

Uncorporated Professionals*

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Abstract

Professional service providers who wish to organize as multi-person firms have historically been limited to the partnership form. Such organizational forms trade the benefit of risk diversification off against the costs of diluted incentives and liability exposure in choosing their optimal size. More recently, states have permitted limited-liability entities that combine the simplicity, flexibility and tax advantages of a partnership with the liability shield of a corporation. We develop a game theoretic model of professional-firm organization that integrates the provision of incentives in a multi-person firm with the choice of business form. We then test the model's predictions with a new longitudinal data set on American law firms. Consistent with our predictions, initial firm size is a strong positive predictor of subsequent conversion to a new limited-liability form. Also consistent with our theory, growth rate of small converters substantially exceeds that of larger adopters. Overall, our findings suggest that while the promulgation of new organizational forms has stimulated growth in the legal services industry, the principal beneficiaries of this growth have been large, well established firms rather than small, entrepreneurial, boutique practices.

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1 Introduction

For much of the last century, service professionals (including accountants, attorneys and physicians) have faced a significantly more limited set of choices concerning organizational form than have their counterparts in other industries. Through a combination of tradition, policy preference, and even accident, courts widely held that professional services industries deserve special scrutiny in light of the importance of personal skills and confidentiality in matters concerning the public trust.¹ As such, groups of service professionals were generally unable to organize themselves as anything other than general partnerships, the organizational arrangement that continues to be the default legal relationship for multi-person firms.² Although partnerships have many advantages (such as flexibility, profit sharing, and pass through taxation), they have a significant drawback: potentially unlimited liability. Indeed, partners are jointly liable for all obligations incurred by any partner on the partnership's behalf, and jointly and severally liable for wrongful acts committed by a partner.³ This liability exposure creates a significant risk at the firm level, and, in the views of some, an impediment to entrepreneurship and growth.

Perhaps persuaded by such criticisms, states began in the early 1980s to allow professional services firms to adopt a special species of corporate status, in the form of a "professional corporation." Originally designed to exploit various loopholes in federal tax law,⁴ professional corporation status also provided a potentially significant liability shield for participants that was not available under partnership law. Although largely retaining personal liability for malpractice and other forms of professional negligence, the professional corporation form provided some measure of relief against other forms personal liability for the entity's obligations. Combined with "S" corporation status (which was developed at around the same time), service professionals were for the first time able to enjoy many of the tax benefits of the partnership form while shielding participants from personal liability.

¹See, e.g., *Leventhal v. Atlantic Fin. Corp.* 55 NE2d 20 (Mass. 1944).

²It is important to note that default does not mean dominant. Rather, if a business organization comes into being without complying with statutory formalities for forming, say, a corporation, it will be considered a general partnership by default.

³See, e.g., Uniform Partnership Act §§ 13-15 (1914).

⁴Economic Recovery Tax Act, Pub. L. No. 97-34, 95 Stat. 172 (1981); Tax Equity and Fiscal Responsibility Act of 1982, Pub. L. No. 97-248, 96 Stat. 324.

Nevertheless, from its initial statutory creation, professional corporate status frequently proved to be an unpredictable refuge for firms, for at least three reasons. First, many state statutes (once interpreted by courts and administrative agencies) did not in fact extend significant liability protection to shareholders of professional corporations, largely limiting the advantages of such forms to tax considerations (Maychek 1986). Second, notwithstanding the existence of a professional corporation statute, state courts frequently constrained the form's availability to certain professions (particularly attorneys).⁵ And finally, many states imposed other forms of restrictions on the professional corporate form to make its adoption cumbersome, inflexible, or inconvenient. (Cox et al. 1996).⁶

Significantly, however, just as the last few states were extending the corporate form to professionals, a steady stream of jurisdictions began to embrace ever more novel statutory reforms authorizing the widespread use of the limited liability company (LLC) and the limited liability partnership (LLP) business forms. Statutes authorizing businesses to organize under these forms were adopted either jointly or individually within every state and the District of Columbia between 1977 and 1996.⁷ While sharing many of the characteristics of the professional corporation, LLCs and LLPs were advertised to have significantly greater flexibility, and significantly more effective liability shields than their corporate forebears.⁸ And, while these business forms were typically unavailable to professional services at the inception of an en-

⁵First Bank & Trust Co. v. Sagoria, 302 SE2d 674 (Ga. 1983).

⁶In addition, S Corporation status was perhaps only modestly attractive. First, the benefit was simply unavailable to large firms or firms with foreign participants, as subchapter S is limited in applicability to companies with fewer than 75 shareholders, all of whom must be United States citizens. Second, S corporations are often unable to deduct the full expenses of many employee benefit plans (as can C corporations), and are generally unable to use basis step-ups to avoid certain tax liabilities upon a sale of assets or share redemption. In addition, S corporations are allowed to have only one class of stock, which limits the ability to allocate control decisions in a way different from cash flow rights. Finally, many state statutes still do not allow S corporations (or C corporations) to disclaim responsibility for certain types of liability (malpractice, in particular).

⁷The statutory implementations are detailed in an appendix.

⁸At the same time, LLC/LLP also comes with a few costs. First, unlike corporations (and even partnerships), these limited-liability firms may be required to have a limited lifespan (frequently in the neighborhood of 35 years). While allowed to reform at the end of this period, the terminal period itself can create both tax and strategic problems for the firm. In addition, some states require that LLC/LLP firms maintain a certain amount of insurance for satisfying other creditors.

abling statute, states shortly began to extend them to professionals (subject to certain restrictions) on a wide-scale basis throughout the 1990s.

There are some differences between LLCs and LLPs, of course. For instance, in some larger states (like California) professionals are limited to the LLP form, while others (such as Illinois, until recently) have required the LLC form. Moreover, the LLP form frequently does not provide the same extent of liability limitation as does the LLC,⁹ and it is thought to impose larger fiduciary duties on its members. Nevertheless, the LLC and LLP both constitute important deviations from the status quo ante of the early '80s, and therefore share more similarities than differences.

In this study, we explore a simple question: How has the increased availability of limited liability business forms over the last 15 years – particularly LLCs and LLPs – affected observable organizational characteristics of law firms? The simplicity of our research question, however, should not obscure its importance. Indeed, the legal services sector comprises a staggeringly important component of economic activity. The tort system in the United States alone accounted for \$233.4 billion in expenditures in 2002, an amount representing over two percent of gross domestic product.¹⁰ Second, law firms constitute a highly visible stratum of economic activity, which lends itself to somewhat accurate measurement. Indeed, there is relatively good data available for the study of how law firms change in practice area, scope, and size. Moreover, the incremental introduction of limited liability forms across states provides us with important source of statistical heterogeneity to measure the importance of regulatory structure on the substantive boundaries of the firm. And finally, an ostensible rationale for introducing LLC/LLP business forms to law firms was to catalyze growth, innovation and entrepreneurship within the industry. Now that the experiment is substantially complete, we are in a position to measure the effectiveness of these legal innovations.

This study has two components, the first theoretical and the second empirical. The theoretical part is devoted to developing a testable model of professional-firm characteristics as a function of regulatory environment, fo-

⁹Most notably, a number of states provide partners in an LLP only partial liability shields against third party creditors (most notably, tort claimants alleging malpractice by other partners). These partial shield states still allow for liability as to the LLP's general debts, and include: Alaska, Louisiana, Ohio, Arkansas, Maine, Pennsylvania, District of Columbia, Michigan, South Carolina, Hawaii, Nevada, Tennessee, Illinois, New Hampshire, Texas, Kansas, New Jersey, Utah, Kentucky, North Carolina, West Virginia.

¹⁰Economic Report of the President 2004, Chapter 11.

cusing in particular on the package of regulatory instruments relating to liability. Our theory augments the rich literature on multi-person organizations, in which the trade-off between incentives and risk sharing is a central focus.¹¹ Increased size can diversify the business risk borne by each participant in a traditional partnership, which unambiguously enhances the value of larger scale. On the other hand, increased size can exacerbate agency costs, since the direct return to effort for a representative attorney becomes increasingly diluted as firm size grows. Faced with these diluted incentives, clients may be willing to make up for these costs by allocating greater amounts of incentive compensation to the law firm. Our theoretical model predicts that some firms are likely to attempt to use this response strategically, growing in size just short of the point where the client no longer finds incentive compensation worthwhile. For those firms that have such strategic incentives, the introduction of new limited liability business forms is likely to be extremely attractive.

Using this framework, we predict that larger partnerships are disproportionately likely to embrace the new limited-liability forms, and that smaller firms are unlikely to be affected. Moreover, our framework predicts that of the population of firms that do adopt the new forms, subsequent growth rates will tend to be the highest among the firms within that population that are more moderate in size.

Our second enterprise in this study proceeds to test our theoretical predictions with data law firms in the United States. The business form, size and location of firms as of 1993 and 1999 was derived from the Martindale-Hubbell Law Directory, perhaps the most comprehensive and long-standing directory of the legal-services industry. Our data thus bookend much of the time span in which states extended LLC/LLP structures to professional firms. In the main, our empirical results appear consistent with our theoretical predictions: Consistent with our model, larger law firms appear to be much more likely than their smaller counterparts to embrace the new form. Moreover, among those that convert, the highest growth rate after conversion appears to be among the lower quantiles as measured by 1993 size, again consistent with our theory.¹²

¹¹Within this broad literature Gaynor and Gertler (1995), Lang and Gordon (1995), and Liebowitz and Tollison (1980) are empirical analyses of the tradeoff between risk sharing and incentives for professional firms, with the latter two focusing on law firms. None directly addresses the issue of limited liability.

¹²At the same time, the data are more equivocal with respect to the very largest of

Ours is not the first study to consider the effects of new business forms on law firm practice. Indeed, a distant cousin of our theoretical approach is Carr and Mathewson's (1990) analysis of the balance between solo and two-person practices offers an interesting contrast. In their model consumers can offer a lump-sum payment to a firm to be forfeited if an attorney is caught shirking. In a two-person firm one partner may credibly commit to monitoring effort through sunk investments in the firm's reputation. Market equilibrium follows from the relative benefits and costs to consumers of representation by a quality partnership, a quality solo practice, and a low-effort solo practice. Carr and Mathewson conclude that limited liability is a temptation to shirking that undermines the economic viability of quality partnerships. Our analysis generalizes theirs by allowing firms of arbitrary size, and considering the extent to which both size and organizational form may be strategic tools used by firms. Moreover, unlike Carr & Mathewson, we attempt to test our theoretical predictions with empirical data.¹³

From an empirical standpoint, our approach complements Hillman's (2003) study analyzing a snapshot of American firms as of mid-2002, also derived from Martindale Hubbell, and in which the prevalence of the LLP appears to increase with firm size. However, unlike Hillman's approach, our longitudinal data permits an assessment of the evolution of general partnerships in 1993 and in particular firm size prior and subsequent to the introduction of LLC/LLP forms for adopters and non-adopters. The relative adoption of these forms among existing and new firms (in a sense to be made more precise) is informative about the costs of reorganization and the lag between regulation and its consequences in this industry. Similarly, Baker and Krawiec (2004) address law firms' choice of business form (if not firm size per se), describing a variety of economic considerations that may motivate form

converting firms, which our model predicts would contract slightly, but whose growth rates appear statistically indistinguishable from zero. As we note below, however, this finding is actually not inconsistent with our model (since we cannot directly observe the ranges over which the deep parameters of our model fluctuate. Moreover, we may simply not have sufficient statistical power to discern much of a pattern for such firms (which are significantly more rare than very small firms).

¹³In some respects, our modeling approach is reminiscent of the literature studying the prohibitions on champerty (i.e., the "selling" by a client of all control and cash flow rights to a lawsuit to another, often an attorney). Santore and Viard (2001) study a moral hazard model to argue that the professional prohibition of champerty is a vehicle for generating significant information rents for attorneys. Our model is in a similar spirit, demonstrating how strategic choices of firm size can also generate positive rents for attorneys.

choice. An analysis of a small, relatively homogeneous sample—firms with 25 or more attorneys based in New York City—yields no evidence of a relationship between the size of an existing firm and its decision about reorganization. As with Hillman (2003), however Baker and Krawiec consider a snapshot of law firms in a specific market, and do not pursue (as do we) a longitudinal comparison of size before and after reorganization.

Our analysis proceeds as follows. Section 2 briefly describes the route through which states embraced the LLC/LLP forms, and how they were adopted at the state level for law firms. Section 3 presents a theoretical framework of optimal contracting, focusing specifically on the relationship between firm size and liability exposure. Using this framework, we generate a core set of predictions, and in particular that (a) liability shields are more likely to be adopted by larger firms than smaller ones; and (b) that firms which do adopt them are likely to grow larger as a result. Section 4 describes our data collection methodology, and provides some simple descriptive statistics. Section 5 then trains our attention more centrally on the hypotheses that our theoretical model generates. We find that both predictions find support in the data (although the first appears to have the strongest amount of support). Section 6 concludes.

2 State Adoption Processes

Although all 50 states had passed LLC and LLP legislation of some kind by the beginning of this century, the manner in which professional firms had these choices available to them was considerably more circuitous. Indeed, by historical precedent, professional firms were generally prohibited from forming ordinary corporations, and thus the professional corporations statutes of the 1970s and 1980s were devised especially for the *sui generis* purpose of regulating law firm behavior. Similarly, then, it should not be surprising to learn that in many states, professional firms were generally treated differently upon the introduction of LLC/LLP statutes. Thus, while in some instances, it is perhaps sufficient to use the effective date of a general statute to pinpoint the date at which law firms could enter alternative limited liability forms, that is the exception more than the rule. Indeed, it appears to have been commonplace for state legislatures, for example, to promulgate separate statutes that specifically enabled professional firms to take the form of LLCs or LLPs. In addition, state supreme courts frequently claim inherent

authority to regulate the legal profession, and therefore promulgate supreme court rules to govern the practice (Donn 2004b).

The resulting landscape of general statutes, specific statutes and supreme court rules presents challenges for those (such as ourselves) who wish to categorize and date the effectiveness of limited liability entity election across all 50 states. In some states, for example, the availability of the form was actually in a state of flux for some time, and the subject of intense litigation.¹⁴ In other states, an administrative court rule or a specific statute appears merely to ratify an existing practice, thus indicating that the alternative form was likely available from the onset of the statute.

Table 1 below presents our categorization of the availability of LLC and LLP forms to law firms, noting (to the best of our ability) the effective dates in each state for the relevant enabling act (be it legislative, judicial, or administrative).¹⁵ In most cases, these dates correspond to the effective date of a state statute that allows for the limited liability form for professionals, which may or may not have been promulgated subsequent to a general statute. In other cases, the date refers to the date at which the state supreme court first gave official authorization of the business form. In a few cases, it appears recognized by practitioners that the general statute itself enabled professional firms to utilize the entity form. The statutory authorizations are more fully described in Appendix C.

Insert Table 1 Here

What factors would be important for a law firm that wished to convert to choose between an LLC and an LLP? First, some states (California, New Mexico, and Nevada) either strictly prohibit the LLC or its permissibility is still in doubt. In these states, the LLP is perhaps the only viable option of new limited liability entity. Second, however, it is important to note that in approximately 12 states, the LLP statute allows for only a “partial shield” on a firm’s liability. Within such partial shield states (with a few variations), partners in an LLP, while not liable for other partners malpractice, are still liable for more general obligations, a fact that can still yield significant lia-

¹⁴Georgia is one good example. See Donn 2004b.

¹⁵These dates are drawn originally from Donn 2004a, but we went directly to the statutes and rules to double check the dates given there. In this effort the USC Law School reference librarians (and particularly Brian Raphael) were extremely generous and helpful with their time.

bility exposure.¹⁶ For example, unsecured creditors in the Arthur Anderson bankruptcy attempted to use partial shield states to claim that they could recover from the partners of Anderson, as those debts were part of “ordinary commercial debt.” (Donn 2004). On the other hand, some practitioners claim that it is still unclear whether LLC memberships are likely to be regulated as securities one day, a risk that may make the LLC option less attractive.

In neither LLCs nor LLPs, however, are attorneys absolved from personal liability for their own negligence or malpractice. Indeed, attorneys are strictly prohibited from entering into contracts that limit their prospective liability for malpractice with clients.¹⁷ As such, the advantage of the LLC/LLP form would seem to accrue more centrally to multi-person firms (and as we will argue below, particularly large ones). In fact, larger firms may be able to substantially hedge even some of the risks of personal liability, by (for example) purchasing malpractice insurance at the firm level.

3 A Model of Optimal Contracting and Liability Shields

This section presents a framework to study the optimal organizational structure of professional firms. Given our data source, we will concentrate on law firms (though our analysis is general to all professional services firms and perhaps more broadly so). We endeavor to generate a model that reflects the pivotal real world relationships that we are interested in testing. Most centrally, our model must provide a mechanism for law firm size and liability shields to “matter” in some way. As noted in the introduction, there are competing arguments about whether the introduction of limited liability entities would favor small or large firms, and our model must make some predictions along this dimension. Moreover, given that the risk of liability is at the core of the attraction to limited liability, our model should allow for attorneys to be risk averse, and for them to be able to hedge liability risk by forming multi-person firms. The model should also include a rationale for why attorneys bear any risk at all, which most who study the legal profession concur to be a significant problem with agency costs at the lawyer/client

¹⁶The states are: Kentucky, Maine, Michigan, Nevada, New Hampshire, Ohio, Pennsylvania, South Carolina, Tennessee, Utah, West Virginia and Wisconsin. See Donn 2004.

¹⁷See, e.g., Restatement (3rd) of the Law Governing Lawyers, at § 54(2).

level.¹⁸

3.1 Basic Framework

Consider a population of N attorneys, indexed by $i \in \{1, 2, \dots, N\}$, each of whom has limited wealth $w > 0$ available to satisfy judgment creditors. The parameter w reflects ‘available’ wealth rather than actual wealth insofar as the choice of organizational form limits the degree to which claimants can recover against the personal assets of the attorney.

In every period, each attorney is assumed able to obtain a reservation utility of u_0 outside the practice of law (which we assume, for simplicity, to be uniform across attorneys). If practicing law, each attorney is matched with exactly one risk-neutral client. In addition, all attorneys are assumed to have identical quasi-linear preferences in total wealth y , given by $U_i(y) = v(y) - \rho_i$, where ρ_i (described in greater detail below) constitutes the disutility of effort by the attorney. To capture the notion of risk aversion, we suppose that $v(\cdot)$ takes on a simple constant absolute risk aversion (CARA) form in which with Arrow-Pratt coefficient of $\gamma > 0$.

Attorney i ’s effort generates (stochastic) income for the client, denoted by Z_i . This value of the client’s income, however, turns in part on the effort the attorney expends. In particular, we suppose that:

$$Z_i = \begin{cases} 0 & \text{w/ probability } 1 - p_{e_i} \\ \bar{Z} & \text{w/ probability } p_{e_i} \end{cases} \quad (1)$$

where $e_i \in \{0, 1\}$, corresponding to low and high effort, accordingly, and where $0 < p_0 < p_1 < 1$. High effort is assumed to impose a (non-monetary) cost of c on the attorney, while low effort imposes a (non-monetary) cost of $c - \phi$ (thus, ϕ represents the incremental cost savings from shirking). We suppose that each client’s case is statistically independent of the others, so that for any i and j , $E(Z_i|e_i, Z_{-i}) = E(Z_i|e_i)$.¹⁹

In the analysis below, we shall from time to time refer to the following regularity assumptions:

¹⁸Although tax treatment of the entity is another factor that we consider important, we have excluded it here to focus on liability aspects alone. Indeed, this was probably the most important contribution of the LLC/LLP revolution for professional firms.

¹⁹In later drafts of this paper, we hope to relax this assumption, in order to consider the effects of firm scope as well as size.

Assumption A: $(p_1 - p_0) > \phi \cdot \max \left\{ \frac{1}{Z}, \gamma(1 - p_1) \right\}$.

Assumption B: $p_1 = 1 - p_0$

Assumption A is tantamount to imposing a condition that effort “matters” from an efficiency standpoint. In particular, high effort must be sufficiently important to justify its cost, and also that it must be large compared to the attorney’s level of risk aversion. While a violation of Assumption A would not undermine our general analysis, the assumption is necessary for there to be any agency cost worth solving. Assumption B asserts that the probability of a successful outcomes conditional on working hard and shirking are symmetric. This is strictly a regularity assumption that simplifies our analysis, but our core results hold under much less stringent assumptions (at the cost of significantly more notation).

At the beginning of each period, the client offers a compensation package to A_i consisting of a payment μ_i in the event that the client’s case/project is successful (and pays Z), and an alternative payment β_i should the case come out unsuccessful. We do not constrain the sign that either of these parameters can take. However, to the extent that either is negative, it cannot exceed (in absolute value) the attorney’s available wealth w . (It will turn out that this nonnegativity constraint usually binds – if at all – only for β_i , for obvious incentive provision reasons. Note as well that, in the event that $\mu_i > \beta_i$, the term $(\mu_i - \beta_i)$ can be interpreted as “damages” that A_i must pay if the client’s case is unsuccessful. We elaborate on this point at greater length below).

Under this contract, attorney i ’s individual expected gross payoff equal to:

$$\beta_i + p_{e_i} \cdot (\mu_i - \beta_i) - c + \phi \cdot (1 - e_i), \quad (2)$$

and the variance of this gross payoff is:

$$(\mu_i - \beta_i)^2 \cdot p_{e_i} (1 - p_{e_i}) \quad (3)$$

3.1.1 Firms

In addition to these basic aspects of the problem, we also include the possibility that the attorney may be part of an m - person firm, or “partnership” (where $m = 1$ represents the limiting case of a sole practitioner, discussed

above).²⁰ Each member of the firm faces a similar type of client (as reflected by an identical Z_i). All members/partners within a firm are assumed identical,²¹ and are assumed to share equally in the gains and losses (to the extent that law allows) of the partnership.²²

A key change that multiperson firms introduces is the possibility of risk spreading. Assuming that all attorneys in the partnership put forth the same effort level e_i (an assertion that we shall confirm later constitutes an equilibrium), the event of k victories within the partnership is distributed binomially with parameters (m, p_{e_i}) . For sufficiently large values of m , the number of victories can be approximated with a normal distribution with mean mp_{e_i} and variance $mp_{e_i}(1 - p_{e_i})$. In what follows, we utilize this normal approximation, which in conjunction with CARA utility functions, allows us to characterize preference in mean-variance space.

Assuming that all attorneys at the firm receive the same form of contract and contribute the identical amount of effort (an assertion we confirm below), the representative attorney's expected utility if she is part of an m -person partnership, and all attorneys exercise effort level e is given by:

$$\pi(\beta, \mu; e, m) = \beta + p_e \cdot (\mu - \beta) - \gamma \cdot \frac{(\mu - \beta)^2}{m} (p_e)(1 - p_e) - c + \phi \cdot (1 - e) \quad (4)$$

Note from (4) that holding the terms of the contract and the attorney's effort choice constant, the attorney's expected utility is increasing in m ,

²⁰We place the term *partnership* in quotation marks since that term has legal significance beyond our intended use in this part of the paper. For now, we simply use the term as a generic place-holder for a multi-person firm.

²¹Although we do not explicitly assume a role for associates or staff in this paper, such a role could be easily included here. For example, if each partner faced a technological constraint imposing something akin to a Leontief production function on a client's project (i.e., the case requires one partner, one associate, two paralegals, and one secretary), then the framework we use above would readily apply, with the costs of support staff factored in as part of the cost of effort. We abstract, however, from the question of agency costs between the various players who provide litigation support, and focus solely on the agency problem between lawyers (however constituted) and clients.

²²The alert reader will note that this assumption is a bit of a simplification. In particular, most LLC/LLP statutes do not exempt professionals from personal liability, though other partners/participants may be exempted. In such circumstances, losses are not shared equally.

While we are sensitive to this criticism, the availability of indemnity agreements and insurance carried by law firms may justify the simplifying assumption we make, so that the firm internalizes the costs of liability on a symmetric, pro rata basis.

reflecting a principal advantage of forming multi-person firms: the ability to hedge risk. In addition to this benefit, our analysis below demonstrates that forming partnerships may also convey another advantage of *creating* a collective action problem in the firm that the client will attempt to undo by offering substantial economic rents to the attorney.

3.1.2 Legal Liability

Finally, should an attorney’s client lose a case, we assume that there exists a noisy technology for adducing evidence about liability. In particular, this evidence consists of a signal R_i that takes on values L and H according to the following probabilities:

$$\begin{aligned}\Pr\{R_i = H|loss; e_i = 0\} &= \theta_0 \\ \Pr\{R_i = H|loss; e_i = 1\} &= \theta_1\end{aligned}$$

For any judicial setting, it is clear that $\theta_0 \leq \theta_1$, so that evidence is helpful (or at least not harmful) in adducing negligence. Thus, the signal R_i represents a noisy representation about whether the evidence suggests that the attorney in fact worked hard or shirked. For current purposes, we will limit our analysis to the the most pessimistic case about courts: i.e., that they are unable to deduce effort level beyond observing the realized state of the world, so that $\theta_0 = \theta_1$. This assumption therefore corresponds to the case where effort is completely unverifiable ex post,²³ and thereby allows us to capture the firm’s liability exposure through the value of the contractual terms. In particular $(\mu - \beta)$ constitutes a “penalty” that the firm will pay if the project is unsuccessful. Moreover, if $\beta < 0$, then not only does the firm lose the attorney’s fee, but it must hand over a payment of its own (from its partners’ reserves).

²³The more general case would require considering an additional state to the contract. There, it would necessary to subdivide the β component into two parts. Should the client lose but the evidence reveals no shirking, or alternativley should the client win (and no shirking is presumed), the fixed component will be denoted as β_H . Conversely, should the client lose and the evidence reveals shirking, the fixed component will be denoted as β_L . Thus, the introduction of legal liability suggests that each client’s contract is given by

$$\{\alpha_i, \beta_H, \beta_L\}$$

This leads to a much more difficult approximation (through Chi-Squared rather than normal, which becomes analytically less tractable).

3.2 Strategic Sequence and Player Objectives

Our model explores the competing choices that law firms and clients make in interacting with one another. Partnerships choose their size m and monitoring technology x (and, in a later section, they simultaneously commit to their organizational structure), while clients choose the contractual terms they will offer the firm. Because size and organizational structure are more difficult to change in the short run, it is appropriate to conceive of the firms' and clients' choices as occurring sequentially.

Consequently, we characterize each player's maximization problem as a component of a sequential game, with the law firm choosing its organizational size first, and the client offering a contract second. Beginning with the latter, the client attempts to maximize his own expected payoff, subject to relevant constraints on the permissible contractual terms, the attorney's participation, and the attorney's incentives to work hard. In particular, the client takes firm size m as given (as well as the firm's organizational form, when applicable), and chooses contract terms (μ_i, β_i) , and an effort level e_i to solve the following program:

$$\begin{aligned}
 & \max_{\beta_i, \mu_i, e} p_e (\bar{Z} - (\mu - \beta_i)) - \beta \\
 & \text{s.t.} \\
 (W) \quad & \min \{\mu_i, \beta_i\} \geq -w \\
 (IR) \quad & \pi(\beta_i, \mu_i; e_i, m) \geq u_0 \\
 (IC) \quad & e \in \arg \max \{\pi(\beta_i, \mu_i; e_i, m)\}
 \end{aligned} \tag{*}$$

The three constraints stated above are worth some reflection, as they will become central in the analysis that follows. The first constraint (denoted as (W)) states that while the fixed component of the attorney's compensation package can be negative (thus representing a form of liability / performance bond), it cannot exceed attorney wealth. In what follows, we shall periodically refer to condition (W) as the attorney's "wealth" constraint. Significantly, note that even in firms that consist of multiple partners – and therefore have additional sources of wealth – this constraint remains as stated, since every attorney's contract within that firm will (in equilibrium) place an additional liability burden on the attorney that offsets the infusion of additional resources. The second condition, denoted as (IR), states that the compensation package must be such the attorney is at least as well off under the contract as he would be taking his outside option that earns u_0 . In what follows we shall periodically refer to (IR) as the "individual rationality"

constraint. Condition (IC) states that the level of effort the client wishes to implement (i.e., $e = H$ or $e = L$) is the attorney's optimal strategy under his compensation package. We shall frequently refer to the (IC) constraint in what follows as the "incentive compatibility" constraint. Let the solution to program (*) be denoted as $(\mu^*(m), \beta^*(m), e^*(m))$, and note that each of these optimal choices will generally depend on the value of m .

Anticipating the contractual terms that clients will offer, firms are assumed to select their size (and later, their organizational structure) to maximize the payoff of their respective partners. Thus, the partnership chooses m to solve the following program:

$$\begin{aligned} & \max_m \pi(\mu, \beta; e, m) \\ \text{s.t.} & \quad (\mu, \beta, e) = (\mu^*(m), \beta^*(m), e^*(m)) \end{aligned} \tag{**}$$

In order to characterize the equilibrium predictions of this game, we proceed by backwards sequentially, beginning with the client's contract design problem.

3.3 Client's Contract Design Problem

It is first important to note that the client must choose between attempting to implement high effort and low effort. The optimal contract can, in theory, attempt to implement either, since for some parametric values, the client would find paying the attorney excess rents worthwhile, while for other values the client would simply allow the attorney to shirk. Thus, the first necessary task is to consider the contracts that the client would choose under the alternative assumption that she attempts to implement low versus high effort levels (respectively).

A first relevant observation here is that the client will disregard the monitoring margin

Implementing Low Effort Perhaps the simplest contract to analyze is the one that implements low effort. Indeed, given that the attorney benefits from a low effort level, there is no need for the client to provide incentives to induce hard work or monitoring by the attorney. This immediately gives rise to the following lemma:

Lemma 1: *The optimal low-effort inducing contract is a flat one consisting of $\mu = \beta = u_0 + c$. Under such a contract the attorney always expends a low effort level.*

The intuition underlying this result is very clear: All that is necessary to induce the attorney to contribute the lowest possible effort is to compensate him for his opportunity cost of time. That is exactly what the above contract does. Moreover, it is easily confirmed that so long as the costs and reservation utilities are the same for all attorneys, the contract is the same for all attorneys in the firm.

Implementing High Effort Let us now turn to the more interesting question of how the client can implement high effort. Unlike the case of implementing low effort, high effort requires that the principal be willing to provide an incentive to the attorney – one that, significantly, can take the form of carrots or sticks (or a combination thereof). Analysis of this problem leads to the following Lemma (whose proof – in addition to all others – can be found in Appendix A):

Lemma 2: *If Assumption B holds, the optimal high-effort inducing contract consists of the following terms:*

$$\begin{aligned}\beta &= \max \left\{ u_0 + c + \phi - \frac{m\phi p_1}{(p_1 - p_0)} \cdot \left(1 - \gamma\phi \frac{(1 - p_1)}{(p_1 - p_0)} \right), -w \right\} \\ \mu &= \beta + m \left(\frac{\phi}{(p_1 - p_0)} \right)\end{aligned}$$

Note from the lemma that, consistent with standard incentive theory, $\mu > \beta$; that is, the agent receives a “bonus” (or alternatively, avoids receiving a “penalty”) when the case is successful. The difference between μ and β , moreover, is strictly increasing in m and ϕ . This result is intuitive. First, as the size of the partnership (reflected by m) grows, free riding problems get larger since each attorney’s income turns less and less on his own case and more on that of other partners. To counter this fact, the client has to offer more in incentives to the attorney. In addition, as the incremental cost of effort (reflected by ϕ) grows larger, the client must provide more incentives to do much of the disciplining work. On the other hand, incentives become

lower powered when $(p_1 - p_0)$ shrinks, since ex post outcomes are a more reliable method for verifying ex ante effort.

Note also that the fixed component β is initially decreasing in m , but it eventually flattens completely at the point where $\beta = -w$. The intuition here is simple: if the attorney's available wealth is sufficiently large relative to the size of the firm, then she can credibly commit to a contract that forces significant damages from her should the case be resolved negatively, and her wealth constraint never binds. On the other hand, if the attorney is extremely wealth constrained (relative to the size of the firm), then she cannot afford to commit to a penalty that offsets (in expectation) the size of her bonus. Here, the (IR) constraint no longer binds, and instead the (W) constraint becomes binding. Consequently, when this occurs, in order to induce high effort, the client must offer the attorney a contract laden with more 'carrots' than 'sticks'. In turn, then, there turns out to be a natural size threshold for the firm, beyond which attorneys' wealth constraints become binding. This size threshold is given by Lemma 3:

Lemma 3: *Constraint (W) rather than constraint (IR) binds if and only if:*

$$m \geq \tilde{m} \equiv \frac{(p_1 - p_0)}{\phi p_1} \cdot \frac{u_0 + c + \phi + w}{\left(1 - \gamma \phi \frac{(1-p_1)}{(p_1-p_0)}\right)} \quad (5)$$

Moreover, if Assumption B holds, \tilde{m} is strictly positive.

3.4 Optimal Contract

While the discussion above characterizes the type of contract the representative client will offer for each level of effort she might attempt to implement, we have not yet considered which level of effort is optimal from the client's perspective. Analysis of the above constraints, however, immediately yields this insight, which is reflected in Proposition 1 and associated Corollaries:

Proposition 1: *If Assumptions A and B hold, the client will choose to implement high effort if and only the size of the firm satisfies $m \leq \hat{m}$, where*

$$\hat{m} = \begin{cases} m^* \equiv (p_1 - p_0) \frac{(p_1-p_0)\bar{Z}+(u_0+c+w)}{\phi p_1} & \text{if } m \geq \tilde{m} \\ m^{**} \equiv (p_1 - p_0)^2 \frac{(p_1-p_0)\bar{Z}-\phi}{\gamma \phi^2 p_1(1-p_1)} & \text{if } m < \tilde{m} \end{cases} \quad (6)$$

Direct application of Proposition 1 immediately yields the following corollaries:

Corollary 1A: *If Assumptions A and B hold, then $m^* > m^{**}$.*

Corollary 1B: *If Assumptions A and B hold, then attorneys will earn positive economic rents if and only if $w \leq w^*$, where:*

$$w^* \equiv \left(\frac{(p_1 - p_0)}{\gamma\phi(1 - p_1)} - 1 \right) (p_1 - p_0) \cdot \bar{Z} - \frac{(p_1 - p_0)}{\gamma(1 - p_1)} - (u_0 + c) \quad (7)$$

Corollary 1C: *If Assumptions A and B hold, then attorneys will earn positive economic rents if and only if $\bar{Z} \geq \bar{Z}^*$, where:*

$$\bar{Z}^* \equiv \left(\frac{(u_0 + c + w)(1 - (p_1 - p_0) + \gamma\phi(1 - p_1)) + \phi}{((p_1 - p_0) - \gamma\phi(1 - p_1))} \right) \quad (8)$$

Proposition 1 and Corollaries 1A-1C offer observations about the contract that the client will find it optimal to offer – observations that are important for considering the firm’s optimal choice of size. First, the proposition shows that regardless of whether the wealth constraint or the participation constraint binds, there exists a critical firm size above which the client is unwilling to implement high effort. Instead, for firms that exceed this critical size, the client will pay for, expect, and receive a low level of effort by the attorney.

Interestingly, the critical cutoffs at which the client decides to implement low effort depend (in part) on whether the attorney’s wealth constraint or the individual rationality constraint is binding for the high-effort contract. Corollary 1A states that the high effort contract cutoff when the rationality constraint binds (m^{**}) is smaller than the maximal firm size that will support high effort when the wealth constraint binds (m^*) this is important, since it suggests that at times where the wealth constraint begins to bind, there may be a discontinuous shift upwards in firm size. Corollaries 1B and 1C state that if the firm is ever in a situation where wealth constraints bind, it is when available attorney wealth is relatively low or (equivalently) when client stakes are relatively large.

3.5 Firm's Organizational Design Decision

We now proceed backward, asking what size the firm will create for itself in light of the contract terms it expects its attorneys to receive from clients (which take firm size into account). Although a direct application of Proposition 1 implies the optimal size choice of a firm in the event that the attorneys' wealth constraints are binding, when the IR constraint is binding the attorneys are indifferent about size. Indeed, here, the client always sets contractual terms so that the representative attorney's expected compensation is precisely equal to his reservation utility. Nevertheless, while the attorney is therefore indifferent between implementing a high-effort and low-effort contract, the client strictly prefers a high-effort contract, since the client reaps the gains from that contract. Thus, in order to generate a more precise prediction about firm size when the wealth constraint is not binding, we need to incorporate an additional assumption. The weakest assumption consistent with this intuition is as follows:

Assumption C: *If the attorneys are indifferent, they choose the largest organizational size that efficiently supports high effort ($e = 1$) rather than one supporting low effort ($e = 0$).*

Assumption C states that at least when attorneys are indifferent in equilibrium, they will choose an organizational choice that will support an efficient effort level, and thus the attorney always receives a contract that has both fixed and contingent components. This seems a sensible choice, since the parties would be throwing money away if the attorney chose a structure that induced inefficient low effort. One can certainly imagine that prospective clients would be willing to make at least modest payments to firms that organize themselves in a way that encourages efficient legal representation. Moreover, choosing the largest firm consistent with such incentives allows maximal spreading of risk.

With this assumption in hand, we can now proceed to state the following Proposition:

Proposition 2: *Suppose that Assumptions A, B, and C hold. If $\bar{Z} \geq \bar{Z}^*$, the firm selects a size of $m = m^*$. Otherwise, the firm selects a size of $m = m^{**} < m^*$.*

Proposition 2 states that the firm's optimal choice of size turns crucially whether the stakes of the average case in the firm are sufficiently large that

attorneys in that firm are likely to face binding wealth constraints. If so, then the firm will exploit the rents that attorneys derive from such a constraint, setting equal to m^* . Conversely if the firm's cases fall short of the threshold where the wealth constraint binds, then it will choose a more modest size of m^{**} .

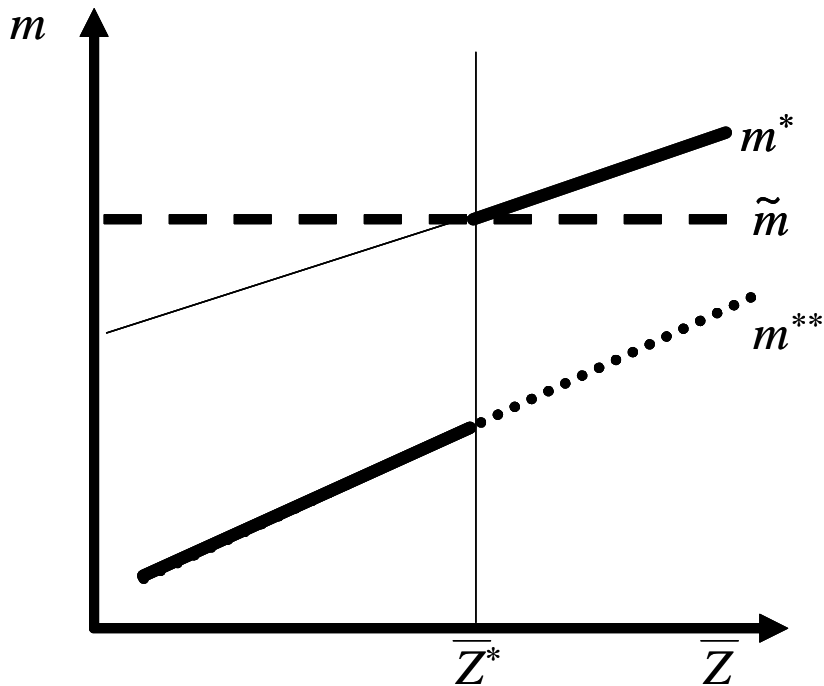


Figure 1

Figure 1 attempts to illustrate this intuition. In the figure, average stakes per client are depicted on the horizontal axis and the firm's size is depicted on the vertical axis. The threshold cutoff is denoted as \bar{Z}^* in the Figure, and the actual size configuration of the firm is tracked by the solid bold line. Note that when $\bar{Z} < \bar{Z}^*$, the firm's optimal size tracks the m^{**} schedule. However once \bar{Z} reaches \bar{Z}^* , the firm immediately jumps in size to \tilde{m} , and grows along the m^* schedule thereafter. From this figure, we can discern a sort of "tipping point" phenomenon: should the type of cases reach a threshold value of \bar{Z}^* , it will experience rapid growth as it settles on a new trajectory. This will prove to be an important observation as we turn our attention to the firm's organizational choice when a limited liability structure

is made available. (A similar graphical analysis to that above applies to the firm size choice as w varies).

3.6 Allowing Alternative Business Forms

We now turn to the central question that motivated this paper: How are firm characteristics (particularly organizational structure and size) likely to change when a limited liability business form (such as with an LLC or LLP) becomes available? Although modeling the precise contours of a limited liability statute would probably require tailoring for each state's specific statute, there is one feature that they all essentially share: the introduction of LLP/LLC status has the effect of reducing the amount of the attorneys' personal assets that are available to creditors. In essence, then, if a firm were to adopt a limited liability regime, it would effectively reduce the amount of available wealth per attorney w under an optimal incentive contract.²⁴ In mathematical terms, then, introduction of limited liability represents a shock to the wealth constraint, reducing available wealth in adopting firms to some $w' < w$. The key questions for us here, then, are: (a) What sorts of firms would opt to constrain themselves in this way? and (b) How will a firm's size change after it adopts (or fails to adopt) limited liability status?

To answer these questions, we consider two types of firms. First, consider a firm that was already earning positive rents under the status quo ante (which recall was possible only for firms for which the wealth constraint was binding – i.e., whose size exceeded \tilde{m} . Recall that such a firm tended to have large-stakes clients (i.e., large \bar{Z}) and was therefore relatively large under the status quo. The representative attorney's indirect payoff in such a firm is as follows:

$$\pi(w, m^*; e_H = 1) = -(w + c + \phi) + p_1 \cdot m \left(\frac{\phi}{(p_1 - p_0)} \right) \left(1 - \frac{\gamma\phi(1 - p_1)}{(p_1 - p_0)} \right) \quad (9)$$

At the optimal contract terms, the representative attorney's expected utility

²⁴We realize that this is perhaps a generalization, and there may be more subtle nuances that the imposition of limited liability may have. However, the comparative statics derived below capture the general flavor of what such statutory innovation brings without significant technical details that are likely to distract the analysis more than change it.

exhibits the following comparative static on w :

$$\begin{aligned} \frac{d\pi}{dw} &= -1 + p_1 \left(\frac{\phi}{(p_1 - p_0)} \right) \left(1 - \frac{\gamma\phi(1 - p_1)}{(p_1 - p_0)} \right) \cdot \frac{\partial m^*}{\partial w} \\ &= -\frac{\gamma\phi(1 - p_1)}{(p_1 - p_0)} < 0 \end{aligned} \quad (10)$$

Thus, for firms sufficiently “large” to have been facing a binding wealth constraint under the status quo ante, the availability of the LLC/LLP status would cause them to become more profitable unambiguously, and therefore they would be likely to take up the new status.

But in addition to firms that begin large, the introduction of a limited liability business form makes it potentially attractive for somewhat more modestly sized firms to choose to convert. For these firms – whose size was less than \tilde{m} – the wealth constraint was not binding (but rather, the participation constraint was). Now, a significant shift from w to w' effectively tightens the wealth constraint, so much so that many moderately sized firms may find that they now have an opportunity to generate positive rents by converting. Such firms, consequently, will also find it profitable to convert.

Taken together, these insights generate the following proposition:

Proposition 3: *Suppose that Assumptions A, B & C hold. All firms that have clients with stakes larger than \bar{Z}' will find it profitable to adopt the limited liability form, where:*

$$\bar{Z}' = \frac{(u_0 + c + w')(1 - (p_1 - p_0) + \gamma\phi(1 - p_1)) + \phi}{((p_1 - p_0) - \gamma\phi(1 - p_1))} < \bar{Z}^*$$

Firms on the interval $\bar{Z} \in [0, \bar{Z}']$, in contrast, will not convert.

In addition to making predictions about conversion, our analysis also facilitates a prediction about the growth rates of firms based on their take-up decisions. These predictions are embodied in Proposition 4:

Proposition 4: *Suppose that Assumptions A, B & C hold. All converting firms facing clients in the range $[\bar{Z}', \bar{Z}^*]$ will experience significant, positive growth after converting. All firms facing clients in the range $[\bar{Z}^*, \infty]$ will experience marginal contraction after converting. Finally, all firms facing clients in the range $[0, \bar{Z}']$ will not convert, and consequently will not grow or shrink as a result of their business form.*

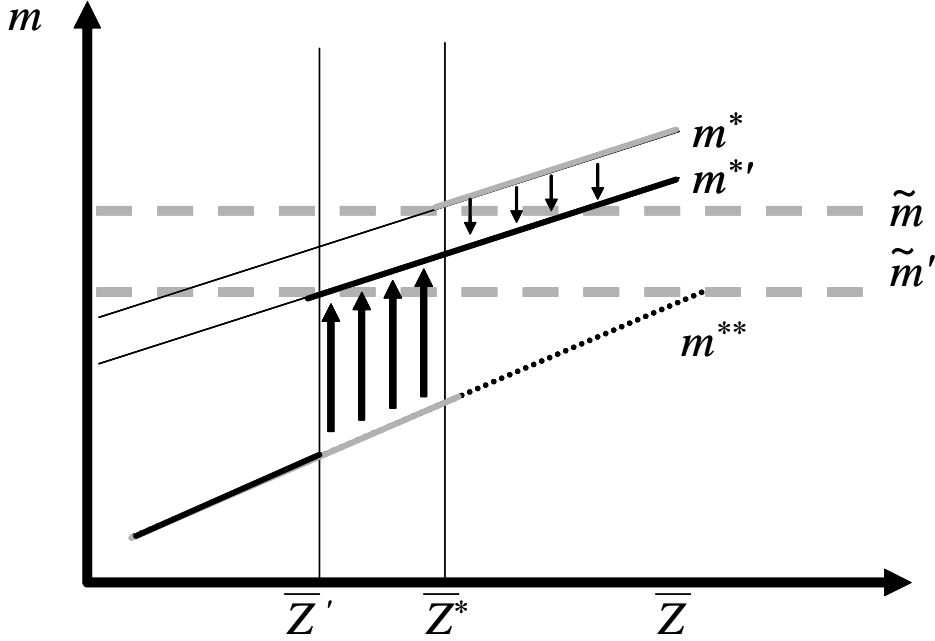


Figure 2

Figure 2 helps illustrate the key intuitions of Propositions 3 and 4. In the figure, the horizontal axis once again represents the stakes represented by the representative client of the firm, while the vertical axis represents the size of the firm. Initially, we suppose that available per-attorney wealth is given by w , and accordingly the threshold stakes level at which a firm can begin to generate rents is at \bar{Z}^* (which corresponds to the lowest point at which m^* exceeds \tilde{m}). All firms with client stakes *above* the threshold value \bar{Z}^* will select a size corresponding to the m^* schedule. In contrast, all firms below the threshold value \bar{Z}^* will select a size corresponding to the m^{**} schedule.

Now consider the effect of introducing an option to adopt limited liability status, effectively sharpening the wealth constraint to some $w' < w$. As the figure illustrates, and as implied by (5) and (6), the reduction to w' causes the m^* curve and the \tilde{m} curve to shift downwards (depicted by the shifted schedules $m^{*'}$ and \tilde{m}' , respectively), though it does not affect the m^{**} schedule.²⁵ As a result of these shifts, the value of the critical \bar{Z}^* declines to \bar{Z}' .

²⁵Note also that the m^* curve shifts by a smaller amount than does the \tilde{m} curve, which

Accordingly, all firms that began in the range of $[\bar{Z}', \bar{Z}^*]$ will convert and jump in size from the m^{**} schedule to the m_2^* schedule. Conversely, all firms that began with client types in excess of \bar{Z}^* also convert, but shrink marginally after converting. In what follows, we will define these two groups of firms as the “marginal” and “extra-marginal” converters, respectively. Finally, those firms with client types below \bar{Z}' never convert and do not change in size.

3.7 Testable Implications

We now turn to some testable implications of our model. Before doing so, we should note that our data do not allow us to calibrate, on *a priori* grounds, the precise values of the deep parameters for firms within in our model. In particular, we cannot say very much about whether the range of client stakes (represented by \bar{Z}) is relatively high or low relative to other parameters in the model. This limitation, in turn, constrains some of our predictive power. It may be, for example, that the population client types is so low on this scale that no firms actually convert. Or, it may be that client types are so large that *all* firms convert. Nevertheless, Propositions 3 and 4 still motivate at least some empirical predictions about the nature of take-up rates and size adjustments after takeup.

First, we would predict that if there is some heterogeneity in takeup decisions (with some firms adopting new forms while other firms not adopting), takeup rates would be disproportionately larger for firms on the ‘right tail’ of the ex ante size distribution. That is, our model would predict that moderately large to large practices are most likely to take up new business forms, given that it is these firms can most effectively use the liability shield to garner larger rents from clients. Small firms, in contrast (with smaller stakes clients), are in a poorer position to realize the benefits of the limited liability form, since clients can retain their expected revenues by ratcheting back the fixed component of compensation. This reasoning thereby generates our first prediction:

Prediction 1: *If firms’ conversion decisions are heterogeneous, then larger firms are systematically more likely than smaller firms to convert to the new limited liability business form(s).*

is an immediate result of differentiating both values with respect to w .

Propositions 3 and 4 facilitate a second form of prediction concerning growth following a conversion. Among “marginal” converters (those with client types between \bar{Z}' and \bar{Z}^*), it is clear that they experience significant growth, with the rate of growth declining in initial firm size. Among the “extra-marginal” converters (those with client types in excess of \bar{Z}^*), our model predicts modest contraction. This non-monotonicity in post-conversion growth rates creates some limitations on what sorts of predictions we can generate (particularly without being able to formulate an a priori distribution of client types over \bar{Z}). Nevertheless, it is still possible to make at least the following sort of prediction:

Prediction 2: *If firms’ conversion decisions are heterogeneous, then among converters, growth rates will be greatest for marginal converters (i.e., the smallest firms that convert). Moreover, post-conversion growth rates will tend to decline (at least initially) as the ex ante size of the firm increases.*

The parenthetical caveat in Prediction 2 is due to the fact that we cannot be sure whether our sample also includes “extra-marginal” converters,²⁶ whose clients have sufficiently large stakes that they would experience a slight contraction in size. If such firms are represented in our data, then at the upper quantiles of converters we would expect modest contraction.

3.8 Caveats and Extensions

Before moving on to the empirical portion of the paper, it is worth noting a number of caveats to our framework, and possible extensions that one might consider to the framework. First, our analysis has not delved very deeply into internal monitoring structures within the firm. This may be a significant factor in the limited liability debate, given that the exposure of other members of the firm to the liability of others may induce them to take actions to reduce agency costs within the firm. Reducing liability exposure, then, would weaken those incentives. It is relatively straightforward to add monitoring technology to our model. For example, following Talley &

²⁶In contrast, we can be relatively confident that if firms’ conversion decisions are heterogeneous, then our data likely include *marginal* converting firms. Indeed, within this population are the firms that (by definition) are right on the extensive margin of converting versus not converting.

Johnsen (2004), one might suppose after clients offer contracts to the firm, the firm allocates x dollars' worth of resources (per partner) at reducing agency costs. In particular, this expenditure might be to reduce the value of shirking (ϕ) for each partner to a smaller value of $\phi(x)$, where $\phi(0) = \phi$, $\phi'(x) < 0$, and $\phi''(x) > 0$. The incentive to expend these resources would, in equilibrium, turn on exposure to downside liability.

Introducing this sort of monitoring technology would have a few important effects on our analysis. First, it would make clients more willing, *ceteris paribus*, to offer incentive contracts to attorneys (such that $\mu > \beta$). Indeed, the client could free ride on the firm's incentive to reduce the benefits from shirking through internal monitoring, which would slacken the incentive constraint for each contract. In turn, such monitoring would increase the critical threshold size levels (m^{**} and m^*) that a firm might reach while still retaining incentive contracts. On the other hand, firms may no longer wish to grow that large, since growth also increases the aggregate costs they can expect to bear on monitoring. Thus, while introducing monitoring might cause firms to grow some, the effect might be limited. As to conversion decisions, the introduction of monitoring technology would have little effect on our predictions: that is, converters would still be disproportionately represented by larger firms. As to post-conversion growth rates, in contrast, the effect may well be ambiguous. On the one hand, conversion would reduce the incentive to monitor, which would cause critical firm levels (m^{**} and m^*) to decrease significantly after converting, thereby suggesting a contractionary effect of conversion for all firms who choose that option. On the other hand, with a lower carrying cost of monitoring, firms may be willing to grow in size, and this effect may have first order significance. Because the effects of internal monitoring do not change our first prediction and merely cloud our second, we have excluded them in our analysis above.

Another important extension worth considering in our model is the effect of competition on firm size decisions. To be sure, part of our analysis reflects some aspects of competition – e.g., clients are assumed to make a take it or leave it contract offer to attorneys. Given an installed firm size, then, our model likely reflects a form of price competition among firms. At the same time, however, firms in our model do not compete on other dimensions, such as size. Rather, they are assumed to select their size strategically, to affect the terms of their eventual contract offer from the client. It would be possible to relax this assumption, positing instead that firms compete along size and price dimensions with one another. The result of introducing such

competition in our model, as one might expect, would be to cause firms to shrink in size, never growing to the point where the attorneys' wealth constraint becomes binding (and attorneys begin to capture equilibrium rents). The introduction of limited liability business forms in such a model, then, would likely be of little moment – at least within our framework. Indeed, if attorneys earned no rents under the status quo ante, and could be assured of competing away any rents they did earn after converting, there would be very little affirmative reason to convert. But if, for some reason, some firms were to convert, their post conversion competition would cause them to contract in value, below the point where they can use their size to earn positive rents. Thus, although we do not formally model size competition in our framework, its effect would produce predictions that are clearly at odds with ours. If we were to find few conversions, with little pattern to them, followed by significant contraction, then such findings would likely represent evidence against our specification and in favor of a size competition model.

4 Testing the Predictions

The structure of the American legal-services industry has shifted markedly and rapidly as LLC and LLP forms for business organization have become available. Table 2 indicates that the share of owners associated with these new forms grew from 1.5% in 1993 to 25.4% in 1999. If our theory is to help explain this phenomenon, its distinctive predictions must be put to the test.

Insert Table 2 Approximately Here

The theory contemplates the responses of existing law firms to the introduction of organizational forms that limit liability. The general partnership (GP) resembles the firm of theory. Its liability is unlimited. Moreover, conversion to the new limited-liability forms does not substantially alter the firm's organizational flexibility going forward.

The empirical analysis therefore considers the behavior of GPs whose menu of organizational choices broadened to include these new forms. Such was the case in 1993. By 1999, only Kentucky and Nebraska had yet to authorize either of the new forms.²⁷ Our new data set—based, like Hillman's

²⁷Section 2 and Appendix C characterize the authorization of these forms in the various states. Our analysis ignores Kentucky and Nebraska. There are too few firms, especially

(2003), on the Martindale Hubbel Law Directory and described in Appendix B—largely bookends this period of substantial flux in the law of business organization governing legal professionals.

The reorganization of GPs indeed contributed to the rise of the new forms. Table 3 indicates that 27.2% of all LLPs in 1999 operated as GPs in 1993; the corresponding statistic for LLCs is 13.8%. Among LLPs and LLCs in 1999 that existed in 1993, 90.1% and 86.5%, respectively, had been GPs. In turn a sizable number and proportion of GPs converted by 1999. In 1993 the general partnership was the leading organizational form, with 41.3% of firms and 55.9% of owners. Table 4 indicates that 5.1% of these firms became LLPs, and another 1.3% became LLCs. Among surviving GPs, these statistics are 10.2% and 2.7%, respectively.²⁸ As the last section noted, such heterogeneity in firms' conversion behavior underlies the theory's testable predictions.

Insert Tables 3 and 4 Approximately Here

A non-trivial proportion of GPs in 1993 (2.2%) operated under the professional corporation/professional association (PC/PA) form in 1999. While we have argued that the PC/PA form is generally limited in its organizational flexibility as well as its liability protections, we have also noted that these broad categories mask heterogeneity across states in the benefits and costs of alternative organizational forms. The authorization of the new forms relatively later within our timeframe in some states may also account for these conversions. In any case, the theory is silent as to this phenomenon. We therefore abstract from the conversion of GPs to PC/PAs, as well as from the general "failure" of PC/PAs to convert to the new forms.²⁹

Furthermore, conditional on conversion, we are generally agnostic about the choice between LLC and LLP status. We do distinguish them in the analysis in an effort to establish some facts. Our empirical approach also attempts to incorporate, if not explain, heterogeneity in the relative attractiveness of these forms across states. In the end, the sample for our principal analyses is comprised of 11,174 GPs in 1993 that operated as GPs, LLCs or

large firms, to be exploited in the investigation of growth among GPs that converted to the new forms.

²⁸The more frequent conversion to LLP status is somewhat surprising in view of its generally more modest liability shield.

²⁹We also abstract from conversions to SPs, or sole proprietorships. Sole proprietorships are like GPs, only smaller. Thus conversion of a GP to an SP simply represents a decline in firm size.

LLPs in 1999 with home offices in states that had authorized either of the new forms by then.

The theory's first prediction is that, in the presence of heterogeneity in firms' conversion decisions, GPs with high-stakes clients (high \bar{Z}) will convert to a new limited-liability form, all else equal. To our knowledge, client stakes among the firms in our sample are not directly observable in any data source. We postulate that \bar{Z} tends to increase in a firm's number of owners. Casual empiricism suggests that large firms tend to specialize in high-stakes litigation and transactions.³⁰ Furthermore, the owners of firms with high enough stakes are more profitable than other firms under our theory, because the wealth constraint is binding. Consistent with this implication, Rebitzer and Taylor (1995) find that the earnings of firm owners are strongly increasing in firm size.³¹ Hereafter, a firm's number of owners should be understood to be a measure of its clients' stakes.

We classify firms by their place within the distribution of the number of owners for our sample. In particular, the 50th, 75th, 90th, 95th and 99th percentiles are approximately identified.³² Table 5 indicates that the corresponding sizes are 2, 4, 8, 16 and 83 owners, respectively. The mean number of owners is 5.90, and the maximum is 370.³³

Insert Table 5 Approximately Here

The relationship between the probability of converting to a new limited-liability form by 1999 and the number of owners in 1993 is illustrated in Figure 3. GPs were much more likely to convert to the LLP form than the LLC form, regardless of size. For LLPs and LLCs the probability of conversion is strongly increasing in firm size, rising from 2.7% and 1.0% for firms with 1-2 owners and reaching maxima of 53.4% and 9.9%, respectively,

³⁰A firm's number of owners is a deterministic and monotonic function of its clients' stakes under the theory. A stochastic relationship between size and stakes is consistent with random (conditional on size) heterogeneity in exogenous factors such as the cost of effort.

³¹Rebitzer and Taylor measure size by the number of lawyers. The simple correlation coefficient between the number of owners and the number of lawyers is 0.969 within our sample in 1993.

³²Because of bunching in the distribution, we identified the smallest size for which the proportion of firms in the sample of equal or lesser size at least equals the relevant threshold.

³³As one would expect, the distribution of the number of owners (and also of the number of lawyers) is highly positively skewed in every sample we have examined.

for firms with 17-83 owners. Firms with 84 or more owners are less likely to convert, especially to an LLC. These downturns are statistically significant at the 10% level in linear probability and logit models of LLC and LLP conversion.³⁴

Insert Figure 3 Approximately Here

The conclusion that conversion rates are substantially higher for larger firms may be confounded by a variety of factors. Firm size and the attractiveness of the new forms relative to GP status both vary across states. The specification should control for the state in which a firm's home office is located. Next, larger firms are more likely to operate in multiple states.³⁵ Conflict of state law may preclude conversion. The number of states in which a firm operates can serve as an admittedly crude control. Finally, we have argued that the relative attractiveness of the new forms varies across states. This argues for an empirical model that accounts for the simultaneous choice among GP, LLC and LLP status.

Table 6 reports the results for a multinomial-logit analysis of the choice facing GPs. The specification includes the state of home office and the number of states in which the firm operated in 1993. The model predicts outcomes reasonably well, with an R^2 of 0.3099. As expected, the state-level controls are highly jointly significant. The number of states in which a firm operates is significant for LLPs, perhaps because many fewer states had authorized LLPs as of 1993, entailing conflicts of law.

Insert Table 6 Approximately Here

All of the parameter estimates relating to firm size in 1993 are statistically significant at the 1% level. A straightforward interpretation of these estimates is not feasible.³⁶ We therefore simulate the probability of conversion to LLC and LLP status for each firm, first in its present size class (e.g., 1-2 owners) and then in the next largest class (3-4 owners). Table 7 reports the simulated effect of increasing the number of owners on conversion rates.

³⁴Heteroscedasticity-robust estimators of the variance-covariance matrix are employed throughout.

³⁵The simple correlation coefficient between the number of owners and the number of states is 0.584 in 1993 for our analytical sample.

³⁶In a multinomial-logit analysis, neither the magnitudes, nor even the signs, of parameter estimates are immediately about the relationships of interest.

GPs with 1-2 owners would have been 1.3% more likely on average to convert to an LLC had there been 3-4 owners. Only 1.0% of such firms in the sample converted, meaning that this effect is quite large. These GPs would have been 6.4% more likely on average to convert to an LLP. In total, GPs with 1-2 owners would have been 7.7% more likely to convert to either LLC or LLP status, had they belonged to the next larger size class. For every size class, the probability of converting to LLP status increases with the number of owners. In particular, in contrast with the pattern in Figure 3, firms with 17-83 owners would have been more likely to convert to LLP status had there been 84 or more owners. The conversion rate to LLCs is increasing with size at first but turns flat for firms with 9-16 owners and declines substantially for GPs with 17-83 owners. Nevertheless, the probability of converting to either of the new forms rises with size for every size class. That is, the downturn for LLCs represents substitution toward LLPs, not unlimited liability.³⁷

Insert Table 7 Approximately Here

Thus, when client stakes are measured by the number of owners, the evidence is consistent with the theory's distinctive prediction that high-stakes GPs will opt for limited liability, all else equal. This evidence is also consistent with the hypothesis that any costs associated with conversion decrease with the number of owners. The cost of effecting a change of status with the relevant authorities is negligible, probably even for the smallest firms. Interviews conducted with owners of law firms suggest that the renegotiation of existing relations is a significant source of psychic costs (Baker and Krawiec 2005). While these psychic costs might decline with the number of owners, we do not believe that this should be the case. A final explanation for these findings is that, while limited liability benefits all firms, larger firms may recognize the opportunity more "readily," i.e., at lower cost. Benchmark models of firm dynamics imply that efficient firms survive and grow to become large (Jovanovic 1982). We cannot rule out this particular account.

The theory's second distinctive prediction concerns the optimal number of owners under limited liability. In particular, the number of owners will tend to grow for small converters, and the growth rate will decline in absolute value

³⁷We reach similar conclusions on the basis of a multinomial-logit analysis of all GPs in 1993. That is, the set of outcomes now includes PC/PA or SP status as well as exit from our sample. Moreover, GPs in states that did not permit either of the new forms as of 1999 were included in the sample.

as ex ante firm size increases. Our test of this prediction is complicated by the substantial lag with which firm characteristics are observed. As in other industries, law firms that survive for six years may tend to grow, even absent any change in form.

We therefore consider growth among both converters and non-converters. Figure 4 suggests that, indeed, non-converters (GPs) as well as converters (both LLCs and LLPs) grew between 1993 and 1999.³⁸ Consistent with the evidence for other industries (Sutton 1998), growth appears to be greater among smaller firms.

Insert Figure 4 Approximately Here

Following Woywode, Harhoff, and Stahl (1998) and others, we regress firms' growth rates on LLC status in 1999, LLP status in 1999, interactions between LLC and LLP status and the various size classes, the state of home office in 1993, and the number of states in which a firm operated in 1993. The results are reported in Table 8. Even by the standard of studies of firms' growth rates, this specification accounts for a modest proportion (3.61%) of the variation observed in Figure 4. Nevertheless, some striking patterns emerge.

Insert Table 8 Approximately Here

Figure 5 illustrates these patterns on the assumption that firms operate within New York State.³⁹ In contrast with conversion, the patterns for LLCs and LLPs are qualitatively similar.⁴⁰ Adopters with 1-2 owners in 1993 grew much more rapidly on average than did non-adopters, on the order of 40% vs. 20%. The growth gap indeed narrowed dramatically with firm size. Among firms with 84 or more owners in 1993, we estimate that converts to the LLP form grew more robustly than non-adopters, though the difference is not statistically significant. LLC converts grew less robustly than non-adopters; again, the difference is insignificant.⁴¹

³⁸Figure 4 does not distinguish LLCs and LLPs because doing so obscures more than it reveals.

³⁹Under our specification variation in state of home office and number of states of operation entails parallel shifts in the patterns in Figure 8.

⁴⁰The null hypothesis that these patterns are identical is strongly rejected, however.

⁴¹When size classes for firms with 17-83 and 84 or more owners are combined, the results indicate that LLP converts with 17 or more owners in 1993 grew more robustly

Insert Figure 5 Approximately Here

The evidence is thus also consistent with the theory's second prediction. As before, the relationship between size in 1993 and unobservable factors such as managerial efficiency is a concern for the interpretation of our findings. The potential relationship between the conversion decision and such unobservables is also an issue in this context.

5 Conclusion

This paper has presented a theoretical framework generating predictions as well as an empirical test for the effects of the introduction of new limited liability forms as measured by characteristics of professional law firms. We have found, consistent with our predictions, that larger firms tended systematically to take advantage of the new business forms, and growth rates were the strongest within the lower deciles of the set of firms that chose to convert. Some of our findings, however, are somewhat equivocal when compared to predictions, which leads us to remain somewhat measured in our conclusions (at least at this juncture).

Nevertheless, to the extent that the data supports our predictions on a general level, our results potentially have important consequences both for the study of entrepreneurship within the practice of law, and regulatory policy more generally. Indeed, if a goal of the introduction of the professional LLC/LLP forms was to encourage entrepreneurial activity among small, boutique law firms, the experiment has met with only limited success. The smallest firms within our sample appear to have been largely unaffected by the introduction of the new forms, as their scale was insufficient to take advantage of the strategic benefits that the LLC/LLP forms offered. However, among more "moderately" sized firms, which could take advantage of these benefits, we both predicted and found substantial growth. Larger established firms, however, also appear to have benefited from the new business forms.

From a general policy standpoint, our analysis has something to contribute as well. Indeed, if – as our theory and preliminary findings suggest – law firms strategically adopted the new business forms to extract rents from

than similarly sized GPs, while the corresponding LLCs grew less robustly. The latter difference remains insignificant, while the former is now significant.

clients, then it is unclear whether the benefits of such activities is desirable from a social perspective.

There are a number of extensions to this work that are well worth considering. For instance, conversion rates and growth rates appear much stronger in LLPs than in LLCs, a curious fact given that the LLP forms offer, in the main, more modest liability protections. While some of this difference is certainly due to statutory restrictions (California, for example, prohibits law firms from practicing as LLCs), there is almost certainly more to the story here. Also worthy of investigation is the “failure” of PC/PAs to exploit the potential tax advantages and administrative simplicity of the new forms, as well as their very robust growth between 1993 and 1999. We leave these explorations for future work.

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7 Appendix A

This appendix contains the central proofs in the analytical results from Section 3.

Lemma 2: *If Assumption B holds, the optimal high-effort inducing contract consists of the following terms:*

$$\beta = \max \left\{ u_0 + c + \phi - \frac{m\phi p_1}{(p_1 - p_0)} \cdot \left(1 - \gamma\phi \frac{(1 - p_1)}{(p_1 - p_0)} \right), -w \right\}$$

$$\mu = \beta + m \left(\frac{\phi}{(p_1 - p_0)} \right)$$

Proof: Suppose that all other attorneys are putting forth high effort. By also putting forth high effort (assuming that all attorneys have identical contracts of (μ, β)), the representative attorney's expected monetary payoff will be

$$\beta + p_1 \cdot (\mu - \beta) - c - \phi$$

and a variance of

$$\frac{(\mu - \beta)^2}{m} (1 - p_1) \cdot p_1$$

On the other hand, by expending low effort, our attorney can reap an expected monetary payoff of:

$$\beta + \frac{1}{m} p_0 \cdot (\mu - \beta) + \frac{m-1}{m} p_1 \cdot (\mu - \beta) - c$$

and a variance of:

$$\frac{1}{m^2} (\mu - \beta)^2 (p_0) (1 - p_0) + \frac{(m-1)}{m^2} (\mu - \beta)^2 (p_1) (1 - p_1)$$

Thus, the attorney will expend high effort if and only if:

$$\begin{aligned} & \beta + p_1 \cdot (\mu - \beta) - \gamma \left(\frac{(\mu - \beta)^2}{m} (p_1) (1 - p_1) \right) - (c + \phi) \\ \geq & \beta + \frac{1}{m} p_0 \cdot (\mu - \beta) + \frac{m-1}{m} p_1 \cdot (\mu - \beta) \\ & - \gamma \left(\frac{1}{m^2} (\mu - \beta)^2 (p_0) (1 - p_0) + \frac{(m-1)}{m^2} (\mu - \beta)^2 (p_1) (1 - p_1) \right) - c \end{aligned}$$

which simplifies to:

$$\left(\frac{(\mu - \beta)}{m} \right) \left(1 - \frac{(\mu - \beta)}{m} \gamma \cdot (1 - p_1 - p_0) \right) \geq \frac{\phi}{(p_1 - p_0)}$$

Clearly, the client would like to choose the lowest level of $(\mu - \beta)$ that induces the attorney to expend high effort. After some analysis,⁴² we obtain the

⁴²Note that the LHS of the above expression is a concave down parabola whenever $(1 - p_H - p_L) > 0$, with one root at zero and one strictly positive root. Thus, any α between the roots of the whole expression will solve. On the other hand, when $(1 - p_H - p_L) < 0$ the LHS is a concave up parabola with one root at zero and a strictly negative root. Here, anything larger than the largest root will solve. Finally, when $(1 - p_H - p_L) = 0$, the LHS is linear in α .

following IC constraint⁴³ for the minimal level of $(\mu - \beta)$ that is incentive compatible:

$$(\mu - \beta) \geq \begin{cases} m \left(\frac{1 - \sqrt{1 - 4\gamma\phi \frac{(1-p_1-p_0)}{(p_1-p_0)}}}{2\gamma(1-p_1-p_0)} \right) & \text{if } p_1 \neq 1 - p_0 \\ \left(\frac{m\phi}{(p_1-p_0)} \right) & \text{if } p_1 = 1 - p_0 \end{cases}$$

Note that the simplest case is satisfied when $p_1 = 1 - p_0$. We focus on this case in what follows (though our results generally carry over to both cases, under some regularity assumptions).

To complete solving for the optimal high-effort contract, then, we substitute the high effort inducing terms μ in and set β such that it satisfies both the attorney's wealth constraint and the attorney's participation constraint. From the above analysis, it is clear that $\mu > \beta$, so the sharpest wealth bound here is that $\beta > -w$.

Recall that the participation constraint is given by:

$$\beta + p_1 \cdot (\mu - \beta) - \gamma \left(\frac{(\mu - \beta)^2}{m} (p_1)(1 - p_1) \right) - (c + \phi) \geq u_0$$

Substituting the above expression for $\mu - \beta$ gives the following form of the participation constraint

$$\beta \geq \beta^{PC} \equiv \overbrace{u_0 + c + \phi}^+ - \overbrace{\left(\frac{mp_1\phi}{(p_1-p_0)} \right) \left(1 - \gamma \left(\frac{\phi(1-p_1)}{(p_1-p_0)} \right) \right)}^+$$

Note that the sign of β is ambiguous, as the second term represents embodies the penalty $(\mu - \beta)$ that the firm pays if the case comes out negatively. In situations where $\beta^{PC} < 0$, the wealth constraint may bind, and in fact it does so whenever $\beta^{PC} < -w$, which is the condition on β given in the Lemma.

QED

⁴³Let $\theta = \frac{\alpha Z}{m}$, so the equation becomes:

$$0 = \theta^2 \gamma (1 - p_H - p_L) - \theta + \frac{\phi}{(p_H - p_L)}$$

Proposition 1: *If Assumptions A and B hold, the client will choose to implement high effort if and only if the size of the firm satisfies $m \leq \hat{m}$, where*

$$\hat{m} = \begin{cases} m^* \equiv (p_1 - p_0) \frac{(p_1 - p_0)\bar{Z} + (u_0 + c + w)}{p_1\phi} & \text{if } m \geq \tilde{m} \\ m^{**} \equiv (p_1 - p_0)^2 \frac{(p_1 - p_0)\bar{Z} - \phi}{\gamma\phi^2 p_1(1 - p_1)} & \text{if } m < \tilde{m} \end{cases}$$

$$m \geq \tilde{m} \equiv \frac{(p_1 - p_0)}{\phi p_1} \cdot \frac{u_0 + c + \phi + w}{\left(1 - \gamma\phi \frac{(1 - p_1)}{(p_1 - p_0)}\right)} \quad (11)$$

Proof: When the client implements low effort, her net expected payoff is given by:

$$p_0\bar{Z} - (u_0 + c)$$

This expected payoff does not turn on the size of the firm, nor the internal governance of it.

When, in contrast, the client wishes to implement high effort, her payoff depends on m and x . Suppose first that $m \geq \tilde{m}$ (so that the wealth constraint binds, and $\beta = -w$). Here, the client's expected net payoff is given by:

$$p_1 \left(\bar{Z} - (\mu - \beta) \right) - \beta = p_1 \left(\bar{Z} - m \left(\frac{\phi}{(p_1 - p_0)} \right) \right) + w$$

Consequently, a high effort inducing contract is favored by the client if and only if the payoff the client receives exceeds her payoff in the low effort contract:

$$p_1 \left(\bar{Z} - m \left(\frac{\phi}{(p_1 - p_0)} \right) \right) + w \geq p_0\bar{Z} - (u_0 + c)$$

$$(p_1 - p_0)\bar{Z} + (u_0 + c + w) \geq m \left(\frac{p_1\phi}{(p_1 - p_0)} \right)$$

$$m \leq m^* \equiv (p_1 - p_0) \frac{(p_1 - p_0)\bar{Z} + (u_0 + c + w)}{p_1\phi}$$

As it turns out, it need not be the case that $m^* > \tilde{m}$.⁴⁴ In a situation where $m^* < \tilde{m}$, there does not exist a firm size that (a) induces a high effort contract, and (b) involves a binding wealth constraint.

Now consider the incentive of the client to implement high effort when $m < \tilde{m}$ (so that the participation constraint binds, but not the liquidity constraint). Here, the client's expected payoff is given by:

$$p_1 (\bar{Z} - (\mu - \beta)) - \beta = p_1 \left(\bar{Z} - m \left(\frac{\phi}{(p_1 - p_0)} \right) \right) - \left(u_0 + c + \phi - \frac{m\phi p_1}{(p_1 - p_0)} \cdot \left(1 - \gamma\phi \frac{(1 - p_1)}{(p_1 - p_0)} \right) \right)$$

Consequently, implementing high effort is worthwhile, when the client's payoff exceeds the payoff she obtains under a low effort contract::

$$p_1 \bar{Z} - \frac{m\phi p_1}{(p_1 - p_0)} + \frac{m\phi p_1}{(p_1 - p_0)} \cdot \left(1 - \gamma\phi \frac{(1 - p_1)}{(p_1 - p_0)} \right) - (u_0 + c + \phi) \geq p_0 \bar{Z} - (u_0 + c)$$

$$(p_1 - p_0) \bar{Z} - \phi \geq \frac{m\phi p_1}{(p_1 - p_0)} \cdot \left(\gamma\phi \frac{(1 - p_1)}{(p_1 - p_0)} \right)$$

Solving for m , the client will induce high effort if and only if:

$$m \leq m^{**} = (p_1 - p_0)^2 \frac{(p_1 - p_0) \bar{Z} - \phi}{\gamma\phi^2 p_1 (1 - p_1)}.$$

⁴⁴To see this, note that this would require:

$$(p_1 - p_0) \bar{Z} + (u_0 + c_L + w) > \frac{u_0 + c + \phi + w}{\left(1 - \gamma\phi \frac{(1 - p_1)}{(p_1 - p_0)} \right)}$$

$$\Leftrightarrow (p_1 - p_0) \bar{Z} - \phi > \gamma\phi(1 - p_1) \left(\bar{Z} + \frac{(u_0 + c + w)}{(p_1 - p_0)} \right)$$

By Assumption A, the right hand side of this expression is strictly positive. However, so is the left hand side, and the sign is ambiguous.

As it turns out, it need not be the case that $m^{**} < \tilde{m}$. In the case where $m^{**} > \tilde{m}$,

$$\begin{aligned} (p_1 - p_0)\bar{Z} + (u_0 + c + w) &> \frac{u_0 + c + \phi + w}{\left(1 - \gamma\phi\frac{(1-p_1)}{(p_1-p_0)}\right)} \\ &\Leftrightarrow \\ (p_1 - p_0)\bar{Z} - \phi &> \gamma\phi(1 - p_1)\left(\bar{Z} + \frac{(u_0 + c + w)}{(p_1 - p_0)}\right) \end{aligned}$$

which corresponds to the second condition in the proposition. QED.

Corollary 1A: *If Assumptions A holds, then $m^* > m^{**}$.*

Corollary 1B: *If Assumptions A and B hold, then attorneys will earn positive economic rents if and only if $w \leq w^*$, where:*

$$w^* \equiv \left(\frac{(p_1 - p_0)}{\gamma\phi(1 - p_1)} - 1\right) (p_1 - p_0) \cdot \bar{Z} - \frac{(p_1 - p_0)}{\gamma(1 - p_1)} - (u_0 + c)$$

Corollary 1C: *If Assumptions A and B hold, then attorneys will earn positive economic rents if and only if $\bar{Z} \geq \bar{Z}^*$, where:*

$$\bar{Z}^* \equiv (u_0 + c + w) \left(\frac{1}{((p_1 - p_0) - \gamma\phi(1 - p_1))} - 1\right) + \frac{\phi}{((p_1 - p_0) - \gamma\phi(1 - p_1))}$$

Proof of 1A: The proof consists of a simple comparison of m^* to m^{**} :

$$\begin{aligned} (p_1 - p_0) \frac{(p_1 - p_0)\bar{Z} + (u_0 + c + w)}{p_1\phi} \\ (m^* - m^{**}) &= (p_1 - p_0) \frac{(p_1 - p_0)\bar{Z} + (u_0 + c + w)}{p_1\phi} - (p_1 - p_0)^2 \frac{(p_1 - p_0)\bar{Z} - \phi}{\gamma\phi p_1(1 - p_1)} \\ &= \frac{(p_1 - p_0)}{p_1\phi} \left[\bar{Z}(p_1 - p_0) \left(1 - \frac{(p_1 - p_0)}{\gamma\phi(1 - p_1)}\right) + \left(u_0 + c + w + \phi \cdot \frac{(p_1 - p_0)}{\gamma(1 - p_1)}\right) \right] > 0 \end{aligned}$$

where the sign on $\left(1 - \frac{(p_1 - p_0)}{\gamma\phi(1 - p_1)}\right)$ follows from Assumption A.

Proof of 1B-C: Note from proposition 1 that the following decision rules are adopted by the client:

$$\begin{array}{l}
m < \tilde{m} & m \geq \tilde{m} \\
\text{Implement High Effort If } m \leq m^{**} & m \leq m^* \\
\text{Implement Low Effort If } m > m^{**} & m > m^*
\end{array}$$

So we still need to check whether the relevant regions described above exist, and if they do, how the firm will organize itself. Our task is simplified a bit by noting that the attorneys in a firm receive rents only when (a) high effort is implemented; and (b) the wealth constrained binds. Equivalently, then, the operative region a firm finds itself in is where $m \in [\tilde{m}, m^*]$. Everywhere else, they will earn no rents. However, in any event they will not earn rents unless $\tilde{m} \leq m^*$. So the first task is to ask when $[\tilde{m}, m^*]$ exists. For it to exist, the following must be true:

$$\begin{aligned}
\tilde{m} &= (p_1 - p_0) \cdot \frac{u_0 + c + \phi + w}{\phi p_1 \cdot \left(1 - \frac{\gamma \phi (1 - p_1)}{(p_1 - p_0)}\right)} \leq (p_1 - p_0) \frac{(p_1 - p_0) \bar{Z} + (u_0 + c + w)}{p_1 \phi} = m^* \\
&\Leftrightarrow \\
w &\leq w^* = \left(\frac{(p_1 - p_0)}{\gamma \phi (1 - p_1)} - 1\right) (p_1 - p_0) \cdot \bar{Z} - \frac{(p_1 - p_0)}{\gamma (1 - p_1)} - (u_0 + c) \\
&\Leftrightarrow \\
\bar{Z} &\geq \bar{Z}^* \equiv \frac{(u_0 + c + w) (1 - (p_1 - p_0) + \gamma \phi (1 - p_1)) + \phi}{((p_1 - p_0) - \gamma \phi (1 - p_1))}
\end{aligned}$$

QED.

* * *

Proposition 2: *Suppose that Assumptions A, B, and C hold. If $\bar{Z} \geq \bar{Z}^*$, the firm selects a size of $m = m^*$. Otherwise, the firm selects any size $m \in [0, m^{**}]$.*

Proof: If $\bar{Z} \geq \bar{Z}^*$, then under Assumptions A and B we know that $\tilde{m} \leq m^*$, and thus the firm will choose a size in the interval $[\tilde{m}, m^*]$, since rents are zero for all other firm size. The representative attorney's expected utility under an optimal contract for a firm size in this interval is given by:

$$\pi(w, m^*) = -(w + c + \phi) + p_1 \cdot m \left(\frac{\phi}{(p_1 - p_0)}\right) \left(1 - \frac{\gamma \phi (1 - p_1)}{(p_1 - p_0)}\right)$$

Note that this value is strictly increasing in m , and thus the firm will grow to the maximal size in this interval. If $\bar{Z} < \bar{Z}^*$, in contrast, the representative

attorney will always garner zero rents, and thus the choice of organizational size is not unique. However, Assumption C implies that this choice must be on the interval $[0, m^{**}]$. QED.

* * *

Proposition 3: *Suppose that Assumptions A, B & C hold. If $\bar{Z} \geq \bar{Z}^*$, the firm will adopt a limited liability business form when it becomes available, and its firm size will shrink marginally in size. In addition, all firms on the interval $\bar{Z} \in [\bar{Z}', \bar{Z}^*]$ will also adopt the limited liability form and will grow inframarginally in size, where*

$$\bar{Z}' = \frac{(u_0 + c + w')(1 - (p_1 - p_0) + \gamma\phi(1 - p_1)) + \phi}{((p_1 - p_0) - \gamma\phi(1 - p_1))} < \bar{Z}^*$$

Firms on the interval $\bar{Z} \in [\bar{Z}', \bar{Z}^]$ will neither convert nor change in size.*

Proof: The textual discussion demonstrates the proof for firms such that $\bar{Z} \geq \bar{Z}^*$. For firms on the interval $\bar{Z} \in [\bar{Z}', \bar{Z}^*]$, note that the Proposition is simply a restatement of Proposition 2 evaluated at w' . The same is true for firms on the interval $\bar{Z} \in [0, \bar{Z}']$.

8 Appendix B

This appendix describes our longitudinal data set on American law firms. Our objective here is to give the interested reader an overview of its development and thus an appreciation of its strengths and weaknesses as well as a sense of its contents.

Like Hillman's (2003) cross-sectional data set for a more recent period, ours derives from the Martindale Hubbell Law Directory.⁴⁵ Hillman observes that Martindale Hubbell describes its directory as the "most complete listing of lawyers and firms" in the United States. Indeed, the Directory includes lawyers not only in law firms but also in government service, business, academia, retirement and perhaps even on temporary leave from the labor force (e.g., due to domestic responsibilities). Appearance in the Directory is voluntary, so that completeness of the listings is a potential concern. Martindale Hubbell was unable to provide Hillman with an official assessment of this issue, though a representative did estimate that eighty to ninety percent of firms are included. We return to this issue.

We obtained computer-readable versions of the Fall 1993 and Fall 1999 editions of the Directory. These databases are structured to distinguish between firms and individuals, including lawyers and their support staff. A unique record exists for each of a firm's offices and each of a lawyer's associations with a location (e.g., multiple offices of the same firm, place of retirement). The nearly eight hundred thousand records in the 1993 database were exported in batches of two hundred. We could and did export much larger batches of records from the similarly sized 1999 database, though at a cost of omitting some fields. These procedures also failed to preserve the inherent structure of the databases. The lack of a "cross walk" between lawyers, firms and offices posed significant challenges for transforming the exported data into an analytical data set, as did the absence of unique identifiers for lawyers within the 1993 database and for firms in both years.⁴⁶

The exported data nevertheless preserve a wealth of information. Of relevance to our context, each firm-office record includes the firm's name and the office address. Firm-office records in 1999 also include a marker for the "home office" for some multi-office firms. Each lawyer-location record includes the lawyer's name and location and, when appropriate and available, firm affili-

⁴⁵Extensive information about Martindale Hubbell appears online at <http://www.martindale.com/xp/Martindale/home.xml>.

⁴⁶The data were transformed with a series of Perl programs (Hoffman 2000).

ation and title. Lawyer-location records in 1999 also include a unique lawyer identifier, namely, the International Standard Lawyer Number (ISLN).⁴⁷ On the basis of this information, we assembled our data set in four steps.

8.1 Identifying law firms and their office locations

In the first step of assembling the data set, we identified law firms, their office locations and their home offices. A firm-office record necessarily identifies a law firm. The presence of an ISLN generally served to distinguish between firm-office and lawyer-location records in the 1999 data. For the 1993 data, after having extracted roughly a quarter of the database, we discovered that firms and lawyers could be exported separately. Where firms and lawyers had been exported together, we generally relied on the presence of fields relevant only to firms (e.g., firm size) to distinguish these records.

Due to the lack of unique firm identifiers in the exported data, we defined a firm in each year as the set of offices that share a common name in the Directory. These names typically include the surnames of prominent members and in many cases a designator for the firm’s organizational form, e.g., ”P.C.” Our matching procedure retained such designators in firm names. As row 2 of Table B.1 indicates, our approach linked 74,966 offices to 65,620 firms in 1993 and 75,409 offices to 65,999 firms in 1999. As of Summer 2002, Hillman found 65,139 firms in the Directory, as derived from LexisNexis.

Nevertheless, these statistics reflect the mistreatment of some unaffiliated offices as a single firm and also of affiliated offices as distinct firms.⁴⁸ We term these errors within-year overlinkages and underlinkages, respectively. Within-year overlinkages arise because surnames (or combinations thereof) are not unique within the Directory. The inclusion of designators in firm names helps limit overlinkages.

Within-year underlinkages arise for two reasons. First, some multi-state firms (as indicated in the databases) operate offices under different business forms. That is, form designators mitigate overlinkage error at a cost of greater underlinkage. Second, the Directory itself is occasionally inconsistent in its nomenclature. For example, a letter in the firm name may be capitalized in

⁴⁷The ISLN system is a cooperative endeavor between Martindale Hubbell and the Bar intended to uniquely identify lawyers. See http://www2.martindale.com/whats_new/isln.html.

⁴⁸Hillman’s data set may be immune to such errors if LexisNexis properly indicates office affiliation.

some firm-office records but not in others. We therefore standardized firm names in various respects, e.g., by converting all letters to lower-case. While standardization can cause overlinkages, we are not aware of any examples, and underlinkages due to inconsistencies in nomenclature were common.⁴⁹ Some underlinkages remain. Of particular relevance, our standardization of names was imperfect, and the Directory sometimes reported different organizational forms for offices belonging to the same firm in the same state.

We were able to assess the prevalence of errors in identifying firms and their offices. We identified potential underlinkages due to the retention of designators in firm names by matching firms based on their names stripped of designators. As many as 1,143 firms in 1993 and 1,622 firms in 1999 may be underlinked. In contrast with underlinkages, a rough assessment of overlinkages was not feasible. As one would expect, our experience has been that sole practitioners and small partnerships can be mistakenly linked due to common surnames.

For each of these firms we then identified a home office. This task was trivial for firms with a single office. For multi-state firms, we first determined whether the Directory designated a home office, as was occasionally the case in 1999. If not, the office with the greatest number of lawyers was classified as the home office. The distributions of firms by state of home office in 1993 and 1999 are qualitatively similar to that found by Hillman for 2002.⁵⁰

Some lawyer records included only a lawyer's name and address, but no institutional affiliation. The status of these lawyers is unknown.⁵¹ Some may be practicing on their own, perhaps in a relatively informal setting. Lawyers of unknown status are quite common. If these lawyers were indeed in active practice, row 1 of Table B.1 indicates that the number of firms would rise to 236,099 in 1993 and 265,713 in 1999.

8.2 Measuring firm size

Next we measured the size of law firms. While firm size may admit a variety of meanings—including, in our context, the number of offices or even the

⁴⁹Inconsistencies across years were especially prevalent and pronounced.

⁵⁰These distributions are available from the authors upon request.

⁵¹The Directory generally indicated when a lawyer is retired, semi-retired, in military service, or otherwise engaged in an activity other than the practice of law. These are not the lawyers of unknown status to which we are referring.

number of states with offices—our analysis focuses on those lawyers who own firms.

We therefore identified lawyers associated with each of a firm’s offices and their places within the firm’s hierarchy, in particular, their ownership status. Because the Directory includes records for support staff, we first distinguished between lawyers and staff. The presence of an ISLN indicated a lawyer in the 1999 data. For the 1993 data, we generally relied on an individual’s title: Member, Associate, and Of Counsel indicated a lawyer. In both years a title of Member generally identified a lawyer with an ownership interest. The number of lawyers and owners in a firm could then be obtained by aggregating across a firm’s offices.⁵²

We assessed the accuracy of this procedure by examining the resulting data on firm size for anomalies and also by comparing the derived numbers of lawyers and owners to the database for a subsample of firms. No lawyer could be associated with 4,231 firms in 1993 and 856 firms in 1999. Inspection of some of these cases revealed that the Directory itself sometimes fails to associate any lawyers with a firm. Apparently random inconsistencies in firm names between firm-office and lawyer-location records also account for these events.⁵³ When at least one lawyer could be associated with a firm, the size data appear to be largely accurate. For an additional 852 (696) firms in 1993 (1999), no owners could be identified.. Again, when our procedure could associate at least one owner with a firm, the resulting data seem accurate.

Excluding firms that could not be associated with an owner, Table B.3 characterizes the distributions of the numbers of lawyers and owners. The average number of lawyers and owners per firm is 5.41 and 3.61, respectively, in 1993; the corresponding figures are 5.75 and 3.81 in 1999. There is substantial variation in each of these measures. For example, the standard deviations of the number of lawyers and owners are 19.40 and 9.17, respectively, in 1993.

The average numbers of lawyers per firm in the data set are somewhat larger than those derived from the Economic Censuses of 1992 and 1997, namely, 2.96 and 2.94, respectively.⁵⁴ This finding is consistent with Hill-

⁵²In the apparently rare event that the Directory indicates that a lawyer practices at multiple offices, our algorithm attempts to count a lawyer only once and appears to be at least somewhat successful in doing so.

⁵³Inconsistencies in office addresses might also contribute, though we are not presently aware of any.

⁵⁴The average number of owners per firm cannot be derived from published reports.

man's (2003) hypothesis that large firms are more likely to be represented in the Directory. Additionally, under the assumption that all (rather than no) lawyers of unknown status are sole practitioners, these averages decline to 2.15 in 1993 and 2.16 in 1999. We conclude that our size data are reasonably reliable.

8.3 Characterizing organizational form

We then characterized the organizational form of law firms. Following Hillman (2003), we focused on five broad forms. These include professional corporation/professional association (PC/PA), limited liability company (LLC), limited liability partnership (LLP), general partnership (GP), and sole proprietorship (SP).

The classification of firms began with any designators appearing at the conclusion of firm names, e.g., the designator "P.C." within the firm name "Talley and Romley, P.C." Various designators may correspond to a form within and across states. We associated designators with PC/PAs, LLPs and LLCs on the basis of the state-specific compendium of permissible forms and their designators that Hillman (2003) developed from his review of state policies. In Arkansas, for example, an LLC may include "PLC" or "PLLC" in its firm name. Furthermore, we classified a firm as a PC/PA if its designator did not appear in Hillman's list of PC/PA designators for its home state, yet the designator always corresponded to a PC/PA elsewhere. For example, a "Chartered" firm in Arkansas was classified as a PC/PA.

We also used designators to assess our characterization of state policy in 1993 and 1999, the applicability of Hillman's compendium to our timeframe, and the quality of Martindale Hubbell's information on organizational form. After identifying and incorporating common variants of permissible designators (e.g., "Professional Limited Company" for "PLC"), there were 43 (148) firms with dubious forms in 1993 (1999). Some of these had "LLC" or "LLP" as a designator even though their home state did not permit it; others included common phrases (e.g., "corp") that lacked a clear association with one of Hillman's broad forms. These firms are excluded from our analytical sample, as indicated in row 5 of Table B.1.⁵⁵

⁵⁵The number of firms in 1993 declines by more than 43 because these firms appear to operate under a dubious form in 1999. Similarly, the number of firms declines by more than 148 in 1999.

Firms whose names lack any of the relevant designators for PC/PAs, LLCs and LLPs were assigned to the GP and SP categories as follows: If there is one lawyer, “associates” appears in the firm name, or the name includes at most a single surname, the firm was a SP.⁵⁶ All other firms were classified as GPs. As Hillman notes, the GP category is underinclusive because a partnership with a single surname in its name is treated as a SP

Table 2 characterizes the organizational structure of the legal-services industry in 1993 and 1999. In 1993 GPs were the leading form, with 41.3% of firms. PC/PAs were next most common, with 33.1%. The share of LLCs and LLPs was negligible at 0.4%. By 1999, the share of PC/PAs had risen to 47.9%, while that of GPs fell to 41.3%. The shares of LLCs and LLPs grew to 3.8% and 7.3%, respectively. Because LLCs and LLPs tend to have a greater number of owners, the share of owners associated with LLCs and LLPs increased from 1.5% to 25.4%. In contrast the ownership share of PC/PAs grew modestly from 35.6% to 39.9%.

8.4 Constructing a longitudinal sample

In the final step we identified firms that operated in both 1993 and 1999. Such an undertaking requires a definition of the firm over time. Our theoretical analysis is focused on joint decisions concerning business form and the number of owners. We wish to study firms that are stable in other respects, abstracting, for example, from sharp changes in firm boundaries arising from mergers and spinoffs.

We developed an algorithm that attempts to identify the set of continuing firms that evolve only with respect to form. As with the task of linking offices to firms, two types of errors may arise. Intertemporal overlinkages arise when distinct firms in 1993 and 1999 are linked. Intertemporal underlinkages arise when the records for the same firm are not linked across years.

This algorithm first matched firms on their names. Prior to matching, names were stripped of designators, so as not to exclude firms that reorganized under a different business form in the intervening period. When firms matched on the stripped name, we verified that the city and state of an office in 1999 matched those of an office in 1993. This requirement limited the prevalence of intertemporal overlinkages that would result from

⁵⁶Whereas Hillman (2003) visually inspected the names of firms that did not meet either of the first two criteria for a SP, our algorithm identifies firms with a single surname by searching for the word "and" or an ampersand in the firm name.

matching on stripped names, at a potential cost of underlinking firms that relocated. After matching 23,812 firms on name and location, we used an inconsistency—namely, the existence of multiple home offices—to identify 171 firms that were distinct in the 1999 cross section but overlapped across years.⁵⁷ These firms are excluded from our analytical sample, as indicated in row 7 of Table B.1.

Turning to intertemporal underlinkages, our algorithm fails to identify a continuing firm whose name was modified to add or remove the surname of an owner. A systematic assessment of the prevalence of intertemporal underlinkages is difficult.⁵⁸ We believe that this is a rare event. Nevertheless, a statistical relationship between firm size in 1993 and subsequent renaming may confound our empirical analysis.

The sample of firms that were matched includes 23,641 firms. That is, 39.1% of the non-overlinked firms in the 1993 cross section continued to operate in 1999.⁵⁹ 53.0% of owners and 56.6% of lawyers in 1993 are affiliated with these firms. The match rates are even higher for GPs: 50.4% of these firms continued to operate in 1999. The number of law firms by organizational form in 1993 and 1999 is characterized in Table B.3.

⁵⁷In some cases the underlying database identifies offices with the same stripped name but different designators as affiliated with the same firm. If the database is correct, our algorithm for linking firms to offices mistakenly treats these "firms" as distinct in 1999. (In these cases our algorithm for linking firms over time corrects this within-year underlinkage, though these firms are then excluded because there are multiple home offices.) We cannot assess the prevalence of such within-year underlinkages for firms that are not matched across years by name and location.

⁵⁸Our algorithm might be refined to count the proportion of surnames matched within a firm name.

⁵⁹In computing these statistics, the 171 intertemporally overlapped firms are excluded from the 1993 cross section corresponding to row 5 of Table C.1.

Appendix C: Tables and Data Description

The following table reports the timing and nature of events respecting the permissibility of LLCs and LLPs in each state. Events refer to a favorable stance on form permissibility unless otherwise noted. Where there are multiple events within a state, the date of the event that in our best judgment meaningfully permitted a form appears in bold face. (The reported timing is with respect to the effective date of introduction, not necessarily the date of statutory authorization, etc.) In general, when a statute specifically authorizing a business form for professionals follows a general limited-liability statute, the form plausibly became available to professionals only with the specific statute. A similar argument applies when judicial approval follows a general statute. Other cases are more difficult. While uncertainties remain, their relevance to this paper is limited to cases in which the timing relative to our bracketing years shifts. For example, a Wyoming statute authorized LLPs in 1998, while the Wyoming Supreme Court promulgated its approval in 2000. We continue to refine our understanding of this complex process.

<i>State</i>	<i>LLC Events</i>	<i>LLP Events</i>
<i>Alabama</i>	10/1/93 (Specific Statute)	1/1/97 (Statute)
<i>Alaska</i>	7/1/95 (General Statute)	1/1/97 (Statute)
<i>Arizona</i>	9/30/92 (Specific Statute)	7/17/94 (Statute)
<i>Arkansas</i>	4/12/93 (Specific Statute)	3/28/97 (Statute)
<i>California</i>		10/10/95 (Statute)
<i>Colorado</i>	4/18/90 (General Statute) 12/1/95 (S. Ct. Rule)	5/24/95 (Statute) 12/95 (S.Ct. Rule)
<i>Connecticut</i>	10/1/93	1/1/96 (Statute)
<i>Delaware</i>	10/1/92 (General Statute) Mid 90s (Ct. Rule) — Prohibits law-firm LLCs 5/1/97 (S.Ct. Rule) 12/1/98 (S.Ct. Rule) — Amendment	93 (Statute) — Defers to the S. Ct. to decide whether to allow LLPs for attorneys 5/1/97 (S.Ct. allows it)
<i>District of Columbia</i>	7/23/94	10/15/93 (Statute)
<i>Florida</i>	1982 (General Statute) 10/1/93 (Specific Statute) 7/1/96 (S.Ct. Rule)	7/1/95 (Statute) 7/1/96 (S.Ct. Rule)

<i>Georgia</i>	3/1/94 (Specific Statute) 8/29/96 (S. Ct. Rule)	7/1/95 (Statute) 8/29/96 (S.Ct. Rule)
<i>Hawaii</i>	4/1/97 (General Statute) 7/1/99 (S. Ct. Rule)	4/1/97 (Statute)
<i>Idaho</i>	Approx. 6/93	7/1/95 (Statute)
<i>Illinois</i>	1/1/94 (General Statute) 12/31/96 (Statute) — States that Supreme Court approval required 3/1/97 (S. Ct. Rule)	8/11/94 (Statute) (S.Ct.) — Prohibited law-firm LLPs until 7/1/03
<i>Indiana</i>	7/1/93 (Specific Statute) — Allows professional LLCs subject to authorization by the licensing authority 1/1/98 (Admission and Discipline Rule)	10/1/95 (Statute) 1/1/998 (S. Ct. Rule)
<i>Iowa</i>	7/1/92 (Specific Statute)	8/15/94 (Statute)
<i>Kansas</i>	90 (Specific Statute)	4/7/94 (Statute) — Effective date of publication in statute book
<i>Kentucky</i>	7/15/94 (Specific Statute) 9/22/95 (S. Ct. Order) — Prohibits law-firm LLCs 2/1/00 (S. Ct.)	7/15/94 (Statute) 2/1/00 (S. Ct Rule)
<i>Louisiana</i>	7/7/92 (General Statute) 6/9/93 (Specific Statute)	7/7/92 (Statute)
<i>Maine</i>	1/1/95 (Specific Statute)	7/3/96 (Statute)
<i>Maryland</i>	10/1/93 (Specific Statute)	10/1/94 (Statute)
<i>Massachusetts</i>	1/1/96 (Specific Statute) 7/11/96 (S.Ct.) — Implements insurance requirements mandated in statute	1/1/96 (Statute) 1/1/98 (S. Ct. Rule) — Effective date may be 10/1/99
<i>Michigan</i>	6/1/93 (Specific Statute)	10/11/94 (Statute)
<i>Minnesota</i>	1/1/93 (Specific Statute)	8/1/94 (Statute)
<i>Mississippi</i>	7/1/94 (Specific Statute)	7/1/95 (Statute)
<i>Missouri</i>	12/1/93 (General Statute) 1/1/94 (S. Ct. Rule)	8/10/95 (Statute)
<i>Montana</i>	10/1/93 (Specific Statute) 1/20/94 (Rule)	10/1/95 (Statute)

<i>Nebraska</i>	7/93 (Specific Statute) — Requires Supreme Court approval 4/4/94 (Statute) — Makes S.Ct. approval necessary 12/1/99 (S. Ct. Rule)	7/18/96 (Statute) 12/1/99 (S. Ct. Rule)
<i>Nevada</i>	10/1/91 (General Statute) 10/1/97 (Statute) — Discusses need for licensing agencies to issue regulations regarding LLCs	10/1/95 (Statute)
<i>New Hampshire</i>	7/1/93 (Specific Statute) 7/7/95 (S. Ct Rule) 2002 (S. Ct Rule) — Amendment	8/9/96 (Statute)
<i>New Jersey</i>	1/26/94 (General Statute) 9/1/94 (S.Ct. Rule) — Prohibits law-firm LLCs 1/1/97 (S.Ct. Rule)	6/30/95 (Statute) 6/30/95 (S. Ct.) — Prohibits law-firm LLPs 1/1/97 (S. Ct. Rule)
<i>New Mexico</i>	6/93 (General Statute) 5/6/94 (State Bar Advisory Opinion) — States that express statutory authority is required	6/16/95 (Statute)
<i>New York</i>	10/24/94 (Specific Statute)	10/24/94 (Statute)
<i>North Carolina</i>	10/1/93 (Specific Statute) 12/8/94 (S. Ct. Rule) 3/6/97 (S. Ct. Rule) — Amendment 10/1/03 (S. Ct. Rule) — Amendment	10/1/93 (Statute)
<i>North Dakota</i>	8/1/93 (Specific Statute)	3/23/95 (Statute)
<i>Ohio</i>	7/1/94 (Specific Statute) 11/1/95 (S. Ct. Rule)	7/1/94 (Statute) 11/1/95 (S. Ct. Rule)
<i>Oklahoma</i>	9/1/92 (General Statute) 11/1/95 (Specific Statute)	11/1/96 (Statute)
<i>Oregon</i>	5/3/95 (Specific Statute) — Eliminates earlier prohibition	Pre-1/1/96 (S. Ct. Rule) 1/1/96 (Statute)
<i>Pennsylvania</i>	2/5/95 (Specific Statute) 4/29/95 (S. Ct. Rule)	2/5/95 (Statute) 4/29/95 (S.Ct. Rule)

<i>Rhode Island</i>	7/28/02 (Specific Statute) 6/27/03 (S. Ct. Order)	7/8/97 (Statute) 1/1/98 (S. Ct. Rule)
<i>South Carolina</i>	6/16/94 (Specific Statute) 6/1/96 (General Statute) — Supersedes specific statute	6/16/94 (Statute)
<i>South Dakota</i>	7/1/93 (Specific Statute)	7/1/95 (Statute)
<i>Tennessee</i>	6/21/94 (Specific Statute) 3/1/03 (S. Ct. Rule)	7/1/95 (Statute)
<i>Texas</i>	8/26/91 (General Statute) 9/1/93 (Specific Statute)	8/26/91 (Statute)
<i>Utah</i>	7/1/91 (Specific Statute)	5/3/94 (Statute)
<i>Vermont</i>	7/1/96 (Specific Statute)	1/1/99 (Statute)
<i>Virginia</i>	7/1/92 (Specific Statute) — Eliminates earlier prohibition 2/1/93 (S.Ct. Rule) 7/1/95 (S. Ct. Rule) — Amendment 2000 (S. Ct. Rule) — Amendment	7/1/94 (Statute) 7/1/95 (S. Ct. Rule) — Requires registration of limited liability law practices with the state bar; may be effective 2/4/00 or 3/29/00
<i>Washington</i>	10/1/94 (Specific Statute)	7/1/95 (Statute)
<i>West Virginia</i>	3/6/92 (General Statute) 6/6/96 (Specific Statute) 10/1/96 (S. Ct. Rule)	6/6/96 (Statute) 10/1/96 (S. Ct. Rule)
<i>Wisconsin</i>	1/1/94 (General Statute) 7/1/97 (S. Ct. Rule)	12/11/95 (Statute) 7/1/97 (S.Ct. Rule)
<i>Wyoming</i>	1977 (General Statute) 7/1/93 (Specific Statute) 8/16/94 (S. Ct.)	7/1/98 (Statute) 6/21/00 (S. Ct.)

Table 2:
Share and Number of Firms, Mean Number of Owners, and Share of Owners
by Broad Organizational Form in 1993 and 1999

	Share (number) of firms		Mean number of owners		Share of owners	
	1993	1999	1993	1999	1993	1999
<i>PC/PA</i>	33.1% (19,853)	47.9% (30,602)	3.9	3.2	35.6%	39.9%
<i>LLC</i>	0.0% (26)	3.8% (2,367)	7.7	4.7	0.1	4.7
<i>LLP</i>	0.4% (262)	7.3% (4,624)	11.3	10.7	1.4	20.7
<i>GP</i>	41.3% (25,061)	31.1% (20,229)	4.9	3.9	55.9	32.0
<i>SP</i>	25.1% (15,222)	9.9% (6,382)	1.0	1.1	7.1	2.8

Note: Sample corresponds to row 5 in Table B.1.

Table 3:
 Number of 1999 LLCs and LLPs
 by Broad Organizational Form in 1993

<i>Form in 1993</i>	<i>Number of LLCs</i>	<i>Number of LLPs</i>
PC/PA	27	23
LLC	14	0
LLP	0	104
GP	326	1,250
SP	10	10
Not in sample in 1993	1,979	3,205
Total	2,356	4,592

Note: Sample corresponds to row 9 in Table B.1.

Table 4:
Number of 1993 GPs
by Broad Organizational Form in 1999

<i>Form in 1999</i>	<i>Number</i>
PC/PA	543
LLC	326
LLP	1,250
GP	9,598
SP	504
Not in sample in 1999	12,077
Total	24,298

Note: Sample corresponds to row 9 in Table B.1.

Table 5
Cumulative Distribution of GPs by Number of Owners in 1993 for Analytic Sample

<i>Number of owners in 1993</i>	<i>Cumulative Distribution</i>
≤2 owners	54.4%
≤4	80.7
≤8	90.7
≤16	95.4
≤83	99.1

Note: Sample is consistent with row 7 in Table B.1.

Table 6:
Multinomial-Logit Analysis of the Distribution of 1993 GPs
by Broad Organizational Form in 1999

Covariate	Parameter Estimate (Standard Error)
<i>LLC</i>	
1-2 owners in 1993	-29.0*** (0.281)
3-4 owners in 1993	0.915*** (0.211)
5-8 owners in 1993	2.333*** (0.187)
9-16 owners in 1993	3.403*** (0.266)
17-83 owners in 1993	3.825*** (0.351)
84+ owners in 1993	2.889*** (0.945)
Number of states in 1993	-0.326 (0.241)
Controls for state of home office in 1993	Included but not reported
<i>LLP</i>	
1-2 owners in 1993	-28.6*** (0.145)
3-4 owners in 1993	1.265*** (0.098)
5-8 owners in 1993	2.632*** (0.095)
9-16 owners in 1993	3.677*** (0.146)
17-83 owners in 1993	4.507*** (0.268)
84+ owners in 1993	4.855*** (0.614)
Number of states in 1993	-0.291*** (0.081)
Controls for state of home office in 1993	Included but not reported
<i>Other Statistics</i>	
Number of observations	11,174
Log likelihood	-3691.54
McFadden's R squared	0.3099
Chi-squared statistic for the hypothesis that all parameters for no. of owners are zero	1571.8
Degrees of freedom for this test	10
Chi-squared statistic for the hypothesis that all parameters for state controls are zero	1.7e+05
Degrees of freedom for this test	76

Notes: Sample corresponds to Table C.1, row 9. GP is the excluded category in the analysis. * denotes statistical significance at the 10% level, ** at 5%, and *** at 1%. Standard errors are heteroscedasticity-robust.

Table 7:
Mean Change in Predicted Probability of Reorganizing under Limited Liability
When Firms Move Up by a Size Class

Size class by number of owners in 1993	Mean Change in Predicted Probability		
	<i>LLC</i>	<i>LLP</i>	<i>Either</i>
1-2	1.3%	6.4%	7.7%
3-4	4.6	15.6	20.2
5-8	4.8	16.5	21.3
9-16	-0.1	14.3	14.2
17-83	-6.5	9.5	3.0
84+	—	—	—

Notes: Sample corresponds to Table B.1, row 9. Firms in 1993 with 84+ owners are in the top class of the size distribution.

Table 8:
Regression of Percentage Growth in Owners, 1993-1999

<i>Covariate</i>	<i>Parameter Estimate (Standard Error)</i>
Constant	2.293*** (0.829)
3-4 owners in 1993	-3.475*** (0.871)
5-8 owners in 1993	0.359 (1.872)
9-16 owners in 1993	-0.069 (2.987)
17-83 owners in 1993	2.649 (3.646)
84+ owners in 1993	9.613*** (3.105)
Reorganized as LLC as of 1999	25.76*** (8.55)
Reorganized as LLP as of 1999	24.21*** (4.09)
3-4 owners*Reorganized as LLC	-4.413 (7.511)
5-8 owners*Reorganized as LLC	-21.04*** (9.28)
9-16 owners*Reorganized as LLC	-18.55* (10.30)
17-83 owners*Reorganized as LLC	-30.34*** (10.31)
84+ owners*Reorganized as LLC	-31.58*** (8.41)
3-4 owners*Reorganized as LLP	-0.072*** (4.092)
5-8 owners*Reorganized as LLP	-8.727** (4.082)
9-16 owners*Reorganized as LLP	-14.02** (6.94)
17-83 owners*Reorganized as LLP	-13.72** (5.90)
84+ owners*Reorganized as LLP	-18.31** (7.71)
Number of states in 1993	-0.125 (0.791)
Controls for state of home office in 1993	Included but not reported
<i>Other Statistics</i>	
Number of observations	11,174
R squared	0.0361
F statistic for the hypothesis that each pair of LLC and LLP parameters is equal	5.64
Degrees of freedom for this test	6, 11105
F statistic for the hypothesis that all parameters on state controls are zero	2.31
Degrees of freedom for this test	50, 11105

Notes: Sample corresponds to Table B.1, row 9. * denotes statistical significance at the 10% level, ** at 5%, and *** at 1%. Standard errors are heteroscedasticity-robust.

Figure 3

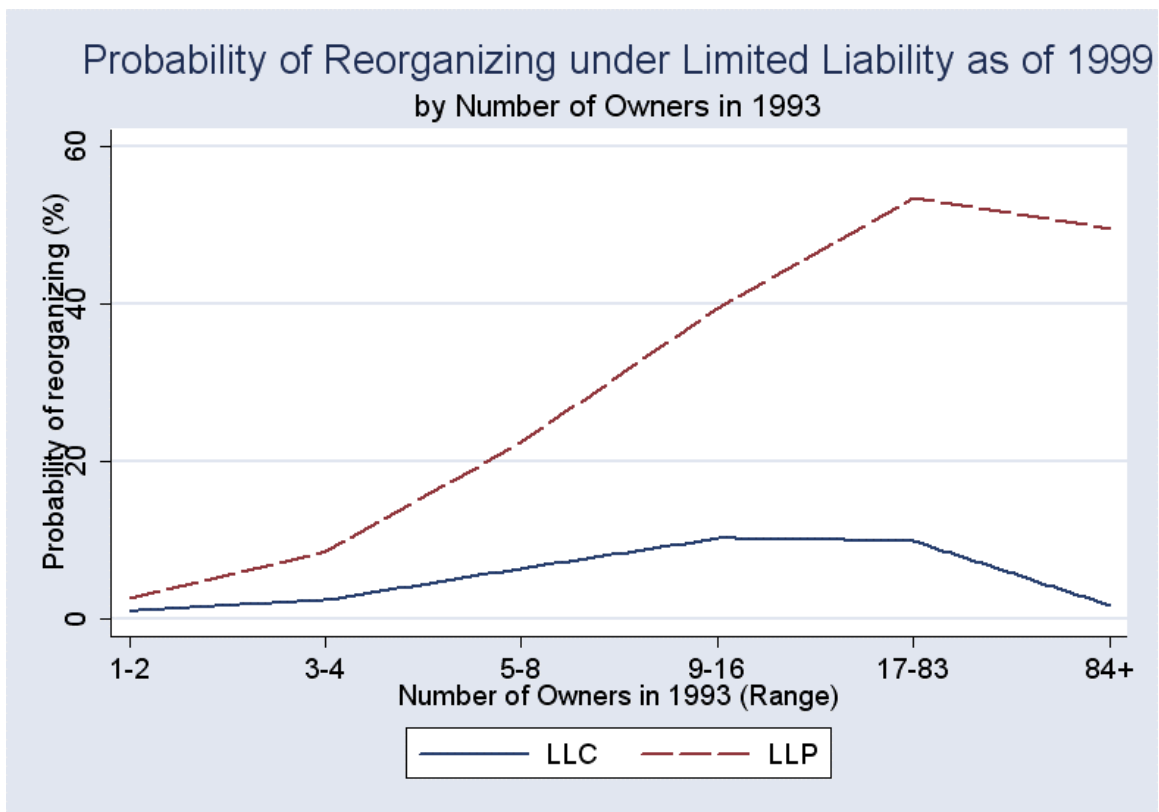


Figure 4

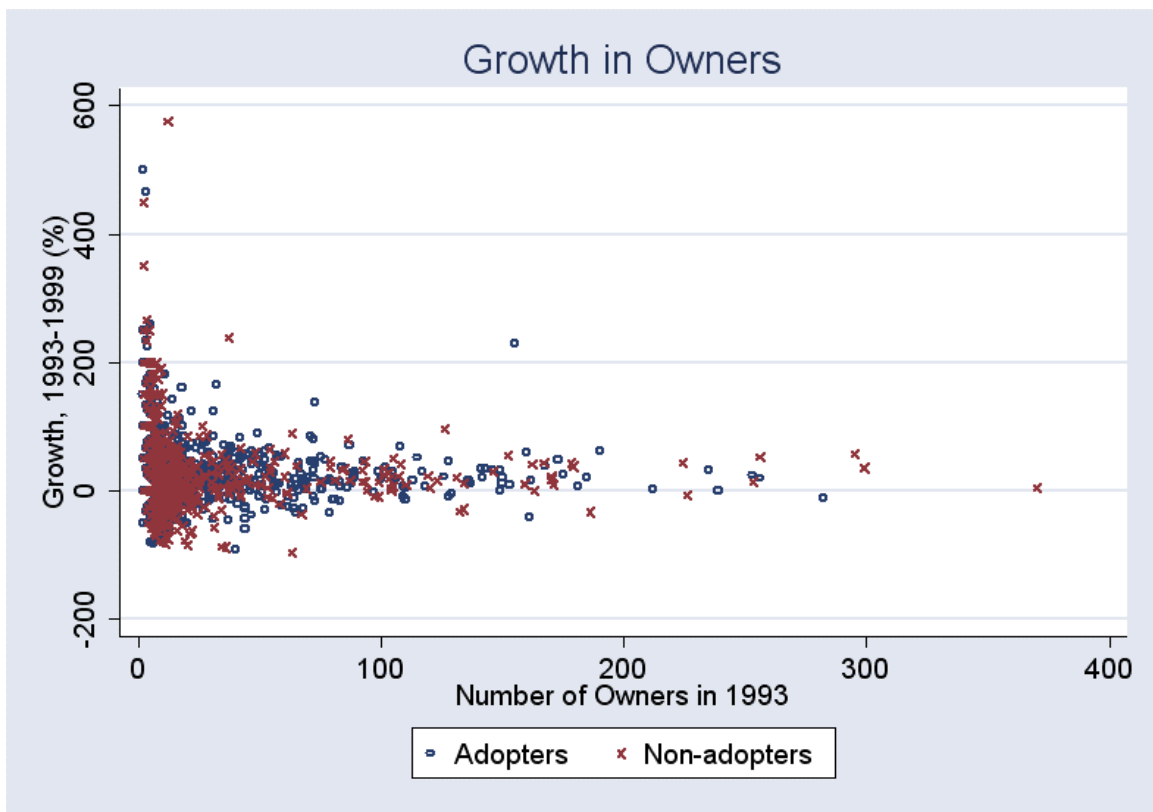


Figure 5

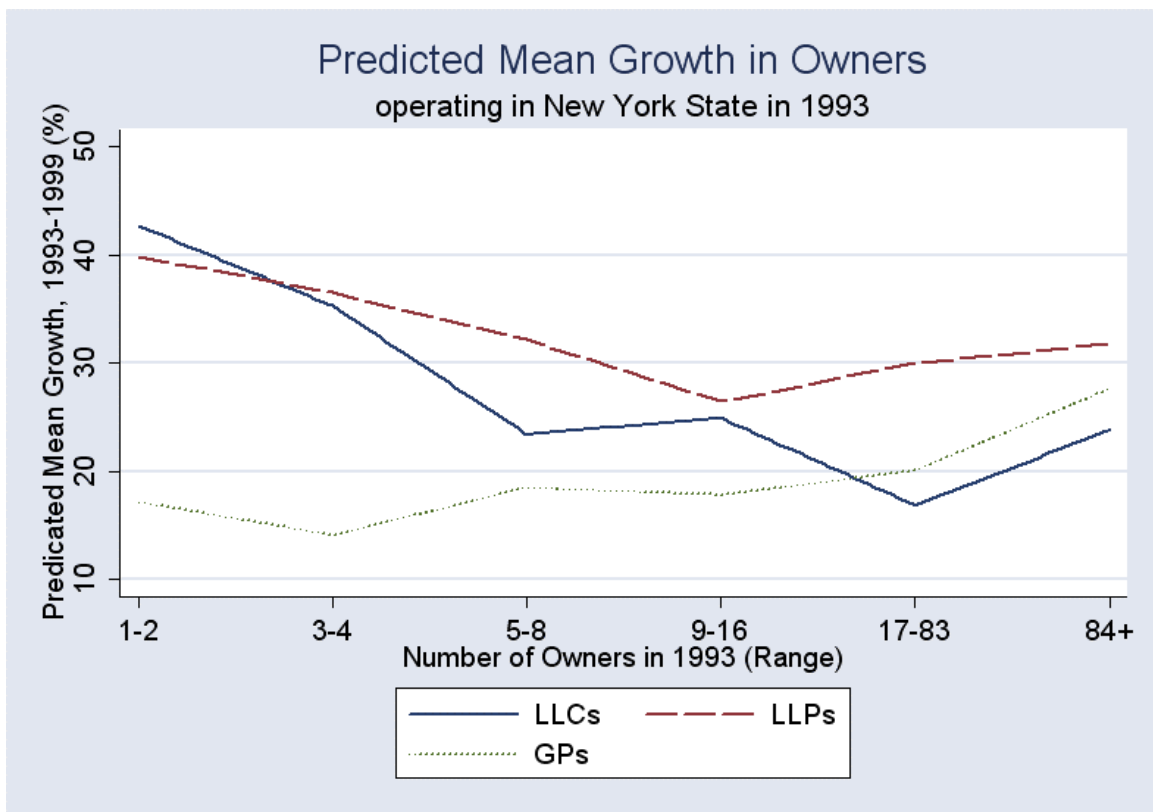


Table B.1:
Tracing the Development of the Analytical Data Set

<i>Row</i>	<i>Sample</i>	<i>1993</i>	<i>1999</i>
1	Firms inclusive of potential sole practitioners	236,099	265,713
2	Excluding potential sole practitioners	65,620	65,999
3	Excluding firms with no lawyers	61,389	65,143
4	Excluding firms with no owners	60,486	64,357
5	Excluding firms of dubious form	60,424	64,204
6	Firms matched by name and location across years	23,812	
7	Matched firms excluding known intertemporal overlinkages	23,641	
8	Excluding firms based in states that didn't permit LLCs or LLPs as of 1999	23,098	
9	Analytical sample, including 1993 GPs that operated as GPs, LLCs or LLPs in 1999	11,174	

Table B.2:
Measures of Firm Size

<i>Statistic</i>	Number of lawyers		Number of owners		Number of offices		Number of states	
	<i>1993</i>	<i>1999</i>	<i>1993</i>	<i>1999</i>	<i>1993</i>	<i>1999</i>	<i>1993</i>	<i>1999</i>
Mean	5.41	5.75	3.61	3.81	1.17	1.16	1.07	1.06
Standard Deviation	19.40	22.93	9.17	10.81	0.65	0.66	0.40	0.36
Median	2	2	2	2	1	1	1	1
Minimum	1	1	1	1	1	1	1	1
5 th percentile	1	1	1	1	1	1	1	1
25 th percentile	1	1	1	1	1	1	1	1
75 th percentile	4	4	3	3	1	1	1	1
95 th percentile	15	15	10	10	2	2	1	1
Maximum	996	1143	370	511	22	24	15	14

Note: Sample corresponds to row 4 in Table B.1.

Table B.3:
Number of Law Firms
by Broad Organizational Form in 1993 and 1999

<i>1999 firms → 1993 firms ↓</i>	<i>PC/PA</i>	<i>LLC</i>	<i>LLP</i>	<i>GP</i>	<i>SP</i>	<i>In 1999 sample</i>	<i>Not in 1999 sample</i>	<i>Total in 1993</i>
<i>PC/PA</i>	8,262	27	23	75	20	8,407	11,415	19,822
<i>LLC</i>	0	14	0	0	0	14	12	26
<i>LLP</i>	2	0	104	0	1	107	155	262
<i>GP</i>	554	326	1,250	9,913	522	12,565	12,366	24,931
<i>SP</i>	252	10	10	554	1,722	2,548	12,664	15,212
<i>In 1993 sample</i>	9,070	377	1,387	10,542	2,265	23,641	36,612	60,253
<i>Not in 1993 sample</i>	21,464	1,979	3,205	9,646	4,098	40,392	—	—
<i>Total in 1999</i>	30,534	2,356	4,592	20,188	6,363	64,033	—	—

Note: Sample is consistent with row 7 in Table B.1. The number of firms in both the 1993 and 1999 samples is 23,641.