Specialization and Organization in Legal Services
Project Description
Luis Garicano and Thomas Hubbard
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Since Adam Smith's famous 'pin factory' fable, economists have been preoccupied with the role that specialization and the division of labor play in economic growth. Surprisingly, however, this recognition of the fundamental impact that specialization plays in economic growth has not led to much systematic empirical work on the organization of specialization. In fact, no systematic empirical work has illuminated such questions as:

- When do individuals specialize and how does this relate to the complexity of activities?
- When do specialists work within the same firm, and when do they work in different firms?
- When is specialization limited by the extent of the market, and when and why is it limited by other factors such as coordination costs?
- What role do hierarchies play in facilitating specialization?
- What accounts for differences in hierarchical forms; for example, when do hierarchies tend to be steep versus flat?

Empirical evidence on these and other related questions is important for understanding a wide range of issues in industrial organization and labor economics. These issues include: how will new communication technologies such as the internet affect firm size, how does firms' organizational structure relate to their service offerings, and how will the on-going diffusion of information technology affect the demand for specialized skills and thus wage inequality.

The legal services industry has features that are ideally suited to study these questions. Law firms are the ultimate human capital-based organizations: no important physical assets are involved in the provision of legal services, apart from widely available reference materials such as legal databases. In this context, the organization of the acquisition and use of knowledge required to solve clients problems is *the* key issue that lawyers face. As a result, the organization of legal services is likely to reflect directly the costs and benefits of specialization.

Every five years as part of the Census of Services, the Bureau of the Census asks every law firm with employees questions about the specialties of lawyers within the firm and the number of individuals who are partners, associate lawyers, paralegals, and non-legal staff. These data therefore contain detailed, firm-level information about specialization and hierarchies within professional service firms, and offer a unique opportunity to study questions such as those described above in an ideal context.

In this project description, we first discuss our methodology. We start by formulating our research questions and theoretical grounding for these questions. We also present our

preliminary findings from current work using market-level data, the limitations of these data, and how we expect to expand on our analysis through the use of the firm-level microdata. We next describe our projected data sources. Last, we discuss the statistical output we expect to generate.

I.   Research Questions and Methodology

Our research aims to study the organization of specialization in legal services. This involves two general sets of issues. The first one concerns the relationship between specialization and firms' boundaries: when is it efficient for specialists to work within the same firm versus different firms? The second concerns hierarchies within firms: Conditional on firms' boundaries, how many lawyers should be partners versus associates and how should relative wages at different hierarchical levels relate to the form of the hierarchy?

1.   Specialization and Firms' Boundaries

Consider a law firm with clients that encounter a set of problems in a wide array of legal fields, for example bankruptcy, contracts, environmental, regulation, etc. In some instances, the law firm will have the expertise (specialists) necessary to deal with particular problems in-house. Sometimes, it will arrange an outside referral, contracting with a specialist at another firm that is a better fit with a problem than any of its in-house lawyers.

Our first question is: what determines which specialists are brought in-house and which ones are dealt with in the market?

Our analytic starting point is Garicano and Santos (2001), which proposes a theory of the organization of horizontal specialization in professional service industries. These authors propose that firms are nexuses of ex ante revenue sharing contracts among individuals. They argue that the benefit of such arrangements – the benefit of transacting "within a firm" – is that they mediate the exchange of referrals efficiently. Ex post "market" arrangements involve contracting only after one individual knows the value of the opportunity, and thus suffer from adverse selection problems. Ex ante revenue sharing arrangements mitigate this problem by effectively taxing individuals when they hold onto opportunities themselves, thus weakening individuals' incentives to hold onto opportunities for which they are not best qualified to serve. The drawback to transacting within firms is that effort incentives are weaker, conditional on the match between individuals and opportunities: taxing individuals via revenue-sharing arrangements weakens effort incentives. Firms' boundaries, therefore, reflect trade-offs between facilitating the exchange of referrals and effort incentives. Specialists should be more likely to be found within the same firm when mediating referrals efficiently between them is valuable.

The theory generates a central proposition: in contexts where referrals among suppliers are valuable, specialization and firm size should be complementary. We next discuss

some preliminary work using market-level data in which we test this proposition. We then relate the shortcomings of relying only on market-level data, and how firm-level data would allow us to conduct more refined tests of this and other, related empirical propositions.

Preliminary Work with Market-Level Data

Since 1972, the Bureau of the Census has published MSA-level data on the specialization of lawyers, number of law firms, and number of partners, associates, and paralegals in the Miscellaneous Subjects series of the Census of Services. Publicly-available data exist for approximately 50 MSAs in the 1970s; this has increased to approximately 250 MSAs in the 1992 Economic Census.

Over the past few months, we have compiled these market-level data into a data base, and have conducted some preliminary empirical analysis. This analysis has mainly investigated the proposition that specialization and firm size should be complementary in circumstances where referrals are valuable. We found several stylized facts that are consistent with this proposition:

- ■ The fraction of lawyers that are in specialties with primarily corporate clients (e.g., corporate law, banking law, insurance law), the "business specialist" share, is higher in larger MSAs than smaller MSAs. Conversely, the fraction of lawyers who are general practitioners declines with market size.

- ■ The fraction of lawyers in other specialties (e.g., estate law, real estate law, tax law), the "other specialist" share, does not significantly vary with market size.

- ■ Average firm size, defined as the number of lawyers per establishment, is higher in larger MSAs than smaller MSAs.

- ■ Controlling for market size, average firm size is higher, the higher the business specialist share. In contrast, there is not a positive relationship between firm size and the other specialist share.

Thus, specialization and firm size are correlated at the market level, but only for specialists that serve clients with complicated demands, and therefore for which referrals are likely most valuable. There is no correlation for specialists that serve clients with less complicated demands, for which they themselves can identify an appropriate individual to serve.

We then conducted some additional analysis to investigate whether specialization causes firms to be larger. Doing this requires instruments for specialization: variables that shift specialization levels but do not directly affect firm size. We use variables that capture the

quantity and quality of law schools within the MSA as instruments. Good law schools shift the supply of specialists by providing a foundation for obtaining expertise in particular fields. If moving is costly to individuals, MSAs with law schools should have an abnormally high fraction of specialists for reasons having nothing to do with local demand (i.e., Champaign-Urbana will have more specialists than a similarly-sized MSA without a law school because of the presence of the University of Illinois law school). We have found this to be the case empirically.

Using the law school instruments, we find that increases in the business specialist share cause average firm size in a market to be larger. Thus, evidence from market-level data strongly suggests that specialization causes firms to be larger.

The Limitations of the Publicly-Available Data

Using publicly-available data to examine this proposition has clear limitations. Propositions about specialization and organization are inherently about micro-level relationships, and patterns in the aggregate data can be consistent with very different micro-level patterns. For example, one cannot tell using MSA level averages whether individual firms are comprised of specialists or generalists, or more specifically, which specialties tend to be grouped within firms and which specialties are rarely found together. If firms tend to be comprised of generalists, or groups of specialties among which referrals are unlikely, this would be evidence against the above proposition.

Access to firm-level data would let us understand relationships between specialization and firm size in much greater detail. It would let us examine many empirical questions, including:

-- Is specialization more common within larger firms than smaller firms?

– How common is it for sole proprietors to be specialists? For which specialties is it most common?

If the above proposition is true, lawyers in larger firms should be more likely to be specialists than those in smaller firms. Sole proprietors should be generalists except in situations where referrals are not valuable. Thus, when sole proprietors are specialists, it should tend to be in fields where clients can match themselves to specialists well, such as real estate or probate law.

-- Which combinations of specialties are commonly found together within a firm? Which combinations are rarely found together?

Under the above proposition, combinations of specialties where cross-referrals tend to be valuable – perhaps banking and insurance law – should be commonly found together. Specialties across which referrals are less likely should rarely be found within the same firm. This is likely to be the case for specialties that serve non-overlapping sets of clients: corporate law and plaintiffs' negligence attorneys, for example.

Answers to these questions would also help distinguish between different theories of firms' boundaries. Other authors have proposed that specialists organize into partnerships to share specialty-specific risks. Risk-sharing explanations generally would predict that specialties with positively-correlated demands should be less likely to be found within the same firm than those whose demands are uncorrelated or positively correlated. We will be able to explore this explanation by estimating correlations of demands across specialties (using either cross-sectional or time-series patterns), then examining whether specialties with weak or negative demand correlations tend to be found within the same firm.

Linking the individual firm data longitudinally, one could conduct further analysis exploiting the time dimension. We would be able to examine such questions as the following:

– When firms add specialists (either when adding lawyers or when generalists specialize), do they add to open specialties or to covered ones? If they add to open specialties, which ones, and how does this relate to which specialties are covered?

– When firms shrink, do the individuals within it become less specialized? That is, is there an increase in the number of generalists? Which fields move from "covered by a specialist" to "not covered by a specialist," and how does this relate to the fields that remain covered?

2. Hierarchies and Vertical Specialization

Once the boundary of the firm is determined in terms of which specialties should be included and which ones should not, firms must organize their personnel. In general, this involves making three sets of choices: the number of individuals at each hierarchical level (e.g., paralegals, associates and partners), the problems for which each individual is responsible, and wages at each level. Casual observation suggests that these choices are interrelated: when firms organize personnel into hierarchies, this often involves "vertical specialization:" individuals in higher tiers address more difficult problems and are paid more than those in lower tiers.

Our second general research question is: what explains differences in the degree to which hierarchies are used to organize production, and conditional on the use of hierarchies, what explains differences in their characteristics?

Our starting point in answering this research question is Garicano (2000), which presents a theory of how organizations jointly determine the assignment of tasks, wage structure and ratio of high to low level employees. The starting point of the analysis is that, within a particular field, the cost of discovering who knows what and of matching problems with individuals who know their solutions constrains the amount of specialization. Garicano shows that under these circumstances a 'knowledge-based hierarchy' is the efficient way

to organize the acquisition of knowledge. The role of the organization is to increase the utilization rate of the knowledge of the most knowledgeable experts: hierarchies spread this knowledge over a wide range of less knowledgeable workers and shield knowledgeable workers from problems that less knowledgeable workers can solve equally well.

Empirical Tests

Garicano's theory implies that differences in hierarchies should reflect differences in the distribution of the complexity of problems organizations face. In particular, his theory predicts that increasing the fraction of non-routine problems an organization faces will a) increase the probability that a hierarchy is used, and b) conditional on a hierarchy being used, increase the number of individuals at higher tiers relative to lower tiers.

The intuition is this. If an organization faces only well-defined, routine problems for which finding the solution requires no substantial expertise, vertical specialization is not valuable. Hence, one should observe only one tier in the organization. As the fraction of non-routine problems increases, vertical specialization becomes more valuable, and it becomes optimal for only *some* individuals to obtain the expertise to solve the non-routine problems, and to organize things so these individuals can specialize in solving such problems. If the fraction of non-routine problems is relatively small, it is optimal for there to be few experts relative to non-experts: associate-partner ratios should be high. As this fraction increases, the demand for expertise increases, and there should be more experts relative to non-experts: associate-partner ratios should decrease.

In this spirit, we will focus our initial research on two empirical questions:

–   How do hierarchies vary across fields? Does expertise appear to be less leveraged in fields where problems tend to be more complex?

We propose to examine this question by examining how measures of the degree of leverage within firms – for example, the associate-partner ratio -- vary with the specialties of lawyers in the firm. For example, are firms with corporate law specialists more likely to employ associates than those without them? Conditional on employing associates, do such firms have fewer associates per partner? Are generalists more or less leveraged than specialists?

Evidence on these relationships would illuminate the proposition that hierarchies are knowledge based, and exist for the purposes of exploiting vertical specialization.

–   How does the degree of vertical specialization vary across geographic markets? Is it greater in those where clients have demands that are more complex?

There are various ways of investigating this proposition that would require merging the firm-level data on law firms to market-level data on the size distribution of firms and industry composition within local markets.

For example, suppose that all else equal, large firms are more likely to face unusual legal problems than small firms. Then the law firms serving the larger firms should be more likely to have associates than those serving smaller firms. Conditional on having associates, partners at such firms should be less leveraged. One could test this by examining whether the probability of employing associates and the number of associates per partner conditional on employing associates, varies with the size distribution of firms within the law firm's MSA.

Similarly, suppose that conditional on size, firms in different industries differ in the complexity of the legal problems they face. Such differences might arise, for example, because of differences in the degree of regulatory exposure: all else equal firms in industries that are the focus of environmental regulation (for example, utilities, oil refineries) tend to face more complex, idiosyncratic legal problems than those that are not as much focus of this regulation (most service industries). If so, firms in areas where business clients face more complex demands, conditional on their size, should be more likely to have associates but be less leveraged conditional on employing associates than those where business clients face less complicated demands. One could test this by examining whether the probability firms employ associates and firms' leverage ratio, conditional on employing associates, differ with the composition of local legal service demand, as proxied by the local industrial composition.

An important additional proposition follows from these two points that would allow us to distinguish between the effect of market-based factors affecting all law firms from those above. The empirical propositions above pertain to specialties that serve business clients, not individual clients. Vertical specialization in firms that do not serve business clients (such as estate or probate lawyers) should neither vary with the size distribution firms nor local industrial composition. Variation in vertical specialization should not appear across all fields: it should only appear across firms that serve business clients.

II. Data Sources

Our primary data source would be firm-level microdata from the Legal Services industry collected as a part of the Census of Services in 1972, 1977, 1982, 1987, 1992, and 1997.[1] These would contain all of the information asked of legal services firms in these surveys, which would include both the data underlying the tables in the Geographic Series (receipts, payroll, and employees, for example) and in the Miscellaneous Subject Series (Tables 23 and 25 in the 1992 version). The latter contain key firm-level information on individual specialties and hierarchies within firms.

We would like to merge these data across Census years. This would provide a longitudinal database with which we could exploit the data's time dimension. Doing this would require access to the Longitudinal Business Database in each of the Census years

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[1] In 1997, the Economic Census did not ask questions about lawyers' specialties. This is why we emphasize the use of data from the other census years. We understand that the 1972 data may not be fully available. This would not jeopardize our project.

above; were are therefore requesting access to the LBD in 1972, 1977, 1982, 1987, 1992, and 1997.

In the short term, we would like to merge these data with other data that contain information about a) the size and composition of economic activity in the market (county or MSA) in which the law firm is based, b) characteristics of the local labor market, and c) characteristics of law schools in the same market. We describe the data sources that would provide these other data below.

Other Census Microdata

In our preliminary proposal, we noted that we might potentially request microdata from several other Census surveys, such as the Census of Manufactures (as compiled in the LRD). We project that we would use these other microdata to calculate various measures of local market conditions that we would then merge with the Legal Services data. For example, above we noted that the boundaries and organization of law firms in an area might reflect local demand: the size distribution and composition of local firms. We would use the microdata from the LRD to construct variables that reflect local demand. Publically-available data from these Census' provide some measures of local demand, but these measures are probably not refined enough for our purposes. For example, one can calculate average firm size, but not further details about the distribution such as the number and characteristics of large firms in the area.

We thus project using the LRD to compute aggregates at a level of detail not available in publically available data. These aggregates would be used as explanatory variables in regressions that tested the determinants of law firms' boundaries and internal organization.

Census of Services microdata would be used for similar purposes. A substantial fraction of the demand for legal services comes from other service firms – especially in finance, insurance, and real estate. We would calculate measures of the size and composition of local service firms, and use these in regressions that tested the determinants' of law firms' boundaries and organization.

Other CES microdata may be useful along similar lines. If so, we will address this in the future in another formal proposal. For now, we are requesting access to the Legal Services microdata as our main data source. We also request access to the LRD and Census of Services microdata for the purposes of constructing variables that proxy for the size and composition of local demand for legal services.

Other Data Sources

County- and/or MSA-level information regarding the size and composition of economic activity are available from various sources, including County Business Patterns and the Economic Census. Data on local labor market characteristics are available through various surveys taken by the Bureau of Labor Statistics. One example is the

Occupational Employment Statistics Survey, which contains MSA level information on wages and employment for many occupations. Another is the Current Population Survey, which contains such information by demographic categories. We would thus integrate publicly-available data from these and other surveys with the Legal Services microdata.

The American Bar Association publishes information annually on the characteristics of each ABA-accredited law school. This information includes such variables as: number of matriculants, number of graduates, full- and part-time tuition, faculty-student ratio, number of electives, and the degrees offered. We have compiled data from this source in our preliminary work, and plan to merge them with the firm-level microdata.

Future Directions

There may be other ways that the Legal Services microdata could be exploited. For example, as we describe in more detail in the "Benefits to Census" section, it may be possible to merge them with the firm-level data collected and reported in the Martindale-Hubbell Law Directory. This directory reports which lawyers work at each firm, and contains some information about the individual lawyers' human capital: for example, their education, age, and specialty. Unlike the Census microdata, the Martindale-Hubbell directory contains no information about revenues, payroll, or non-legal employees. Combining the two would create a comprehensive matched worker-employer database for this sector that researchers could use to investigate a wide variety of organizational and labor issues.

Extensive work that relies on combining the Legal Services microdata with the Martindale-Hubbell data will not be conducted in the near future, and is therefore not part of this proposal. We mention this project here because we would like to conduct a pilot study that would involve matching observations from the Legal Services data to those in the Martindale-Hubbell data. This would require access SSEL name and address files for 1992 and 1997.) Finding that such a match is feasible would set the foundation for this longer-range project, a project that complements projects currently underway at Census that involve the construction of worker-establishment databases that cover other areas of the economy.

III.   Projected Statistical Output

As in any empirical project, we expect our work to be an iterative process between theory and applied work. Since no-one at CES has ever used the microdata we propose to use, it is difficult to project exactly which regressions will shed the most light on the data at hand. Our description of our statistical output is thus preliminary, and captures what we believe after working with some highly-aggregated data. We expect that this will evolve as we learn the strengths and weaknesses of the microdata. Regardless of what we find during the process, we look forward to working with Census staff to ensure that no results are inappropriately released.

That said, at this point we project that our research outputs will come in two forms.

We project that much of our initial research output will come in the form of simple regressions and frequency tables. As we describe at the very beginning of this proposal, so little is known about relationships between specialization and organization that any study must start by establishing a series of stylized facts. We would therefore begin by examining a series of simple relationships that depict how specialization is organized. These would, for example, report:

--   How does the probability that an individual works with no other lawyers vary with the field in which he or she specializes?

--   What is the frequency with which one observes different combinations of specialties within the same firm?

--   What is the probability that a law firm has no associates or paralegals (i.e., no hierarchy) as a function of the specialties of the lawyers?

We would report these relationships either as regression results or as highly-aggregated frequency tables (like Dunne, Roberts, and Samuelson (1988)). We plan to work closely with Census staff to ensure that any tabular output does not release data inappropriately.

We would then move beyond simple stylized facts to hypothesis testing. We project that this would involve regression analysis exclusively. These regressions would relate variables that depict how firms are organized to the characteristics of their local markets. For example, we would extend our preliminary analysis on how specialization affects firm size to the microdata, and regress firm size on the specialties of the lawyers within the firm, using local white collar wages and the characteristics of local law schools as instruments. Likewise, we would examine how individual firms' hierarchies reflect the composition of local demand by regressing the firm's associate-partner ratio on variables that depict the size distribution and regulatory exposure of firms in the market.