Resource co-specialization and supplier concentration in concurrent sourcing

Mari Sako  
University of Oxford  
Said Business School  
mari.sako@sbs.ox.ac.uk

George Chondrakis  
University of Oxford  
Said Business School  
george.chondrakis@sbs.ox.ac.uk

Paul M. Vaaler  
University of Minnesota  
Carlson School of Management  
vaal0001@umn.edu

Abstract

Although the preconditions for the simultaneous use of multiple sourcing modes have been explored, the question of what determines how much to make and how much to buy in plural sourcing has been understudied. This study fills this gap. Using longitudinal data of in-house lawyers at, and law firms used by, Fortune 500 firms, we find empirical evidence that plural sourcing strategies are tilted in favor of "make? whenever firms have opportunities for resource co-specialization (notably between legal resources and R&D, marketing, and top management teams) and a broad portfolio of suppliers that raises the cost of contracting. Our study suggests that plural sourcing research benefits from examining a group of transactions within a corporate function, to complement the predominant focus on transaction-level outcomes.

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Resource Co-Specialization and Supplier Concentration in Plural Sourcing: Evidence from Legal Services Sourcing at Fortune 500 Companies

INTRODUCTION

How do firms organize economic transactions? Since the seminal work on firm boundaries by Coase (1937, 1988), scholars have addressed this question by identifying multiple modes (i.e. make, buy, ally, etc.). Prior work in transaction cost economics (TCE) analyzed the transactional characteristics that lead to choosing one of these modes (Poppo et al., 1998; Walker et al., 1984; Williamson, 1985) while the resource-based view of the firm (RBV) suggests that firm boundaries reflect differences in capabilities and knowledge (Argyres, 1996; Jacobides et al., 2005; Kogut et al., 1996).

Both TCE and RBV employ a comparative analysis of sourcing modes, leading to the choice of the most efficient institutional arrangement (i.e. market, hierarchy or hybrid) for each transaction. However, prior research has documented the simultaneous use of multiple sourcing modes by firms, calling this concurrent sourcing (Parmigiani, 2007; Parmigiani et al., 2009), plural sourcing (Bradach, 1997; Gulati et al., 2006; Heide, 2003; Jacobides et al., 2006), or taper integration (Harrigan, 1986; Rothaermel et al., 2006). In contrast to a TCE or RBV logic, firms are often found to both make and buy the same input.

There is robust theory and evidence on the conditions under which plural sourcing is likely to occur. For example, Parmigiani (2007) demonstrates that greater overlap between the firm’s and the supplier’s expertise increases the likelihood of plural sourcing while Parmigiani et al. (2009) explain that firms may make and buy sets of complementary components. Performance uncertainty and information asymmetry between buyers and suppliers (Dutta et al., 1995; Heide, 2003), technological volatility (Krzeminska et al.,
forthcoming), and complementarities in incentives or knowledge (Puranam et al., forthcoming) can also lead to plural sourcing.

While important in identifying the prevalence of plural sourcing, this research has provided limited guidance on a logical follow-on question, that is, how to explain the mix of internal and external sourcing (Parmigiani, 2007:306; Puranam et al., forthcoming). Assuming that a firm does indeed both make and buy, why would it choose 80% make vs. 20% buy as opposed to 40% make vs. 60% buy? Thus, given the presence of preconditions for plural sourcing, how do firms decide how much to make and how much to buy?

In addition, the literature does not explore the selection of suppliers and their impact on the design of plural sourcing strategies. For example, if a firm decides to buy 40% for a given product or service, this 40% could be outsourced to a single firm or multiple firms. Existing theory assumes the decisions on the make-buy balance and supplier selection to be independent of each other. This is despite the fact that behind the ‘façade of the market’ lies another firm, with its own capabilities and contractual relationship with the focal firm (Jacobides et al., 2005). To the extent that supplier selection influences the cost of contracting, it would have an impact on the make-and-buy decision.

In this paper we build on recent progress in the area of plural sourcing and address these two limitations. In doing so we identify two mechanisms that help better understand the design and variability in plural sourcing strategies. First, resource co-specialization enhances the benefits of internalization. By resource co-specialization we refer to the synergistic gains that arise from the interaction of different resources within firm boundaries (Lippman et al., 2003; Teece, 1986). When firms outsource part of production they essentially position certain resources, e.g. personnel, equipment etc. outside of their boundaries. By doing so, they forego opportunities to harvest synergies resulting from resource combinations that increase their marginal productivity through on-going interaction, shared expertise, and knowledge
spillovers (Dierickx et al., 1989; Kogut et al., 1992; Milgrom et al., 1995). Consequently, in cases of plural sourcing the extent of integration, or make, will increase when there are opportunities for resource co-specialization with other firm resources.

Second, we highlight the impact of supplier concentration (Moeen et al., 2013) on the relative importance of internal versus external suppliers in plural sourcing. Here we suggest that the number of suppliers chosen to outsource to is not independent of the proportion that is bought. A large number of suppliers leads, ceteris paribus, to high mundane transaction costs and reduces the benefits from relational contracting (Baker et al., 2002; Langlois, 2006), resulting in the firm relying more heavily on make in plural sourcing. By contrast, when firms use a small number of suppliers, they will benefit from relational contracting and lower transaction costs and consequently buy more from their suppliers (Dyer, 1997; Moeen et al., 2013).

We develop our arguments in the context of corporate legal services, a setting where the use of both internal and external suppliers for the same input, known as multi-sourcing, is common (Sako, 2011; Susskind, 2008). We demonstrate that resource co-specialization drives the design of plural sourcing strategies as the balance tilts in favor of make when firms rely more on R&D resources, advertising resources, international presence, and legal expertise in their top management team. We also find that the extent of insourcing increases when the firm sources from a large number of law firms. Although this result might sound counterintuitive, it is explained by the endogenous impact of supplier concentration on the costs of contracting.

This paper contributes to our understanding of plural sourcing by moving beyond the recognition of the phenomenon to the identification of specific strategies that firms employ and their antecedents. Moreover, this study is important in extending the inquiry on firm boundaries to the domain of corporate functions. The vast majority of an admittedly
voluminous literature on vertical integration (or disintegration) has focused on primary activities (Gibbons, 2005; Williamson, 1985), to the neglect of corporate functions providing important support activities in the value chain (Porter, 1985). This paper highlights the importance of investigating firm boundary-setting and the mix of make and buy activities with a focus on value-adding professional and business services in corporate functions (Sako, 2013).

In the next section we review the relevant literature and explain why corporate legal services provide an ideal setting to test our predictions. Then, we present in sequence our hypotheses, data and methodology, and results. The final part offers a concluding discussion.

**PLURAL SOURCING: THEORY & EVIDENCE**

TCE and RBV are the two dominant theories employed to understand firm boundary decisions. On the one hand, TCE explains the make-or-buy decision as a response to close comparison of costs associated with each alternative (Williamson, 1985). Market-based buy strategies tend to have lower costs and thus dominate comparable make strategies emphasizing firm ownership of and hierarchical control over suppliers. But cost advantages of buy over make strategies reverse themselves in exceptional circumstances where hazards with market-based contracting are substantial. In contrast, RBV contends that the reason an activity is conducted within the firm is not market failure but rather firm success: the firm as an institution enjoys an ‘organizational advantage’ in organizing economic activity (Madhok, 2002:536). Thus, RBV explains firm boundary-setting based on competitive interest in exploiting value from difficult to imitate resource bundles (Barney, 1986).

TCE and RBV differ on many dimensions but share assumptions about the choice of one ‘optimal’ exclusive governance mode that runs counter to long-term use of multiple sourcing modes. Nevertheless, the simultaneous use of multiple sourcing channels is something we observe empirically, and numerous studies testify to its systematic use, at
different points in production of goods and services in different industry contexts (Bradach, 1997; Heide, 2003; Jacobides et al., 2006; Parmigiani, 2007; Porter, 1980). Plural sourcing, along with other terms such as tapered integration or concurrent sourcing, has been used to describe such phenomena.

The benefits and rationale for undertaking plural sourcing are well understood. Some of the earlier arguments focused on the role of demand uncertainty, whereby firms can avoid maintaining idle capacity through the use of external suppliers (Adelman, 1949), and the threat of backwards integration to external suppliers (Harrigan, 1986). Besides these, firms also have a better understanding of the production process when making and buying and are thus better at monitoring suppliers (Dutta et al., 1995; Heide, 2003). Finally, ‘knowledge complementarities’ between the two sourcing modes have been noted (Puranam et al., forthcoming). For example, internal and external suppliers can benefit from mutual learning and from transferring best practices across different organizational arrangements (Bradach, 1997; Cassiman et al., 2006; Parmigiani, 2007).

Of course, these findings have not gone unchallenged by TCE orthodoxy. Williamson (1985) suggests that plural sourcing is actually an artifact of ill-identified transactional heterogeneity. Consistent with this argument, He et al. (2006) find that although trucking firms appear to engage in plural sourcing (through the use of both internal and external drivers), they are in fact choosing to outsource hauls that are qualitatively different from the ones undertaken internally. Similarly, Azoulay (2004) demonstrates that variation in project characteristics guides pharmaceutical companies when choosing to outsource or assign their own employees on different projects. More generally, the difficulty in identifying when firms both make and buy ‘exactly the same input’ presents a substantial challenge to plural sourcing research (Krzeminska et al., forthcoming).
Two further limitations of prior theorizing are notable. First, there is little guidance on the relative balance of make and buy in cases of plural sourcing (Parmigiani, 2007; Puranam et al., forthcoming). When the preconditions for plural sourcing exist, we still know little about how firms choose the mix of internal and external procurement.

Second, existing theories do not analyze supplier selection and its impact on the design of plural sourcing strategy. Although the role of suppliers’ capability and expertise has been explored (Parmigiani, 2007; Parmigiani et al., 2009), the overall cost of contracting is assumed to be independent of concentration in the portfolio of suppliers. However, this premise is unlikely to hold given that the costs of contracting are affected by the nature of the contractual relationship between any two parties. In particular, one-off arms-length transactions between parties are characterized by increased costs of contracting because there are higher ‘mundane’ transaction costs and lower opportunities to benefit from relational contracting (Dyer, 1997; Langlois, 2006; Moeen et al., 2013). Hence, the degree of supplier concentration, and its subsequent impact on the cost of contracting, should influence the make-buy balance in the plural sourcing of products or services.

In order to address these limitations and contribute to our understanding of plural sourcing we study corporate legal services. This setting is ideal as it is an unambiguous example of plural sourcing (see below). We are thus able to dispense with the discussion about whether inputs are actually both internally and externally procured and focus instead on observed variability in the design of plural sourcing strategies.

In addition, by moving from the level of the individual transaction to that of a portfolio of transactions (i.e. legal services) we are able to account for patterns of interdependence between different transactions and firm resources (Moeen et al., 2013; Puranam et al., forthcoming). Without such focus, it is impossible to observe ‘spillovers’ from different transactions (Mayer, 2006) and the effect of complementarity between inputs
(Parmigiani et al., 2009). Firms regularly employ suppliers for a variety of inputs – with varying degrees of similarity (Krzeminska et al., forthcoming) – and supplier selection is naturally affected by existing contractual relationships. For example, a corporation using a law firm for patent filing could choose the same law firm in case some of its patents are targeted in a patent suit, given the law firm’s expertise and experience in this area. A portfolio-level analysis ensures that this information is not lost.

The plural sourcing of legal services

The procurement of legal services by corporations presents an ideal context for the study of plural sourcing (Sako, 2011; Susskind, 2008). Firms typically have an in-house legal department headed by a general counsel (GC) leading a staff of in-house lawyers, while at the same time regularly engaging external law firms. Make-and-buy strategies are driven to some extent by transactional characteristics: routine legal tasks, such as regulatory form filing, may be undertaken by in-house lawyers while external lawyers may take the lead on more specialized tasks such as complex acquisitions, litigation, and criminal matters. However, in-house and external lawyers often work simultaneously, as a team or in parallel, on the same type of legal matter. For example, combined teams of in-house and external lawyers support and consult senior managers during acquisitions. Similarly, in-house legal departments usually undertake patent filing and prosecution with the help of specialist law firms.

The plural sourcing of legal services is not surprising given complementarity between the in-house lawyer’s firm-specific and the outside counsel’s practice-specific knowledge and experience (Puranam et al., forthcoming). Important synergies and learning opportunities arise from such interactions. There are also bargaining and oversight dimensions to consider in the plural sourcing of legal services (Dutta et al., 1995; Harrigan, 1986). If firms have the capacity to re-direct legal matters from outside counsel to qualified in-house lawyers, then these firms also have more power to bargain over the costs of retaining outside counsel. They
can also exercise oversight of outside counsel actions to assure high-quality and cost-effective representation in some legal matter. Conversely, the use of external law firms helps create competitive pressure to the in-house legal department, thus ensuring a minimum level of efficiency in its operations (Jacobides et al., 2006).

**HYPOTHESES**

**Co-specialization of legal resources**

A central tenet of RBV is that firms create and capture value by deploying different or unique combinations of resources. This suggests that the value of a resource is not exogenously determined but rather depends on other surrounding resources. Lippman et al. (2003) go as far as to state that no resource is firm-specific, and suggest that firm value can be traced to the presence of co-specialized resources that exist within the legal shell of the firm. Resource co-specialization then is associated with excess value, or synergy, that results from the interaction of different resources within firm boundaries.

A number of explanations have been put forward in the literature to explain the emergence of gains from resource co-specialization.¹ Nelson et al. (1982) describe how organizational resources are engaged in functioning routines that enable firms to economize on coordination costs. Kogut et al. (1992) explain that the emergence of high-order principles through organizational membership enhances knowledge creation and sharing.

The generation of synergies resulting from resource co-specialization will affect the design of plural sourcing strategies, as firms will be less reluctant to outsource production. Market contracting entails the externalization of resources, which reduces the opportunities of resources to become co-specialized. Hence, in the case of plural sourcing, there will be more emphasis on make when resource co-specialization is likely to generate synergies. It is

¹ We prefer to use the concept of resource co-specialization as opposed to resource complementarity (Milgrom et al. 1995) because resource co-specialization emphasizes the dynamic nature of the process of generating synergy. This synergy is not a characteristic of the resource but develops through ongoing interactions within firm boundaries. Complementarity results in a more instant generation of surplus value due to the attributes of assets or resources that may lie within or across the firm boundary.
important to clarify here that our notion of resource co-specialization is distinct from complementarity between procurement modes as described by Puranam et al. (forthcoming). Whereas they focus on the excess value resulting from the simultaneous use of both market contracting and hierarchical governance, we emphasize the excess value resulting from the interaction of internalized resources with other firm resources.

Legal resources can be combined with other firm resources, giving rise to opportunities for exploiting resource co-specialization. Thus, instead of regarding lawyering as necessary fixed overhead costs for the corporation, in-house legal resources may be seen as a source of competitive advantage (Bagley, 2008; Orozco, 2010). But exactly what firm resources give rise to co-specialization opportunities, which in turn increase reliance on the internal legal department?

International firms

Internationalization as a process compounds the complexity of all managerial tasks (Carpenter, 2002; Prahalad, 1990; Sanders et al., 1998). As multinationals enter foreign markets which are more distant in geographic, cultural, and administrative dimensions (Ghemawat, 2001), they suffer from greater ‘liability of foreignness’ (Zaheer, 1995). In relation to legal tasks, complexity multiplies with the number of foreign jurisdictions in which the company has presence, as it has to deal with diverse institutional environments.

This additional complexity creates opportunities for generating value through regulatory arbitrage. This term is used to describe cases when parties take advantage of a gap between the economics of a deal and its regulatory treatment, restructuring the deal to reduce or avoid regulatory costs (Fleischer, 2010:227). Examples include transfer pricing, effective cross-jurisdictional tax planning, investment decisions based on tax, or other regulatory incentives. Yet, a strong legal expertise within the firm is required in order to identify such opportunities and fully capture their benefits (Bagley, 2008). As Marchant et al. (1999)
explain, legal expertise largely relies on tacit knowledge of the context and past experience with the specifics of the situation. Hence, frequent interaction between the corporate legal department and, say, the corporate accounting department (for international tax planning) or the strategic planning department (for foreign direct investment or M&A) is likely to create important benefits for international firms through the identification and realization of unexplored opportunities. The potential to exploit opportunities from the co-specialization of legal with other resources, arising from multi-jurisdictional international presence, is likely to favor more ‘make’ in the plural sourcing of legal services. Thus:

**H1: The more internationalized a firm is, the greater its reliance on the internal sourcing of legal services.**

**R&D intensive firms**

Besides international firms, we also expect R&D intensive firms to rely more on their internal legal departments. Firms investing in new technology must choose an appropriate strategy to appropriate gains by protecting their intellectual property, for example by choosing between secrecy and patenting. Exactly what to patent and how to patent is a know-how that arises from the co-specialization of legal and technical knowledge. Internal patent lawyers tend to be highly knowledgeable about the company’s unique technologies (Somaya *et al.*, 2007). They can interact with the firm’s R&D department to discuss patentable ideas from an early stage and thus help to increase the share of the value appropriated from innovation. For example, Reitzig *et al.* (2009) have found that intermediate levels of cross-functional involvement between the legal and R&D department increase the speed of patent grants.

In case studies of innovating firms there is also increased evidence on the role and importance of internal legal experts in the management of intellectual property – for example through various committee memberships (Fox, 1998; Grindley *et al.*, 1997). Hence, the value
of in-house lawyers will be higher for R&D intensive firms due to the co-specialization of legal and technical resources. We therefore hypothesize that:

\[ H2: \text{The higher the R&D intensity of a firm is, the greater its reliance on the internal sourcing of legal services.} \]

**Advertising intensive firms**

Similarly to R&D intensive firms, firms that rely on advertising to compete will benefit from the co-specialization of legal resources. Advertising relies on the use of intangible assets, such as brand names and trademarks, which require protection from competition. Increased interaction between the legal and marketing departments will therefore help firms devise a trademark strategy that is informed by and exploits the legal opportunities and limitations in the use of trademarks (Cohen, 1986, 1991). This will enable firms to reduce brand dilution and create stronger brand names. Increased communication between lawyers and marketers is important in this process as lawyers can identify threats to the intellectual capital of the firm that are not immediately obvious to marketing staff (Peterson et al., 1999). In view of these gains, firms with high advertising intensity will rely more on their internal legal department. Thus:

\[ H3: \text{The higher the advertising intensity of a firm is, the greater its reliance on the internal sourcing of legal services.} \]

**Legal expertise in TMTs**

Legal resources may be used directly by top management teams (TMT) to hone their capability for making strategic choice. Defined as ‘the ability of a TMT to communicate effectively with the counsel and to work together to solve complex problems’, ‘legal astuteness’ is a valuable dynamic capability (Bagley, 2008:378). By incorporating legal know-how in business decisions, ‘legally astute’ TMTs use legal tools to create options (e.g.
in litigation), and convert regulatory constraints into opportunities (e.g. by proactively going beyond the letter of the law in environmental compliance to improve financial performance).

Legal astuteness impacts on the orientation of both TMTs and company lawyers. As for TMTs, the upper echelons perspective points out that organizational outcomes reflect the values and cognitive bases of powerful actors in the organization (Hambrick et al., 1984). Consequently, examining prior experiences and background of TMT members help us identify the ways they shape and direct the resources at their disposal. In the legal context, TMTs with legal expertise may create more structures and processes to improve the effectiveness of the in-house legal function. Thus, the presence of a functional TMT member influences organization design, and equally, the TMT composition is affected by changes in organization structure (Menz, 2012).

Legal astuteness also affects the orientation of in-house corporate lawyers. They would be expected to be proactive in identifying complementarities between business opportunities and legal know-how. They are, in effect, counsels (combining legal and business advice) or entrepreneurs (giving priority to business objectives rather than legal analysis), rather than cops (limiting their advice to legal mandates) (Nelson et al., 2000). In short, these ‘decision consultants’ (Rosen, 1984) give legal advice in the context of the business. Thus, legally astute TMTs rely much on the GC’s capacity to create value from the co-specialization of legal resources and business-context knowledge within the firm. Thus, the more legally astute the TMT, the more likely the GC is a member of the TMT and the more likely in-house lawyers rely on co-specialization of legal and firm-specific business knowledge.

*H4: The general counsel’s membership in the top management team will result in greater reliance on the internal sourcing of legal services.*
**Supplier concentration**

Besides resource co-specialization, the degree of concentration of suppliers affects the design of plural sourcing strategy. As explained before, heterogeneity in supplier selection has not been explored in the context of plural sourcing. In essence, the analytical calculus that prompts a firm to choose plural sourcing is assumed to be independent of the composition of supplier portfolio. Here, however, we suggest that different degrees of supplier concentration impose different costs of contracting to the outsourcing firm. These costs depend on the nature of the contractual relationship. Low scale, arms-length transactions are characterized by high costs of contracting as the parties do not have much incentive to invest in firm-specific transacting platforms and systems (Baldwin *et al.*, 2003; Langlois, 1992, 2006). In addition, infrequent interactions with suppliers do not generate inter-organizational trust and the associated benefits of relational contracting and increased commitment (Baker *et al.*, 2002; Dyer, 1997; Sako *et al.*, 1998). Hence, in the presence of high costs of contracting, we expect lower reliance on external providers.

In-house legal departments may choose to procure legal services from a large number of law firms in pursuit of increased expertise in some area (e.g. regulatory compliance in a specific industry) or lower cost. This model is closer to arms-length-style market governance, as firms scan the environment for the best possible provider for their specific legal needs. Alternatively, legal departments could outsource to a concentrated panel of law firms involved in relational governance. This mode involves less flexibility in terms of supplier selection but the firm benefits from reduced costs of contracting. For example, having an ongoing and committed relationship with a law firm facilitates communication (as there is no need to identify points of contact or firm background), and ensures that the client firm will get the top partners for their case.
We therefore expect a company’s willingness to invest in relational governance with a selected few law firms to result in a high degree of outsourcing and a smaller in-house legal department (Moeen et al., 2013). By contrast, companies collaborating with a large number of law firms will increase their reliance on internal legal resources. Thus, we predict the following:

\[ H5: \text{The larger the number of external law firms employed by a firm, the greater its reliance on the internal sourcing of legal services.} \]

**EMPIRICAL METHODS**

**Data and sampling**

To evaluate our theoretical framework and test our hypotheses, we first collect information on the size and composition of internal legal departments and their relationships with external law firms. This information is not publicly available, so we use proprietary survey and secondary data collected by ALM Legal Intelligence, a research unit within the American Lawyer Media Group. In particular, we used ALM’s annual survey of in-house legal departments as well as ALM’s reports on corporate activity, including litigation, M&A transactions, and corporate bankruptcies. These data are available from 2004 until 2011 for Fortune 500 companies\(^2\).

To be included in our sample, we require firms to have ALM annual survey data as well as data on firm operations in Compustat corporate and industry segment files. Our final dataset is an unbalanced panel consisting of 1230 observations from 285 firms \((i)\) observed over up to eight years \((t)\). Our reported number of observations drops to 945 as several statistical analyses below require the inclusion of one-year lagged variables.

\(^2\) For 2004 and 2005 the data are only available for Fortune 250 companies.
Dependent variable

Consistent with other empirical work on plural sourcing (Parmigiani, 2007; Parmigiani et al., 2009), we seek comparable information on internal and external suppliers of legal services. Ideally we would have information on hours worked on specific matters by in-house lawyers at corporations as well as hours worked on the same matters by lawyers at outside law firms on behalf of these client corporations. Such data are not publicly available as lawyers at both types of organizations treat such information as sensitive and strictly confidential.

We do, however, have ALM survey data on the number of in-house lawyers and the number of external law firms providing outside legal work for these firms. Thus, we construct our dependent variable based on the count of in-house lawyers (as reported in the ALM annual survey of general counsel (GC)) and include the count of external law firms as a right-hand side term. Our dependent variable is the natural log of the annual count of in-house lawyers per $100 billion in firm sales. Changes in the dependent variable then reflect changes in the in-house lawyer count attributed to factors unrelated to organic growth.

An increase (decrease) in the dependent variable can be attributed to two possibilities: a) increased (decreased) reliance on internally made legal services by in-house lawyers rather than externally bought legal services by outside law firms; or b) an increase (decrease) in the overall amount of legal work that needs to be undertaken on behalf of the firm by both internal and external providers. In order to account for the second possibility and isolate changes in the make-and-buy mix, we include controls for the overall amount of legal work undertaken and employ multiple regression analyses that incorporate dynamic processes and account for possible reverse causality.
Independent variables

*Internationalization.* We measure the degree of internationalization as a count of the number of countries where each firm operates via subsidiaries in a given year. Although different measures of internationalization have been suggested, we use the number of countries as it more accurately captures the complexity associated with operating in multiple jurisdictions. Even modest sales or presence in a country requires basic knowledge of and compliance with substantive laws and legal processes.

*R&D intensity.* We calculate R&D intensity as R&D expenses divided by sales.

*Advertising intensity.* We calculate advertising intensity as advertising expenses divided by sales.

*General counsel in TMT.* In order to examine the GC’s participation in the firm’s TMT, we construct a dummy variable taking the value of one when the GC has the title ‘Senior Vice President’ or ‘Executive Vice President’ and otherwise taking the value of zero. Data on the GC’s role were obtained from S&P’s Capital IQ database which includes biographical and other information on key professionals, executives and directors.

*Law firms.* In order to measure the degree of concentration in the provision of external legal services we use a count of external law firms working for a given client corporation surveyed. This variable is included in ALM’s annual survey and asks GCs to identify the law firms that undertook legal work on their behalf in a given year. All other equal, the higher the number of law firms, the lower the degree of concentration in the provision of external legal services across the group.

**Control variables**

We include a number of time-varying firm controls including firm debt exposure, calculated as total debt divided by total assets, firm profitability, calculated as EBITDA divided by sales, and the natural log of the count of firm employees. We also control for the
effect of product diversification using the entropy measure of diversification, where industry segments are defined by 4-digit SIC codes. In addition, we include a count of new acquisitions started in a given firm as well as a count of new litigation cases started in a given year where the firm was involved either as defendant or plaintiff. Both acquisitions and lawsuits are important controls as they may prompt a significant increase in the amount of legal work to be done in-house or externally. To account for the possibility that the additional work may come with some delay, we also include one-year lagged value of these two counts.

To better control for the overall amount of legal work undertaken by the firm in each year, we also use annual selling, general and administrative expenses (SG&A) as a proxy for legal expenses. This variable is reported by Compustat and includes all commercial expenses of operation not directly related to production, including GC office expenses and legal fees paid to law firms. We are thus able to observe changes in the legal service make and buy propensity as opposed to changes in the overall amount of legal work undertaken. Finally, we include a dummy variable which is equal to one when the firm is in bankruptcy proceedings in a given year. Table 1 reports summary statistics and correlations for the variables.

- Insert Table 1 about here -

**Econometric specifications**

Standard fixed- or random-effects specifications allow us to control for unobserved firm characteristics that influence the legal services make-and-buy decision. However, our data have two additional characteristics that need to be accounted for. First, the in-house lawyer count is likely to be influenced by past observations. Including a lagged value of the dependent variable as a regressor allows us to account for autocorrelation but the presence of both a lagged dependent variable and fixed-effects can render estimates inconsistent (Nickell,

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3 ALM only collects data for “important” acquisitions and lawsuits as reported in trade publications. Although this probably results in loosing some information, this is unlikely to bias our results as reporting criteria are similar for all firms in our sample. In addition, the biggest acquisitions and lawsuits are likely to have the most important effect on legal service sourcing dynamics.
Second, several of our regressors may be endogenously determined or predetermined, that is, correlated with current or past disturbances. To address these concerns we employ a dynamic panel data estimator with GMM-type instruments (Arellano et al., 1991). This estimator is ideal for ‘small T, large N’ panels like ours. In addition, GMM estimators are robust to heteroskedasticity in the cross-section and unknown patterns of serial correlation (Arellano, 1987).

More specifically, we estimate a statistical model of the form:

$$l_{it} = \alpha l_{i(t-1)} + \beta' x_{it} + y_t + \eta_i + u_{it}$$

where $l_{it}$ is the natural log of the count of lawyers divided by sales in firm $i$ of year $t$, $x_{it}$ is a vector of explanatory variables, $y_t$ is a year effect, $\eta_i$ is a time-invariant firm-specific effect and $u_{it}$ is the error term.

The GMM estimator originally proposed by Arellano et al. (1991) uses first differencing to remove unobservable firm-specific effects and then instruments the endogenous variables using lagged levels of the series. However, this approach is problematic in our setting as the first-differenced GMM estimator is found to have large finite sample bias and poor precision when time series are short and persistent (Blundell et al., 1998). Instead, we employ the system GMM estimator suggested by Arellano et al. (1995) and Blundell et al. (1998). This approach uses lagged differences as instruments for equations in levels, in addition to lagged levels as instruments for equations in first differences. The system estimator introduces an additional assumption that changes in instrumenting variables are uncorrelated with the fixed effects. All models were calculated using the xtabond2 Stata module (Roodman, 2006).

To address concerns about simultaneity bias we treat the number of law firms and general counsel in TMT variables as endogenous while the remaining explanatory variables as predetermined. From the control variables, selling, general and administrative expenses are
endogenous as they proxy overall legal expenses. Litigation cases are also treated as endogenous given that larger legal departments are more likely to take cases to court. The remaining control variables are treated as exogenous. We use the forward orthogonal deviation transformation instead of first differencing given that our panel is unbalanced. This minimizes data loss while preserving the orthogonality among the errors (Arellano et al., 1995; Roodman, 2006). Finally, we use standard errors that are robust to heteroskedasticity and arbitrary patterns of autocorrelation within firms.

RESULTS

Descriptive statistics and preliminary analysis

Descriptive statistics and pair-wise correlations are reported in Table 1. The sample mean for In-house lawyers is 5.37, suggesting that firms employ on average 3.62 lawyers per billion dollar of sales. The raw number of in-house lawyers at Fortune 500 firms sampled exhibited substantial variation ranging from a handful to more than 1200 in certain firms such as General Electric. The sample mean of Outside law firms is 1.83, meaning that firms reported on average nine outside law firms as undertaking legal work on their behalf in a given year. Those numbers ranged from one to more than 50 outside law firms. Pair-wise correlations are largely intuitive. Variables corresponding to the five hypotheses for testing all exhibit the predicted positive sign when correlated with the dependent variable.

Figures 1A-E present results from Lowess analyses4 of In-house lawyers and make and buy determinants related to Hypotheses 1-3 and 5 (Internationalization, R&D intensity, Advertising intensity, and Outside law firms), and from comparative bar-chart analyses of In-house lawyers related to Hypothesis 4 (General counsel on TMT). The pattern of results in all figures indicates preliminary support for Hypotheses 1-5.

4 Lowess analyses compute linear regressions around each observation of given determinant (e.g., Internationalization) with neighborhood observations chosen within some sampling bandwidth and weighted by a tri-cubic function. Based on the estimated regression parameters, In-house lawyers values are computed. Combinations of determinants and In-house lawyers are then connected, yielding a Lowess curve.
Regression analysis

Table 2 presents the results of our regression analysis. Models 1-2 present fixed-effects specifications while Models 3-5 present results from the system GMM estimator. Simpler fixed-effects models suggest that the lagged dependent variable, In-house lawyers$_{it-1}$, explains roughly 30% of variation in the dependent variable. We noted previously, however, that the lagged dependent variable coefficient estimates in fixed-effects regressions are typically biased downwards (Nickell, 1981). When the number of time-periods, $t$, are few as here, the downward bias can be substantial as corrected system GMM regression results demonstrate. Coefficients on In-house lawyers$_{it-1}$ jump from 0.310 and 0.305 in Models 1-2 to 0.973, 0.882 and 0.883 in Models 3-5. All estimates are significant at the 1% level.

Model 3 reports one-step system GMM results with the lagged dependent variable and controls only. Models 4-5 are fully-specified and report one- and two-step system GMM results (the two-step estimator is corrected for downward bias in the computed standard errors (Windmeijer, 2005)). Diagnostics at the bottom of each column suggest that key estimation assumptions hold. The Arellano-Bond $z$ test for second- and higher-order autocorrelation is not statistically significant. This is not weakened by the number of instruments as instrument count is lower than the number of firms (Roodman, 2006). Hansen’s $J$ test fails to reject the null hypothesis that the instruments generated are exogenous.

We look primarily to results in Models 4-5 for evidence to evaluate support for our hypotheses. Results support our predictions and the importance of resource co-specialization in designing plural sourcing strategies. Consistent with Hypothesis 1, we observe positive coefficients for Internationalization significant at the 1% level. Firms operating in more countries increase their dependence on in-house lawyers. Consistent with Hypotheses 2 and
3, we see positive coefficients on \( R&D \) intensity significant at the 10% level and positive coefficients on \( Advertising \) intensity significant at the 5% level. Consistent with Hypothesis 4, we observe positive coefficients on \( General \) counsel on \( TMT \) significant at the 10% level, suggesting that elevating senior legal personnel to top management ranks also increases in-house lawyer counts.

Recall that Hypothesis 5 explains that the design of the portfolio of external legal service providers is not independent of the proportion of legal work that is externally procured. Our analysis confirms the hypothesized positive relation between the number of law firms supplying to a company and the propensity to internalize legal work. The coefficient for the number of external law firms is positive and significant at the 10% level, suggesting that the proportion of legal work undertaken within the firm boundaries increases with the number of external service providers. Although this result might sound counter-intuitive, it is consistent with a relational contracting logic. Firms employing a large number of suppliers do not develop the mechanisms that reduce contractual uncertainty and, as a result, face higher contracting costs.

From the control variables we find that firm profitability is negatively correlated with the extent of internal procurement of legal services. The coefficient for SG&A expenses, a proxy for the overall amount of legal work undertaken by the firm, is also negative and significant. This might reflect the ‘natural’ tendency to outsource legal work due to low asset specificity and increased expertise in the marketplace. Finally, the coefficient for the number of acquisitions undertaken is negative and significant. Given that corporate acquisitions require specialist legal knowledge during negotiations, due diligence, contract design etc, it is reasonable to expect that more outsourcing of legal work will take place.
Robustness checks

These results prove robust to several changes in model specification and sampling. For example, we excluded firms from our sample that were involved either in antitrust suits or in bankruptcy proceedings – see Model 6. We also obtain consistent results when re-measuring the dependent variable, In-house lawyers, as a simple count and then analyzed in Poisson panel count models – see Models 7-8. Results remain essentially unchanged when employing different variable definitions (e.g. we varied Internationalization to account for the number of foreign jurisdictions with differing (from US) legal system and rule-of-law traditions) and when excluding possible outliers (e.g. R&D intensity values above 30%).

Another issue we explored further is the measurement of supplier portfolio concentration. On average, we expect that a high number of law firms undertaking work for the focal firm is associated with low concentration in the supply of legal services. However, this relationship is less clear when there are changes in the type of representation. For example, assume firm A employs 4 different law firms in four different practice areas (M&As, patent litigation etc) while firm B similarly employs 4 law firms but in one practice area. As it stands, our measure suggests that both corporations have the same level of supplier concentration. However, firm B clearly has a less concentrated portfolio of suppliers given that it has 4 different suppliers for the same practice area. To account for this, we counted the number of law firms undertaking work for the focal firm in each practice area (this information is available from ALM) and then averaged these. A high number of this measure suggests that the focal firm has multiple suppliers in the same practice area, which is indicative of low concentration in the provision of legal services. Consistent with our results, the coefficient for this variable remains positive and significant at the 6% level.
DISCUSSION AND CONCLUSION

A substantial body of research has examined the conditions under which plural sourcing is likely to occur. Moving beyond the question of when it occurs, the issue of how firms choose the balance between making and buying in plural sourcing has remained under-explored. This study fills that gap. In doing so we identify two mechanisms that dictate the make-buy balance in plural sourcing, namely resource co-specialization and supplier concentration. Our framework enables us to predict the make-and-buy mix in the context of legal services provision.

The empirical findings support the view that when making and buying, firms exploit resource co-specialization and supplier selection to tip the balance in favor of in-house production and delivery. We noted statistically significant increases in the reliance on in-house lawyers with increases in the number of countries where the firm had operations, with increasing R&D and advertising expenses as a percentage of sales, when the CG is part of the firm’s TMT, and as the number of law firms providing work for the firm increases. Overall, these findings provide broad-based support for our make-and-buy framework that explains how firms decide to balance internal and external activities.

Implications for theory and research

Our study has important implications for strategy theory. First, our study extends the plural sourcing research by going beyond important but still basic questions of whether and when firms engage in this practice to theorize about firm-level mechanisms, including resource co-specialization and supplier selection, that determine the mix of sourcing modes.

Second, these co-specialization opportunities exist for resources lying in different corporate functions. Thus, whilst our empirical context is the legal department as a focal corporate function, other corporate functions also engage in plural sourcing by balancing internal and external resources within the firm. In particular, in-house accountants work
alongside outside accounting and audit firms, in-house engineers with outside engineering consultant firms, in-house marketing departments with marketing and PR agencies, and internal strategy consultants with outside consulting firms. In these and other contexts, we think our theoretical framework can provide researchers with relevant guides for making inferences about make and buy strategies.

A third research implication relates to methods. We suspect that the dearth of research on sourcing decisions in legal services is due to the absence of good data and the difficulty in making causal inference. Despite their still relatively short time-series (i.e. seven years) and limited cross-sectional coverage (i.e. Fortune 500 firms), our panel data provide us with advantages relative to single firm case narratives (e.g. Smith, 2001) or one-time cross-sectional surveys (e.g. Schwarcz, 2008).

**Implications for practice**

The findings of this study draw practitioners’ attention to a few, yet important, aspects of the sourcing decisions in legal services. Some of them may appear paradoxical. First, in legal circles, the last two decades have seen vigorous debate on the proper size and scope of work for in-house lawyers. One view championed by the US giant, General Electric (Smith, 2001), argues for substantially increasing the number of in-house lawyers. In-house lawyers are expected to increasingly play a dual role of being a lawyer and a business partner (Green, 2012). The chief legal officer (CLO) is said to be ‘one of the mightiest figures in the C-suite’\(^5\). This is because the 2002 Sarbanes-Oxley Act, the 2010 Dodd-Frank Act and the 2008 financial crisis have heighted the need for compliance and risk management, making companies turn to lawyers to prevent corporate bosses from going to jail and to fend against endless threats of lawsuits. Our study indicates that whilst the power and status of GC may be

on the rise, the resulting trend towards insourcing leads to business benefits only if resource co-specialization benefits are exploited.

Limitations and further research

A number of limitations of this study are worth noting. The first limitation in the analytical framework is self-imposed to simplify the analysis. Plural sourcing in legal services in full manifestation involves multiple sourcing modes (make, buy, ally) from multiple types of providers other than law firms, including LPO providers, legal technology providers, and contract lawyers. By limiting our analysis to the co-existence of ‘make’ and ‘buy’ only from law firms, we did not take into account the impact of the growth of providers other than law firms on the number of law firms and the consequent make-buy balance.

The second limitation lies in available data. Our study links the number of in-house lawyers to the number of outside law firms, not the number of external counsel or hours spent by these lawyers. In an ideal world, we would have better data on internal to external legal personnel or hours worked. We deal with this limitation by including a number of control variables and employing a dynamic panel data estimator.

A third limitation relates to sampling and generalizability. We think our framework and evidence can be generalized to other large, established firms in the US. But this leaves many other firm types where we are reluctant to generalize and advise additional study on make and buy strategies. The discount consumer services purchasing giant, Groupon, was founded in 2008, but did not have a full-time in-house counsel until 2011 when it already operated in 48 countries generating $1.6 billion in annual revenue\(^6\). Groupon’s history suggests that explanation of plural sourcing strategies for legal services in entrepreneurial firms may require quite different frameworks and assumptions.

Conclusion

We began this study by asking how firms develop plural sourcing strategies important to their survival and success. We end it with a call for strategy researchers to continue developing plural sourcing frameworks and evidence relevant to different organizational forms and different product and service producing activities. We chose legal services and demonstrated how such frameworks and evidence could help us understand the relative size of in-house legal departments. Hitherto, strategy scholars have undervalued the analysis of what Porter (1980) and others refer to as “support activities” to the firm. Our study suggests that they can be essential to the firm’s strategy for gaining and maintaining competitive advantage. In this context, we should count all the inside and outside professionals as part of the search for an optimal make and buy mix in corporate functions. Research on firm boundaries will be enriched by placing plural sourcing decisions in corporate functions on a par with vertical (dis)integration decisions for the primary activities of the firm.
REFERENCES


### Table 1. Descriptive statistics and pairwise correlations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Descriptive statistics</th>
<th>Pair-wise correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>St.Dv.</td>
</tr>
<tr>
<td>1) In-house lawyers</td>
<td>5.37</td>
<td>1.10</td>
</tr>
<tr>
<td>2) Internationalization</td>
<td>2.24</td>
<td>1.48</td>
</tr>
<tr>
<td>3) R&amp;D intensity</td>
<td>0.02</td>
<td>0.05</td>
</tr>
<tr>
<td>4) Advertising intensity</td>
<td>0.01</td>
<td>0.03</td>
</tr>
<tr>
<td>5) General counsel on TMT</td>
<td>0.79</td>
<td>0.41</td>
</tr>
<tr>
<td>6) Outside law firms</td>
<td>1.83</td>
<td>0.93</td>
</tr>
<tr>
<td>7) Diversification</td>
<td>0.90</td>
<td>0.36</td>
</tr>
<tr>
<td>8) Debt</td>
<td>0.04</td>
<td>0.07</td>
</tr>
<tr>
<td>9) Profitability</td>
<td>0.16</td>
<td>0.13</td>
</tr>
<tr>
<td>10) Employees</td>
<td>3.67</td>
<td>1.11</td>
</tr>
<tr>
<td>11) SG&amp;A</td>
<td>6.64</td>
<td>2.93</td>
</tr>
<tr>
<td>12) Litigation</td>
<td>0.13</td>
<td>0.44</td>
</tr>
<tr>
<td>13) Acquisitions</td>
<td>0.09</td>
<td>0.33</td>
</tr>
<tr>
<td>14) Bankruptcy</td>
<td>0.00</td>
<td>0.06</td>
</tr>
</tbody>
</table>

N=945, * statistically significant at the 5% level
Table 2. Panel data regression models of corporate legal services make and buy balance

<table>
<thead>
<tr>
<th>Dep. Variable</th>
<th>In-house lawyers</th>
<th>No of lawyers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fixed effects</td>
<td>GMM</td>
</tr>
<tr>
<td>Lagged dep. variable</td>
<td>0.310** (0.000)</td>
<td>0.305** (0.000)</td>
</tr>
<tr>
<td>Explanatory variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No of countries (log)</td>
<td>0.055 (0.818)</td>
<td>0.041** (0.005)</td>
</tr>
<tr>
<td>R&amp;D intensity</td>
<td>2.878* (0.028)</td>
<td>0.770† (0.072)</td>
</tr>
<tr>
<td>Advertising intensity</td>
<td>0.350 (0.778)</td>
<td>2.442* (0.012)</td>
</tr>
<tr>
<td>General counsel in TMT</td>
<td>0.090* (0.034)</td>
<td>0.090† (0.094)</td>
</tr>
<tr>
<td>No of law firms (log)</td>
<td>0.023 (0.112)</td>
<td>0.041† (0.069)</td>
</tr>
<tr>
<td>Control variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product diversification</td>
<td>0.006 (0.937)</td>
<td>0.021 (0.653)</td>
</tr>
<tr>
<td>Debt ratio</td>
<td>-0.139 (0.686)</td>
<td>-0.213 (0.562)</td>
</tr>
<tr>
<td>Profitability</td>
<td>-1.092*** (0.000)</td>
<td>-1.026** (0.037)</td>
</tr>
<tr>
<td>No of employees (log)</td>
<td>-0.344** (0.000)</td>
<td>-0.344** (0.825)</td>
</tr>
<tr>
<td>Selling, general &amp; admin expenses (log)</td>
<td>-0.118** (0.005)</td>
<td>-0.117** (0.204)</td>
</tr>
<tr>
<td>No of litigation cases</td>
<td>-0.028† (0.096)</td>
<td>-0.040* (0.013)</td>
</tr>
<tr>
<td>No of litigation cases_i</td>
<td>-0.021 (0.529)</td>
<td>-0.009 (0.765)</td>
</tr>
<tr>
<td>No of acquisitions</td>
<td>-0.003 (0.911)</td>
<td>-0.012 (0.722)</td>
</tr>
<tr>
<td>No of acquisitions_i</td>
<td>-0.034 (0.270)</td>
<td>-0.035 (0.266)</td>
</tr>
<tr>
<td>Bankruptcy</td>
<td>-0.463* (0.049)</td>
<td>-0.467* (0.045)</td>
</tr>
<tr>
<td>Sales (log)</td>
<td>5.952** (0.000)</td>
<td>5.658** (0.000)</td>
</tr>
<tr>
<td>Constant</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year dummies</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N (number of firms)</td>
<td>945(285)</td>
<td>945(285)</td>
</tr>
<tr>
<td>Wald $r^2$ ($R^2$)</td>
<td>(0.344)</td>
<td>(0.361)</td>
</tr>
<tr>
<td>Arellano-Bond test AR(1)</td>
<td>-3.80** (0.31)</td>
<td>-4.15** (0.23)</td>
</tr>
<tr>
<td>Arellano-Bond test AR(2)</td>
<td>No of instruments</td>
<td>126</td>
</tr>
<tr>
<td>Hansen test</td>
<td>106.2</td>
<td>224.74</td>
</tr>
</tbody>
</table>

$p$-values in parentheses, † $p \leq 10\%$, * $p \leq 5\%$, ** $p \leq 1\%$
Figures 1A-E. Locally-weighted scatter-plot smoothed and comparative bar-chart analyses of in-house lawyer counts

1A: Locally-weighted scatter-plot smoothed and comparative bar-chart analyses of in-house lawyer counts vs. No of countries.

1B: Locally-weighted scatter-plot smoothed and comparative bar-chart analyses of in-house lawyer counts vs. R&D intensity.

1C: Locally-weighted scatter-plot smoothed and comparative bar-chart analyses of in-house lawyer counts vs. Advertising intensity.

1D: Locally-weighted scatter-plot smoothed and comparative bar-chart analyses of in-house lawyer counts vs. No of law firms.

1E: Locally-weighted scatter-plot smoothed and comparative bar-chart analyses of in-house lawyer counts vs. CG in TMT.