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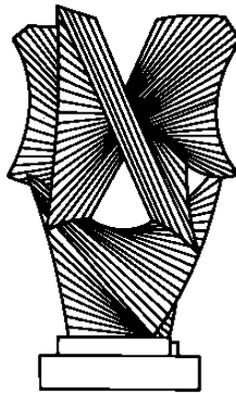
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**Specialization, Firms, and Markets:
The Division of Labor Within and Between Law Firms**

Luis Garicano*
Thomas N. Hubbard**

November 2003

Abstract

What is the role of firms and markets in mediating the division of labor? This paper uses confidential microdata from the Census of Services to examine law firms' boundaries. We find that firms' field scope narrows as market size increases and individuals specialize, indicating that firms' boundaries reflect organizational trade-offs. Moreover, we find that whether the division of labor is mediated by firms differs systematically according to whether lawyers in a particular field are mainly involved in structuring transactions or in dispute resolution. We then analyze which types of specialists tend to work in the same firm and which tend not to do so. Our evidence leads us to eliminate risk-sharing as an important determinant of firms' field boundaries, and narrows the set of possible monitoring or knowledge sharing explanations. Our findings show how the incentive trade-offs associated with exploiting increasing returns from specialization help lead the structure of the industry to be fragmented, but highly-skewed.

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1. Introduction

As economists since Adam Smith have observed, individuals tend to become more specialized as the size of the market increases. Once individuals specialize, economic institutions become necessary to mediate relationships among them. When is the division of labor efficiently mediated by firms? When is it efficiently mediated by markets? In addressing these questions, we seek to illuminate the role firms and markets play in the organization of human capital. This organizational issue has become increasingly salient as service sectors' share of developed economies has grown, because these sectors tend to be human capital-intensive.¹

This paper investigates the determinants of law firms' field boundaries. Our analysis relies on law office-level data collected by the Bureau of the Census. A key question in the survey form law offices receive asks how many lawyers in the office specialize in each of 13 areas of the law. This question provides evidence not only on law firms' scope, but also on the scope of individual lawyers' expertise. It allows us to examine patterns of individual specialization, how specialists are organized into firms, and relationships between the two: how does the division of labor across individuals affect the division of labor across firms? The data provide us a rare opportunity to empirically investigate the organization of human capital, and study the role of firms in facilitating specialization.

We employ two empirical approaches. The first approach investigates whether and how firms' boundaries are sensitive to the division of labor. We investigate whether lawyers field-specialize more as market size increases, and if so whether the share of lawyers working in field-specialized firms increases as well. This provides evidence regarding whether law firms' boundaries reflect only the distribution of individual clients' demands, or reflect organizational trade-offs: whether firms or markets best mediate relationships between lawyers. If organizational trade-offs are irrelevant, then firms' boundaries should be insensitive to the division of labor; thus, the share of lawyers working in field-specialized firms should not increase with market size, even if the share of lawyers that field-specialize does. Finding instead that both the share of lawyers that field-specialize and the share of lawyers working in field-specialized firms increases with market size is consistent with the hypothesis that organizational

trade-offs affect firms' boundaries. To ensure that our estimates capture the effects of market size rather than differences in the composition of demand, this approach focuses only on small, relatively isolated geographic markets.

The second approach examines which types of specialists tend to work in the same firm and which tend not to do so. Unlike the first approach, it provides no evidence on how firms' boundaries change with the division of labor, since individuals' fields are held constant. But it provides more detailed evidence with respect to law firms' field composition. We use this evidence to examine various hypotheses regarding what drives organizational trade-offs with respect to firms' boundaries: if law firms' boundaries reflect Coasian organizational trade-offs, what is the nature of such trade-offs? These hypotheses focus on the benefits and costs of revenue-sharing arrangements. In particular, we consider the possibility that law firms' field boundaries reflect variation in the value of knowledge-sharing, risk-sharing, and monitoring costs.

Results from the first approach indicate that both the share of lawyers that field-specialize and the share of lawyers that work in field-specialized firms increase as market size increases. This is evidence that firms' boundaries sometimes narrow as market size increases and individuals specialize. It is inconsistent with the proposition that firms' boundaries reflect only the distribution of clients' demands, and consistent with the hypothesis that they are shaped by organizational trade-offs: whether firms or markets best mediate relationships between lawyers. We find that this relationship differs systematically across business-oriented fields according to whether clients primarily demand expertise in the process of structuring transactions ("ex ante" fields) or in the process of resolving disputes revolving around existing contractual relationships ("ex post" fields). We do not find that firms' boundaries narrow as individuals specialize in ex ante fields: as lawyers specialize more in ex ante fields such as corporate law, there is little evidence that relationships between them and lawyers in other fields are increasingly mediated by markets rather than firms. In contrast, our evidence suggests that firms' boundaries narrow as lawyers specialize in ex post fields: fields such as insurance law tend only to be covered in the same firm as other fields when insurance law and other fields are covered by the same lawyer.

¹ In the U.S., the service sector's share of GDP (not including financial services) increased from 12% to 22% between 1970 and 2000; this sector is currently about 40% larger than manufacturing. In contrast, manufacturing's share fell from 24% to 16% during this time. See *Economic Report of the President*, February 2002, p. 336.

Our evidence from individual-oriented fields is similar to that from the ex post business fields: firms' boundaries tend to narrow as lawyers specialize in fields such as criminal and domestic law.²

Although our main results use data from only small, relatively isolated geographic markets, we also show that our results persist when we use our full sample, which includes large cities and suburbs in the analysis as well. Furthermore, we show that the patterns we uncover are robust to controlling for differences in firm size.

Results from our second approach indicate several patterns in law firms' field scope. We find that lawyers in ex ante fields that serve business demands tend to work at the same firm as lawyers in any of the ex ante business fields, and tend not to work at the same firm as lawyers in either ex post business fields or fields that serve individual demands. For example, specialists in corporate law tend to work at the same firm as specialists in real estate law, but not specialists in insurance or criminal law. There are two exceptions to this general pattern. One is that patent lawyers generally do not work at the same firm as specialists in other ex ante business fields. The other is that probate lawyers, specialists who serve individual clients, tend to work at the same firm as ex ante business specialists. For example, the scope of firms that have corporate or real estate specialists generally tends not to include patent law but does tend to include probate law, accounting for patent and probate lawyers' share of the industry overall. Finally, we find that lawyers are more likely to work at the same firm with other lawyers in the same field than in any other field.

This second set of results leads us to eliminate risk-sharing as an important determinant of firms' field boundaries, and narrows the set of possible monitoring or knowledge sharing explanations. Neither risk-sharing theories nor monitoring theories that emphasize fields' cognitive closeness can explain why ex ante business fields tend to be found in the same firm. These fields have positively correlated demands, but some of them draw from substantively different bodies of the law. In contrast, monitoring theories in which shared client knowledge lowers specialists' costs of monitoring each other are consistent with these patterns, though they require additional elements to explain the split between ex ante and ex post business fields. The

² The result that law firms' field boundaries tend to narrow as market size increases is related to Holmes' (1999) finding that manufacturing firms' vertical boundaries tend to narrow as market size increases. Our paper differs sharply from Holmes' in many ways, particularly in its emphasis on the specialization of individuals, organization-theoretic trade-offs, and its analysis of firms' horizontal rather than vertical boundaries.

same is true for theories where the benefits of organizing lawyers within a firm rest on facilitating the sharing of client-specific knowledge. Finally, theories in which organizing lawyers within a firm facilitates referrals – the exchange of knowledge about economic opportunities – can explain most of the patterns that we uncover with respect to firms’ field scope. They may also be consistent with the fact that specialists in the same field tend to work with each other, if lawyers “subspecialize” within fields or face time constraints, although this fact may have other explanations as well.

Beyond deepening our knowledge of the role of firms in human capital intensive contexts, our findings help illuminate several other issues, traditionally addressed by different literatures. First, our findings on the horizontal scope of firms have bearing on the determination of industry structure, a key concern of the industrial organization literature.³ Second, an understanding of the effect of market size in the organization of work and the horizontal division of labor is key to the study of the sources of agglomeration effects in cities and their role in economic growth, a concern of the new urban economics literature.⁴ Third, our empirical evidence illuminates the grouping of task types into jobs and of jobs into firms in law firms and, as such, is of interest to the recent labor economics literature dealing with the problems of the breadth of task assignment and of job design.⁵ Finally, understanding the sources of the trade-offs involved in the coordination of specialists is relevant to the growth literature that, building on Smith and Young (1928), investigates the determinants of specialization and the impact of specialization on economic growth.⁶

The rest of the paper is organized as follows. Section 2 discusses Coasian and non-Coasian views of firms’ boundaries, relates them to our context, and describes our general empirical approaches. Section 3 presents the data. Section 4 presents results from our first empirical approach, which investigates whether and how firms’ boundaries change with the division of labor. Section 5 presents and discusses results from our second empirical approach, which analyzes patterns in firms’ field composition. Section 6 concludes.

³ Sutton (1991, 1998).

⁴ See e.g. Glaeser et al (1992), Lucas and Rossi-Hansberg, (2002).

⁵ See e.g. Holmstrom and Milgrom, (1991), Olsen and Torsvik, (2000).

⁶ See e.g. Romer (1986, 1987).

2. Understanding the Boundaries of the Law Firm

2.1. Law Firms and the Scope of Client Demands

A prevailing view of the scope of law firms is that it is *client-centered*. Support for this view can be found in Heinz and Laumann's (1982) study of the Chicago bar.⁷ This study, which is perhaps the leading sociological analysis of the organization of professional services, stresses how the type of client served shapes the organization of legal services. Heinz and Laumann conclude that the bar is divided in two "hemispheres" that correspond to client type: the corporate bar and the individual bar. Lawyers in these two hemispheres are so distinct in their training, practice, and socio-economic characteristics so as to be considered within different professions (1982:174). These authors conjecture that this division of the bar's social structure is reflected by a sharp distinction between law firms that serve corporate and individual clients; those that serve corporate clients do not serve individual clients and vice-versa. Within each of these "hemispheres," and particularly in the corporate one, lawyers will tend to specialize, but the firm will "feel the pressure to serve a broad range of the demands of the firm's clients" (1982:131).

An analogous, demand-centric view of firms' scope exists within the industrial organization literature as well. This view posits that scope economies can be demand-based, derived from "one-stop-shopping" economies. A precise modern statement of this view holds that in the presence of *shopping costs*⁸ multiproduct firms exist to "offer a variety of products at a single destination" (Klemperer and Padilla, 1997:472).⁹ The scope of the firm is then shaped by firms' desire to capture externalities between product lines due to these shopping costs. As applied to legal services, this view has implications that are similar to the sociological view depicted above: law firms' scope should reflect only the scope of clients' needs, and not problems associated with mediating relationships between lawyers.

An implication of these demand-centric views is that firm scope should not change as market size increases if the composition of demand is held constant. If firms' scope simply

⁷ The study is based on hour long interviews with 777 Chicago lawyers. Being the first in-depth study of a profession, it is now considered a classic in sociology.

⁸ Shopping costs are the real or perceived costs of using additional suppliers (Klemperer (1992)).

⁹ Strategy researchers have also argued that offering demanders one-stop-shopping is a particular advantage of broad scope (e.g. Porter (1985)).

reflects the scope of individual clients' demands, doubling market size by simply replicating the demands of existing clients should not affect firms' scope, since replicating demands does not alter the scope-distribution of clients' demands.

2.2. Organizational Trade-offs and Law Firm Boundaries

Since Coase (1937), economists have viewed firms and markets as alternative institutional structures through which economic activity is coordinated. Whether firms or markets efficiently mediate the division of labor, and thus best promote specialization, depends on which structure minimizes transaction costs. Modern theories of organization have since built from Coase by proposing what differentiates transacting within versus between firms, then analyzing the trade-offs associated with using firms and markets. While the details of these theories differ, they share the Coasian view that firms' boundaries reflect *organizational trade-offs*; in this context, that they reflect whether relationships between lawyers are best mediated within firms or by markets. What distinguishes this view from the demand-centric views above is that it emphasizes that firms' boundaries are determined not by demand patterns (e.g., whether clients find expertise in different fields complementary), but by how relationships between suppliers are best organized.

The Coasian logic suggests a natural way for investigating whether organizational trade-offs affect firms' boundaries: examine whether firms' boundaries narrow as market size increases and individuals become more specialized. We depict this in Figure 1. Suppose one can partition knowledge into fields of expertise. The dashed lines depict the scope of individuals' expertise, and the solid lines depict how individuals are grouped into firms. In the Figure, one individual covers both field A and other fields in small markets but different individuals cover field A and other fields in large markets. As market size increases, individuals specialize in field A.

When a single individual covers both field A and other fields, the scope of his or her firm includes field A and other fields. Organizational trade-offs, which appear only when different individuals cover field A and other fields, do not affect whether the firm's scope includes field A and other fields. Firms' scope tends to be broad because individuals cover multiple fields. But once individuals specialize, firms' scope depends not just on the range of individuals' expertise, but also on whether firms or markets mediate the division of labor efficiently. When firms do,

firms' boundaries should not change as individuals specialize. When markets do, firms' boundaries should narrow. In the Figure, if markets efficiently mediate relationships between individuals in field A and other fields, then firms' scope should include field A and other fields only when these fields are covered by the same individual.

One can therefore test whether organizational trade-offs affect firms' boundaries by examining whether firms' boundaries change with increases in the size of demand, holding constant the distribution of demands. If organizational trade-offs associated with the division of labor do not affect firms' boundaries, then firms' boundaries should not narrow as market size increases and individuals specialize. This is the case when, as depicted in the previous subsection, firms' boundaries merely mirror the distribution of demands of individual demanders. Finding instead that firms' boundaries narrow as individuals specialize is therefore evidence that organizational trade-offs associated with the division of labor affect firms' boundaries.¹⁰

2.3 Law Firms' Boundaries: The Benefits and Costs of Ex Ante Revenue Sharing Arrangements

Regardless of their legal form of organization, law firms in the U.S. are always structured around "ex ante" revenue-sharing arrangements among the firm's partners, i.e. arrangements that are in place before individuals obtain information about specific economic opportunities, and have the feature that all individuals receive some share of revenues from the services any of them supply (although the share the involved individuals receive may be higher). Firms' horizontal scope reflects the fields that partners cover. From the perspective of the partnership, whether a field is covered by the firm is equivalent to whether an individual with expertise in the field is included in the revenue-sharing arrangement. Thus, when discussing the organizational trade-offs with respect to law firms' scope, we emphasize the benefits and costs associated with ex ante revenue-sharing arrangements.¹¹

¹⁰ The idea that firms' boundaries may narrow as market size increases is not new to industrial organization. It is an implication in Stigler (1951) and was studied recently by Holmes (1999). The Coasian logic discussed here is not part of Stigler's or Holmes' analysis.

¹¹ We focus on issues that bear on revenue sharing arrangements' effect on firm scope. Revenue sharing arrangements may have other roles as well, such as encouraging the hiring of high-ability individuals (Levin and Tadelis (2002)). Similarly to Holmstrom and Milgrom (1994) and Holmstrom (1999), our account emphasizes how firms can outperform markets by weakening individual incentives. Because the trade-offs we investigate are different, so are our predicted relationships between specialization (job design) and optimal organizational form.

The production of legal services also involves the use of other resources such as office space, office equipment, libraries, or secretaries. Although scale economies exist with respect to these resources, it is common, though perhaps not costless, for them to be shared across lawyers in different firms when these resources would be otherwise underutilized.¹² This feature of the industry suggests that law firms' boundaries are shaped primarily by contractual trade-offs rather than technological trade-offs, consistent with the view taken by the economics of organization literature. Our analysis will thus focus on contractual issues rather than scale or scope economies associated with inputs other than lawyers' human capital. Nonetheless, we will show that our main results are robust to controlling for firm size (i.e., the number of lawyers), indicating that they are not driven by scale-related effects.

a. Knowledge Sharing

An important problem created by specialization is the need for individuals with different expertise to share knowledge. This knowledge could be about the existence of economic opportunities or it could concern expertise relevant to addressing a client's legal problem.

Consider first the problem of sharing knowledge about the existence of an opportunity between lawyers with different expertise. A lawyer who knows that a particular client has a legal problem may conclude that she herself has a comparative advantage in addressing this problem or, alternatively, she may determine that some other lawyer is better qualified to deal with the problem. In the latter case, she must refer it to another lawyer, potentially losing the rents that could be derived from serving the client herself.

This problem was studied by Garicano and Santos (2003). They note that information asymmetries favor those who have private information about opportunities, regardless of whether firms or markets mediate relationships between individuals. Giving away this information is equivalent to giving up rents. As a result, referrals take place under some incomplete information, with an informational asymmetry that favors the referrer. In this context, *ex ante*

We do not address other incentive problems, such as those deriving from the risk of expropriation of specific investments (Klein, et al. (1978)) or to the role of physical assets in providing incentives in the presence of incomplete contracts (Grossman and Hart (1986), Hart and Moore (1990)), which may be more important in other environments.

¹² Results from the Heinz and Nelson survey described below report that most sole practitioners share office space, copying machines, libraries, and other fixed inputs with lawyers in other firms.

revenue sharing arrangements facilitate the exchange of referrals. When firms mediate relationships between individuals, individuals share revenues regardless of who supplies the service. In contrast, when markets mediate such relationships, individuals with private knowledge about an opportunity only share revenues with others if a referral actually takes place.¹³ Individuals' incentives to hold on to problems that others have a comparative advantage in solving are weaker when firms mediate relationships than markets, because they share revenues even when no referral takes place.

Ex ante revenue sharing arrangements effectively *tax* individuals when they hold on to opportunities themselves, thus weakening their incentives to hold on to opportunities for which they are not best qualified to serve. Thus, one benefit of partnership-like arrangements – the benefit of transacting “within a firm” – is that they improve the efficiency of the exchange of referrals relative to alternative organizational structures.

A similar logic implies that ex ante revenue-sharing arrangements also facilitate the exchange of substantive knowledge among specialists, such as legal expertise or knowledge about clients. Again, incentive problems can arise from the exchange of knowledge because when lawyers share knowledge with one another, they reduce their future value to clients relative to those with whom they share it. Revenue sharing arrangements facilitate the exchange of knowledge for two reasons. First, the receiver of knowledge shares with the transmitter a share of his future revenues, so that the sender benefits in the future from the more extensive knowledge of the receiver. Second, the sender shares with the receiver his present and future revenues, thus diminishing the extent to which he appropriates returns from his own use of this knowledge. Revenue sharing arrangements increase the extent to which the sender benefits when others use his knowledge relative when he uses it himself.

It follows that lawyers should be more likely to work within the same versus different firms, the more valuable knowledge sharing – referrals or collaboration -- is. Thus, lawyers in fields across which knowledge-sharing is valuable should be more likely to be found within the same firm than those in fields across which knowledge-sharing is less valuable.

b. Risk Sharing

¹³ Lawyers in different firms are generally allowed to compensate each other for referrals as long as the terms are disclosed to clients. This is unlike the medical profession, in which compensation for referrals is (nominally) prohibited.

An alternative view of the benefits of revenue-sharing arrangements is that they facilitate risk sharing among specialists. This is proposed by Gilson and Mnookin (1985). In this view, revenue sharing arrangements insure lawyers against fluctuations in demand for their expertise. It follows that such arrangements would be particularly valuable for lawyers in fields where demands are negatively correlated, and least valuable for lawyers in fields where demands are highly positively correlated.

c. Free Riding and Monitoring

The general drawback to revenue-sharing arrangements, the drawback to transacting within firms in this context, is that free-rider problems emerge. Individuals do not appropriate the full value of their efforts under such arrangements, and this weakens effort incentives. (Alchian and Demsetz (1972), Holmstrom (1982)) Revenue-sharing arrangements could weaken lawyers' incentives to do high-quality work. The agency costs associated with such arrangements are one reason firms' boundaries might narrow as market size increases and individuals specialize.

Partnerships have other incentive instruments in addition to revenue-sharing arrangements, such as bonuses. If used effectively, these instruments can mitigate free-rider problems to some extent, and thus decrease the cost of transacting within firms. Using these effectively, however, requires that lawyers be able to assess each others' output. Because of this, all of these incentive instruments tend to become less useful as specialization increases, since agents' expertise overlaps less. As lawyers become more specialized, the cost of transacting within firms tends to increase. This would be particularly the case when different lawyers specialize in fields where the fundamental legal doctrines have little overlap if this makes it difficult for them to assess each others' work. An implication is that, other things being equal, lawyers in fields with strong cognitive connections should be more likely to work in the same firm than those with weak connections, since the monitoring cost of transacting within firms is lower.

2.4. Empirical Strategy and Implications

We provide empirical evidence with respect to whether these sources of variation affect firms' boundaries in two ways. One extends the exercise described above: we analyze *how* firms' boundaries narrow as market size increases and individuals become more specialized. Specifically, we determine which fields tend to be covered in the same firm as other fields only

when they are covered by the same individual – that is, for which specialties the pattern looks like the top rather than the bottom in Figure 1. Once individuals specialize in these fields, they tend to work in field-specialized firms. Relationships between them and specialists in other fields tend to be mediated by markets, not firms. The other approach simply assesses which pairs of specialists tend to work in the same firm with one another versus not. Unlike the approach described above, this holds individuals' fields constant, and thus provides no evidence on whether changes in the division of labor are associated with changes in firms' boundaries. But it provides additional evidence with respect to the scope of non-specialized firms. Returning to Figure 1, while the first approach could detect whether specialists in field A work in the same firm as specialists in other fields, it could not detect *which* other fields. Evidence on which specialists work at the same firm as individuals in field A and which do not sheds some light on whether firms' scope corresponds to variation in the value of knowledge sharing, risk sharing, and monitoring costs.

This evidence will narrow the set of possible organization-theoretic explanations of law firms' field boundaries. If firms' boundaries are primarily driven by risk-sharing benefits, one would expect fields that differ sharply in their client base to be more likely to be found within the same firm than fields with similar client bases. In fact, we will find the opposite. We will also be able to distinguish among various explanations in which firms' scope is driven by knowledge sharing or monitoring cost considerations. In particular, we will use evidence from Heinz, et al (1998) on patterns of "co-practice" by individual lawyers – which combinations of fields lawyers cover – as an indicator of fields' cognitive connections. We then compare this evidence to ours. We will find several cases in which specialists who work in fields that do not have strong cognitive connections nevertheless are likely to work in the same firm, and interpret this as evidence against monitoring-based theories that revolve around fields' cognitive connections. We will then discuss other monitoring-based and knowledge sharing explanations, and describe the conditions under which they could explain the important patterns in our data. Distinguishing definitively among these remaining explanations probably requires direct evidence on monitoring, knowledge-sharing, and referral patterns across lawyers in different fields, evidence that our data do not provide.

3. Data

The data are from the legal services portion of the 1992 Census of Services. Like in other industries, the Census surveys individual establishments in this industry. Forms are sent to all law offices that surpass a size threshold (approximately ten employees) or that are part of multi-establishment firms. In addition, forms are sent to a random sample of smaller offices, where the sampling rate is set to obtain reliable MSA- and national-level estimates. In all, the Census sends survey forms to law offices that account for approximately 80% of revenues in the industry. Details are in Bureau of the Census (1996). The Census publishes MSA-level estimates derived from this survey in Bureau of the Census (1996). In this paper, we use establishment-level data, which are not publicly available.

Along with standard questions regarding revenues, payroll, and employment, the survey asks law offices industry-specific questions that provide detailed information about the distribution of lawyers across fields of the law. (See Appendix 1.) It asks respondents to classify the lawyers that work in the office by their primary field and report how many are in each category: how many lawyers at the establishment specialize in corporate law, for example. When lawyers work in multiple fields, they are classified as “general practitioners.” The survey thus provides unusually detailed information about organization and specialization at the establishment level. We use data from 1992 because it is the most recent year for which the Census asks about lawyers’ fields.

In all, the Census received responses to these organizational questions from about 28,000 law offices. We omit from our sample law offices with inconsistent responses for the total number of lawyers; for example, those where the number of lawyers summed across fields does not equal the number of partners plus the number of associates. Omitting these offices, our “full sample” includes 26,151 law offices and 219,033 lawyers. These constitute about 17% of law offices and 50% of privately-practicing lawyers in the United States in 1992.

Table 1 contains some summary statistics. The average law office has 3.56 lawyers, and the average firm has 3.65 lawyers, a reminder that the average law firm in the U.S. is a very small, single-establishment enterprise. 71% of the lawyers in our sample are reported to specialize in one of the Census-defined fields. 37% of law offices and 28% of firms are specialized, in the sense that all lawyers in the office or firm specialize in the same field. 28% of lawyers work in multiestablishment firms, but only 5% of offices are part of multiestablishment

firms. Although only 2% of the law firms in our sample have multiple locations, those that do are much larger than most single establishment firms.

Table 2 provides a more detailed look at specialization patterns. We report these patterns for each of the Census-defined fields. To facilitate analysis both here and below, we present patterns for groups of fields that differ in the source and timing of demands. “Individual fields” are those where all or nearly all demand comes from individuals; in our data, these include criminal, domestic relations, negligence-plaintiff, and probate. We label the rest of the fields, fields where a substantial part of demand comes from businesses, as “business fields.” Within these groups, fields differ according to the timing of demands. We propose that demand for legal services can arise either before a contractual arrangement is agreed upon, when lawyers may be involved in drafting agreements and predicting the contingencies that agreements should address, or after contractual terms are agreed upon and take force, when lawyers may be involved in dispute resolution and litigation. We label these “ex ante” and “ex post” fields respectively. Among the business fields, we classify insurance and negligence-defendant as ex post fields, and the rest as ex ante fields. Expertise in insurance law is generally demanded to assess insurance claims or provide defense for parties covered by insurance. (Abrams (2000)) Expertise in negligence is demanded by defendants in tort-related matters. Among individual fields, we classify probate as ex ante and the rest as ex post.¹⁴

Survey data confirms these cross-field differences in the source and timing of demands. Table 3 reports results from an extensive interview-based survey (“Chicago Lawyers II”) of Chicago lawyers completed in 1995 by Jack Heinz and Bob Nelson of the American Bar Foundation.¹⁵ Questions in this survey ask privately-practicing lawyers what share of their time they spend on business, non-business organizational (e.g., governmental), and individual clients, and how many days per month they spend in state and Federal court. Days per month in court is a good indicator for the degree to which lawyers provide “ex ante” or “ex post” services. We

¹⁴ We report these together in Table 2 because there is only one ex ante individual field.

¹⁵ These data were collected as a follow-up project to Heinz and Laumann (1982). Heinz and Nelson surveyed a random sample of Chicago-based lawyers taken from the State of Illinois’ lawyer registration records. They collected the data by conducting one-hour interviews with subjects at their offices. In all, 788 lawyers from this random sample were interviewed, 526 of whom were in private practice. See Heinz, et. al. (1998) for more details. We are extremely grateful to Jack Heinz and Bob Nelson for sharing their data.

report the average response for fields that closely match those defined in the Census data.¹⁶ The table indicates a sharp break in the share of time lawyers in different fields spend on business clients. Specialists in personal injury (on the plaintiff's side of the bar), criminal, divorce, and probate law spend almost all of their time on individual clients. The rest (except specialists in municipal law, which predominantly have governmental clients) spend the majority of their time on business clients. Likewise, personal injury, criminal, and divorce specialists spend more days in court than lawyers in any of the other specialties, consistent with the idea that demands for expertise in these fields tend to be more "ex post" than other fields. Although the number of observations is very low, probate specialists appear to spend less time in court than other specialists that serve individual clients, reflecting that the demand they face tends to be more for "ex ante" services.

The first column of Table 2 reports the share of lawyers in each of the Census fields and groups of fields. 27% of lawyers specialize in an "ex ante" business field; about a third of these are corporate law specialists. 13% specialize in an "ex post" business field. 15% specialize in an individual field; about half of these are classified as "negligence-plaintiff." The second and third columns report the share of lawyers working in specialized offices and firms, by field. These figures are very similar because individual offices within large multi-establishment firms are generally not specialized by field: if a multi-establishment firm contains lawyers in different specialties, its offices usually do as well. The final column reports the fraction of specialists that work in specialized firms, by field. The notable pattern here is that, with the exception of patent lawyers, ex ante business specialists are less prone to work in a specialized firm than ex post business or individual specialists. Over a third of ex post specialists and nearly half of individual specialists work at specialized firms, but less than 20% of ex ante specialists do. The lowest fraction among the fields is for corporate law: only 5% of corporate law specialists work at firms with only corporate law specialists.

¹⁶ Even these do not always match perfectly. For example, the Chicago Lawyers II survey does not include a separate category for "insurance law," but the Census data does. Jack Heinz reported to us that he believes that most of those reporting "insurance law" to the Census would classify themselves in the Chicago Lawyers II survey as "personal injury-defendant." Fifteen lawyers in the Chicago Lawyers II report themselves to be specialists in "securities;" these lawyers would probably be classified as "corporate" in the Census data. These lawyers' responses to the time allocation and days in court questions are very similar to the "general corporate" lawyers reported in Table 1.

Table 2 thus provides some initial evidence regarding firms' scope. This evidence, however, does not indicate that firms' boundaries are sensitive to the division of labor: the fact that ex post business and individual specialists are more likely to work in field specialized firms than most ex ante business specialists may just reflect differences in the scope of clients' demands. Furthermore, it provides no evidence on the scope of non-specialized firms: with which other lawyers do lawyers in ex ante business specialties work? Sections 4 and 5, which present the main empirical analysis in the paper, provide evidence on these fronts.

The Size and Distribution of Demand

In Section 4, we examine whether firms' boundaries change with increases in the size of demand, holding constant the distribution of demands: the exercise that corresponds to Figure 1. We merged our office-level Census data with data from 1992 County Business Patterns to obtain controls for cross-sectional differences in the distribution of demand. County Business Patterns (CBP) provides county-level information regarding the distribution of employment across industries and the employment size distribution of establishments. We compute employment shares for each of seven major (one-digit) industries (e.g., manufacturing) for each county; although information is available for more detailed industry definitions for many counties, the Census withholds more detailed data in many cases because of confidentiality-related restrictions.¹⁷ We also compute the share of establishments within various employment size categories in the county, and an estimate of employees per establishment by major sector. We derive the latter by multiplying the size category shares by the midpoints of the employment size categories.

The CBP data provide information about the distribution and size of local demand for legal services. The employment shares characterize the local economy, and depict the extent to which local demand for legal services comes from different classes of firms: manufacturing versus financial services, for example. They also depict whether local demanders are small or large firms overall and within sectors. For example, counties where the average establishment size in financial services is large contain the country's most important financial districts. If the employment shares capture differences in the distribution of local demand well, one can think of

¹⁷ We have run specifications with two-digit controls, using imputations for county-sectors for which the Census does not report figures. None of the results differ from those reported below, that use one-digit controls.

increases in total employment, conditional on these shares, as *rotations* in the demand curve for legal services: proportionate increases in the various legal problems encountered by individuals and businesses located in the county.¹⁸

An important concern in our empirical work is that variation in county-level employment, conditional on our controls, captures differences in the size and not the distribution of demands faced by lawyers based in the county. This condition seems *a priori* more plausible in some contexts than others. It may be reasonable when comparing relatively small, isolated counties: to a first approximation, the demand for legal services in Lubbock, TX, which is about twice as large as Abilene, TX in terms of employment, may be simply two times that in Abilene. But agglomeration economies may mean that the demand faced by lawyers in very large cities is not just a “scaling up” of those faced by lawyers in very small cities; businesses may choose to locate in very large cities precisely because they require special services that are only available in such cities. Holding constant the employment shares described above, the demand faced by lawyers in Houston may not be simply 18 times that in Lubbock. Furthermore, the distribution of demands addressed by lawyers based in similarly-sized suburban and non-suburban counties may differ, if suburban clients are served by lawyers who are based in nearby cities.

We address this concern by basing this empirical exercise on a part of our sample where problems associated with agglomeration economies and market definition are relatively small: counties that are either part of single-county Metropolitan Statistical Areas (MSAs) as defined by the United States Census or that are not part of MSAs.¹⁹ The Census combines counties into a single MSA on the basis of their degree of economic and social integration. Restricting the analysis to counties that fit the above criterion eliminates all counties that are economically integrated with other, neighboring counties; it excludes all suburban counties and all but four of the 50 largest MSAs in the United States.²⁰ These four single-county MSAs – Honolulu, Las Vegas, San Diego, and Phoenix – are much larger than the rest of the single-county MSAs; we

¹⁸ Bresnahan and Reiss (1991) use rotations in the demand curve to identify relationships between competitive conduct and entry in concentrated markets. The main issues in this paper – the specialization of individuals and firms’ scope – play no role in their analysis. See also Campbell and Hopenhayn (2003).

¹⁹ The Census defines an MSA as “a core area containing a substantial population nucleus, together with adjacent communities having a high degree of economic and social integration with that core.” To qualify as an MSA, an area must have at least 50,000 population.

²⁰ The Census combines two counties into the same MSA if at least 15% of inhabitants of one commute to the other counties or at least 15% of employees in one commute from the other.

exclude these as well.²¹ A full list of the MSAs in our “small market subsample” is in Appendix 2. The counties in this subsample all relatively small and have a low level of economic integration with other counties. The largest of these is Tucson, AZ, which has 212,068 employees.

We examine the degree to which this sample restriction and our controls hold constant the field distribution of demands by exploiting an additional variable in our data. The Census asks offices to report the distribution of revenues by client type: what share of revenues come from individual clients, business clients, and government clients? We regress the share that comes from individual clients on county employment and our controls, weighting each office by the number of lawyers that work there. Finding that this fraction decreases with county employment would imply that our controls do not completely soak up market size-related differences in the distribution of demands: lawyers in larger markets handle disproportionately business and government demands. In contrast, finding no relationship between the “individual client share” and county employment would indicate that the distribution of revenues across clients stay constant with market size, thus lending support to the assumption that, conditional on our controls, the field distribution of demands more generally does not vary with county-level employment.

Table 4 contains the results from this exercise. The first three columns use the small market subsample. The first of these columns report coefficients from regressions that contain only a set of market size dummies and no controls. The coefficients on these indicate that the individual client share tends to fall with market size, even within the small market subsample. The second column includes our set of controls. All of the coefficients are small and none are statistically significantly different from zero. The fact that the coefficients decrease between the second and first column provides evidence that the controls pick up differences in the distribution of demands for legal services. The fact that the coefficients on the market size dummies are no longer statistically significant implies that, conditional on these controls, there is no evidence that the distribution of demands varies with county employment within this

²¹ There are two natural breaks in the employment size distribution of single-county MSAs. The four MSAs listed here all have more than 335,000 employees. There are no such counties with between 215,000 and 335,000 employees. There are then six (Albuquerque, NM; El Paso, TX; Fresno, CA; Lancaster, PA; Madison, WI; and Tucson, AZ) with between 170,000 and 215,000 employees, then none again with between 145,000 (Flint, MI) and

subsample. The third replaces the market size dummies with $\ln(\text{county employment})$; the coefficient on this variable is once again not statistically significantly different from zero. Looking only at our small market subsample, we find no evidence of a relationship between the individual client share and county employment once our controls are added, lending support to the assumption that the size, but not the distribution, of demands varies with employment when looking across these counties once we include these controls.

The other three columns repeat this exercise using the full sample. These results indicate a relationship between the individual share and employment that persists even after including the controls, particularly when comparing very large with smaller markets. This indicates that the distribution of demands varies with employment when using the full sample. This evidence shapes how we present and interpret the evidence from our first approach. While we will show that the patterns that we uncover within the small market subsample also appear when using the full sample, we will base inferences from our first approach on results from the small market subsample.

Other Issues

Several notable empirical issues remain, even when restricting the analysis to the small market subsample. One concerns market definition for lawyers working in multi-office firms. If lawyers in multi-office firms serve clients based in all of the regions in which their firm is located, using employment in the county in which the lawyer is based as a measure of market size understates the actual market the lawyer potentially serves, and could bias our estimates of relationships between specialization and market size. While this issue would appear to be relatively minor with respect to our small market subsample – only 10% of lawyers in this sample work at multi-office firms, and very few of the nation’s largest law firms have offices in these counties – we investigated it nonetheless. Following the approach described in a working paper version of this paper (Garicano and Hubbard (2003b)), we allowed market size to be a function of employment in all of the counties a lawyer’s firm has an office rather than just the county in which the office is located. There is no difference in our results when we do so. This is not a surprise, since the working paper version of this paper had shown that accounting for this

170,000 employees. The results reported below include the six counties with between 170,000 and 215,000 employees; they are virtually the same when excluding these six counties.

had little effect on the results when using our full sample – a sample that includes big-city law firms with sizeable networks of offices.

A second issue is that individuals as well as businesses demand legal services, and employment-based measures may not capture the size and distribution of individual demand well. Better measures of individual demand would be population- rather than employment-based, and demographic variables might capture certain demands well (for example, the demand for probate work should be higher in regions with many elderly residents). We have run specifications that use such controls. While some of the controls do help explain cross-market differences in specialization patterns, none of our results of interest – which concern relationships between specialization and market size – change when including these additional controls.²²

Finally, a third issue is whether our results persist when controlling for firm size. While this exercise is of empirical interest, it has an uneasy relationship with the organization-theoretic view we describe above. In this view, lawyers, not firms, are the units of production. Firms are viewed as one possible institution through which relationships among lawyers are governed. Firm size (e.g., the number of lawyers in the firm) is an outcome of organizational trade-offs, and all scale and scope economies are contractual in nature. In this light, firm size is not something to control for; rather, since firms' size in part reflects their scope, it is something that our analysis illuminates.

This is not the only possible view of firms, however. In neoclassical theory, firms are the unit of production, and some scale and scope economies (or diseconomies) are defined at the firm level.

Suppose that firm-level scale and scope economies are intertwined, so that it is only efficient for firms to be field-specialized if their scale is sufficiently high. For example, suppose it is inefficient for a two-lawyer firm to be field-specialized but more efficient for a seven-lawyer firm to be. Then if firms tend to be larger in larger markets, they would also be more field-specialized as well, but for reasons that need not have to do with Coasian organizational trade-offs.

²² We do not report these results here because they are very similar to those reported below, and releasing results from multiple, closely related specifications can raise disclosure issues for the Bureau of the Census.

We investigate this by examining whether the relationships we uncover between market size and the share of lawyers working in field-specialized firms persist when controlling for the number of lawyers in the office. If law firms' scope tends to narrow with market size only because of firm size effects, there should be no relationship between the share of lawyers working in field-specialized firms and market size once one controls for firm size. As we show later, we do not find this to be the case: if anything, relationships between the share of lawyers who work in field-specialized firms and market size become stronger once we control for the number of lawyers in the firm.

4. Market Size, Specialization, and Organization

4.1 Empirical Framework

The first step in our empirical work examines relationships between market size and the probability that lawyers specialize in one of the Census-defined fields. Our basic empirical framework for examining relationships between market size and individual specialization is simple. Let the probability that lawyer i in market j is a specialist of some sort be p_i , where:

$$p_i = f(X_j \beta_1)$$

X_j is a vector of observable characteristics of local market j and β_1 is a parameter vector. The coefficient on our proxy for local market size, county employment, will be of particular interest. We interpret variation in this variable, conditional on our controls for the distribution of local demand, as proportionate differences in the demand for the spectrum of services lawyers provide.

Our data are at the level of the law office rather than the lawyer. We thus estimate β_1 using the expression:

$$s_k = f(X_j \beta_1)$$

where s_k is the share of lawyers in law office k that are specialists of some sort, weighting each observation by the number of lawyers working at the law office. To make interpreting the coefficient estimates simple, we assume that f is linear, so:

$$s_k = X_j \beta_1 + \varepsilon_{1k}$$

This produces a grouped data analog to the linear probability model; β_1 can thus be interpreted as a probability derivative. It captures reduced-form relationships between specialization shares and market characteristics.

We estimate analogous specifications for particular fields and for groups of fields. These, for example, relate market size and composition to the share of lawyers who specialize in corporate law, or in any one of the ex ante business fields.

The second step in our empirical approach estimates specifications that relate the probability that an individual works at a field-specialized law firm to market characteristics.²³ Let p_i^{sf} denote the probability that an individual is a specialist and works at a field-specialized firm.²⁴ We specify:

$$p_i^{sf} = f(X_j\beta_2)$$

As before, because the unit of observation is the law office rather than individual, we estimate specifications based on the equation:

$$s_k^{sf} = f(X_j\beta_2) = X_j\beta_2 + \varepsilon_{2k}$$

where s_k^{sf} is the share of lawyers at office k who are in a specialized firm and we weight observations by the number of lawyers. Note that $s_k^{sf} = 0$ if lawyers at office k do not share the same field as all other lawyers in their firm and $s_k^{sf} = 1$ if they do; this is a discrete dependent variable model. As above, we estimate analogous specifications for individual fields and groups of fields.

Combined, β_1 and β_2 depict how much individual specialization increases with market size, and whether increases in the division of labor across individuals take place within or between law firms. They thus provide evidence regarding whether firms' scope merely reflects the scope of individual clients' demands. If $\beta_1 > 0$ and $\beta_2 = 0$, this indicates that although individuals specialize more as market size increases, the share of individuals working in field-specialized firms does not. This pattern corresponds to the upper arrow in Figure 1, in which firms' boundaries do not narrow as market size increases and individuals specialize. In contrast, if $\beta_1 > 0$ and $\beta_2 > 0$, this indicates that both the share of individuals who specialize and the share

²³ Very few lawyers work in field-specialized offices that are part of non-specialized multi-office firms. Thus, our results and conclusions would be exactly the same if we analyzed relationships between market size and the specialization of law offices rather than firms.

of individuals who work in field-specialized firms increase with market size. This would indicate that sometimes the pattern corresponds to the lower arrow in Figure 1, in which firms' boundaries narrow as market size increases and individuals specialize. When $\beta_1 > 0$, β_2/β_1 reflects the degree to which increases in the division of labor are mediated by markets. Finding such a pattern is therefore evidence against the hypothesis that law firms' boundaries reflect only the distribution of clients' demands. It would indicate that firms' boundaries sometimes change with the division of labor, consistent with the view that organizational trade-offs – whether firms or markets best mediate relationships between lawyers – influence law firms' scope.²⁵

4.2 Market Size and Lawyer Specialization

Table 5 contains results regarding individual specialization and market size using our small market subsample. It presents estimates from eight regressions. In the first column, the dependent variable is s_k , the share of lawyers at law office k who are specialized in one of the fields described above. In the top panel, there are no control variables. β_1 , the coefficient on $\ln(\text{county employment})$, is positive and significant: the share of lawyers who field-specialize is greater in larger markets. The point estimate of 0.137 indicates that doubling county employment is associated with a 9.5 percentage point increase in the predicted share of specialists. The bottom panel contains results when including our full set of controls. The estimate of β_1 hardly changes. While none of the coefficient estimates on the controls are individually significantly different from zero, one can reject the null hypothesis that they are jointly different from zero using an F-test with size 0.05.

The other three columns present results from analogous specifications, where the dependent variable is the share of individuals that specialize in ex ante business fields, ex post business fields, and individual fields, respectively. Looking at the bottom panel, each of the estimates of β_1 is positive and significant; lawyers specialize more in larger markets within each

²⁴ Our results are unchanged if we define a specialized firm as one where most of the lawyers (rather than all) share the same specialty, for example as one where 75% or 90% do.

²⁵ The ratio β_2/β_1 is an instrumental variables estimate of the effect of lawyer specialization on law firm specialization if county employment is a valid instrument for lawyer specialization. This can be seen by writing the ratio as: $\beta_2 / \beta_1 = [\partial s_k^{sf} / \partial (\ln(\text{county employment}))] / [\partial s_k / \partial (\ln(\text{county employment}))] = \partial s_k^{sf} / \partial s_k$. This identification strategy requires that market size be related to firms' boundaries only through its effect on lawyers' specialization decisions. In Garicano and Hubbard (2003a), we discuss why this assumption is plausible in human capital

of these groups of fields. Note that these estimates differ from those in the upper panel; the business field coefficients are lower and the individual field coefficient is greater. This is as expected in light of Table 3, which showed that part of the simple relationship between the individual client share and county employment reflected differences in the distribution of demands that are picked up by the controls. Some of the coefficients on the controls are statistically different from zero. As one would expect, the share of lawyers specializing in an ex ante business fields is greater in counties with larger financial services sectors, and the share specializing in individual segments is greater in counties with larger retail (and thus smaller production-related) sectors.

Table 6 reports results from 13 additional regressions where the dependent variables are the share of lawyers that specialize in each of the fields in our data. The estimates of β_l are positive for each of the fields in our sample, and significantly greater than zero for six of the fields. Assuming that changes in our market size measure alter the size but not the distribution of demand for legal services, fields for which the coefficients are positive – corporate, environmental, tax, insurance, criminal, and negligence-plaintiff (and perhaps also real estate and probate, both of which are close to being statistically greater than zero) -- are those that tend to be covered by "general practitioners" in very small markets but specialists in larger ones.

In sum, our evidence on lawyer specialization is that lawyers specialize more as market size increases. These increases in specialization with market size reflect that small market lawyers supply services that usually cross field boundaries, but this becomes less and less true as market size increases. The next section examines whether firms' field boundaries change as well. In fields in which lawyer specialization increases with market size, this will indicate the degree to which increases in the division of labor take place within or between firms, and thus provide evidence whether organizational trade-offs affect firms' boundaries.

4.3 Market Size and the Division of Labor Within and Between Firms

The first row of Table 7 contains results from regressions that are analogous to those in the bottom panel of Table 5, but use s_k^{sf} rather than s_k as the dependent variable. These regressions relate the share of lawyers working in field-specialized law firms to market size and

intensive contexts in light of recent organizational theory. We do not emphasize causal interpretations of β_2/β_1 in

composition. These relationships are of particular interest for fields in which individual lawyers specialize more with market size. Finding that lawyers become more specialized and work more in field-specialized firms as market size increases indicates circumstances where organizational trade-offs influence firms' boundaries; in these cases, the division of labor tends to be mediated between rather than within firms.

In the first column, the dependent variable is the share of lawyers who work in a field-specialized law firm. β_2 , the coefficient on $\ln(\text{county employment})$, is positive and significant: as market size increases, a larger share of lawyers works in field-specialized firms. The point estimate is 0.066, indicating that doubling market size is associated with a 4.6 percentage point increase in the share of lawyers working at specialized firms. This is about one-fourth of the sample mean of 16.2%. The bottom of the table contains the estimates of β_1 from the bottom panel of Table 5, which track relationships between individual lawyer specialization and market size. The ratio of the point estimates, β_2/β_1 , equals 0.49, indicating that about half of the overall increase in the division of labor is happening between rather than within firms. This indicates that in some cases, firms' field scope narrows as market size increases, suggesting that firms' boundaries do not merely reflect the distribution of demands. This evidence is consistent with the hypothesis that organizational trade-offs, which appear only when fields are covered by different individuals, influence firms' boundaries.

The other three columns break things down by classes of fields as before. In the second column of the top row, the dependent variable is the share of lawyers that work at an office where all lawyers specialize in a single ex ante business field. The coefficient on $\ln(\text{county employment})$ is very small and not statistically significantly different from zero. Table 5 indicated that as market size increases, lawyers specialize more in these fields; this result provides no evidence that they are more likely to work in field-specialized firms. The ratio β_2/β_1 is approximately 0.14, indicating that practically all of the increase in the division of labor is occurring within rather than between firms. In contrast, in the next column of the top row, the dependent variable is the share of lawyers that work at an office where all lawyers specialize in a single ex post business field. Here, the coefficient on market size is positive and significant. From before, as market size increases, more lawyers become insurance and negligence-defendant specialists. Here, we see that a substantial fraction of these specialists work in specialized law

firms. The ratio β_2/β_1 provides an estimate of this fraction: 41%. Like the ex ante business fields, the division of labor increases with market size; unlike the ex ante business fields, a significant fraction of it happens between rather than within firms.

This result indicates that ex post business fields tend only to be covered in the same firm as other fields when they are covered by the same person, but ex ante business fields tend to be covered in the same firm as other fields even when they are covered by different individuals. Assuming that variation in our market size proxy captures differences in the size but not the distribution of demand, demand for services that involve each of these fields of the law exists in smaller markets, but the individuals supplying these services tend not to be specialized. For example, lawyers who advise clients on insurance law issues might also advise clients on corporate and tax law issues. When individual lawyers have multiple specialties, so do firms. As market size increases, lawyers specialize more: different lawyers begin to advise clients on different areas of the law. As lawyers specialize, some specialties remain within the firm and some are spun off: the scope of the firm continues to include corporate and tax law, but it often no longer includes insurance law.

Figures 2 and 3 summarize the general patterns for ex ante and ex post business fields, respectively. The top line in each represents the share of lawyers in a specialized field, and the bottom line represents the share of lawyers working at a field specialized law firm. For the ex ante fields, the distance between the lines increases with market size; an increasing share of lawyers work as specialists but in non-specialized firms. The bottom line is flat. For the ex post fields, the distance between the lines increases somewhat but the bottom line is upward sloping. More lawyers specialize in these fields as market size increases, and an increasing share of lawyers work in specialized firms.

Finally, the last column reports results for the same exercise for the individual fields. In the top panel, the coefficient on $\ln(\text{county employment})$ is positive and significant. The ratio β_2/β_1 equals 0.66. Lawyers specialize more in individual fields as market size increases, and when they do so, they work in field-specialized firms. Firms' boundaries thus tend to narrow as market size increases.

Table 8 provides a more detailed view. The dependent variables in these regressions, analogous to the top panel of Table 7, are the share of lawyers working at firms that specialize in the different fields. The contrast in Table 7 between ex ante business and other fields holds in

this table as well. None of the coefficient estimates in the first row show statistically significant relationships between market size and the fraction of lawyers working in field-specialized firms. In contrast, several of the coefficients in the other rows are positive and significant, and all of the point estimates are larger than any of those in the first row.

Full Sample Estimates and Firm Size Controls

Table 9 reports three sets of results. The top panel is the same as Table 6. The middle panel uses the full sample rather than the small market subsample. Although the magnitudes of the estimates are lower, especially in the last column, the general pattern of the results is similar when including large cities and suburban counties in the analysis. The ratio β_2/β_1 in the first column is about one-half, and as before, this ratio is higher for the individual than business fields, and for the ex post than the ex ante fields. We have also run these specifications using *only* large markets (those with more than 200,000 employment; the results are reported in Garicano and Hubbard (2003b)), and the estimates are very similar to those in the middle panel here. While the conceptual exercise is far cleaner when using the small market sample rather than the full sample, the results are quite similar across these samples.

Returning to the small market subsample, the bottom panel reports estimates of β_1 and β_2 when we including a set of dummy variables that depict the number of lawyers in the office along with our other controls.²⁶ Once again, the estimates of β_2 are positive and significant in the first, third, and fourth columns. To the extent that the point estimates of β_2 change when including the number of lawyers dummies, they increase. There is thus no evidence that the estimates in the top panel, which indicate that firms' field scope tends to narrow as market size increases, reflect just "firm size effects."²⁷

Summing Up

We conclude that firms' boundaries change with increases in the size of demand, holding constant the distribution of demands. In particular, as lawyers specialize in ex post business fields or individual fields, these fields tend to be spun-off into separate firms. This result is

²⁶ We include 11 dummies that capture whether the law office has 1-12 lawyers, plus a dummy for whether it has more than 12 lawyers. Less than 5% of the offices in the small market subsample have more than 12 lawyers.

²⁷ Note that the ratio β_2/β_1 in this panel is not interpretable in the same way as when the model is estimated without the size dummies. The conceptual experiment that supports the interpretation that this ratio is the fraction of the

inconsistent with the hypothesis that organizational trade-offs associated with the division of labor do not affect firms' boundaries, since under this hypothesis, firms' boundaries simply reflect the distribution of individual demands and should not narrow as market size increases and individuals specialize.

Which specific organizational trade-offs matter in determining law firms' boundaries? The fields that are spun off (individual fields and ex post business fields) have a common characteristic: they are mostly concerned with dispute resolution, and much of the work undertaken by these lawyers has to do with addressing legal problems that clients themselves can identify: at the individual level, a divorce, a burglary or a lawsuit; at the business level, a lawsuit or a complex insurance claim. On the other hand, fields that are not spun off tend to be those where much of lawyers' work has to do with structuring transactions. What does this mean? And is there evidence that lawyers in these transactional fields tend to work in the same firm with each other, and not with lawyers in other fields? The following section deepens the previous analysis by providing evidence on which types of specialists tend to work at the same firm with one another and which do not.²⁸ We then interpret these patterns in light of the knowledge-sharing, risk-sharing, and monitoring cost hypotheses discussed above.

5. The Field Composition of Law Firms

We develop a statistic that indicates the degree to which lawyers in one field work in the same firm with lawyers in other fields, relative to a benchmark in which the field-shares of lawyers in each firm is the same as the field-shares of lawyers in the economy.²⁹ Let N_i be the number of lawyers in firm i and n_i^j be the number of those lawyers who specialize in field j . We start by computing the share of field a lawyers in the average field b lawyer's firm. Define this share as s^{ab} :

time the division of labor is mediated by markets (as depicted in Figure 1 and Section 4.1) does *not* hold firm size constant.

²⁸ See also Phillips and Zuckerman (2001), who analyze the determinants of whether Silicon Valley law firms' scope includes family law.

²⁹ Previous versions of this paper (Garicano and Hubbard, 2003b), reported versions of the Ellison-Glaeser statistic (Ellison and Glaeser (1997)), which uses random allocation rather than a uniform distribution as a benchmark. The results are very similar. We report the uniform-benchmarked statistics described here because the magnitudes are more readily interpretable.

$$s^{ab} = \sum \frac{n_i^b}{\sum n_i^b} \frac{n_i^a}{N_i}$$

where all the sums are taken over i . s^{ab} is a weighted average of the share of lawyers in field a , where the average is taken across all firms in the economy and the weight for each firm i is the share of b lawyers in the economy who work in firm i . We then normalize s^{ab} by the share of lawyers in field a in the economy. Thus for any pair of fields a and b , this statistic is:

$$\Gamma^{ab} = \frac{s^{ab}}{s^a} = \frac{1}{s^a} \sum \frac{n_i^b}{\sum n_i^b} \frac{n_i^a}{N_i}$$

Γ^{ab} is the share of field a lawyers in the average field b lawyer's firm, normalized by s^a , the share of lawyers in field a in the economy. It is straightforward to show that this statistic is symmetric: i.e. $\Gamma^{ab} = \Gamma^{ba}$.

This statistic is easy to interpret. $\Gamma^{ab} = 1$ if the share of field a lawyers in each firm where field b lawyers work is equal to the share of field a lawyers in the economy. If $\Gamma^{ab} > 1$, this indicates that most field b lawyers work in firms with high shares of field a lawyers, relative to the share of field a lawyers in the economy. $\Gamma^{ab} = 1.30$ indicates the share of field a lawyers in the firm where the average field b lawyer works is 30% higher than in the population as a whole. $\Gamma^{ab} = 0.70$ indicates that it is 30% lower.

Table 10 presents our results from this approach. We first note four important patterns. First, the general pattern with the off-diagonal terms is that ex ante business specialists tend to work at the same firm as one another, but most other pairs of specialists tend not to do so. Most of the statistics in the upper left of the figure are greater than one; most in the rest of the figure are less than one. The second and third patterns are the exceptions to this rule. The second is that specialists in patent law, classified as an ex ante business field, tend not to work at the same firm with specialists in other ex ante business fields (or any other field, for that matter). Unlike other ex ante business specialists, patent lawyers tend to work in firms that are field-specialized. The third is that specialists in probate law, an individual field, tend to work in the same firm with ex ante business specialists. In fact, they are more likely to work at the same firm as banking, corporate, environmental, and other ex ante business specialists than other types of individual specialists. This is the exception to the general rule that specialists in business and individual-oriented fields tend not to work at the same firm with each other. Last, the diagonal terms are systematically greater than the off-diagonal terms. Some of this is artificial, since part of the

high value of the diagonal reflects that specialists always work at firms where the share of their own field is positive – their firm reflects themselves. At the bottom of the table we report statistics for the diagonal terms that do not include this effect; these statistics remain greater than any of the associated off-diagonal terms. Lawyers are more likely to work at the same firm with lawyers in their own field than with lawyers in any other field. This reflects groups of partners and associates in the same field working at the same firm.³⁰

Broadly, these patterns provide no support for the hypothesis that law firms' field boundaries strongly reflect the risk-sharing benefits of revenue-sharing arrangements. Lawyers in the same field or fields where demands are closely related tend to work at the same firm more than lawyers in fields where demands are less closely related. Demand for the services supplied by banking, corporate, real estate, and other ex ante business fields is likely positively correlated, but specialists in these fields tend to work at the same firm with each other.

It is also difficult to explain these patterns with a monitoring-based theory that emphasizes cognitive connections across fields. Although some of the ex ante business fields have strong cognitive connections with each other, others do not. For example, corporate law has some doctrinal overlap with banking law, but is largely distinct from other ex ante business fields such as environmental law and real estate law. It is unlikely that the legal expertise of corporate law specialists provides them a comparative advantage in monitoring lawyers in these other fields.

Some empirical justification for these claims about cognitive relationships across fields is evident in Heinz, et al (1998), who analyze the “patterns of co-practice” of the 788 randomly-selected Chicago-based lawyers in the “Chicago Lawyers II” database described above. These data contain detailed information on how individual lawyers, including non-specialists, allocate their time among fields. One would expect non-specialists' field coverage to reflect some combination of the scope of clients' demands and scope economies in learning. The latter would be derived from fields' cognitive closeness: if banking and corporate law are cognitively close, one would expect lawyers who spend some of their time addressing problems in banking law to also spend some of their time addressing problems in corporate law. Conversely, observing that few or no lawyers spend time in both corporate and environmental law is consistent with the

³⁰ Garicano and Hubbard (2003c) study partner-associate ratios and how they vary with returns to specialization. This paper investigates more thoroughly the organization of specialists in the same field.

hypothesis that these fields are not close in this way. Heinz and Laumann (1998) find that, indeed, an extremely small share of lawyers that spend at least 5% of their time in corporate law also spend at least 5% of their time in environmental law, and vice-versa. This is not because all lawyers who do work in these fields are specialists: these authors' results indicate that it is not unusual for lawyers to spend at least 5% of their time in both corporate law and other fields such as banking or tax law, and it is not unusual for lawyers to spend at least 5% of their time in environmental law and other fields such as negligence-defense. Similar results hold when examining connections between corporate and real estate law, and between corporate and government-related subfields such as utilities law and municipal law. These patterns of co-practice provide no support for the hypothesis that corporate law has a close cognitive connection to environmental, real estate, or government law. We thus conclude that it is unlikely that the patterns in Table 10 reflect that monitoring costs are low among specialists in the ex ante business fields because of their fields' cognitive closeness.³¹

In contrast, our evidence does not allow us to reject a different hypothesis about the source of monitoring-related scope economies, namely that they have to do with client- rather than field-specific factors. For example, client knowledge required to structure a transaction (such as location of the firm being bought, type of firm, history of the firm) is used by all the lawyers involved in the transaction and this shared knowledge base may allow cheaper monitoring across those lawyers. Free-rider problems associated with organizing these fields within the same firm may be lower as a consequence. Such a theory would leave open the issue of why the monitoring-related benefits of shared client knowledge do not extend to the ex post business fields as well. It is possible that such benefits only apply when lawyers are working with clients at the same time.

Finally, our data are consistent with certain hypotheses regarding firms' role with respect to knowledge-sharing. First, fields may be grouped in order to facilitate the exchange of substantive knowledge – legal expertise or facts about the client -- between lawyers in different fields. This can easily explain some patterns in our data: for example, why ex ante business specialists (except patent lawyers) tend to work in the same firm with each other. This version of

³¹ Heinz, et al's (1998) results are similar to those in Heinz and Laumann (1982), which analyzes data from 1975. One of these authors' main inferences is the point we make here: the organization of legal services does not simply reflect cognitive relationships between fields.

the knowledge-sharing theory has a more difficult time explaining why these business specialists tend not to work at the same firm as specialists in negligence-defense or insurance law, unless substantive or client knowledge that is useful in organizing transactions is not useful in litigation and vice-versa.

Second, fields may be grouped to facilitate the exchange of knowledge about opportunities – referrals -- across field-specialized lawyers. The patterns in our data could reflect differences in the value of cross-field referrals. This version of the knowledge-sharing hypothesis can more easily explain the split between ex ante and ex post fields. One would expect knowledge-sharing about opportunities to be more valuable across ex ante fields than ex post fields if clients' ability to assess the scope of their legal problem – their ability to self-refer - - differs with the timing of demand. Clients demand ex ante services in anticipation of potential future disputes among parties or conflicts with the law; these problems often potentially can involve many different areas of the law. (Does this deal have important tax implications or create regulatory problems?) Legal expertise is valuable for determining which of these areas are important. In contrast, it tends to be less difficult for clients demanding ex post services to determine the range of relevant legal expertise. The interaction between a client's situation and the law is often clear, even to non-experts. For example, expertise in insurance law is valuable for a company with a complicated insurance claim; expertise in torts is valuable to a company being sued for negligence. While legal expertise is generally valuable for such clients, referrals across specialists in different areas of the law tend not to be because the scope of most clients' legal problems is well-defined at this point in contractual time. If this is true, this could explain why lawyers in ex ante fields tend to work in the same firm with each other, while lawyers in ex post fields tend to work in field-specialized firms. It could also explain the exceptions to the general empirical pattern. Patent law is fairly distinct from other areas of the law, and is probably an exception to the rule that clients have difficulty judging the scope of services they need for ex ante problems. Referrals between ex ante business specialists and probate lawyers may be valuable, as when the senior management of corporate clients needs help arranging wills and estates.

In contrast, this version of the knowledge sharing theory does not explain why lawyers in the same field tend to work with each other in the same firm (the diagonal pattern in Table 10), if it is the case that such lawyers' expertise is the same and lawyers face no time constraints. In

such situations, referrals across lawyers would be not valuable and one would not expect to observe that, for example, corporate law specialists work in the same firm as other corporate law specialists. We make the following observations. First, it is highly likely that there are within-field differences in lawyers' expertise that are not picked up in our data: for example, corporate lawyers vary in their ability and sometimes sub-specialize within corporate law (e.g., in securities law). Second, lawyers do face time constraints, and this may make referrals valuable even among lawyers with the same expertise. Either of these conditions could reconcile this fact with the "referrals" version of the knowledge sharing theory, although this fact could have other explanations as well.

In sum, while this evidence does not allow us to establish a particular organization-theoretic explanation for law firms' field boundaries, it allows us to eliminate risk-sharing as an important element and puts some structure on the type of monitoring or knowledge sharing hypotheses that are compatible with our data. Risk-sharing theories or monitoring theories that emphasize fields' cognitive closeness cannot explain major patterns in our data. Monitoring theories or knowledge-sharing theories that rest on the value of shared client knowledge can explain many patterns in our data, but require additional (but perhaps reasonable) elements to explain the split between the ex ante and ex post business fields. As established earlier, firms' boundaries do not simply reflect the scope of clients' demands; these additional elements must therefore explain why shared client knowledge is valuable among some, but not all, a client's lawyers. Finally, theories in which firms facilitate the exchange of economic opportunities can easily explain most of the patterns we uncover with respect to firms' field scope, including the division between ex ante and ex post fields, but require additional (but once again perhaps reasonable) assumptions to explain why a specialist in one field is more likely to work with a specialist in the same field than with one in any other field.

6. Conclusion

Economists have long recognized that economic activity is organized, in part, to exploit increasing returns. For example, a large literature in industrial organization analyzes relationships between industry structure and scale economies; these economies are generally depicted as arising from fixed costs associated with physical capital. But physical capital is not the only source of increasing returns that can affect how production is organized into firms.

Rosen (1983) emphasizes that there are increasing returns to human capital, as the cost of learning a skill is independent of its subsequent utilization rate. It follows that the organization of industries where production is knowledge-intensive should reflect problems associated with exploiting returns to human capital specialization. That is, it should reflect trade-offs that have traditionally been examined in the economics of organizations literature starting with Coase (1937) rather than the industry structure literature.

This paper provides new empirical evidence on how one human-capital-intensive industry, legal services, is organized. Our evidence indicates that organizational trade-offs affect firms' field scope: firms' field scope tends to narrow as market size increases and lawyers specialize. Firms' boundaries reflect not just the scope of clients' demands, but also how relationships between lawyers are optimally organized. Moreover, this pattern varies across fields. As market size increases, the division of labor between lawyers in fields involved in structuring transactions tends to be mediated within firms. In this segment of the market, firms' scope does not narrow as market size increases. In contrast, the division of labor between lawyers in fields involved in dispute resolution and litigation and lawyers in other fields tends to be mediated by markets. Firms' boundaries narrow with market size as individuals become more specialized; in larger markets, these services tend to be supplied by lawyers in field-specialized firms. These and other patterns are inconsistent with the hypothesis that firms' field boundaries reflect variation in the benefits of risk-sharing or the cognitive relationships between fields. They are consistent with theories that emphasize firms' role in facilitating the exchange of knowledge, and some variants of theories in which shared client knowledge lowers specialists' costs of monitoring each other. Distinguishing further among these theories probably will require direct evidence on referral and monitoring patterns, evidence that our data cannot provide.

These findings have implications for the industry structure. Two notable features of the legal services industry in the United States are that the average firm size is small, and that the size distribution of firms is highly skewed: even within large markets, the largest firms have many times more lawyers than the median firm. Our findings suggest that the incentive trade-offs associated with exploiting increasing returns from specialization in this industry differ across fields, and help lead the structure of the industry to be fragmented, but highly-skewed. The fragmentation results from the fact that, for the reasons we discuss above, the division of

labor between lawyers in different fields is usually best mediated by markets. The skewness in part reflects that relationships between lawyers in ex ante fields such as corporate, tax, and real estate law are often best mediated by firms. Future research is needed to investigate how the organizational trade-offs that shape the structure of the legal services industry – including those associated with knowledge sharing and monitoring – influence the structure of other human-capital-intensive industries.

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Table 1
Summary Statistics -- Lawyers, Law Offices, and Law Firms

	Lawyers	Offices	Firms
N	219033	26151	23465
Average Number of Lawyers		3.56	3.65
Share Specialized	0.71	0.37	0.28
Share Multiestablishment	0.28	0.05	0.02

Averages and shares computed using sampling weights supplied by the Bureau of the Census.

Table 2
Shares of Lawyers in Specialized Fields, Offices, and Firms

	Share of Lawyers In Specialized Fields	Share of Lawyers In Specialized Offices	Share of Lawyers In Specialized Firms	Fraction of Specialists In Specialized Firms
Ex Ante Business Field	0.270	0.047	0.044	17.4%
Banking	0.047	0.006	0.005	12.9%
Corporate	0.083	0.004	0.004	4.8%
Environmental	0.016	0.001	0.001	6.2%
Governmental	0.015	0.002	0.002	13.7%
Patent	0.020	0.014	0.014	70.4%
Real Estate	0.062	0.014	0.013	22.7%
Tax	0.028	0.005	0.005	17.9%
Ex Post Business Field	0.128	0.044	0.044	34.5%
Insurance	0.061	0.025	0.023	40.8%
Negligence-Defendant	0.066	0.018	0.018	27.2%
Other Specialized Field	0.155			
Individual Field	0.158	0.071	0.071	44.9%
Criminal	0.024	0.012	0.012	49.7%
Domestic Relations	0.026	0.009	0.009	34.8%
Negligence-Plaintiff	0.074	0.042	0.041	57.1%
Probate	0.035	0.008	0.008	23.1%
General Practice	0.289			

All shares computed using Census-provided sampling weights.

Table 3
Share of Time on Business Clients, Days per Month in State or Federal Court

Selected Fields

Specialty	Share of Time Business Clients (percent)	Days per Month In State or Federal Court	N
Commercial Law: Banking	91.3	6.4	8
General Corporate	86.1	1.8	12
Municipal Law	35.6	0.5	6
Environmental Law	82.3	2.8	12
Real Estate	69.9	2.9	43
Tax	64.7	1.3	32
Patents, Trademarks or Copyrights	89.8	2.0	25
Personal Injury -- Defendant	88.3	11.6	20
Personal Injury -- Plaintiff	7.6	13.9	16
Criminal	10.0	16.7	9
Divorce (including family, adoption, etc.)	8.0	16.7	7
Probate (wills and trusts)	3.8	6.0	4

Source: Chicago Lawyers II survey.
 Fields are as listed on Chicago Lawyers II survey forms.

Table 4 Share of Revenues from Individual Clients and Market Size

Dependent Variable: Percentage of Law Office's Revenues That Come From Clients Who Are Individuals.

	Small Market Subsample			Full Sample		
Employment 20K-100K	-9.77 (1.88)	-2.59 (2.02)		-8.75 (1.47)	1.04 (2.03)	
Employment 100K-200K	-13.14 (2.27)	-1.05 (3.31)		-20.27 (2.49)	-4.00 (2.90)	
Employment 200K-400K	-17.99 (9.33)	0.45 (8.27)		-27.50 (2.23)	-5.97 (3.37)	
Employment 400K-1M				-36.19 (3.09)	-11.85 (4.11)	
Employment > 1M				-43.74 (2.76)	-19.11 (4.31)	
ln(employment)			-1.57 (1.07)			-4.42 (0.82)
C						
Includes Controls?	N	Y	Y	N	Y	Y
N		5780			24984	

Small market subsample includes law offices in non-MSAs and in single-county MSAs with less than 225,000 employment.

Standard errors are clustered at the county level, and are reported in parentheses.

Bold indicates statistically significantly different from zero, using a two-sided t-test of size 0.05.

The number of observations differs from that in other results because of missing values for the dependent variable.

Table 5
Market Size and Lawyer Specialization
Small Market Subsample

Dependent Variable	Share Any Specialized Field	Share Ex Ante Business Field	Share Ex Post Business Field	Share Individual Field
ln(county employment)	0.137 (0.006)	0.042 (0.004)	0.037 (0.004)	0.031 (0.006)
C	0.328 (0.012)	0.094 (0.006)	0.048 (0.005)	0.150 (0.008)
<hr/>				
ln(county employment)	0.136 (0.012)	0.029 (0.007)	0.027 (0.007)	0.047 (0.009)
sh(mfg)	-0.188 (0.182)	0.090 (0.079)	-0.005 (0.065)	-0.053 (0.144)
sh(trans/util)	0.063 (0.478)	-0.461 (0.263)	0.364 (0.193)	0.325 (0.376)
sh(wholesale)	0.482 (0.445)	-0.360 (0.247)	0.641 (0.195)	0.075 (0.391)
sh(retail)	0.217 (0.294)	0.033 (0.172)	-0.114 (0.137)	0.520 (0.255)
sh(FIRE)	1.153 (0.825)	1.193 (0.545)	0.318 (0.419)	-0.416 (0.698)
sh(services)	-0.059 (0.269)	0.019 (0.142)	0.257 (0.118)	-0.062 (0.207)
state capital	-0.021 (0.029)	-0.022 (0.030)	-0.034 (0.030)	-0.001 (0.025)
emp/estab -- construction	-0.0004 (0.0034)	-0.0004 (0.0017)	0.0040 (0.0023)	-0.0003 (0.0002)
emp/estab -- mfg	-0.0003 (0.0004)	-0.0007 (0.0002)	0.0002 (0.0002)	0.0004 (0.0003)
emp/estab -- trans/util	-0.0007 (0.0017)	0.0017 (0.0013)	-0.0008 (0.0006)	-0.0015 (0.0013)
emp/estab -- wholesale	-0.0011 (0.0045)	0.0031 (0.0020)	-0.0023 (0.0015)	0.0011 (0.0031)
emp/estab -- retail	0.0066 (0.0072)	0.0028 (0.0041)	0.0064 (0.0034)	-0.0046 (0.0051)
emp/estab -- FIRE	-0.0064 (0.0053)	-0.0033 (0.0033)	-0.0013 (0.0026)	0.0009 (0.0043)
emp/estab -- services	-0.0030 (0.0052)	-0.0001 (0.0028)	-0.0031 (0.0021)	0.0002 (0.0035)
C	0.291 (0.160)	0.023 (0.069)	-0.095 (0.061)	0.090 (0.135)

N=6032

Small market subsample includes law offices in non-MSAs and in single-county MSAs with less than 225,000 employment. Standard errors are clustered at the county level, and are reported in parentheses. Bold indicates statistically significantly different from zero, using a two-sided t-test of size 0.05.

Table 6
Market Size and Lawyer Specialization
Small Market Subsample

Ex Ante Business Specialties

Dependent Variable	Share Banking	Share Corporate	Share Environmental	Share Governmental	Share Patent	Share Real Estate	Share Tax
ln(county employment)	0.001 (0.003)	0.011 (0.003)	0.002 (0.001)	0.003 (0.002)	0.000 (0.001)	0.008 (0.004)	0.004 (0.001)

Ex Post Business Specialties

Dependent Variable	Share Insurance	Share Negligence-Def
ln(county employment)	0.022 (0.004)	0.005 (0.004)

Individual Specialties

Dependent Variable	Share Criminal	Share Domestic Rel.	Share Negligence-Pla	Share Probate
ln(county employment)	0.009 (0.003)	0.004 (0.004)	0.026 (0.005)	0.007 (0.004)

N=6032

All regressions contain segment shares, average employment size within segments, state capital as controls.

Small market subsample includes law offices in non-MSAs and in single-county MSAs with less than 225,000 employment.

Standard errors are clustered at the county level, and are reported in parentheses.

Bold indicates statistically significantly different from zero, using a two-sided t-test of size 0.05.

Table 7
Market Size, Lawyer, and Law Firm Specialization
Small Market Subsample

Dependent Variable	Share Any Specialty	Share Ex Ante Business Specialty	Share Ex Post Business Specialty	Share Individual Specialty
<i>Market Size and Law Office Specialization Regressions (Beta2)</i>				
ln(county employment)	0.066 (0.011)	0.004 (0.003)	0.011 (0.003)	0.031 (0.008)
<i>Market Size and Individual Specialization Regressions (Beta1)</i>				
ln(county employment)	0.136 (0.012)	0.029 (0.007)	0.027 (0.007)	0.047 (0.009)
Beta2/Beta1	0.49	0.14	0.41	0.66

Controls include share of employment in 7 major sectors, average establishment size within each of these sectors, and a state capital dummy

Small market subsample includes law offices in non-MSAs and in single-county MSAs with less than 225,000 employment. Standard errors are clustered at the county level, and are reported in parentheses. Bold indicates statistically significantly different from zero, using a two-sided t-test of size 0.05.

Table 8
Market Size and Law Firm Specialization
Small Market Subsample

Estimates of Beta2, by Field

Ex Ante Business Fields

Dependent Variable	Share Banking	Share Corporate	Share Environmental	Share Governmental	Share Patent	Share Real Estate	Share Tax
ln(county employment)	-0.001 (0.002)	0.001 (0.001)	0.000 (0.000)	0.002 (0.001)	0.000 (0.001)	0.001 (0.002)	0.001 (0.001)

Ex Post Business Fields

Dependent Variable	Share Insurance	Share Negligence-Def
ln(county employment)	0.008 (0.002)	0.004 (0.003)

Individual Fields

Dependent Variable	Share Criminal	Share Domestic Rel.	Share Negligence-Pla	Share Probate
ln(county employment)	0.009 (0.003)	0.003 (0.003)	0.014 (0.004)	0.005 (0.003)

N=26131

All regressions contain segment shares, average employment size within segments, state capital as controls.

Small market subsample includes law offices in non-MSAs and in single-county MSAs with less than 225,000 employment.

Standard errors are clustered at the county level, and are reported in parentheses.

Bold indicates statistically significantly different from zero, using a two-sided t-test of size 0.05.

Table 9
Market Size, Lawyer, and Law Firm Specialization

Alternative Specifications

Dependent Variable	Share Any Specialty	Share Ex Ante Business Specialty	Share Ex Post Business Specialty	Share Individual Specialty
<i>Small Market Subsample</i>				
Beta2	0.066 (0.011)	0.004 (0.003)	0.011 (0.003)	0.031 (0.008)
Beta1	0.136 (0.012)	0.029 (0.007)	0.027 (0.007)	0.047 (0.009)
<i>Full Sample</i>				
Beta2	0.039 (0.009)	0.000 (0.005)	0.012 (0.003)	0.019 (0.004)
Beta1	0.083 (0.011)	0.020 (0.006)	0.021 (0.004)	0.017 (0.006)
<i>Small Market Subsample, Includes "Number of Lawyers in the Office" Dummies</i>				
Beta2	0.080 (0.011)	0.006 (0.003)	0.013 (0.004)	0.039 (0.008)
Beta1	0.117 (0.012)	0.015 (0.006)	0.014 (0.006)	0.054 (0.009)

Beta1 is the coefficient on ln(county employment) in regressions where the dependent variable is the share of individuals who are specialized.

Beta2 is the coefficient on ln(county employment) in regressions where the dependent variable is the share of individuals who work in field-specialized firms.

Controls include share of employment in 7 major sectors, average establishment size within each of these sectors, and a state capital dummy. In the bottom panel, we also include 11 dummy variables that capture whether law office has 2-12 lawyers, plus a dummy for whether it has more than 12 lawyers.

Small market subsample includes law offices in non-MSAs and in single-county MSAs with less than 225,000 employment. Standard errors are clustered at the county level, and are reported in parentheses.

Bold indicates statistically significantly different from zero, using a two-sided t-test of size 0.05.

Table 10
Normalized Composition of Law Firms
 By Field

	Banking	Corporate	Governmental	Environmental	Tax	Real Estate	Patent	Insurance	Negligence-Defendan	Criminal	Domestic	Negligence-Plaintiff	Probate	Other	General Practice
Banking	7.52														
Corporate	1.27	4.42													
Government	1.06	1.26	24.28												
Environmental	1.34	1.50	2.36	13.61											
Tax	1.18	1.84	1.13	1.39	10.90										
Real Estate	1.44	1.18	0.85	0.96	1.07	6.79									
Patent	0.35	0.63	0.42	0.62	0.53	0.25	39.05								
Insurance	0.61	0.50	0.56	0.99	0.37	0.35	0.01	11.75							
Neg-Def	0.73	0.65	0.71	1.04	0.60	0.54	0.17	0.58	9.83						
Criminal	0.33	0.48	0.47	0.44	0.41	0.49	0.07	0.19	0.19	26.97					
Domestic	0.61	0.49	0.80	0.47	0.40	0.74	0.07	0.30	0.33	1.61	20.80				
Neg-Pla	0.64	0.31	0.37	0.26	0.22	0.60	0.05	0.14	0.37	0.84	0.78	10.03			
Probate	0.97	1.12	0.81	0.86	1.62	1.27	0.22	0.52	0.64	0.59	1.10	0.43	11.31		
Other	0.65	1.05	0.73	1.02	0.89	0.68	0.31	0.23	0.26	0.28	0.38	0.18	0.53	4.20	
Gen Prac	0.30	0.25	0.29	0.31	0.27	0.25	0.09	0.12	0.15	0.16	0.29	0.13	0.29	0.18	2.95
Diagonal (colleagues only)	4.47	3.48	13.93	10.38	3.73	2.63	32.62	9.95	8.23	6.43	5.95	4.50	3.02	2.83	1.38

Bold indicates values greater than 1.00.

Figure 1
Specialization and Organizational Trade-Offs

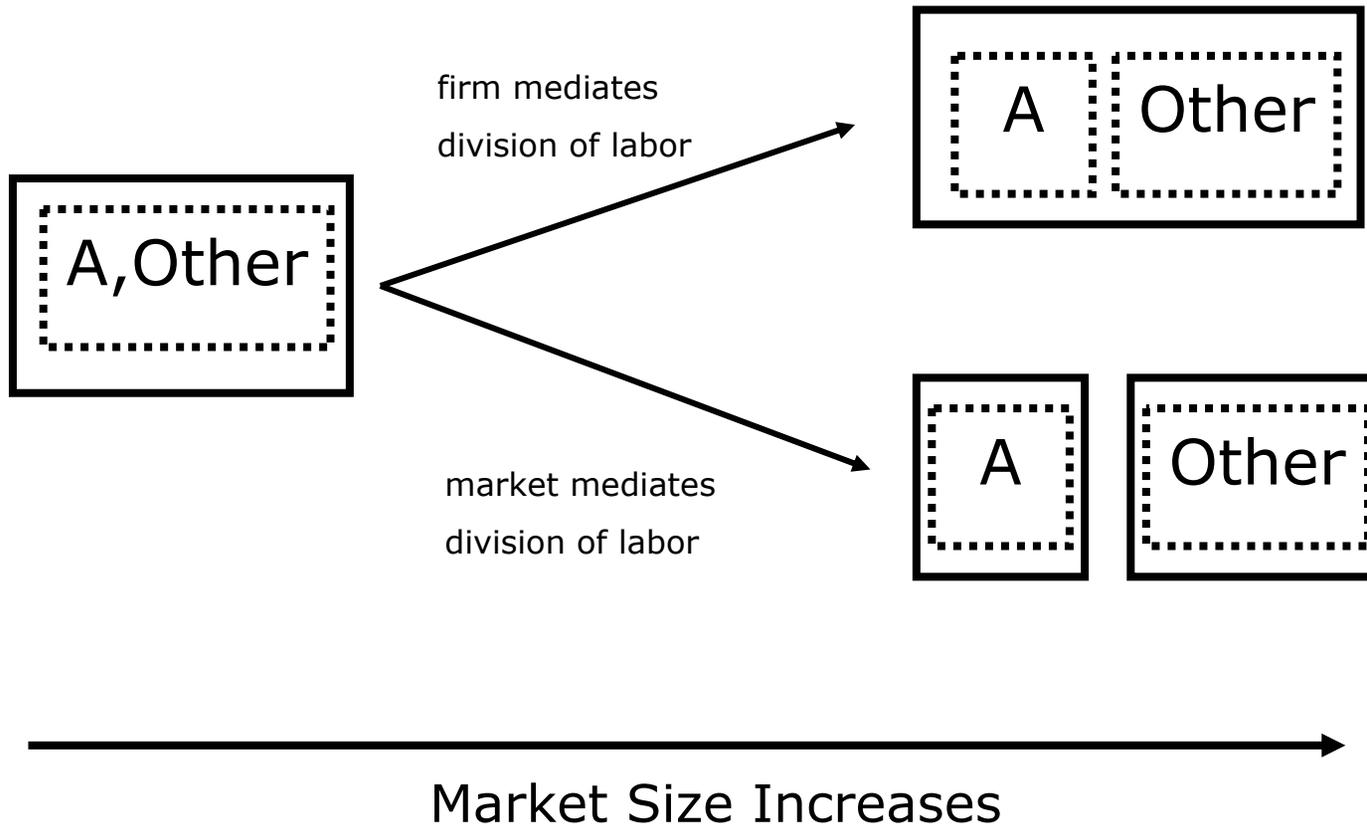


Figure 2
Share of Lawyers in Specialized Fields, Field Specialized Firms
Ex Ante Business Fields

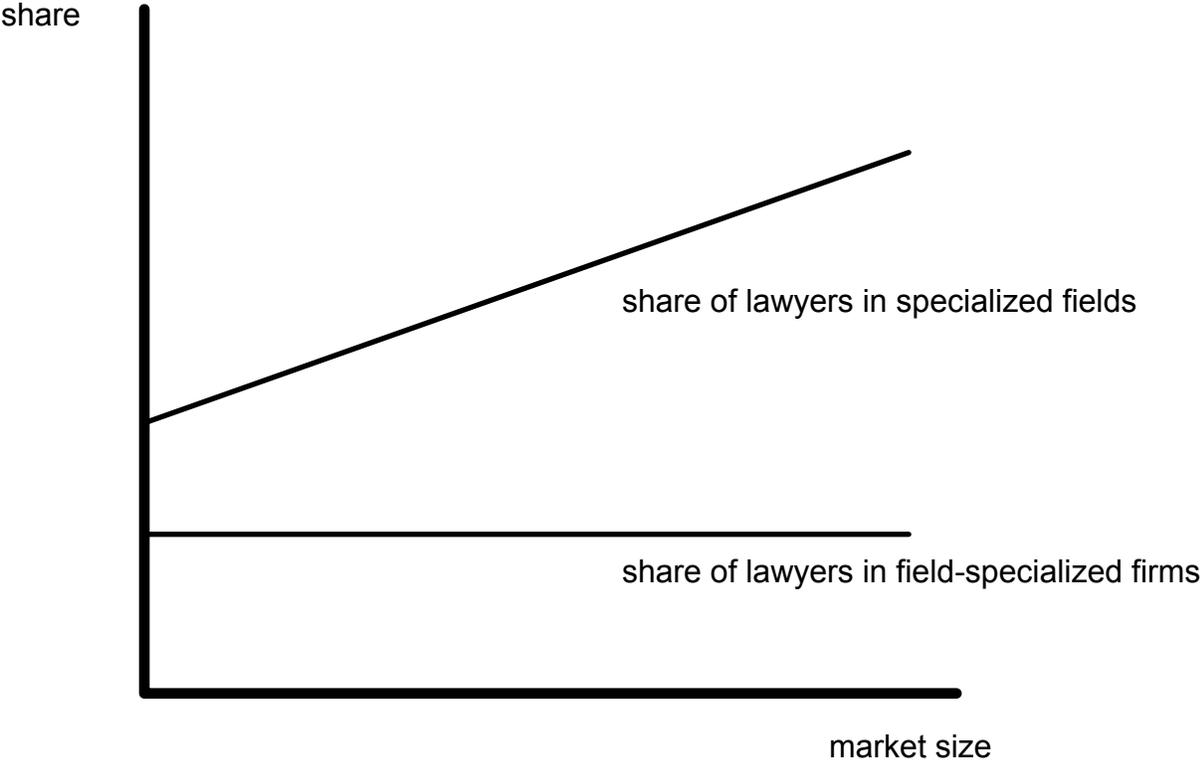
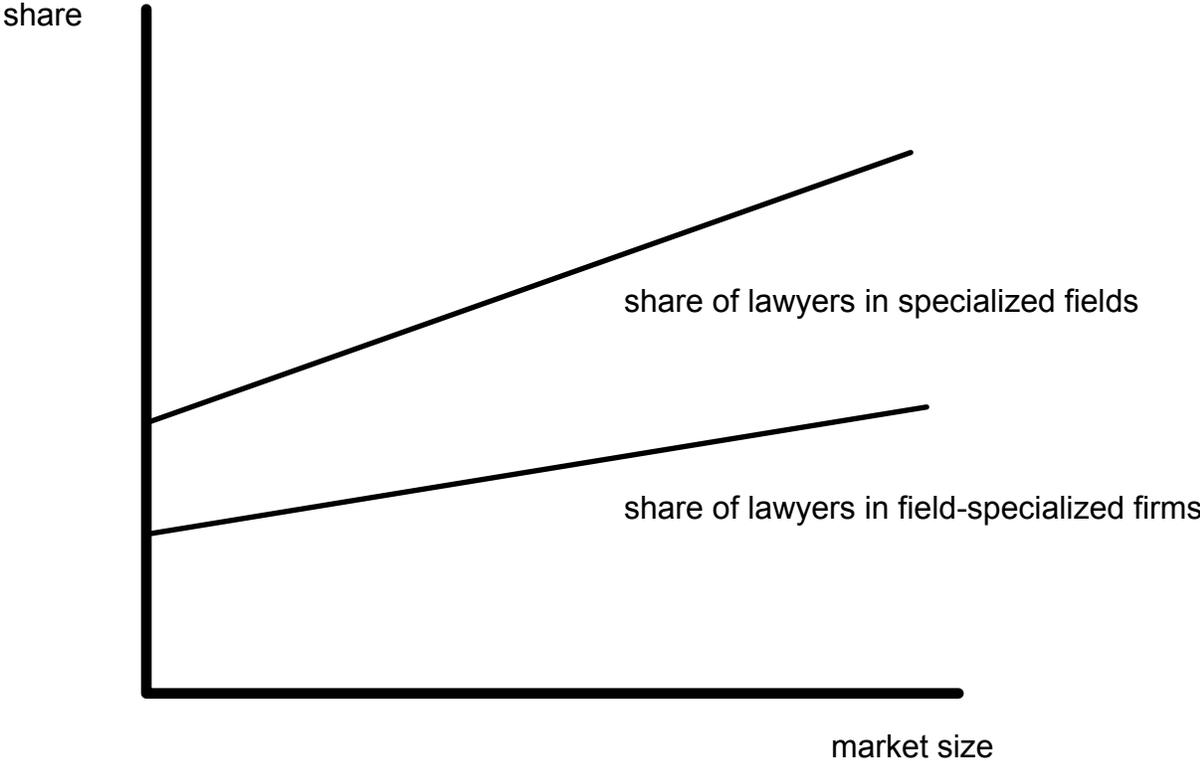


Figure 3
Share of Lawyers in Specialized Fields, Field Specialized Firms
Ex Post Business Fields



Appendix 1

Survey Form

LEGAL SERVICES

(Form CB-8100)

Item 10. PERSONNEL AND PAYROLL, BY OCCUPATION				Item 11. NATURE OF LAWYERS' PRACTICE			
Include personnel who perform a variety of functions (secretaries, etc.) on the one line which best describes the primary nature of their work.				Include each individual lawyer reported in items 10a(1) and 10b (associate lawyers plus proprietors and partners at this location) on the one line which best describes the lawyer's primary field of specialization. Lawyers who are not primarily engaged in a single specialized field should be included on line b.			
Line a(1) – Lawyers who are members of a professional service corporation should be included here.							
Line b – Only proprietors and partners not considered employees of the firm for Federal tax purposes should be included here.							
Occupation (include proprietors and partners on line b only)	Personnel for pay period including March 12, 1992 (number)	Annual payroll			Primary fields of practice	Number of lawyers	
		Mil.	Thou.	Dol.			
a. Type of employee	565	570			a. Specialized fields	575	
(1) Associate lawyers (employees of firm)					(1) Banking and commercial law	576	
(2) Paraprofessionals (law clerks, legal assistants, investigators, etc.)	566	571			(2) Corporate law	577	
(3) Managers and other nonlegal professional staff	567	572			(3) Criminal law	578	
(4) All other (stenographers, bookkeepers, etc.)	568	573			(4) Domestic relations	579	
(5) TOTAL (Sum of lines a(1) through a(4) above should equal entries in items 6a and 7)	569	574			(5) Environmental law	580	
					(6) Governmental law	581	
b. Active proprietors or partners at this location (unincorporated operations only)	450				(7) Insurance law	582	
					(8) Negligence – defendant	583	
					(9) Negligence – plaintiff	584	
					(10) Patent, trademark, and copyright law	585	
					(11) Real estate	586	
					(12) Tax law	587	
					(13) Wills, estate planning, and probate	588	
					(14) Other specialized field – <i>Specify</i>	589	
					b. General practice	590	
					c. TOTAL (Sum of above lines should equal the sum of items 10a(1) and 10b)		
Item 13. EXPENSES OF LEGAL AID SOCIETIES				Mil.	Thou.	Dol.	
Report total operating expenses, including payroll, interest, rent, depreciation, taxes, and other overhead. Exclude capital expenditures, funds invested, and transferred contributions.				040			

Appendix 2

List of Single-County MSAs in Small Market Sample

Abilene, TX	Fort Collins-Loveland, CO	Naples, FL
Albuquerque, NM	Fort Myers-Cape Coral, FL	Ocala, FL
Alexandria, LA	Fort Walton Beach, FL	Odessa, TX
Altoona, PA	Fresno, CA	Olympia, WA
Anchorage, AK	Gadsden, AL	Owensboro, KY
Anderson, IN	Grand Forks, ND	Panama City, FL
Anderson, SC	Great Falls, MT	Pascagoula, MS
Anniston, AL	Greeley, CO	Pine Bluff, AR
Asheville, NC	Green Bay, WI	Poughkeepsie, NY
Bakersfield, CA	Hagerstown, MD	Provo-Orem, UT
Battle Creek, MI	Huntsville, AL	Pueblo, CO
Bellingham, WA	Iowa City, IA	Rapid City, SD
Benton Harbor, MI	Jackson, MI	Reading, PA
Billings, MT	Jackson, TN	Redding, CA
Bloomington, IN	Jacksonville, NC	Reno, NV
Bloomington-Normal, IL	Jamestown-Dunkirk, NY	Rochester, MN
Boise City, ID	Janesville-Beloit, WI	St Joseph, MO
Bradenton, FL	Kalamazoo, MI	Salinas-Seaside-Monterey, CA
Bremerton, WA	Kankakee, IL	San Angelo, TX
Brownsville-Harlingen, TX	La Crosse, WI	Sarasota, FL
Bryan-College Station, TX	Lafayette-West Lafayette, IN	Sharon, PA
Burlington, NC	Lake Charles, LA	Sheboygan, WI
Casper, WY	Lakeland-Winter Haven, FL	Sioux Falls, SD
Cedar Rapids, IA	Lancaster, PA	South Bend-Mishawaka, IN
Champaign-Urbana-Rantoul, IL	Laredo, TX	Spokane, WA
Cheyenne, WY	Las Cruces, NM	State College, PA
Chico, CA	Lawrence, KS	Stockton, CA
Colorado Springs, CO	Lawton, OK	Topeka, KS
Columbia, MO	Lincoln, NE	Tucson, AZ
Daytona Beach, FL	Lubbock, TX	Tuscaloosa, AL
Decatur, IL	Madison, WI	Tyler, TX
Dubuque, IA	Mansfield, OH	Victoria, TX
El Paso, TX	McAllen-Edinburg-Mission, TX	Visalia-Tulare-Porterville, CA
Elmira, NY	Medford, OR	Waco, TX
Enid, OK	Melbourne-Titusville, FL	Wausau, WI
Erie, PA	Merced, CA	W. Palm Beach-Boca Raton, FL
Eugene-Springfield, OR	Midland, TX	Wichita Falls, TX
Fayetteville, NC	Modesto, CA	Williamsport, PA
Fayetteville-Springdale, AR	Monroe, LA	Wilmington, NC
Flint, MI	Muncie, IN	Yakima, WA
Florence, SC	Muskegon, MI	Yuma, AZ

Note: The small market sample also includes all law offices located in non-MSAs.

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