we find no evidence of a reduction in monthly hours or billable hours among more senior associates (see the small

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[20] The precise wording of the question is presented in Table 2. The survey also included a table describing what a 5-percent change in work hours would mean for associates working different hours. For example, an associate working 200 hours per month would learn from the table that a 5-percent change in hours would imply an increase or decrease of one eight-hour day per month or 12 eight-hour days per year.

[21] In a comprehensive review of the literature on labor supply, John Pencavel (1986) observes that the elasticity of hours with respect to the wages for men is very small. The central tendency for U.S. estimates lies between -0.17 and -0.08 (Pencavel, p. 69). Shulamit Kahn and Kevin Lang (1991) find that the elasticity of actual hours with respect to wages is nearly identical to the elasticity of desired hours with respect to the wage.

TABLE 2—HOW ASSOCIATES WOULD CHOOSE TO USE A HYPOTHETICAL 5-PERCENT WAGE INCREASE[a]

| | Associates | | | |
| | | | Married whose spouses work full-time | |
Choices	All	With children	No children	With children
1. **Reduce** billable and nonbillable work hours by **5-percent with no change** in annual salary:				
Percentage	65.41	60.47	78.57	76.19
Number of associates	87	26	33	16
2. Continue working **the same number** of hours with a **5-percent increase** in annual salary:				
Percentage	25.56	25.56	9.52	23.81
Number of associates	34	13	4	5
3. **Increase** billable and nonbillable work hours by **5-percent** with a **10-percent increase** in annual salary:				
Percentage	9.02	9.02	11.90	0.00
Number of associates	12	4	5	0
Number of Observations	133	43	42	21

[a] These results are in response to following question: "This question asks you to consider a *hypothetical* five percent change in *your* work hours over the coming year. You can use the table on the following page to get a sense of what a 5% change in work hours may mean for you. Please indicate which of the following alternatives you would be most likely to choose:" "The table on the following page" refers to a chart that presented the following calculation. If an associate's average billable and nonbillable work hours total 160 hours per month, then a 5-percent change in billable and nonbillable hours would be equivalent to an increase of one eight-hour day per month or 12 eight-hour days over 12 months. Similar calculations were presented for associates working 200, 240, and 280 hours per month.

and statistically insignificant coefficients on the tenure variable in the work hour equations presented in columns (2)–(4) of Table 3). The income effect implicit in the work hours question should increase as salaries increase. If backwards bending labor supply curves were important, we should observe that associates who want to reduce hours have, on average, higher incomes than associates who want to keep current hours. In fact the average income for these two groups is virtually identical.[22]

Allowing for the possibility that some of the respondents who want to reduce hours are responding optimally to a wage increase rather than stringent work norms, we can put a lower bound on the degree of overwork by estimating the proportion of associates who would reduce hours at their current wage. Our survey does not collect such information, but a 1985 supplement to the Canadian Labor Force Survey does (see Statistics Canada, 1985).

The Canadian Labor Force Survey is a nationally representative survey similar to the Current Population Survey in the United States. In June 1985 a special supplement was administered to collect data on the hours preferences of the Canadian work force. The survey instrument first asked respondents to

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[22] We compared associates who wanted to reduce hours and those who wanted to keep current hours along the following dimensions: fraction male, mean year graduated law school, mean age, mean tenure, fraction married, fraction with children, mean annual salary, mean hours worked and billed, fraction working part-time, and weekend days worked in average and busy weeks. In no case were there statistically significant differences across groups. The "increase hours" group had less legal experience prior to joining the current firm and therefore

slightly lower average salaries. It is possible that associates in this group were trying to "catch up" to other associates in the firm by accumulating more experience. In any case, the number of associates in the "increase hours" group (there are 12) is small.

TABLE 3—THE EFFECT OF TENURE ON ANNUAL SALARY AND MONTHLY HOURS[a]

	Ln(salary) (1)	Hours worked (2)	Hours worked (3)	Hours billed (4)	Hours billed (5)
Tenure	0.074 (11.435)	−1.397 (−0.967)	−1.168 (−0.794)	−0.015 (−0.013)	−0.277 (−0.236)
Years prior experience	0.016 (2.843)	−2.603 (−2.058)	−1.849 (−1.415)	−1.482 (−1.457)	−1.338 (−1.284)
Married			5.374 (0.787)		8.070 (1.462)
Male			18.927 (3.351)		16.910 (3.681)
Has children			−10.719 (−1.569)		−3.805 (−0.689)
Constant	yes	yes	yes	yes	yes
N	129	131	130	126	126
Adjusted R^2	0.505	0.021	0.111	0.001	0.109

Note: t statistics are given in parentheses.
   [a] All estimates are ordinary least squares.

consider working less time for less pay at the respondent's current wage.[23] The survey then asked whether the respondent would trade some or all of a pay increase to gain more leisure time.[24] Restricting our attention to college educated employees working full-time, we found that 79.1 percent of the respondents answered both hours preferences questions the same way. However, the fraction of respondents who would reduce hours at current wages was 67.8 percent of the proportion who would pass up future wage increases to reduce work hours.[25] If similar ratios hold in our sample of associates, then a lower bound estimate of the proportion working "too many" hours is 44.5 percent.[26]

If the high incidence of overwork recorded in Table 2 is indeed the result of the processes described by our adverse selection model, we should also find that work hours are an important indicator in the promotion to partnership decision. To address this issue, we examined the role of work hours in promotions in three different ways. First, we asked each attorney in the firm to indicate the importance of billable hours and other factors in determining promotion to partnership. Second, we asked each attorney the importance of hours billed as an *indicator* of qualities that the firm might look for in partners. Third, partners were asked to evaluate different hypothetical associates for promotion. We describe each of these investigations in turn.

[23] The survey framed the hours-income trade-off as follows: "The following questions are about working less time for less pay. Assume that you would lose one hour's pay for each hour that you no longer work ... Put another way, you would lose 5% of your pay if you work 5% less time."
   [24] The question was worded as follows: "Another way to gain more time off is to trade all or some part of your pay increase. Would you trade some of your increase in the next two years for more time off? (For example, gain 5 percent more time off instead of a 5 percent pay raise?)"
   [25] There were 2200 college educated, full-time workers in the survey out of a sample of 15,754. 25.6 percent of the college educated, full-time sample would reduce hours at current wage levels and 37.7 percent would sacrifice future wage increases to reduce hours.

[26] It might be objected that the high salaries associates lawyers receive make them more likely to be on the backwards bending portion of the labor supply curve than the typical, college educated employee. In the Canadian data, however, the probability that a college educated employee would prefer current hours at current wages and shorter hours at future (higher) wages is independent of salary levels.

TABLE 4—THE PERCEIVED ROLE OF HOURS IN PROMOTION TO PARTNERSHIP[a]

Factor in the promotion decision:	Importance for promotion		Importance of hours as indicator of other factors	
	Associates (1)	Partners (2)	Associates (3)	Partners (4)
The quality of work product	0.90	0.99	0.32	0.32
The potential for bringing new clients and business to the firm	0.75	0.69	0.16	0.20
A willingness to work long hours when required	0.96	0.89	0.92	0.78
Loyalty to the firm	0.69	0.71	0.50	0.28
A willingness to pursue the interests of clients aggressively	0.76	0.76	0.48	0.37
Ambition for success in the legal profession	0.67	0.51	0.46	0.39
The number of hours billed to clients	0.68	0.52		
The mastery of an important area of specialization	0.67	0.75		
Contribution to administration or recruitment	0.08	0.01		
The development of good working relationships or mentoring relationships with senior lawyers in the firm	0.68	0.51		
The development of a good working relationship with clients and peers	0.76	0.81		
Demonstrated ability to bring new clients and business to the firm	0.48	0.19		
Number of observations	130	118	130	117
Median number of factors for which hours are important indicator			3	2

[a] Respondents were asked to rate factors on the following 5 point scale: 1 = not important; 2 = slightly important; 3 = moderately important; 4 = very important; and 5 = of the utmost importance. Columns (1) and (2) list the fraction of associates and partners who rated the factor 4 or above. Columns (3) and (4) consider the perceived importance of hours as a signal for the first five of these factors. Billable hours were seen as an important indicator when two conditions held. First, respondents gave billable hours a score of 4 or 5 as an indicator. Second the factor which was being indicated by billable hours was given an importance rating of 4 or 5 in the previous columns. Thus 32 percent of associates reported that the quality of work product was very important in promotion decisions *and* that partners assigned much importance to billable hours as an indicator of ability to produce high quality work product.

Factors Important in Promotion.—Respondents were asked to evaluate the importance of 12 different factors that were likely to play a role in the promotion process in these law firms. Importance was measured using a five point scale where 1 was not important, 2 was slightly important, 3 was moderately important, 4 was very important, and 5 was of the utmost importance. Table 4 lists the fraction of respondents who claimed that a factor

had an importance of 4 or 5. Column (1) presents the results for associates and column (2) presents the results for partners.

It is clear from inspection that associates and partners had similar views about which factors were important in the promotion process. The correlation coefficient between the first two columns in Table 4 is 0.992. The vast majority of associates (90 percent) and partners (99 percent) clearly viewed the quality of work product as important in promotion decisions. Willingness to work hard was also considered important by large numbers of associates (96 percent) and partners (89 percent). In contrast the number of hours billed to clients was seen to be important by a much smaller proportion of associates (68 percent) and partners (52 percent). Indeed, billable hours ranked 7th in importance for both associates and partners.

Hours as an Indicator.—Quite a different picture emerges when attorneys are asked about the importance of billable hours as an *indicator* of other traits and achievements relevant to the partnership decision. Respondents were asked to evaluate the importance of billable hours as an indicator for 6 of the 12 factors listed in columns (1) and (2) of Table 4. Attorneys who believed that billable hours are an important indicator and who also believed that the factor itself was important in promotion were assigned a value of 1 and zero otherwise.[27] Thus 32 percent of associates reported that the quality of work product was very important in promotion decisions *and* that partners assigned much importance to billable hours as an indicator of ability to produce high quality work product. The figure for partners was also 32 percent. Inspection of columns (3) and (4) in Table 4 reveals that similar proportions of associates and partners viewed hours as an important indicator of underlying associate abilities and accomplishments. The cor-

relation coefficient between rows 1–6 of columns (3) and (4) is 0.94. Consistent with our model of income sharing among partners, a large majority of associates (92 percent) and partners (78 percent) viewed billable hours as an important indicator of a willingness to work long hours when required. The signaling value of work hours was *not* limited, however, to work propensities. In our sample of associates, the median number of important factors for which billable hours was also an important indicator was 3. The median for partners was 2.

Hypothetical Promotion Decisions.—Our third approach to assessing the importance of work hours in promotion involved asking partners to evaluate hypothetical promotion cases. Each partner was randomly assigned to one of four different cases.

The first case asked the partner to evaluate George Davidson, an associate described as follows:

> George Davidson has distinguished himself as a very capable lawyer. He has handled difficult cases, often with good results. In addition, George is a very hard working attorney. He volunteers for more work and can regularly be found at the office nights and weekends.
> Although George is not the pre-eminent authority in his field, he has a bright and engaging style and is well liked by other lawyers. To date George has had little opportunity to demonstrate his ability to attract new clients to the firm and it is therefore difficult to assess his potential in this area.

The second case was identical to the first—but George Davidson became Sandra Davidson.

The third scenario added the following paragraph in between the two presented in cases 1 and 2.

> George took a month of leave after the birth of his son. Upon returning to work, he stopped his practice of working nights and weekends and the result has been a marked reduction in his billable hours over the past three years. He has indicated that he would be interested in shifting to a reduced hour schedule if he should have a second child in the near future.

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[27] The importance of hours as an indicator was measured by the same 5-point scale described in the previous paragraph. Hours were classified as an important indicator whenever the respondent indicated that they were very important (4 points) or of the utmost importance (5 points).

TABLE 5—DEGREE OF SUPPORT FOR A HYPOTHETICAL CANDIDATE FOR PROMOTION
TO PARTNER, WITH THE ABILITY TO ATTRACT CLIENTS

	Candidate's characteristics			
	Unclear ability to attract clients		Some demonstrated ability to attract clients	
Degree of support	Long hours	Short hours	Long hours	Short hours
Very heavy support	1.72	0	20.34	1.75
Heavy support	31.03	17.54	38.98	35.09
Moderate support	53.45	56.14	35.59	50.88
Little support	10.34	22.81	3.39	10.53
Very little support	3.45	3.51	1.69	1.75
Number of observations	58	57	59	57

The fourth scenario was the same as the third, but George was changed to Sandra.

After reading their assigned case, partners were asked the likely degree of support they would give George (or Sandra) in an actual promotion decision. A follow-up question asked what degree of support they would give if the candidate had demonstrated *some* ability to attract new clients.

The partners' assessments of the short- and long-hour job candidates are presented in Table 5 and summarized in the ordered probits presented in Table 6. Column 1 of Table 6 reports estimates when the candidate's ability to attract new clients is unclear and column 2 reports estimates when the candidate has demonstrated some ability to attract clients. The right-hand side variables in the equations represent the dimensions along which the scenarios were allowed to vary. The statistically significant and positive coefficients on short-hour candidate, in columns 1 and 2 indicate that support for promotion *falls* as work hours fall. Similarly the small and statistically insignificant coefficients on Male candidate, means that the associate's gender per se had no direct effect on the partner's evaluation of associates.

The importance of work hours documented in Table 6 is also reflected in a nationally representative survey of attorneys conducted by the American Bar Association. In this survey 59.3 percent of attorneys whose firms offered part-time or reduced hour employment believed that accepting these options would limit opportunities for advancement including

partnership (American Bar Association, 1991 p. 27).

C. How Are Work Norms Communicated and Enforced?

We have so far ignored the way in which firms might communicate and enforce work norms. The simplest approach would be to specify the minimum number of hours associates should bill each month. One of the two firms in our sample has such a minimum billable hours policy, but it is understood at this firm that acceptable performance requires hours substantially above this minimum.[28]

An alternative way to specify work norms is to scale the acceptable number of hours with respect to the distribution of hours billed by associates in the firm. For example, associates might be expected not to bill hours very far below the mean (or median) number of hours worked by associates. This approach to work norms is consistent with the practice we observed of regularly distributing to partners a listing of the billable hours of all associates in the firm.

To establish the role that the *distribution* of work hours plays in individual work hour

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[28] A 1990 survey by the American Bar Association finds that written or unwritten billable hours requirements are widespread in larger private firms. The proportion of respondents working with no billable hours requirement increases as the size of the law firm falls (American Bar Association, 1991 Table 20, p. 22).

TABLE 6—ORDERED PROBIT ESTIMATES OF THE DETERMINANTS OF SUPPORT
FOR A HYPOTHETICAL CANDIDATE FOR PROMOTION TO PARTNER

| | Candidate's characteristics | |
| | Unclear ability to attract clients | Some demonstrated ability to attract clients |
Dependent variable	Support for promotion[a]	Support for promotion[a]
Short-hour candidate	0.45 (2.16)	0.65 (3.16)
Male candidate	0.02 (0.11)	−0.01 (−0.06)
N	115	116
χ^2	4.70	10.25

Note: t statistics are given in parentheses.
  [a] Support was recorded in a 5-point scale where: 1 = very heavy support; 2 = heavy support; 3 = moderate support; 4 = little support and 5 = very little support.

decisions, we followed the question on work hours preferences presented in Table 2 with questions about shifts in the distribution of hours in the firm. Half of the associates we surveyed were asked what their hours preferences would be if they knew that the majority of other associates in the firm had *increased* their work hours by 5 percent. The other half of the associates were asked what their hours preferences would be if they knew that the majority of other associates in the firm had *decreased* work hours by 5 percent.

The answers to these follow-up questions are presented in Table 7. The columns of the Panel A indicate an associate's preferred response to the initial question about work hours. The rows of the table present the same associate's preferred response once informed that the majority of other associates in the firm have *increased* their billable and nonbillable hours by 5 percent.

In a conventional labor supply model, individual work hours decisions are determined independently of the distribution of work hours of other associates in the firm. If this model pertains, we should expect all observations to lie along the diagonal of the table. In Panel A we instead observe that significant numbers of respondents wanted to *increase* their desired level of work hours if others were doing the same thing. Indeed the hypothesis that the distribution of original hours prefer-

ences was identical with the distribution of preferences when other associates increase work hours is strongly rejected.[29]

Panel B of Table 7 is the same as the top panel except that associates were asked to imagine that other associates in the firm reduced their work hours by 5 percent. Some associates changed their answers in response to the downwards shift in the hours distribution. The response, however, was small and the hypothesis that the distribution of row and column variables are the same cannot be rejected at conventional significance levels.[30] This pattern is what we would expect if work norms were specified in terms of relative hours. The associates who wanted to reduce hours (those in column (1) of Panel B) would still have incentives to do so when the hours distribution shifted down. The associates who liked their current hours (those in column (2) of Panel B) would like them even more as their standing in the hours distribution improved.

The asymmetric response to shifts in the hours distribution observed in Table 7 is consistent with a work norm based on rela-

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[29] A Wilcoxon sign rank test yields a z statistic of −5.28.
[30] A Wilcoxon sign rank test of the hypothesis that the two distributions are identical yields a z statistic of 1.28.

TABLE 7—CHANGES IN HOURS PREFERENCES OF ASSOCIATES AS THE DISTRIBUTION OF HOURS IN THE FIRM SHIFTS

Panel A:	Original hours preferences[a]		
Preferences when others increase hours[b]	Reduce hours 5 percent (1)	Keep current hours (2)	Increase hours 5 percent (3)
Reduce hours 5 percent	51.35	0	0
Keep current hours	35.14	35.71	0
Increase hours 5 percent	13.51	64.29	100.00
Column total	100.00	100.00	100.00
Number of observations	37	14	6
Panel B:	Original hours preferences[a]		
Preferences when others reduce hours[c]	Reduce hours 5 percent (1)	Keep current hours (2)	Increase hours 5 percent (3)
Reduce hours 5 percent	100.00	15	0.00
Keep current hours	0	85	16.67
Increase hours 5 percent	0	0	83.33
Column total	100.00	100.00	100.00
Number of observations	50	20	6

[a] This is how associates would choose to respond to a 5-percent wage increase.

[b] This is how associates would choose to respond to a 5-percent wage increase if the majority of other associates in the firm increased hours by 5 percent.

[c] This is how associates would choose to respond to a 5-percent wage increase if the majority of other associates reduced hours by 5 percent.

tive hours. The associates in column (1) of Panel B expressed a desire to reduce their work hours even before they were presented with a hypothetical reduction in the hours of other associates. If relative ranking in the hours distribution is important for promotion, the downward movement in average hours would allow the associates in column (1) to further reduce their preferred level of work hours. The bulk of the remaining associates are in column (2) of Panel B. These attorneys like their current work hours and the desirability of these hours is only increased as others reduce hours. Thus, attorneys in column (2) of Panel B have little incentive to reduce work hours.

The results in Table 7 might alternatively be the result from coordination problems. If attorneys work in teams requiring face to face contact among attorneys, then a 5-percent increase in one attorney's hours would *require* other group members to increase hours 5 percent. We don't find this interpretation

plausible because associates in large firms commonly spend a substantial proportion of work time on legal research and writing. This type of activity consists in large measure of solitary library work and does not require continuous face-to-face contact among between attorneys.[31]

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[31] To get some idea of the disposition of associate work time, we analyzed the survey of lawyers described in the American Bar Associate report, The State of the Legal Profession 1990. This survey contains information on the use of work time for 68 associates in large private firms (that is, those with more than 90 attorneys). The associates were asked what percent of work time they spent on various activities. Responses were grouped into five categories: 0–5 percent, 6–20 percent, 21–49 percent, 50–74 percent and more than 75 percent. Assigning each respondent to the mid-point of their category, we find that the mean associate in large firms spent 28 percent of work time on research/memo writing and 20 percent of work time drafting instruments.

D. *Discussion*

The prediction that employees overwork early in their career is not unique to adverse selection models. Agency models in which firms back load compensation to elicit high levels of work effort from employees can also produce a similar pattern (see Edward P. Lazear, 1981; and Kahn and Lang, 1992).[32] The agency explanation may be particularly relevant in the context of law firms. Economists and legal scholars frequently interpret the up-or-out promotion practices of these firms as an incentive compatible means of inducing associates to post performance bonds in the form of deferred compensation (Gilson and Mnookin, 1989). As an empirical matter, the amount of deferred compensation in large law firms is substantial (Rebitzer and Taylor, 1995b).

Adverse selection and agency problems are not mutually exclusive. Firms trying to keep short-hour attorneys out of partnerships through long-hour norms may also back load compensation with an eye towards increasing the incentives of long-hour associates to work hard or to invest in specific human capital. It should be noted, however, that the economic significance of overwork in the agency model is different than in the adverse selection model. In the agency context, the overwork that results from back loading compensation is *efficient* with respect to information constraints. Moreover, firms will be indifferent between hiring equally productive short- and long-hour workers, even though both types of workers will overwork early in their careers. Evidence of widespread overwork is therefore

necessary but not sufficient to establish the claim that law firms are inefficient and sluggish in providing jobs suited to short-hour employees. The simplest version of the agency model does not require that employers prefer long- or short-hour workers. Our findings that partners are more willing to promote long-hour than short-hour associates offers some additional support for adverse selection.

The pattern of responses reported in Table 2 might also appear if there are substantial, fixed employment costs. However the fixed cost explanation is hard to reconcile with the finding that both partners and associates view hours as an *indicator* for other important traits.

III. Conclusion

This paper makes the case for the importance of adverse selection models to the determination of work hours in managerial and professional employment relationships. The focus of our empirical investigation is law firms. We argue that the income sharing characteristic of legal partnerships creates incentives to, all else equal, promote those associates with the greatest propensity to work hard. Since this propensity is unobservable, law firms will use indicators of this propensity for the purpose of selecting associates for promotion to partnership. In particular, law firms rely upon an associate's record of billable hours.

Using a simple model, we show that these practices can lead to the imposition of work norms entailing inefficiently long work hours. In such cases, firms will also fail to adjust work norms in response to an influx of employees desiring short hours.

Survey data we collected from two large law firms provides evidence that sizable numbers of associates do work too many hours. In addition, both associates and partners view billable hours as an important indicator in promotion decisions. The response of partners to hypothetical promotion scenarios supports this conclusion as well.

Law firms differ from other professional service providers in that the indicator used in promotion decisions is denominated in terms of hours. It is important to note that there is nothing in our model that requires indicators

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[32] Holmström (1982) shows that signaling models can also generate rat-race equilibria in which professional and managerial employees overwork early in their career. His model is similar in spirit to our adverse selection model. It differs in that, like all signaling models, the hidden information (for example, propensity to work hard) is held by the same party that determines the use of the indicator (here work hours). Holmström's goal was to demonstrate that introducing reputation into a dynamic labor market model will not eliminate the labor market distortions resulting from imperfect information. To make this point more strongly, Holmström assumes that markets will, over time, learn the true characteristics of the individual employee and set wages accordingly.

have this characteristic. All that is needed from an indicator in order to generate overwork is that the indicator be an *increasing* function of work hours. Thus a rat-race equilibrium can occur among associates in major consultancies, even though clients are billed by the project rather than the hour. Rat-race effects might also appear in academic departments of research universities (where tenured faculty benefit from the research efforts of other members of their department) or in the competition for high level managerial positions (where small differences in commitment or effort can have large effects on the organization, Rosen [1982]).

The discussion so far has emphasized the efficiency consequences of adverse selection in the determination of work hours. We close by returning to a distributional issue briefly raised in Section 2. Partnerships in the large law firms we study are the elite positions in the legal profession. Not only do partners in large firms earn more money than other attorneys (Rebitzer and Taylor, 1995b), they also constitute the source of much of the leadership in the profession. The same is likely to be true in other settings where adverse selection is important. It follows then that, relative to situations where hours are limited by custom or law, rat race equilibria reduce access to powerful positions for those unwilling to tolerate excessive work hours early in their careers. This selection process may have the effect, although not the intent, of keeping a disproportionate number of qualified women out of leadership positions in business and professional organizations.[33] It may also be that the male and female professionals who emerge victorious from a rat race are those who are personally the least well equipped to address the consequences that shifting demographics have for professional and managerial employment relationships. The consequences of this selection pressure for the adaptability of or-

ganizations is an important question not yet addressed in the economics of professional and managerial labor markets.

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[33] This gender effect appears because women currently bear the lion's share of nonmarket activities. For comparisons of the time men and women spend in nonmarket work activities see Victor Fuchs (1986), Laura Leete and Schor (1994), and Thomas F. Juster and Frank P. Stafford (1991). For additional discussion, see Claudia Goldin (1990).

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